

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Virgil Curley, Licensing Assistant
Operating Licensing Branch, R_1

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON
Oct. 21-24, 1996 AT Susquehanna Steam Electric Station
DOCKET #50-387 and 50-388

On Oct. 21-24, 1996 Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

- Item #1 -
 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.
 - b) As given operating examination, designated for distribution under RIDS Code A070.
- Item #2 - Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.



August 16, 1996

USNRC
c/o Ms. Tracy Walker
99 West Seven Stars Road
Spring City, PA 19473

Susquehanna Training Center
Operator Licensing Examination Outline
PLA 4496 File A14-2C

Dear Ms. Walker:

Enclosed is the examination outline for the Susquehanna Steam Electric Station Operator Licensing Examination scheduled for Monday, October 21, 1996. This package is bound and separated by dividers into sections including; simulator, walkthrough administrative type, walkthrough JPM, SRO written, and RO written examination.

Also enclosed, separately, is the interim examination outline quality assurance checklist (Form ES-201-3).

If you have any questions, please contact Art Fitch at (717) 542-3510 or Tom Hunt at (717) 542-3472.

Sincerely,

A. S. Fitch
Operations Training Supervisor

Response: No

Enclosures

cc: W. H. Lowthert
B. R. Stitt
NTG File
Nuc Records-Site

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Susquehanna Steam Electric Station
Operator Licensing Examination Outline

October 21, 1996

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Susquehanna Scenario Set 1

Scenario 1

Initial Conditions: 90% power, APRM A is upscale & bypassed, EHC pump B is tagged OOS

Turnover: Lower reactor power to 75% using recirculation flow, then remove RFPT B from service for maintenance.

<u>Event No.</u>	<u>Type</u>	<u>Description</u>
1.1-1	R	Lower reactor power to 75% using recirculation flow.
1.1-2	N	Remove RFPT B from service
1.1-3	I	HPCI steam leak detection temperature instrument fails high isolating HPCI
1.1-4	C	Loss of instrument air (rupture in reactor building), requires manual scram, and causes the outboard MSIVs to drift closed, loss of air pressure prevents use of the low load valve for feedwater complicating use of condensate
1.1-5	M	LOCA occurs after the MSIVs close, the leak is larger than the capacity of RCIC, CRD, and SLC combined, requires lowering pressure to allow using condensate to recover level

Scenario 2

Initial Conditions: 16% power ready to synchronize the main generator, APRM A is upscale & bypassed, SLC pump B tagged out of service to replace its breaker

Turnover: Synchronize the main generator to the grid and continue increasing reactor power with control rods.

<u>Event No.</u>	<u>Type</u>	<u>Description</u>
1.2-1	N	Synchronize the main generator to the grid.
1.2-2	R	Raise reactor power with control rods.
1.2-3	I	RWM fails blocking further rod motion, must be manually bypassed
1.2-4	C	EHC pump trips, the standby pump won't start
1.2-5	M	Low power ATWS, no EHC for pressure control, PC challenged when steam dumped to pool, must vent scram air header to insert rods
1.2-6	C	SLC pump A seizes when started, requires implementing ES procedure to inject SLC with RCIC

SCENARIO SET NO.: /

Applicant Type	Evolution Type	Number Reqr'd	Scenario Number			
			1	2	3	4
RO	Reactivity	1	1.1-2			
	Normal	1		1.2-1		
	Instrument	2	1.1-3	1.2-3		
	Component	2	1.1-4	1.2-4	1.2-6	
	Major	1	1.1-5			
As RO	Reactivity	1		1.2-2		
	Normal					
	Instrument	1		1.2-3		
	Component	1		1.2-4		
	Major	1		1.2-5		
SRO-I						
As SRO	Reactivity					
	Normal	1	1.1-2			
	Instrument	1	1.1-3			
	Component	1	1.1-4			
	Major	1	1.1-5			
SRO-U	Reactivity					
	Normal	1		1.2-1		
	Instrument	1		1.2-3		
	Component	1		1.2-4	1.2-6	
	Major	1		1.2-5		

NOTE: Enter the scenario set number and Form ES-301-3 event numbers for each evolution type.

Examiner: _____
 Chief Examiner: _____

Note: Set 1 tests two crews of one instant SRO, one upgrade SRO, and one RO.

Susquehanna Scenario Set 2

Scenario 1

Initial Conditions: 100% power, APRM A is upscale & bypassed, CRD pump B is tagged OOS

Turnover: Maintain rated power operations. RCIC monthly pump operability must be completed this shift.

<u>Event No.</u>	<u>Type</u>	<u>Description</u>
2.1-1	C	Loss of feedwater heating
2.1-2	R	Lower reactor power by to 80% due to loss of feedwater heating
2.1-3	N	RCIC monthly pump operability
2.1-4	I	EHC pressure regulator fails swapping to the standby regulator
2.1-5	M	Unisolable steam break in RCIC pump room, fuel failure, requires manual scram and rapid depress, mode switch doesn't cause scram

Scenario 2

Initial Conditions: 50% power, APRM A is upscale & bypassed, RCIC is tagged out of service

Turnover: Continue plant startup, place RFPT A in service

<u>Event No.</u>	<u>Type</u>	<u>Description</u>
2.2-1	N	Place RFPT A in service.
2.2-2	R	Raise power with control rods and recirc in manual
2.2-3	I	APRM C fails downscale (<minimum number of operable channels per trip system)
2.2-4	C	Recirc pump A flow controller fails upscale.
2.2-5	M	LOCA, larger than makeup capacity with HPCI, must lower pressure and recover level with condensate.
2.2-6	C	HPCI flow controller fails low

SCENARIO SET NO.: 2

Applicant Type	Evolution Type	Number Req'd	Scenario Number			
			1	2	3	4
RO	Reactivity	1	2.1-2			
	Normal	1		2.2-1		
	Instrument	2	2.1-4	2.2-3		
	Component	2	2.1-1	2.2-6		
	Major	1	2.1-5	2.2-5		

As RO	Reactivity	1		2.2-2		
	Normal					
	Instrument	1		2.2-3		
	Component	1		2.2-4		
	Major	1		2.2-5		
SRO-I						
As SRO	Reactivity					
	Normal	1	2.1-3			
	Instrument	1	2.1-4			
	Component	1	2.1-2			
	Major	1	2.1-5			

SRO-U	Reactivity					
	Normal	1		2.2-1		
	Instrument	1		2.2-3		
	Component	1		2.2-4	2.2-6	
	Major	1		2.2-5		

NOTE: Enter the scenario set number and Form ES-301-3 event numbers for each evolution type.

Examiner: _____
 Chief Examiner: _____

Note: Set 2 tests one crew of one instant SRO, one upgrade SRO, and one RO.

Set Number	Topic	Level	Subject Description	Method	Description	Description
1	1	R	Refueling	Question	Items the PCO Assigned to Control Room Refueling Activities is required to communicated during a fuel bundle movement to the core (OP-ORF-005, page 11 and 12)	SRM requirements.
1	1	R	Review a Power Plex	Question	Thermal limits.	APRM Gain Adjustment Factors
1	2	R	Motor Operated Valves	Question	Requirements for electrical stroking of MOVs (NDAP-C.A-0302)	Operation of MOVs for leakage control (ON-100-005 page 7)
1	3	R	Dose Limitations	Question	Facility Limits for Exposure	High Radiation Areas
1	4	R	Emergency Notification	JPM	Facility JPM 9 00.126.051 - Control Room Communicator	

Set Number	Topic	Level	Subject Description	Method	Description	Description
2	1	S	Refueling	Question	Technical Specifications - actions on failure to comply with TS.	Refueling SRO required verifications for movement in fuel pool and the core.
2	1	S	Reportability Requirements	JPM	Evaluate and document reportability and contact required individuals in accordance with NDAP-QA-0724.	
2	2	S	Surveillance Time Limit Requirements	Question	Required action when a surveillance is determined to be out of date. (NDAP-QA-0722, page 33 and 35).	A daily surveillance was not completed before your turnover. How long is allowed to complete and how can the time limits be determined (OP-AD-003 page 28, rev. 2.)
2	3	S	High Radiation Areas	Question	Definition and locking requirements.	Radiological requirements for entry into RWCU Holdup room (NDAP-00-0626 page 20).
2	4	S	General Emergency Classification	JPM	Classify a General Emergency and determine required PAR.	

Set Number	Topic	Level	Subject Description	Method	Description	Description
3	1	S	Tagging	Questions	Requirements for operation of components within a permit boundary.	Required action if a component is not returned to normal position on clearing of a permit.
3	1	S	Shift Complement Requirements	Questions	Required Complement - 01-AD-044	Required Actions if unable to maintain complement.
3	2	S	Determine operability of an MSIV Isolation Actuation	JPM	Modify facility JPM 1 722.06.102 to be for Main steam line differential pressure.	
3	3	S	Contamination	Questions	Conditions requiring a CR or EP actions (NDAP-00-0627 page 25, 26, 8) - Ask for the criteria for CR.	When an RWP's required based on contamination levels. (NDAP-00_0626 page 26)
3	4	S	Medical Emergency	Questions	Access by emergency teams (NDAP-00-626 page 26)	Required actions for a contaminated individual to be transported off-site

Facility: Susquehanna 1 and 2

Exam Week of 4/21/96

SET NUMBER: 1

JPM Title: Reset Recirculation Pump Limite. #2 Runback IAW OP-164-001

OP-164-001

Source: Bank Facility Number: 64.OP.004.102

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Conditions that will cause the runback and basis.

KA #1: 202002K402 RO 3.0 SRO 3.0

Question 2: Limitations in raising flow in other loop if cannot reset runback.

KA#2: 202002G005 RO 3.3 SRO: 3.4

JPM Title: Perform a RCIC System Manual Startup Component by Component with a CNTRL Malfunction IAW OP-150-001

OP-150-001

Source: Bank Facility Number: 1.50.102.151

Safety Function: 2 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: RCIC response to a steam line break in steam tunnel for Unit 2.

KA #1: 217000K107 RO 3.1 SRO 3.2

Question 2: When the manual isolation switch will isolate the system and what actions occur.

KA#2: 217000A404 RO 3.6 SRO: 3.6

JPM Title: Reopen MSIV's and MSL Drain Isolations to vent the RPV

ES-184-002, section 4.9

Source: New Facility Number:

Safety Function: 3 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Mode switch interlocks with the MSIVs

KA #1: 239001K127 RO 4.0 SRO 4.1

Question 2: Indications of a failed disk on an MSIV

KA#2: 239001A210 RO 3.8 SRO: 3.9

JPM Title: Restore RHR in Shutdown Cooling IAW OP-149-002

OP-149-002, page 46, section 3.5.7.

Source: New Facility Number:

Safety Function: 4 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Isolation signals for Shutdown Cooling.

KA #1: 205000K403 RO 3.8 SRO 3.8

Question 2: Interlocks to prevent draining the vessel

KA#2: 205000K102 RO 3.6 SRO: 3.6

SET NUMBER: 1

JPM Title: Recovery from Automatic Shifting of Chilled Water to RBCCW for Containment Cooling (except RWCU restoration).

OP-134-001, Section 3.7, OP-114-001, Sec

Source: New Facility Number:

Safety Function: 5 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Signals that can cause the shift.

KA #1: 290001K101 RO 3.3 SRO 3.5

Question 2: What conditions will isolate cooling water to the containment coolers.

KA#2: 290002K306 RO 3.1 SRO: 3.1

JPM Title: Synchronize D/G "A" with the grid to restore normal power to 4.16 KV bus 1A

OP-024-001

Source: Bank Facility Number: 264.012.01

Safety Function: 6 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Voltage Regulator Operation in Manual and Automatic

KA #1: 264000A403 RO 3.2 SRO 3.4

Question 2: Effect of tripping on train of core spray logic.

KA#2: 264000K408 RO 3.8 SRO: 3.7

JPM Title: Respond to a Loss of Recirc Drive Flow Instrument

ON-164-001

Source: Bank Facility Number: 64.ON.001.001

Safety Function: 7 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Simulator

Question 1: Cause of the flow reference off-normal alarm and how is it functional after the evolution.

KA #1: 215005G005 RO 3.6 SRO 3.6

Question 2: Identify the applicable Technical Specifications

KA#2: 215005G005 RO 3.3 SRO: 3.4

JPM Title: Place RHR SPC in Suppression Pool Cooling using RHR Pump 1P202B at RSDP

OP-149-005

Source: Bank Facility Number: 1.49.505.101

Safety Function: 5 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Plant (Simulator)

Question 1: Normal response of RHR to a LPCI signal when in SPC.

KA #1: 219000A214 RO 4.1 SRO 4.3

Question 2: Tech Spec entry conditions for Suppression Pool Temperature

KA#2: 223001G005 RO 3.3 SRO: 4.1

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

SET NUMBER: 1

JPM Title: Hydraulically remove a HCU from service

OP-155-001

Source: Bank Facility Number: 201.012.02

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Plant

Question 1: How the mechanism is damaged if valve order is not followed?

KA #1: 201003G010 RO 3.2 SRO 3.2

Question 2: Effect of low nitrogen pressure during startup

KA#2: 201003A208 RO 3.8 SRO: 3.7

JPM Title: Place the vital AC uninterruptible power supply in service

OP-157-001

Source: Bank Facility Number: 262.003.01

Safety Function: 6 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 1 Location: Plant

Question 1: Power supplies to the inverter.

KA #1: 262001K104 RO 3.1 SRO 3.4

Question 2: Transfer sequence between power supplies.

KA#2: 262001K304 RO 3.1 SRO: 3.3

SET NUMBER: 2

JPM Title: Reset Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path) OP-164-001.

Source: Bank Facility Number: 64.OP.004.152

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Conditions that will cause the runback and basis.

KA #1: 202002K402 RO 3.0 SRO 3.0

Question 2: Limitations in raising flow in other loop if cannot reset runback.

KA#2: 202002G005 RO 3.3 SRO: 3.4

JPM Title: Perform a HPCI Manual Startup, Component by Component, in accordance with OP-152-002

Source: Bank Facility Number: 1.52.125.102

Safety Function: 2 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Effect of starting up in automatic with the flow controller set below min. flow valve close setpoint.

KA #1: 206000A203 RO 3.5 SRO 3.5

Question 2: Basis for prohibiting HPCI startup above 26' in the suppression pool.

KA#2: 206000K106 RO 3.7 SRO: 3.7

JPM Title: Reopen MSIV's and MSL Drain Isolations ES-184-002, section 4.8

Source: New Facility Number:

Safety Function: 3 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: RPV parameter that will isolate Main Steam and Cont. Inst. Gas. (Include Setpoints)

KA #1: 239001K401 RO 3.8 SRO 3.8

Question 2: Low Condenser Vacuum Bypass

KA#2: 239001A208 RO 3.6 SRO: 3.6

JPM Title: Transfer from Shutdown Cooling Mode to LPCI Injection Mode OP-149-002, page 55, rev. 22.

Source: Bank Facility Number: 215.015.02

Safety Function: 4 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Determine time to reach 200F on a loss of cooling.

KA #1: 295021A201 RO 3.5 SRO 3.6

Question 2: Applicable TS for LPCI/Shutdown Cooling

KA#2: 205000G005 RO 3.1 SRO: 3.9

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

SET NUMBER: 2

JPM Title: Venting Suppression Chamber within Offsite Release Limits

ES-173-001, Section 4.3.

Source: Bank Facility Number: 73.EO.001.102

Safety Function: 5 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Condition that would require venting the drywell instead of the suppression pool.

KA #1: 223001A302 RO 3.4 SRO 3.4

Question 2: Conditions that would require terminating this evolution.

KA#2: 223001G010 RO 3.2 SRO: 3.6

JPM Title: Perform a transfer of DG "E" in accordance with OP-024-004

OP-024-004

Source: Bank Facility Number: 264.023.01

Safety Function: 6 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Diesel Technical specifications

KA #1: 264000G005 RO 3.4 SRO 4.1

Question 2: Response of DG "E" to a LOCA when running for a test

KA#2: 264000A210 RO 3.7 SRO: 4.1

JPM Title: Restore Reactor Building Ventilation following a loss of RPS. (Existing JPM 200.054.01 may cover part of the evolution)

ON-158-001, page 11, rev. 3.

Source: New Facility Number:

Safety Function: 9 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Simulator

Question 1: Technical Specifications for a failed isolation damper.

KA #1: 290001G005 RO 3.3 SRO 4.2

Question 2: Isolation sequence for Zones 1 and 2

KA#2: 290001K601 RO 3.5 SRO: 3.6

JPM Title: Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) from RSDP

OP-150-001

Source: Bank Facility Number: 1.50.111.102

Safety Function: 2 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Plant (Simulator)

Question 1: What initiated room cooling.

KA #1: 217000A213 RO 2.9 SRO 3.0

Question 2: Why is it necessary to ensure that the Topaz Inverter is energized.

KA#2: 217000K203 RO 2.7 SRO: 2.8

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

SET NUMBER: 2

JPM Title: Shift the CRD Flow Control Stations from A to B

OP-155-001

Source: Bank Facility Number: 201.025.01

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Plant

Question 1: Effects on Venting Scram Air Header on Driving Control Rods

KA #1: 201001K602 RO 3.0 SRO 2.9

Question 2: Flow rate through the FCV on a Scram and reason.

KA#2: 201001K412 RO 2.9 SRO: 2.9

JPM Title: Fire Protection System Crossie to RHRSW (At the ESW Pump House)

ES-013-001

Source: Bank Facility Number: 9.13.001.102

Safety Function: 8 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 2 Location: Plant

Question 1: Response of the fire protection system to initiation at a specific flow.

KA #1: 286000A301 RO 3.4 SRO 3.4

Question 2: Describe the flow path from the source to the core for using fire water for core cooling.

KA#2: 286000A105 RO 3.2 SRO: 3.2

SET NUMBER: 3

JPM Title: Reset a Fluid Drive Scoop Tube Lock in accordance with OP-164-001

OP-164-001

Source: Bank Facility Number: 64.OP.007.101

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number: 3 Location: Simulator

Question 1: When is the error limiting network not effective

KA #1: 202002A205 RO 3.1 SRO 3.1

Question 2: ECC-RPT Technical Specifications

KA#2: 202002G005 RO 3.3 SRO: 3.4

JPM Title: Override an inadvertent start of the HPCI system in accordance with OP-152-001

OP-152-001

Source: Bank Facility Number: 206.017.51

Safety Function: 2 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: Effect of starting up in automatic with the flow controller set below min. flow valve close setpoint.

KA #1: 206000A203 RO 3.5 SRO 3.5

Question 2: Basis for prohibiting HPCI startup above 26' in the suppression pool.

KA#2: 206000K106 RO 3.7 SRO: 3.7

JPM Title: Prepare to reopen MSIV's and MSL Drain Isolation Valves

ES-184-002, section 4.2

Source: New Facility Number:

Safety Function: 3 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: Isolation Signals and Setpoints

KA #1: 239001K401 RO 3.8 SRO 3.8

Question 2: Power supplies to the solenoids on MSIVs

KA#2: 239001K201 RO 3.2 SRO: 3.3

JPM Title: Transfer from Shutdown Cooling Mode to LPCI Injection Mode

OP-149-002, page 55, rev. 22.

Source: Bank Facility Number: 215.015.02

Safety Function: 4 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: Determine time to reach 200F on a loss of cooling.

KA #1: 295021A201 RO 3.5 SRO 3.6

Question 2: Applicable TS for LPCI/Shutdown Cooling

KA#2: 205000G005 RO 3.1 SRO: 3.9

SET NUMBER: 3

JPM Title: Alternate Containment Spray: RHR-RHRSW Using Unit 1 or Unit 2, RHRSW pump OP-116-001, page 36, rev. 19

Source: New Facility Number:

Safety Function: 5 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: Effect of the spray valve tripping after initiation of spray.

KA #1: 226001A218 RO 3.3 SRO 3.5

Question 2: Maximum suppression pool level that drywell spray can be used

KA#2: 226001G010 RO 3.2 SRO: 3.4

JPM Title: Manually synchronize Diesel Generator "A" to 4.16 KV bus 2A OP-024-001

Source: Bank Facility Number: 264.003.02

Safety Function: 6 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: Response to a loss of off site following this evolution.

KA #1: 264000K407 RO 3.3 SRO 3.4

Question 2: Method of performing an emergency stop.

KA#2: 264000G009 RO 3.8 SRO: 3.9

JPM Title: Restore Reactor Building Ventilation following a loss of RPS. (Existing JPM ON-158-001, page 11, rev. 3 (Steps 12.2-1 200.054.01 may cover part of the evolution)

Source: New Facility Number:

Safety Function: 9 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Simulator

Question 1: SBTG Technical Specifications

KA #1: 261000G005 RO 3.0 SRO 4.1

Question 2: Isolation sequence for Zones 1 and 2

KA#2: 290001K601 RO 3.5 SRO: 3.6

JPM Title: Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) from the RSDP OP-150-001 using Trip and Throttle Valve

Source: Bank Facility Number: 50.OP.004.152

Safety Function: 2 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Plant (Simulator)

Question 1: What initiated room cooling.

KA #1: 217000A213 RO 2.9 SRO 3.0

Question 2: Why is it necessary to ensure that the Topaz Inverter is energized.

KA#2: 217000K203 RO 2.7 SRO: 2.8

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

SET NUMBER: 3

JPM Title: Initiate Boron Injection using RCIC

ES-150-002

Source: Bank Facility Number: 200.056.02

Safety Function: 1 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Plant

Question 1: RCIC trips that could prevent injection of boron.

KA #1: 217000A202 RO 3.8 SRO 3.7

Question 2: Why operating the pumps locally would not cause injection of SLC?

KA#2: 211000A101 RO 3.6 SRO: 3.7

JPM Title: Startup a 125 VDC Battery Charger

OP-188-001

Source: Bank Facility Number: 263.011.02

Safety Function: 6 Alternate Path: Shutdown/Low Power: Emergency/Abnormal Outside CR: RCA Entry:

Set Number 1: 3 Location: Plant

Question 1: Effect of loss of loss of Battery Bank A or B on Alternate Control Power Breakers

KA #1: 263000K401 RO 3.1 SRO 3.4

Question 2: Effects of Securing Equipment Early or Late on LOOP.

KA#2: 263000A403 RO 2.7 SRO: 2.8

SRO KA Summary Report

10-Aug-96

Section Title	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOTAL
Plant Wide Generics	0	5	0	0	0	0	0	12	0	0	0	0	17
		Plant Wide Generics											17
Plant Systems	1	2	1	0	7	1	0	0	5	4	0	3	23
Plant Systems	2	0	3	1	4	1	0	4	1	1	2	4	21
Plant Systems	3	0	0	0	0	0	1	0	2	1	0	0	4
		Plant Systems											48
Emergency and Abnormal Plant Evolutions	1	2	5	3	0	0	0	4	4	0	0	10	28
Emergency and Abnormal Plant Evolutions	2	0	3	2	0	0	0	4	3	0	0	4	16
		Emergency and Abnormal Plant Evolutions											44
		Grand Total:											109

SRO KA List Report
Plant Wide Generics

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	RO Group	Exam Level
	294001A101	2.9	3.4	Ability to obtain and verify control procedure copy	Method of verifying that procedures that have changes are complete and current.		S
	294001A102	4.2	4.2	Ability to execute procedural steps	Activities that can be performed without reference to the procedure.		B
	294001A102	4.2	4.2	Ability to execute procedural steps	Procedures that allow steps to be performed out of order.		B
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	Permission required to voluntarily enter Technical Specification LCO 3.0.3		B
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	Control Room command function with Shift Supervisor absent.		S
	294001A105	3.4	3.8	Ability to make accurate, clear, and concise verbal reports	Definition of "Promptly Reparable"		S
	294001A106	3.4	3.6	Ability to maintain accurate, clear and concise logs, records, status boards and reports	Aborted Evolution Control Log requirements. Refuel Supervisor and Refuel Manager duties during operations key activities.		B
	294001A112	3.5	4.2	Ability to direct personnel activities outside the control room			S
	294001A115	3.2	3.4	Ability to use plant computer to obtain and evaluate parametric information on system and component status	Color coding on the SPDS system.		B
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	Who fills the roll of the control room communicator?		B
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	Action for immediately entering and exiting an Emergency Action Level.		S
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	Site Accountability is required to be performed at the Alert level for which of the following conditions?		S
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	Control of Bypass		S
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	Use of Status Control Tags.		B
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	Dose limits		B
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	Maximum elevation for personnel access when moving fuel from vessel.		S
	294001K116	3.5	3.8	Knowledge of facility protection requirements, including fire brigade and portable fire-fighting equipment usage	Fire Brigade Leader		S

SRO KA List Report
Plant Systems
Senior Reactor Operator Group 1

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	RO Group	Exam Level
Recirculation Flow Control	202002G010	3.3	3.3	Ability to explain and apply all system limits and precautions	Personnel limitations placed on local operation of the scoop tube.	1	B
Recirculation Flow Control	202002K403	3	3	Signal failure detection: Plant-Specific	Effect of low control signal on the recirculation pumps	1	S
RHR/LPCI: Injection Mode	203000A214	3.8	3.9	Initiating logic failure	Effect of a single logic train operating.	1	B
RHR/LPCI: Injection Mode	203000A301	3.8	3.7	Valve operation	Response to a LOCA signal while in the test mode.	1	B
High Pressure Coolant inject.	206000K402	3.9	4	System isolation: BWR-2,3,4	Vacuum breaker isolation conditions	1	B
Low Pressure Core Spray	209001A201	3.4	3.4	Pump trips	Effects of LOCA signal from opposite unit on Core Spray Pumps.	1	B
Standby Liquid Control	211000G006	3.1	4.2	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits	Discharge relief valve open on running pump what plant condition cannot be assured.	1	S
Reactor Protection	212000G005	3.8	4.5	Knowledge of limiting conditions for operations and safety limits	SDV Technical Specifications	1	S
Reactor Protection	212000K412	3.9	4.1	Bypassing of selected SCRAM signals (manually and automatically): Plant-Specific	Reactor power is at 8% during a reactor startup. What condition will cause a scram?	1	B
Average Power Range Monitor/Local Power Range Monitor	215005A308	3.7	3.6	Control rod block status	Recirculation flow comparators and upscale rod blocks.	1	B
Average Power Range Monitor/Local Power Range Monitor	215005K401	3.7	3.7	Rod withdrawal blocks	Effect of bypassing more than the maximum LPRMs to an APRM	1	B
Nuclear Boiler Instrumentation	216000A211	3.2	3.3	Heatup or cooldown of the reactor vessel	Temperature effects on Fuel Zone instrumentation.	1	B
Reactor Core Isolation Cooling	217000K201	2.8	2.8	Motor operated valves	Effect on operation of RCIC if F059 open indication is lost.	1	S
Automatic Depressurization	218000K403	3.8	4	ADS logic control	Response of the ADS logic to level, time and available ECCS.	1	B
Primary Containment and Aux.	223001K103	3.2	3.3	Containment/drywell atmosphere control	Automatic operation of the Containment Cooling ventilation fans.	1	B
Reactor Water Level Control	259002A203	3.6	3.7	Loss of reactor water level input	Failure of reactor water level instrument	1	B
AC Electrical Distribution	262001A211	3.2	3.6	Degraded system voltages	Response of ESS bus to low voltage and manual closure of breakers.	2	B
AC Electrical Distribution	262001A302	3.2	3.3	Automatic bus transfer	RPS bus automatic transfers.	2	B
AC Electrical Distribution	262001A304	3.4	3.6	Load sequencing	Load sequencing times	2	B

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Emergency Generators	264000K104	3.2	3.3	Emergency generator cooling water system	Diesel operation without ESW limitations.	1	B
Emergency Generators	264000K402	4	4.2	Emergency generator trips (emergency/LOCA)	Trips during emergency operation.	1	B
Emergency Generators	264000K407	3.3	3.4	Local operation and control	Effect of resetting the local annunciators during shutdown.	1	B
Emergency Generators	264000K506	3.4	3.5	Load sequencing	ESW Pump loading following a LOCA.	1	B

SRO KA List Report
Plant Systems
Senior Reactor Operator Group 2

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	Q Group	Exam Level
Control Rod Drive Hydraulic	201001A102	2.9	2.9	CRD cooling water header pressure	Effects of an adjustment of drive header flow.	1	S
Control Rod Drive Hydraulic	201001K203	3.5	3.6	Backup SCRAM valve solenoids	What will prevent the backup scram valves from venting the scram air header.	1	B
Control Rod Drive Hydraulic	201001K303	3.1	3.2	Control rod drive mechanisms	Effect of a scram inlet valve failing to open on a SCRAM.	1	B
Reactor Manual Control	201002G010	3.9	3.9	Ability to explain and apply all system limits and precautions Knowledge of limiting conditions for operations and safety	Action required if a rod that is withdrawn 2 notches beyond rod sheet position.	1	B
Rod Sequence Control	201004G005	3.4	4.1	limits	Determine required actions for bypassed rod.	2	S
Recirculation	202001A109	3.3	3.3	Recirculation pump seal pressures	Indications of seal failure.	2	B
Recirculation	202001A214	3.9	4.2	Specific High reactor pressure (ATWS circuitry initiation): Plant-	Conditions that will cause an ATWS trip.	2	B
Recirculation System (RHR Shutdown Cooling Mode)	202001G010	3.5	3.7	Ability to explain and apply all system limits and precautions	Pump starting limitations.	2	B
Recirculation System (RHR Shutdown Cooling Mode)	205000K202	2.5	2.7	Motor operated valves	RPS swing bus loads	2	B
Rod Position Information	205000K403	3.8	3.8	Low reactor water level: Plant-Specific	Shutdown Cooling Isolation Signal	2	B
Rod Block Monitor Intermediate Range Monitor	214000A402	3.8	3.8	Control rod position	Positive determination of rod position following loss of SiP or CRT SDS 4 Rod position displays.	2	B
Rod Block Monitor Intermediate Range Monitor	215002A304	3.6	3.5	Verification of proper functioning/ operability: BWR-3,4,5	Determination of RBM setpoints based on flow and APRM bypass switch positions.	2	B
Rod Block Monitor Intermediate Range Monitor	215003A407	3.6	3.6	Verification of proper functioning/ operability	Give the overlap data that was observed and ask what the required action is?	1	S
Rod Block Monitor Intermediate Range Monitor	215003K401	3.7	3.7	Rod withdrawal blocks	IRM rod blocks and scram.	1	B
Fuel Handling Equipment	234000K502	3.1	3.7	Fuel handling equipment interlocks	Refuel Bridge Interlocks	3	B
MSIV Leakage	239003K406	3.1	3.3	The depressurization of main steam piping prior to routing leakage through system: BWR-4,5,6	Conditions to enable the Inboard Main Steam Isolation Valve Leakage Control System blower to start.	3	B
Reactor Feedwater	259001A104	2.8	2.7	RFP turbine speed: Turbine-Driven-Only	Turbine speed control operation.	1	B
DC Electrical Distribution	263000A101	2.5	2.8	Battery charging/discharging rate	Capacity of the 125 VDC batteries.	2	B

SRO KA List Report

Knowledge of limiting conditions for operations and safety

DC Electrical Distribution	263000G005	3.1	3.8 limits	Operability determination for 125 VDC.	2	S
DC Electrical Distribution	262200K201	3.1	3.4 Major D.C. loads	Power supply to Control Room Annunciators	2	B
Control Room HVAC	290003K401	3.1	3.2 System initiations/reconfiguration: Plant-Specific	CREOASS response to initiation signal.	2	B

SRO KA List Report
 Plant Systems
 Senior Reactor Operator Group 3

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	RO Group	Exam Level
Traversing In-Core Probe	215001A207	3.4	3.7	Failure to retract during accident conditions: Mark-I&II(Not-BWR1)	Required actions to withdraw a TIP if an isolation signal is not generated.	3	B
Main and Reheat Steam	239001K609	3.9	4.1	PCIS/NSSSS	A leak has occurred on the line to feedpumps. What signal will cause the MSIVs to close?	2	B
Plant Ventilation Reactor Vessel Internals	288000A301	3.8	3.8	Isolation/initiation signals	Start signals for the RHR/CS fan cooler and cooling source	3	B
	290002A204	3.7	4.1	Excessive heatup/cooldown rate	Maximum allowable heatup rate as allowed by GO-100-002.	3	S

SRO KA List Report
Emergency and Abnormal Evolutions
Senior Reactor Operator Group 1

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	RO Group	Exam Level
Partial or Complete Loss of Forced Core Flow Circulation	295001A201	3.5	3.8	Power/flow map	Required action on a recirculation runback that places in region 1 of the Power to Flow Map.	2	B
Partial or Complete Loss of Forced Core Flow Circulation	295001G003	3.2	4.1	Knowledge of limiting conditions for operations and safety limits	Safety limit that may be violated on core instability.	2	S
Partial or Complete Loss of Forced Core Flow Circulation	295001G004	2.8	3.7	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits	Technical Specification entry condition for single loop operation.	2	B
Partial or Complete Loss of Forced Core Flow Circulation	295001K306	2.9	3	Core flow indication	Determine the total core flow rate in single loop.	2	B
Loss of Main Condenser Vacuum	295002K301	3.7	3.8	Reactor SCRAM: Plant-Specific	When a reactor scram will occur without any operator action (low power).	2	B
Part/Complete Loss of AC Power	295003A102	4.2	4.3	Emergency generators	How long diesels can operate without ESW.	2	S
Part/Complete Loss of AC Power	295003A103	4.4	4.4	Systems necessary to assure safe plant shutdown	How HPCI and RCIC should be used during a station blackout.	2	B
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	Purpose of sequence and time delays used in starting loads in EC-000-031.	2	S
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	Effects of a sustained loss of 4KV ESS bus 1D on the drywell.	2	B
Part/Complete Loss of AC Power	295003G007	3.2	3.6	Ability to explain and apply all system limits and precautions	Time limits and basis for securing Lube Oil Pumps	2	S
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	HPCI component affected by loss of 480 volt power supply	2	B
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	Available indications of a leaking SRV during a station blackout.	2	B
Part/Complete Loss of AC Power	295003K306	3.7	3.7	Containment isolation	Effects of a loss of ESS Bus 1A on PCIS.	2	B

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Part/Complete Loss of DC Power	295004K203	3.3	3.3 D.C. bus loads	Affect on diesel generator by a loss of 125 VDC power	2	B
SCRAM	295006G010	4.1	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	Required action for three rods at positions greater than 00 and an EOP entry on low RPV level	1	B
SCRAM	295006G012	3.8	4.4 Ability to utilize symptom based procedures	Requirement for use of ON-100-101.	1	B
High Reactor Pressure	295007G011	4.1	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	Required action if an SRV opens at power due to pressure.	1	B
High Reactor Water Level	295008K206	3.4	3.6 RCIC: Plant-Specific	Required actions to restart RCIC after a high level shutdown	2	B
Low Reactor Water Level	295009G008	3.6	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	Technical Specification Leakage Limits	1	B
Low Reactor Water Level	295009K202	3.9	3.9 Reactor water level control	Vessel level control conditions that can result in low level.	1	B
Inadvertent Reactivity Add.	295014G010	4	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	Required actions on a loss of feedwater heating	1	B
Inadvertent Reactivity Add.	295014K104	3	3.4 PCIOMR: Plant-Specific	Reason for reducing power by 20%.	1	B
Power Above APRM DownScale or Incomplete SCRAM	295015G011	4.2	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	What conditions constitute determination that the reactor will remain shutdown during all conditions. What mechanism is being used to close the MSIVs if they are not closed before evacuating the control room.	1	B
Control Room Abandonment	295016A101	3.8	3.9 RPS		2	B
Control Room Abandonment	295016A108	4	4 Reactor pressure	Location of where ADS valves can be operated.	2	B
Control Room Abandonment	295016A203	4.3	4.4 Reactor pressure	How reactor pressure will be controlled following control room evacuation with all actions taken	2	B
Part/Complete Loss of Component Cooling Water	295018K101	3.5	3.6 Effects on component/system operations	How a Main steam isolation can result from loss of RBCCW.	2	B
Part/Complete Loss Instrument Air	295019G010	3.7	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	Conditions requiring a scram on a loss of instrument air. (Possibly including basis)	2	B

SRO KA List Report
Emergency and Abnormal Evolution
Senior Reactor Operator Group 2

Title	K/A	RO Value	SRO Value	KA Statement	Question Stem	RO Group	Exam Level
Loss of Shutdown Cooling	295021A206	3.2	3.3	Reactor pressure	Definition of alternate heat removal method.	3	S
Loss of Shutdown Cooling	295021K203	3.6	3.6	RHR/shutdown cooling	Available Shutdown Cooling loops on a loss of RPS.	3	B
Loss of CRD Pumps	295022A201	3.5	3.6	Accumulator pressure	Requirement to scram the reactor on loss of CRD.	2	B
Refueling Accidents	295023G001	3.3	4.2	Knowledge of system status criteria which require the notification of plant personnel	Required action for a refuel floor high exhaust radiation.	3	B
Refueling Accidents	295023G008	3.2	3.9	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	Technical Specification Entry condition on Fuel Pool Low Level.	3	B
High Drywell Pressure	295024K215	3.8	3.9	Containment spray logic: Plant-Specific	Drywell spray logic.	1	B
High Reactor Pressure	295025A103	4.4	4.4	Safety/relief valves: Plant-Specific	With an SRV cycling what action should be taken.	1	B
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	Use of vortex limits.	2	B
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	Suppression pool level that requires a scram.	2	S
Reactor Low Water Level	295031A102	4.5	4.5	High pressure (feedwater) coolant injection: Plant-Specific	Interlocks that can be bypassed in RPV Control.	1	S
Reactor Low Water Level	295031A201	4.6	4.6	Reactor water level	Temperature effects on the usability of RPV water level instruments	1	B
Reactor Low Water Level	295031K303	4.1	4.1	Spray cooling	Basis for reducing level per step LQ/L-6 of Level Power Control	1	S
High Secondary Containment Area Temperature	295032A104	3.3	3.4	Fire protection system	Indications available that temperature on 749' exceeds 149 F and affect on level indication.	3	S

SRO KA List Report

High Secondary Containment Area Temperature	295032A105	3.7	3.9 Affected systems so as to isolate damaged portions	Systems that can be secured to protect the secondary containment.	3	S
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K209	4	4.2 Reactor water level	Level band during a failure to scram and use of the target band.	1	S
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K306	3.8	4.1 Maintaining heat sinks external to the containment	Opening and bypassing interlocks for the Main Steam Isolation valves during a failure to scram.	1	S

RO KA Summary Report (Summary)

10-Aug-96

Section Title	RO Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G0	TOTAL
Plant Wide Generics	0	4	0	0	0	0	0	9	0	0	0	0	13
		Plant Wide Generics											13
Plant Systems	1	3	2	1	8	1	0	2	6	2	2	2	29
Plant Systems	2	0	2	0	3	2	1	2	4	3	1	1	19
Plant Systems	3	0	0	0	1	1	0	0	2	1	0	0	5
		Plant Systems											53
Emergency and Abnormal	1	1	2	0	0	0	0	2	1	0	0		13
Emergency and Abnormal	2	1	4	3	0	0	0	4	4	0	0		21
Emergency and Abnormal	3	1	1	0	0	0	0	0	0	0	0	2	4
		Emergency and Abnormal Plant Evolutions											38
		Grand Total:											104

RO KA List Report Information

Plant Wide Generics

System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
	294001A102	4.2	4.2	Ability to execute procedural steps	Definition of "Confirm."		R
	294001A102	4.2	4.2	Ability to execute procedural steps	Procedures that allow steps to be performed out of order.		B
	294001A102	4.2	4.2	Ability to execute procedural steps	Activities that can be performed without reference to the procedure.		B
	294001A103	2.7	3.7	station directives related to shift staffing and activities	Permission required to voluntarily enter Technical Specification LCO 3.0.3		B
	294001A103	2.7	3.7	station directives related to shift staffing and activities	Temporary absence from the ATC by the Plant Control Operator.		R
	294001A106	3.4	3.6	concise logs, records, status boards and reports	Aborted Evolution Control Log requirements.		B
	294001A115	3.2	3.4	evaluate parametric information on system and component status	Color coding on the SPDS system.		B
	294001A116	2.9	4.7	Facility Emergency Plan, including (if required) supporting or acting as the	Who fills the roll of the control room communicator?		B
	294001A116	2.9	4.7	Facility Emergency Plan, including (if required) supporting or acting as the	When accountability is required to be performed.		R
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	Operation of an MOV for protective blocking.		R
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	Use of Status Control Tags.		B
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	Dose limits		B
	294001K116	3.5	3.8	requirements, including fire brigade and portable fire-fighting equipment usage	Expected information for a fire report.		R

RO KA List Report Information

Plant Systems							
Reactor Operator Group 1							
System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
Control Rod Drive Hydraulic	201001K203	3.5	3.6	Backup SCRAM valve solenoids	What will prevent the backup scram valves from venting the scram air header.	2	B
Control Rod Drive Hydraulic	201001K303	3.1	3.2	Control rod drive mechanisms	Effect of a scram inlet valve failing to open on a SCRAM.	2	B
Reactor Manual Control	201002G010	3.9	3.9	Ability to explain and apply all system limits and precautions	Action required if a rod that is withdrawn 2 notches beyond rod sheet position.	2	B
Recirculation Flow Control	202002G010	3.3	3.3	Ability to explain and apply all system limits and precautions	Personnel limitations placed on local operation of the scoop tube.	1	B
Recirculation Flow Control	202002K103	3.7	3.7	Reactor core flow	Effect on core flow by inserting control rods at 100%.	1	R
RHR/LPCI: Injection Mode	203000A214	3.8	3.9	Initiating logic failure	Effect of a single logic train operating.	1	B
RHR/LPCI: Injection Mode	203000A301	3.8	3.7	Valve operation	Response to a LOCA signal while in the test mode.	1	B
High Pressure Coolant Inject.	206000A413	4.1	4	Turbine reset control: BWR-2,3,4	Method of shutting down HPCI.	1	R
High Pressure Coolant Inject.	206000K402	3.9	4	System isolation: BWR-2,3,4	Vacuum breaker isolation conditions	1	B
Low Pressure Core Spray	209001A201	3.4	3.4	Pump trips	Effects of LOCA signal from opposite unit on Core Spray Pumps.	1	B
Low Pressure Core Spray	209001K404	3	3.2	Line break detection	Indications of a break using the CS leak detection system.	1	R
Standby Liquid Control	211000A101	3.6	3.7	Tank level	Level effects during operation. Effect of air on determination of when to secure SLC injection.	1	R
Reactor Protection	212000A214	3.9	4	High SCRAM instrument volume water level	Scram Discharge Volume scram logic.	1	R
Reactor Protection	212000A219	3.8	3.9	Partial system activation (half-SCRAM)	Transferring of power supplies and a failed group fuse on the transfer.	1	R
Reactor Protection	212000K412	3.9	4.1	(manually and automatically): Plant-Specific	Reactor power is at 8% during a reactor startup. What condition will cause a scram?	1	B
Intermediate Range Monitor	215003A407	3.6	3.6	Verification of proper functioning/ operability	Overlap with the SRMs.	2	R

RO KA List Report Information

Intermediate Range Monitor	215003K401	3.7	3.7	Rod withdrawal blocks	IRM rod blocks and scram.	2	B
Range Monitor/Local Power	215005A308	3.7	3.6	Control rod block status	Recirculation flow comparators and upscale rod blocks.	1	B
Range Monitor/Local Power	215005K202	2.6	2.8	APRM channels	Power supplies to the APRMs.	1	R
Range Monitor/Local Power	215005K401	3.7	3.7	Rod withdrawal blocks	Effect of bypassing more than the maximum LPRMs to an APRM	1	B
Nuclear Boiler Instrumentation	216000A211	3.2	3.3	Heatup or cooldown of the reactor vessel	Temperature effects on Fuel Zone instrumentation.	1	B
Automatic Depressurization	218000K403	3.8	4	ADS logic control	Response of the ADS logic to level, time and available ECCS.	1	B
Containment and Aux.	223001K103	3.2	3.3	Containment/drywell atmosphere control	Automatic operation of the Containment Cooling ventilation fans.	1	B
Reactor Feedwater	259001A104	2.8	2.7	RFP turbine speed: Turbine-Driven-Only	Turbine speed control operation.	2	B
Reactor Water Level Control	259002A203	3.6	3.7	Loss of reactor water level input	Failure of reactor water level instrument	1	B
Emergency Generators	264000K104	3.2	3.3	Emergency generator cooling water system	Diesel operation without ESW limitations.	1	B
Emergency Generators	264000K402	4	4.2	Emergency generator trips (emergency/LOCA)	Trips during emergency operation.	1	B
Emergency Generators	264000K407	3.3	3.4	Local operation and control	Effect of resetting the local annunciators during shutdown.	1	B
Emergency Generators	264000K506	3.4	3.5	Load sequencing	ESW Pump loading following a LOCA.	1	B

RO KA List Report Information

Plant Systems							
Reactor Operator Group 2							
System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
Rod Sequence Control	201004A201	3.3	3.6	Loss of rod position information: BWR-4,5	RSCS actions if two reed switches are bad	2	R
Rod Worth Minimizer	201006K509	3.2	3.2	Select error: P-Spec(Not-BWR6)	Effects of selecting incorrect rod.	2	R
Rod Worth Minimizer	201006K514	3	3	Alternate withdraw and insert limits: P-Spec(Not-BWR6)	Alternate limits for RWM.	2	R
Recirculation	202001A109	3.3	3.3	Recirculation pump seal pressures	Indications of seal failure.	2	B
Recirculation	202001A214	3.9	4.2	High reactor pressure (ATWS circuitry initiation): Plant-Specific	Conditions that will cause an ATWS trip.	2	B
Recirculation	202001G010	3.5	3.7	Ability to explain and apply all system limits and precautions	Pump starting limitations.	2	B
Reactor Water Cleanup	204000K403	2.9	2.9	Over temperature protection for system components	Response to a non regenerative heat exchanger hi outlet temperature.	2	R
System (RHR Shutdown Cooling)	205000K202	2.5	2.7	Motor operated valves	RPS swing bus loads	2	B
System (RHR Shutdown Cooling)	205000K403	3.8	3.8	Low reactor water level: Plant-Specific	Shutdown Cooling Isolation Signal	2	B
Rod Position Information	214000A402	3.8	3.8	Control rod position	Positive determination of rod position following loss of SIP or CRT SDS 4 Rod position displays.	2	B
Rod Block Monitor	215002A304	3.6	3.5	Verification or proper functioning/ operability: BWR-3,4,5	Determination of RBM setpoints based on flow and APRM bypass switch positions.	2	B
Main and Reheat Steam	239001K609	3.9	4.1	PCIS/NSSSS	A leak has occurred on the line to feedpumps. What signal will cause the MSIVs to close?	3	B
AC Electrical Distribution	262001A211	3.2	3.6	Degraded system voltages	Response of ESS bus to low voltage and manual closure of breakers.	1	B
AC Electrical Distribution	262001A302	3.2	3.3	Automatic bus transfer	RPS bus automatic transfers.	1	B
AC Electrical Distribution	262001A304	3.4	3.6	Load sequencing	Load sequencing times	1	B
DC Electrical Distribution	263000A101	2.5	2.8	Battery charging/discharging rate	Capacity of the 125 VDC batteries.	2	B

RO KA List Report Information

DC Electrical Distribution	263000K201	3.1	3.4	Major D.C. loads	Power supply to Control Room Annunciators	2	B
Secondary Containment	290001A205	3.1	3.3	High area temperature	High temperature startup of ECCS Area Cooling.	1	R
Control Room HVAC	290003K401	3.1	3.2	System initiations/reconfiguration: Plant-Specific	CREOASS response to initiation signal.	2	B

RO KA List Report Information

Plant Systems							
Reactor Operator Group 3							
System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
Traversing In-Core Probe	215001A207	3.4	3.7	Failure to retract during accident conditions: Mark-I&II(Not-BWR1)	Required actions to withdraw a TIP if an isolation signal is not generated.	3	B
Fuel Handling Equipment	234000K502	3.1	3.7	Fuel handling equipment interlocks	Refuel Bridge Interlocks	2	B
MSIV Leakage	239003K406	3.1	3.3	prior to routing leakage through system: BWR-4,5,6	Isolation Valve Leakage Control System blower to start.	2	B
Plant Ventilation	288000A301	3.8	3.8	Isolation/initiation signals	Start signals for the RHR/CS fan cooler and cooling source	3	B
Reactor Vessel Internals	290002A204	3.7	4.1	Excessive heatup/cooldown rate	Maximum allowable heat up rate per GO-100-002	3	R

RO KA List Report Information

Emergency and Abnormal Procedures							
Reactor Operator Group 1							
System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
SCRAM	295006A101	4.2	4.2	RFS	Reason for placing mode switch to shutdown.	1	R
SCRAM	295006G010	4.1	4.2	procedures those actions that require immediate operation of system	Required action for the rods at positions greater than 00 and an EOP entry on low RPV level	1	B
SCRAM	295006G012	3.8	4.4	Ability to utilize symptom based procedures	Requirement for use of ON-100-101.	1	B
High Reactor Pressure	295007G011	4.1	4.3	for system operating parameters which are entry-level conditions for emergency and	Required action if an SRV opens at power due to pressure.	1	B
Low Reactor Water Level	295009G008	3.6	4.4	operating parameters which are entry-level conditions for technical specifications	Technical Specification Leakage Limits	1	B
Low Reactor Water Level	295009K202	3.9	3.9	Reactor water level control	Vessel level control conditions that can result in low level.	1	B
Inadvertent Reactivity Add.	295014G010	4	3.9	procedures those actions that require immediate operation of system	Required actions on a loss of feedwater heating.	1	B
Inadvertent Reactivity Add.	295014K104	3	3.4	PCIOMR: Plant-Specific	Reason for reducing power by 20%.	1	B
DownScale or Incomplete SCRAM	295015G011	4.2	4.4	for system operating parameters which are entry-level conditions for emergency and	What conditions constitute determination that the reactor will remain shutdown during all conditions.	1	B
High Drywell Pressure	295024K215	3.8	3.9	Containment spray logic: Plant-Specific	Drywell spray logic.	2	B
High Reactor Pressure	295025A103	4.4	4.4	Safety/relief valves: Plant-Specific	With an SRV cycling what action should be taken.	2	B
Reactor Low Water Level	295031A201	4.6	4.6	Reactor water level	Temperature effects on the usability of RPV water level instruments	2	B

RO KA List Report Information

Emergency and Abnormal Procedures

Reactor Operator Group 2

System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
Present & Reactor Power Above APRM	295037G007	3.7	3.9	Ability to explain and apply all system limits and precautions	System prohibited from being used in Level/Power Control.	2	R
Loss of Forced Core Flow Circulation	295001A101	3.5	3.6	Recirculation system	Required RPV level on a loss of Shutdown Cooling.	1	R
Loss of Forced Core Flow Circulation	295001A201	3.5	3.8	Power/flow map	Required action on a recirculation runback that places in region 1 of the Power to Flow Map.	1	B
Loss of Forced Core Flow Circulation	295001G004	2.8	3.7	specifications for limiting conditions for operations and safety limits	Technical Specification entry condition for single loop operation.	1	B
Loss of Forced Core Flow Circulation	295001K306	2.9	3	Core flow indication	Determine the total core flow rate in single loop.	1	B
Loss of Main Condenser Vacuum	295002K301	3.7	3.8	Reactor SCRAM: Plant-Specific	When a reactor scram will occur without any operator action (low power).	1	B
Part/Complete Loss of AC Power	295003A103	4.4	4.4	Systems necessary to assure safe plant shutdown	How HPCI and RCIC should be used during a station blackout.	1	B
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	Effects of a sustained loss of 4KV ESS bus 1D on the drywell.	1	B
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	Available indications of a leaking SRV during a station blackout.	1	B
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	HPCI component affected by loss of 480 volt power supply	1	B
Part/Complete Loss of AC Power	295003K306	3.7	3.7	Containment isolation	Effects of a loss of ESS Bus 1A on PCIS.	1	B
Part/Complete Loss of DC Power	295004K203	3.3	3.3	D.C. bus loads	Affect on diesel generator by a loss of 125 VDC power	1	B
High Reactor Water Level	295008K206	3.4	3.6	RCIC: Plant-Specific	Required actions to restart RCIC after a high level shutdown	1	B
High Suppression Pool Temp.	295013G008	3.5	4.4	operating parameters which are entry-level conditions for technical specifications	Technical Specification entry condition on high suppression pool temperature.	1	R
Control Room Abandonment	295016A101	3.8	3.9	RPS	they are not closed before evacuating the control room.	1	B
Control Room Abandonment	295016A108	4	4	Reactor pressure	Location of where ADS valves can be operated.	1	B

RO KA List Report Information

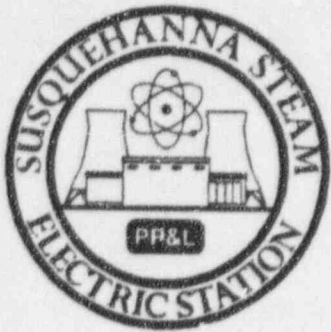
Control Room Abandonment	295016A203	4.3	4.4	Reactor pressure	How reactor pressure will be controlled following control room evacuation with all actions taken	1	B
High Off-Site Release Rate	295017G011	4.2	4.5	for system operating parameters which are entry-level conditions for emergency and	Radiological Release Entry Condition.	1	R
of Component Cooling Water	295018K101	3.5	3.6	Effects on component/system operations	How a Main steam isolation can result from loss of RBCCW.	1	B
Part/Complete Loss Instrument Air	295019G010	3.7	3.4	procedures those actions that require immediate operation of system	Conditions requiring a scram on a loss of instrument air. (Possibly including basis)	1	B
Loss of CRD Pumps	295022A201	3.5	3.6	Accumulator pressure	Requirement to scram the reactor on loss of CRD.	2	B
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	Use of vortex limits.	2	B

RO KA List Report Information

Emergency and Abnormal Procedures

Reactor Operator Group 3

System/Evolution	K/A	RO Value	SRO Value	KA Statement	Question Stem	SRO Group	Exam Level
Loss of Shutdown Cooling	295021K104	3.6	3.7	Natural circulation	RPV Level required to assure cooling due to circulation.	2	R
Loss of Shutdown Cooling	295021K203	3.6	3.6	RHR/shutdown cooling	Available Shutdown Cooling loops on a loss of RPS.	2	B
Refueling Accidents	295023G001	3.3	4.2	Knowledge of system status criteria which require the notification of plant personnel	Required action for a refuel floor high exhaust radiation.	2	B
Refueling Accidents	295023G008	3.2	3.9	operating parameters which are entry-level conditions for technical specifications	Technical Specification Entry condition on Fuel Pool Low Level.	2	B



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SIMULATOR SCENARIO

Scenario Title: Flow Comparator Failure, RCIC Pump Operability, Loss Of Feedwater Heating, Loss Of 1B246, Unisolable RCIC Steam Line Break

Scenario Duration: One hour

Scenario Number: 1/1

Revision/Date: 0, 9/25/96

Prepared By:

Instructor

9/25/96

Date

Reviewed By:

Nuclear Operations Training Supervisor

9/30/96

Date

Approved By:

Supervising Manager/Shift Supervisor

9/30/96

Date

0/1 A070

SCENARIO SUMMARY

The reactor is operating at 100% power. The "A" APRM is failed upscale and is bypassed. I&C is troubleshooting the problem. The "B" CRD pump is tagged out of service for bearing replacement and is expected to be restored to service in about 30 hours. Other than the monthly RCIC pump operability surveillance, no other activities are planned.

The first activity is a failure of the "A" flow comparator for the RBMs and APRMs. The PCOU will identify the failed comparator and dispatch an NPO to the relay room to investigate. Then using the annunciator response procedure and ON-178-001, Flow Unit Failure, will bypass the failed instrument with the joystick at the 651 panel, and have the NPO place the operate selector switch to ZERO at the relay room cabinet. The US will initiate maintenance activities on the failed flow unit and determine there is no Technical Specifications impact. The PCOU and the US will be primarily involved in this instrument failure.

The second activity is the monthly RCIC pump operability. The PCOX will perform SO-150-001 and operate RCIC pumping from CST to CST. After RCIC is operating, a small steam leak will occur in the pipe tunnel, slowly raising temperatures in the area. The PCOX will be primarily involved in this normal evolution.

The third activity is a loss of feedwater heating when the extraction steam isolation valve to the 5B feedwater heater fails closed. The crew will implement ON-156-001, Unexplained Power Increase and ON-144-001, Loss of Feedwater Heating. Reactor engineering will be notified to evaluate thermal limits and the crew will begin investigating the cause of the failure. Both PCOs and the US will be actively involved in this component failure.

The fourth activity is the power reduction required by the loss of feedwater heating. The PCOU will reduce reactor power to 80% using recirculation flow. The new operating position on the power to flow map will be plotted. The PCOU will be primarily involved with this reactivity manipulation.

The fifth activity is a loss of 1B246 480 vac MCC. This will cause a loss of a number of valves and other components. The main effects of this lost bus is the loss of power to the inboard RCIC steam isolation valve and reduced drywell cooling. Maintenance will report no obvious problems and recommend reenergizing it. The crew may implement scram imminent actions should drywell pressure approach the scram setpoint. Both PCOs and the US will be actively involved in this component and instrument failure.

The sixth activity is a steam line break in the common RCIC and HPCI pipe routing area leading to a high temperature alarm condition on both RCIC and HPCI requiring entry into EO-100-104, Secondary Containment Control. The crew will attempt to isolate RCIC but the outboard valve will bind and its breaker will trip. A Site Area Emergency will be declared on the unisolable steam leak. The crew will manually scram the reactor as temperatures continue to rise towards max safe values. The crew will implement EO-100-102, RPV Control, and manually scram the reactor. Seven control rods will fail to insert requiring entry into EO-100-113, Level/Power Control. The CRD north areas and remote shutdown panel area will rise above 10 R/hr, requiring the crew to enter EO-100-112, Rapid Depressurization. The crew will rapidly depressurize the reactor. Both PCOs and the US will be actively involved in this major transient.

SCENARIO KNOWLEDGES AND ABILITIES
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General:

294001 A102	4.2/4.2	294001 A104	3.1/3.2
294001 A105	3.4/3.8	294001 A109	3.3/4.2
294001 A110	3.6/4.2	294001 A111	3.3/4.3
294001 A112	3.5/4.2	294001 A113	4.5/4.3
294001 A115	3.2/3.4		

Event 1: Flow comparator A failure

215005 A205	3.5/3.6	215005 A207	3.2/3.4
215005 A405	3.4/3.4	215005 G009	3.6/3.4
215005 G012	3.7/3.6	215005 G015	4.1/4.3

Event 2: RCIC pump operability

217000 A403	3.4/3.3	217000 A404	3.6/3.6
217000 A408	3.7/3.6	217000 A409	3.7/3.6
217000 G013	3.8/3.5		

Event 3: Loss of feedwater heating

295014 AA203	4.0/4.3	295014 AA107	4.0/4.1
295014 G011	4.2/4.4	295014 G010	4.0/3.9

Event 4: Power reduction

202002 A408	3.3/3.3	202002 G013	3.6/3.4
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Event 5: Loss of 1B246

262001 A405	3.3/3.3	262001 G011	3.1/3.9
262001 G012	3.3/3.3	262001 G015	3.7/3.9

Event 6: Unisolable RCIC steam line leak

295033 EA101	3.9/4.0	295033 FA103	3.8/3.8
295033 EA105	3.9/4.0	295033 L 201	3.8/3.9
295033 EA203	3.7/4.2	295033 G011	4.2/4.3
295033 G012	3.8/4.4		

1. EO-100-102, RPV Control
2. EO-100-103, Primary Containment Control
3. EO-100-104, Secondary Containment Control
4. EO-100-112, Rapid Depressurization
5. EO-100-113, Level/Power Control
6. ON-147-001, Loss of Feedwater Heating Extraction Steam
7. ON-156-001, Unexplained Power Increase.
8. ON-164-001, Recirc Drive Flow Instrument Failure
9. SO-150-001, RCIC Flow Verification
10. AR-103-C05, APRM/RBM Flow Reference Offnormal
11. AR-102-F01/F02 Recirc A/B Low Clg Flow
12. Technical Specifications 3.6.3, 3.7.3

SCENARIO SPECIAL INSTRUCTIONS

1. Reset the simulator to IC-18 and:
 - place the bypass joystick for div. 1 APRMs to "A"
2. Execute preference file, **YPB.SCEN2-1**, establishing the following conditions:

Malfunctions: 9:9

- RD1550064643 22 Rod 46-43 Stuck At Position 22
- RD1550064607 12 Rod 46-07 Stuck At Position 12
- RD1550061443 32 Rod 46-43 Stuck At Position 22
- RD1550062223 20 Rod 46-43 Stuck At Position 22
- RD1550062659 28 Rod 46-07 Stuck At Position 12
- RD1550061407 44 Rod 46-43 Stuck At Position 22
- RD1550065043 42 Rod 46-43 Stuck At Position 22
- NM178007A 125 APRM A Failed Upscale
- MV09:HV149F008 RCIC Outboard Steam Isolation Fails To Close

Remote Functions: 1

- MRF PM131P132B OUT CRD Pump B Breaker Out

Overrides: 0:0

Triggers: 0

Pushbuttons Assignments

- | | |
|-------------------------------|--|
| 1. IMF NM178012A 0 | Flow Comparator A Fails Downscale |
| 2. MRF NM1780006 ZERO | Flow Comparator A Mode Switch To ZERO |
| 3. IMF RC150005 0.5 10:00 | RCIC Steam Line Break In Pipe Area, 0.5% Over 10 Minutes |
| 4. IMF MV05:HV10242B | 5B Heater Extraction Valve Spurious Closure |
| 5. MRF DB105118 OPEN | 1B246 Supply Breaker Trips Open |
| 6. IMF RR179003 1 5:00 | Fuel Failure, 1% Over 10 Minutes |
| 7. MMF RC150005 80 0:30 | RCIC Steam Line Break In Pipe Area, 80% Over 30 Seconds |
| 8. MMF RR179003 70 | Fuel failure severity increases to 70% |
| 9. IMF TR02:RIT13750 15 6:00 | CRD North Area Rad, 15 R/Hr Over 6 Minutes |
| 10. IMF TR02:RIT13753 15 5:00 | RSD Panel Area Rad, 18 R/Hr Over 5 Minutes |

5. Prepare a turnover sheet indicating the "A" APRM is failed upscale and is bypassed, I&C is troubleshooting it now and that the "B" CRD pump motor is being replaced, expected to be returned in approximately 30 hours. The crew is to perform RCIC flow verification including ISI data and S0126 per SO-150-001 as soon as possible as it is about to exceed its grace period.
6. Place a danger tag on CRD pump B.

INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES

Event No: 1

Brief Description: **Flow comparator A fails downscale**

INSTRUCTOR ACTIVITY:

Two minutes after the crew has taken the shift:

Depress **P-1**, inserting malfunction NM178012A 0

This fails the A flow comparator downscale.

When directed to place the function switch for the flow comparator to zero, wait two minutes then:

Depress **P-2**, modifying remote function NM178006 ZERO

This places the function switch for flow comparator A to ZERO.

ROLE PLAY:

When directed as the NPO to place the flow comparator to ZERO, wait two minutes then report back that the switch is in ZERO.

When directed as I&C to investigate the failure of the flow comparator, wait five minutes then report it will take a while to determine the cause of the failure.

SCENARIO EVENT FORM (EVALUATION)

Event No: 2

Brief Description: RCIC quarterly pump operability taking ISI data

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOX		Perform RCIC pump operability per SO-150-001, RCIC Flow Verification		
		Start ESW		
		Station NPO at 1D254		
		Notify US that RCIC is inoperable while breakers are open		
		Direct throttling of F022 to 40%		
		Direct opening 1D254 breakers 22 and 51		
		Start GETARs		
		Opens HPCI F011 and manually initiates RCIC ~ 5 secs later		
		Resets initiation signal		
		Directs closing breakers at 1D254		
		Adjusts RCIC flow parameters by throttling F022		
		Coordinate local activities with NPO, HP, and maintenance		
	PCOU		Confirms Rx Bldg Hi Rad alarm due to RCIC surveillance	
US		Monitors surveillance activity		
		Evaluates Technical Specifications for RCIC inop		

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES

Event No: 2

Brief Description: RCIC quarterly pump operability

INSTRUCTOR ACTIVITY:

When RCIC is operating:

Depress P-3, inserting malfunction RC150005 0.5 10:00

This creates a small steam leak in the pipe routing area. It will not be detected but will start raising pipe area temperatures to support the unisolable leak later.

Position RCIC F022 to 40% with GCF as directed (then remove the GCF after it is at 40%)

Open breakers as directed.

ROLE PLAY:

As NPO directed to throttle F022 to 40%, wait one minute then report it is at 40%.

As NPO at 1D254 directed to open breakers 22 and 51, wait one minute then report them open. When directed to close them later, wait one minute and then report them closed.

As maintenance when directed to obtain ISI data, delay reporting back that ISI data is completed.

SCENARIO EVENT FORM (EVALUATION)

Event No: 3 and 4

Brief Description: Loss of feedwater heating and power reduction with recirculation flow

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Recognizes increasing reactor power above 100% and reduces power to 100% with recirculation flow per ON-156-001, Unexplained Power Increase.		
		Reduces reactor power by 20% per ON-147-001, Loss of Feedwater Heating Extraction Steam		
		Plots position on power to flow map.		
		Initiates GETARS		
PCOX		Diagnoses problem as the 5B heater extraction steam valve closing		
		Monitors steam line and offgas radiation levels		
		Directs NPO to heater panel to determine cause of isolation		
		Notifies PCC of power change		
US		Directs actions per ON-156-001, Unexplained Power Increase and ON-147-001, Loss of Feedwater Heating Extraction Steam.		
		Contacts Electrical Maintenance		
		Notifies Duty Manager of problem		
		Notifies HP and Chemistry of power change		
		Contact Reactor Engineering		

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES

Event No: 3 and 4

Brief Description: Loss of feedwater heating and power reduction with recirculation flow

INSTRUCTOR ACTIVITY:

When RCIC is operating for the surveillance activity:

Depress P-4, IMF MV05:HV10242B

This causes the extraction steam valve to the 5B heater to spuriously close.

ROLE PLAY:

As the NPO sent to the 1C102 panel, wait two minutes then report that you cannot determine any cause for the extraction steam valve closing. Call up LP1C10101 and report on any annunciators alarming also.

As electrical maintenance, wait five minutes and report it will take a while to determine why the valve closed.

SCENARIO EVENT FORM (EVALUATION)

Event No: 5
 Brief Description: Loss of 1B246

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Monitor plant conditions		
		Acknowledge AR-102-F1 & F4, Recirc Low Cig Flow annunciator and monitors recirculation pump winding temperatures		
		Determine drywell temperature/pressure rise is caused by a loss of drywell coolers		
PCOX		Acknowledge annunciators.		
		Diagnose problem as a 1B246 problem.		
		Dispatch NPO to investigate		
		Report problem is 1B246 supply breaker and breaker to RCIC F007 are tripped.		
		Direct NPO to reclose supply breaker		
		Report rising drywell temperature		
		Direct NPO to reclose breaker		
		Direct NPO to commence reloading bus, beginning with drywell coolers		
		Report problem with the RCIC inboard isolation valve breaker		
		Direct NPO to 1C275/276 to restore RX Bldg ventilation		
US		Contact electrical maintenance		
		Determine Technical Specifications actions for inboard RCIC isolation breaker problem 3.7.3 and 3.6.3		
		Notify Duty Manager		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5
Brief Description: Loss of 1B246

INSTRUCTOR ACTIVITY:

When the crew has completed actions for the loss of feedwater heating or when directed by the lead evaluator:

Depress **P-5**, modifying remote function DB105118 OPEN

This opens the supply breaker to 1B246

When directed to close the 1B246 supply, then:

modify the remote function above to CLOSE the breaker.
and

Depress **P-6**, inserting malfunction RR179003 1 5:00

This causes a single pin fuel failure to occur over Fuel Failure 5 Minutes

ROLE PLAY:

As the NPO dispatched to 1B240, wait one minute, then report the supply breaker to the 1B246 bus is tripped open. When directed to investigate the 1B246 problem, report breaker 22, the supply to RCIC F007 is tripped open.

As electrical maintenance, wait three minutes, then report there are no obvious problems. Recommend attempting to reclose the supply breaker and recommend leaving the 22 breaker as is. When asked about the RCIC F007 breaker, report it will take a while to determine the cause of the problem.

SCENARIO EVENT FORM (EVALUATION)

Event No: 6

Brief Description: Unisolable RCIC steam line break in pipe area

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Recognize elevated radiation levels in reactor building		
		Prevents injection of condensate during rapid depressurization		
		Manually scrams the reactor.		
		Reports seven rods fail to insert.		
PCOX		Acknowledge steam leak detection annunciators for RCIC and HPCI		
		Confirm temperatures are rising in RCIC and HPCI piping area and timers have started		
		Start ESW and ESS room coolers		
		Rapidly depressurize the reactor by opening the ADS SRVs.		
		Prevents injection of RHR and CS during rapid depressurization		
US		Enter and direct actions of EO-100-104, Secondary Containment Control		
		Directs starting ESW and room coolers		
		Directs manual scram of reactor on approaching maximum safe temperature		
		Enters and directs EO-100-113, Level/Power Control		
		Enter and direct actions of EO-100-112, Rapid Depressurization		
		Directs preventing injection of low pressure systems		
		Directs opening ADS SRVs		
		Enter and direct actions of EO-100-112, Rapid Depressurization		
	Declare a Site Area Emergency			

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6

Brief Description: Unisolable RCIC steam line break in pipe area

INSTRUCTOR ACTIVITY:

When the crew has completed correcting the 1B246 problem or when directed by the lead evaluator:

Depress P-7, modifying malfunction RC150005 80 3:00

This increases the severity of the RCIC steam line break to 80%.

When the crew makes the decision to perform scram imminent actions:

Depress P-8, modifying malfunction RR179003 70

This increases the severity of the fuel failure to 25% over 3 minutes.

After the crew attempts to manually isolate RCIC:

Depress P-9, inserting malfunction TR02:RIT13750 15 6:00

and

Depress P-10, inserting malfunction TR02:RIT13753 18 5:00

These will ramp CRD area north and Remote Shutdown Panel area radiation to greater than 10 R/hr requiring rapid depressurization.

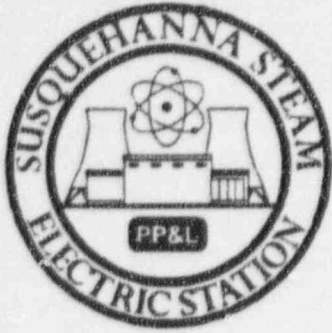
ROLE PLAY:

As the NPO directed to investigate the steam leak, wait two minutes then report there is a loud roar in the pipe area and it cannot be entered.

As HP with the NPO, report radiation levels are increasing in the pipe area, preventing entry.

TERMINATION CUE:

The crew has rapidly depressurized the reactor and level and pressure are stabilized.



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SIMULATOR SCENARIO

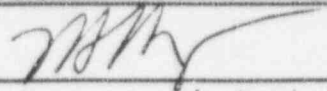
Scenario Title: Plant Startup, FW Flow Detector Failure, Place RFPT In Service, HPCI Supp Pool Level Instrument Failure, APRM Failure, ATWS

Scenario Duration: One hour

Scenario Number: 1/2

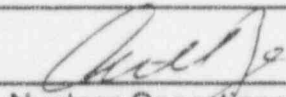
Revision/Date: 0, 9/25/96

Prepared By:


Instructor

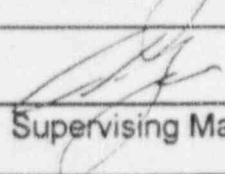
9/25/96
Date

Reviewed By:


Nuclear Operations Training Supervisor

9/25/96
Date

Approved By:


Supervising Manager/Shift Supervisor

9/25/96
Date

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SCENARIO SUMMARY

The plant is operating at 44% power with 55 Mlbm/hr core flow. The "A" RFPT has just been placed in standby with the other two RFPTs in service in three element control. Control rods are being withdrawn to raise reactor power during a startup.

The first activity is raising recirculation flow to 55 Mlbm/hr. The PCOU will be primarily involved in this reactivity manipulation.

The first activity is a failure of the "B" feedwater flow instrument. At this power level, with only one feed flow input, total indicated feed flow drops below 20% causing a runback to number 1 limiter. In three element control, RPV level will increase until it offsets the flow mismatch (about 44 inches). The crew will diagnose the problem and implement ON-145-001, Reactor Water Level Control System Malfunction and ON-164-002, Loss of Recirculation Flow. Both PCOs and the US will be actively involved in this instrument and component failure.

The second activity is placing the "A" RFPT in service and placing the "B" RFPT in standby. The crew will do this per OP-145-001, Feedwater, to restore normal feedwater flow indication until the breaker problem is resolved. Once the "A" RFPT is in service, indicated feedwater flow will be greater than 20% allowing the runback to be reset and core flow to be restored to 55 Mlbm/hr. The PCOX and US will be primarily involved in this normal activity.

The fourth activity is a failure of the acoustic monitor for the "L" SRV. The crew will acknowledge the SRV open annunciator and determine that the SRV is not open, but that the acoustic monitor is failed high using the temperature monitoring recorder and the failure of any reactor parameters to change when the alarm is received. The US will determine the Technical Specifications actions for the failure and will initiate corrective actions. Both PCOs and the US will be involved with this instrument failure.

The fifth activity is a loss of CRD. The crew will attempt to start the standby pump, but its breaker will fail to close. Within a few minutes, two accumulator trouble alarms will be received requiring the mode switch be placed to SHUTDOWN. Both PCOs and the US will be involved with this component failure.

The sixth activity is a failure of the reactor to scram and the ARI valves will fail to vent the scram air header. Since no bypass valves are available for pressure control, SRVs must be used to control reactor pressure. The crew will enter EO-100-113, Level/Power Control. The crew will attempt initiate SLC but the "A" SLC pump will seize and RCIC must be used to inject boron. The crew will lower RPV level to <-60 inches and manually control RPV pressure with the SRVs. The crew will attempt to insert rods using EO-100-113 sheet 2 by pulling RPS fuses, venting the scram air header, maximizing CRD flow, and manually inserting control rods. When the crew vents the scram air header, the rods will fully insert. Both PCOs and the US will be involved in this major transient. The PCOX will be involved in the component failure of SLC failing to initiate.

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SCENARIO KNOWLEDGES AND ABILITIES
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General:

294001 A102	4.2/4.2	294001 A104	3.1/3.2
294001 A105	3.4/3.8	294001 A109	3.3/4.2
294001 A110	3.6/4.2	294001 A111	3.3/4.3
294001 A112	3.5/4.2	294001 A113	4.5/4.3
294001 A115	3.2/3.4		

Event 1: Raise core flow to 55 Mlbm/hr

202002 A105	3.6/3.6	202002 A407	3.3/3.2
202002 A207	3.3/3.3	202002 G013	3.6/3.4

Event 2: Feedwater flow element B fails low

263000 G015	3.4/3.8	216000 G011	3.2/4.2
216000 A206	2.9/3.1		

Event 3: Place RFPT A in service and RFPT B in standby

259001 G013	3.6/3.4
259001 A402	3.9/3.7

Event 4: Failure of SRV L acoustic monitor

239002 A403	3.8/3.9	239002 A401	4.4/4.4
239002 A109	3.1/3.3	239002 A101	3.3/3.4
239002 A105	3.7/3.4	239002 A107	2.9/3.0
239002 G012	3.8/3.6		

Event 5: Loss of CRD

295022 AA201	3.5/3.6	295022 G010	3.7/3.5
295022 G011	3.9/4.0		

Event 6: ATWS

295037 EA101	4.6/4.6	295037 EA103	4.1/4.1
295037 EA110	3.7/3.9	295037 EA201	4.2/4.3
295037 EA202	4.1/4.2	295037 EA205	4.2/4.3
295037 G011	4.4/4.7	295037 G012	3.9/4.6

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REFERENCES

1. EO-100-102, RPV Control
2. EO-100-103, Primary Containment Control
3. EO-100-113, Level Power Control
4. ON-145-001, FWLC Malfunction
5. ON-164-002, Loss Of Recirculation Flow
6. ON-183-001, Stuck Open SRV
7. ON-155-007, Loss Of CRD System Flow
8. OP-145-001, Feedwater
9. Technical Specifications 3.3.7.5-1

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SCENARIO SPECIAL INSTRUCTIONS

1. Reset the simulator to IC-131. Ensure rod step at A1-524. Ensure B and C RFPTs are in service in 3-element and A RFPT is in standby.
2. Execute preference file, **YPB.SCEN1-2**, establishing the following conditions:

Malfunctions: 5:5

- | | |
|-----------------|-------------------------------|
| • NM178007A 125 | APRM A failed upscale |
| • PM05:1P208A | SLC pump shaft shear |
| • RP158007B | RPS B failure to scram |
| • PM10:1P132B | CRD pump B breaker fail as-is |
| • PM03:1P208B | SLC pump motor overcurrent |

Remote Functions: 3

- | | |
|------------------|--|
| • PM101P113B OUT | EHC pump B breaker racked out |
| • RD155018 100 | ARI air supply isolation valves bypassed |
| • RD155030 0 | ARI vent valve isolated |

Overrides: 0:0

Triggers: 0

Pushbuttons Assignments

- | | |
|---------------------------|--|
| 1. IMF TR02:FTC321N002B 0 | Feedwater flow instrument B fails low |
| 2. IMF TR02:VT14180A6 60 | SRV F013L Acoustic Monitor Fails To 60% Output |
| 3. IMF PM03:1P132A | CRD Pump A Motor Overcurrent Fault |
| 4. IMF RD1550191835 | Accumulator Trouble Rod 18-35 |
| 5. IMF RD1550191043 | Accumulator Trouble Rod 10-43 |

5. Turnover Information:
Prepare a turnover sheet indicating continue plant startup at step 6.91 of GO-100-002.
Recirculation flow is 48 Mlbm/hr. Power is 38%. Rod step A1-524
6. Place a status control tag on EHC pump B.

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SCENARIO EVENT FORM (EVALUATION)

Event No: 1
 Brief Description: Raise recirculation flow to 55 Mlbm/hr.

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Raises core flow to 55 Mlbm/hr per CRMR.		
		Plots position on power to flow map		
US		Supervises reactor power increase		

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES
--

Event No: 1

Brief Description: **Raises core flow to 55 Mlbm/hr.**

INSTRUCTOR ACTIVITY:

No instructor activity required for this event.

ROLE PLAY:

As required.

SCENARIO EVENT FORM (EVALUATION)

Event No: 2

Brief Description: FW flow instrument B fails downscale.

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Acknowledge RPV high level annunciator		
		Diagnose problem as a failure of FW flow B instrument		
		Respond per ON-145-001, FWLC Malfunction		
		Transfer FWLC to single element.		
		Restore RPV level to 35 inches		
PCOX		Dispatch NPO to check transmitter		
		Report no apparent problems with transmitter		
US		Direct actions per ON-145-001, FWLC Malfunction		
		Contact electrical maintenance and I&C for support on problem		

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES
--

Event No: 2

Brief Description: **FW flow instrument B fails downscale.**

INSTRUCTOR ACTIVITY:

Approximately two minutes after the crew has assumed the shift:

Depress **P-1**, modifying remote function MRF DC102285 OPEN.

This will open the breaker feeding FW flow C and FWLC NR level instrument B.

ROLE PLAY:

As the NPO sent to check the flow transmitter, wait two minutes then report there are no apparent problems

As I&C, after five minutes report it will take a while to determine the cause of the transmitter problem.

SCENARIO EVENT FORM (EVALUATION)

Event No: 3

Brief Description: Place RFPT A in service and place RFPT B in standby.

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOX		Places RFPT A in service per OP-145-001, Feedwater		
		Increases speed until pump begins to feed.		
		Closes recirc flow valve.		
		Nulls controller and places in automatic.		
		Balances flow between pumps		
		Places RFPT B in standby per OP-145-001.		
		Opens recirc flow valve to establish min flow protection		
		Lowers speed to establish discharge pressure ~100 psig below reactor pressure		
		Restores FWLC to three element		
PCOU		Resets recirculation pump runback.		
US		Directs placing RFPT A in service and RFPT B in standby.		
		Directs transferring back to three element control		
		Resets recirculation pump runback		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 3

Brief Description: Place RFPT A in service and place RFPT B in standby.

INSTRUCTOR ACTIVITY:

No instructor activity required for this event.

ROLE PLAY:

As necessary

SCENARIO EVENT FORM (EVALUATION)

Event No: 4

Brief Description: Failure of the acoustic monitor for the "L" SRV

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Reports no change in steam flow and feed flow.		
		Reports no change in RPV level or power.		
		Implements actions of ON-183-001, Stuck Open Safety Relief Valve		
PCOX		Acknowledge SRV open annunciator.		
		Notes acoustic monitor light illuminated for SRV L		
		Reports no change in temperature on the "L" SRV.		
		Determines the indication is a failure of the acoustic monitor.		
US		Directs actions per ON-183-001, Stuck Open SRV.		
		Evaluates Technical Specifications for acoustic monitor failure 3.3.7.5-1 item 9		
		Contact I&C to initiate corrective action.		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 4

Brief Description: Failure of the acoustic monitor for the "L" SRV

INSTRUCTOR ACTIVITY:

When the PCOU has transferred to three-element control or as directed by the lead evaluator:

Depress P-2, inserting malfunction TR02:VT14180A6 60

This will fail the acoustic monitor to 60% output.

ROLE PLAY:

As I&C when contacted to investigate the failure of the acoustic monitor, wait five minutes, then report that it appears the module needs to be replaced and it will take about two hours to get another module and replace it.

SCENARIO EVENT FORM (EVALUATION)

Event No: 5
 Brief Description: Loss of CRD

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Monitor full core display for accumulator faults		
		Report accumulator faults as they occur		
		Scram the reactor when the second fault is received (one on a withdrawn control rod)		
		Report failure of the reactor to scram due to failure of RPS B to actuate		
PCOX		Recognize trip of the operating CRD pump		
		Attempt to restore CRD by manually closing the flow control valve and starting the standby pump		
		Report failure of the standby pump to start.		
		Dispatch NPO to check out the pump		
		Dispatch NPO to check out the pump breaker		
		Manually initiate ARI		
		Report failure of scram air header to depressurize.		
US		Direct actions per ON-155-007, Loss of CRD System Flow		
		Direct manual scram of reactor		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5
Brief Description: Loss of CRD

INSTRUCTOR ACTIVITY:

When the crew has completed actions for the acoustic monitor failure or when directed by the lead evaluator:

Depress **P-3**, inserting malfunction IMF PM03:1P132A

This will trip the operating CRD pump on overcurrent.

After four minutes:

Depress **P-4**, inserting malfunction IMF RD1550191835

This will cause rod 18-35 accumulator fault.

Two minutes later:

Depress **P-5**, inserting malfunction IMF RD1550191043

This will cause rod 10-43 accumulator fault.

ROLE PLAY:

As the NPO directed to check out the "A" CRD pump, wait two minutes then report the motor is very hot to the touch.

As the NPO directed to check out the "A" CRD pump breaker, wait two minutes then report the 50/51 device is tripped.

As electrical maintenance, wait five minutes then report there appears to be a fault in the "A" CRD pump motor.

SCENARIO EVENT FORM (EVALUATION)

Event No: 6

Brief Description: ATWS with failure of SLC to initiate

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Report failure of control rods to insert		
		Arm and depress the manual scram pushbuttons		
		Throttle feedwater flow and lower level to -60 to -16l inches.		
		Report all rods inserted when scram fuses are pulled		
PCOX		Manually initiate ARI		
		Recognize failure of scram air header to depressurize.		
		Attempt to initiate SLC		
		Override ADS		
		Inject SLC with RCIC		
		Prevent HPCI and RCIC from injecting.		
US		Enter and direct actions per EO-100-113, Level/Power Control		
		Direct ES-150-001, Alternate boron injection with RCIC		
		Direct ES-158-001, Pulling RPS fuses		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6

Brief Description: ATWS with failure of SLC to initiate

INSTRUCTOR ACTIVITY:

Respond to requests for actions as necessary

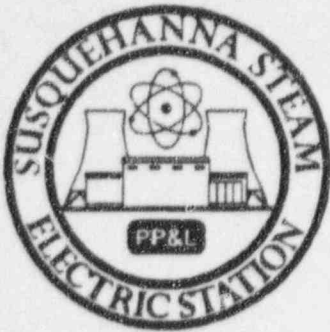
ROLE PLAY:

As the NPO directed to perform ES-150-001, Alternate Boron Injection, wait 20 minutes then report the hoses are connected and ready to open the valve.

As the AUS directed to perform ES-158-001, Pulling RPS Fuses, wait 8 minutes then report you are ready to begin pulling the fuses.

TERMINATION CUE:

RPV level and pressure are stable. Direction has been given to insert rods by pulling the RPS fuses and venting the scram air header.



**PP&L-SUSQUEHANNA
TRAINING CENTER**

Attachment 1
STCP-QA-612
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SIMULATOR SCENARIO

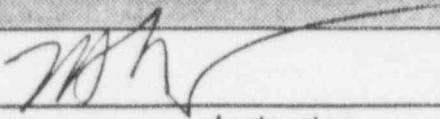
Scenario Title: Power reduction, Shutdown RFPT, HPCI steam leak detection failure, Loss of 1Y115, Loss of Instrument Air, Small Break LOCA with RCIC malfunction

Scenario Duration: One hour

Scenario Number: 2/1

Revision/Date: 0, 9/25/96

Prepared By:

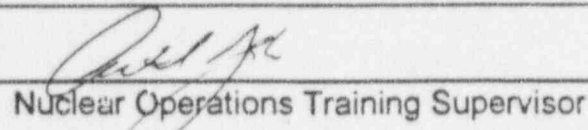


Instructor

9/25/96

Date

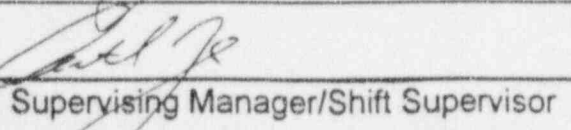
Reviewed By:


Nuclear Operations Training Supervisor

9/30/96

Date

Approved By:


Supervising Manager/Shift Supervisor

9/30/96

Date

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SCENARIO SUMMARY

The scenario begins at 85% power following a rod pattern exchange. A power ascension was suspended when an oil leak on the "B" RFPT was discovered that requires the RFPT be removed from service to repair. The "A" APRM is failed upscale and is bypassed. The "B" EHC pump motor has a ground and is being replaced by electrical maintenance.

The first activity is a power reduction to 75% with recirculation flow. The crew will lower power, plotting operating position on the power to flow map and notifying HP and Chemistry of the change in reactor power. The PCOU will be primarily involved in this reactivity manipulation.

The second activity removes the "B" RFPT from service using OP-145-001, leaving feedwater in a two RFP lineup. The PCOX will be primarily involved in this normal activity.

The third activity is a loss of instrument bus 1Y115 due to a faulted load. This failure results in the loss of a number of instruments in the control room. The crew will respond using ON-117-001, Loss of Instrument AC. The crew will use the throwover switches in the control panels to repower the instrumentation off their alternate sources. The US will address the technical specifications for the loss of instrumentation and determine the instruments are operable off alternate power. Both PCOs and the US will be active in this instrumentation and component failure.

The fourth activity is a failure of the division I HPCI pipe room temperature element upscale. When this occurs, the inboard HPCI isolation valve will isolate after the 15 minute timer times out. The crew will determine there is no leak in the area and diagnose a failure of the temperature element. They may manually isolate the valve. I&C will be contacted to troubleshoot and repair the problem. The unit supervisor will address the Technical Specifications actions to be taken. The PCOX and US will be primarily involved in this instrumentation failure.

The fifth activity is an instrument air header rupture in the reactor building. Air pressure will be lost quickly, requiring a manual scram at 65 psig per ON-118-001, Loss of Instrument Air. The outboard MSIVs will close. Both PCOs and the US will be active in this component failure.

The sixth activity is a small LOCA increasing in severity causing a LOCA load shed. Containment pressure will increase requiring SP and DW sprays. When RCIC initiates, its F013 injection valve will not automatically open, but can be manually opened. Level will be controlled by CRD and RCIC injection. Both PCOs and the US will be active in this major transient. The PCOX will be active in the component failure of the RCIC injection valve.

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SCENARIO KNOWLEDGES AND ABILITIES
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General:

294001 A102	4.2/4.2	294001 A104	3.1/3.2
294001 A105	3.4/3.8	294001 A109	3.3/4.2
294001 A110	3.6/4.2	294001 A111	3.3/4.3
294001 A112	3.5/4.2	294001 A113	4.5/4.3
294001 A115	3.2/3.4		

Event 1: Power reduction with recirculation flow

202002 A408	3.3/3.3
202002 G013	3.6/3.4

Event 2: Remove RFPT B from service

259001 G013	3.6/3.4
259001 A402	3.9/3.7

Event 3: Loss of Instrument bus 1Y115

262001 G012	3.1/3.0	262001 G015	3.5/3.8
262001 G005	2.7/3.5	262001 A401	3.1/3.0
262001 G012	2.9/3.1		

Event 4: HPCI steam leak detection temperature element failure

223002 A302	3.5/3.5
223002 G005	3.1/4.1

Event 5: Loss of instrument air

295019 AA201	3.5/3.6
295019 G010	3.7/3.4

Event 6: Small break LOCA

295031 EA204	4.6/4.8	295031 EA111	4.1/4.1
295031 G010	4.0/3.8	295031 G012	3.9/4.5
295024 EA201	4.2/4.4	295024 EA204	3.9/3.9
295024 EA206	4.1/4.1	295024 EA111	4.2/4.2
295024 EA112	3.8/3.8	295024 G010	3.9/3.7
295024 G012	3.9/4.5		

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REFERENCES

1. OP-145-0C1, Feedwater
2. ON-118-001, Loss of Instrument Air
3. ON-117-001, Loss of Instrument AC
4. GO-100-012, Power Maneuvering
5. AR-114-F04, HPCI Lk Detect Logic A Hi Temp
6. EO-100-102, RPV Control
7. EO-100-103, Primary Containment Control
8. Technical Specifications 3.3.2, 3.5.1
9. NDAP-QA-0338, Reactivity Control

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SCENARIO SPECIAL INSTRUCTIONS

1. Reset the simulator to IC-18 and:
 - lower power to 85% (recirculation flow at 75%)
 - place bypass joystick to APRM A position
 - place EHC pump B control switch to OFF and place danger tag on switch
2. Execute preference file, **YPB.SCEN1-1**, establishing the following conditions:

Malfunctions: 3:3

- | | |
|------------------|---|
| • NM178007A 125 | APRM A Failure |
| • PM07:1K107B | Instrument Air Compressor B Shaft Shear |
| • MV06:HV149F013 | RCIC Injection Valve Auto Logic Failure |

Remote Functions: 2

- | | |
|------------------|-------------------------------|
| • PM101P113B Out | EHC Pump B Breaker Racked Out |
| • IA118033 0 | SA-IA Tie Valve Closed |

Overrides: 0:0

Triggers: 0

Pushbuttons Assignments

- | | |
|---------------------------|--|
| 1. MRF DC102149 Open | Supply breaker to 1Y115 Inverter Open |
| 2. MRF DB157001 ALT | Place HSE11115 To Alternate Power Source |
| 3. IMF TH02:TEE51N25C 350 | HPCI Pipe Room Div. 1 Temp Element Failed Upscale |
| 4. IMF IA118004 20 3:00 | Instrument Air Rupture In Rx Bldg., 20% Over 3 Minutes |
| 5. IMF RR164010 0.5 5:00 | Bottom Head Drain Leak, 0.5% Over 5 Minutes |
| 6. IMF IA188004 100 | Instrument Air Rupture In Rx Bldg., 100% |
| 7. IMF MV07:HV141F019 0 | Closes MSL Drain Valve F019 |
| 8. MMF RR164010 10 | Bottom Head Drain Leak, 10% |

5. Prepare a turnover sheet indicating the crew is to lower power to 75% with recirculation flow, then remove RFPT B from service leaving it in warming lineup. EHC B pump is tagged out. APRM A is upscale and bypassed. The service air to instrument air cross-tie regulator is inoperable and is tagged out while maintenance is repairing it. Prepare a CRMR directing the power change is to be done with recirculation flow. Provide a marked up copy of GO-100-012. Unit two is starting up preparing to transfer the mode switch to run.
6. Place a status control tag on EHC pump B.

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SCENARIO EVENT FORM (EVALUATION)

Event No: 1

Brief Description: Reactor power reduction using recirculation flow.

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Lowers reactor power using recirculation flow at 1% per minute per GO-100-012		
		Plots position on power to flow map		
		Notifies US when at 75% power		
PCOX		Directs NPO to check on feedwater panel alarms		
		Lowers load set to 100 MWe above actual generator load		
US		May provide courtesy notification to HP and Chemistry of new power level		
		Directs actions per GO-100-012.		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 1

Brief Description: Reactor power reduction using recirculation flow.

INSTRUCTOR ACTIVITY:

No instructor activity required other than responding to routine communications.

ROLE PLAY:

No role play other than as required by routine communications.

SCENARIO EVENT FORM (EVALUATION)

Event No: 2
 Brief Description: Remove RFPT B from service.

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOX		Removes RFPT B from service IAW OP-145-001		
		Opens recirc flow controller to 5000 gpm		
		Lowers RFPT speed in manual to 100 psig below reactor pressure		
		Closes the RFPT discharge valve F003		
		Lowers RFPT speed to the LSS of the EAP		
		Trips RFPT		
		Lowers MSC to LSS		
		Directs NPO to perform local activities		
		Sets lube oil controller to 100F		
		Ensures the RFPT engages on the turning gear		
US		Directs removal of RFPT from service.		
		Contacts maintenance when the RFPT is removed from service.		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 2

Brief Description: Remove RFPT B from service.

INSTRUCTOR ACTIVITY:

No instructor activity required other than responding to routine communications.

ROLE PLAY:

No role play other than as required by routine communications.

SCENARIO EVENT FORM (EVALUATION)

Event No: 3
 Brief Description: Loss of 1Y115

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Recognizes loss of level and pressure instruments		
		Pulls ON-117-001, Loss of Instrument Bus and ON-145-001, Reactor Level Anomaly and determines problem to be loss of 1Y115		
		Directs NPO to check out inverter for 1Y115 and breaker 1D614030		
		Directs NPO to transfer throwover switch in relay room at 1C661-A1.		
PCOX		Recognizes loss of division 1 SPOTMOS		
		Transfers throwover switches in control room at 1C690A and 1C601-18C.		
		Recovers SPOTMOS div. 1 per OP-159-001.		
US		Evaluates Technical Specifications for loss of accident monitoring instrumentation and determines they are operable on alternate power source		
		Contacts I&C and electrical maintenance to investigate the problem		
		May loss of instruments effects per attachment M of ON-117-001.		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 3
Brief Description: **Loss of 1Y115**

INSTRUCTOR ACTIVITY:

After the crew has completed evaluating the Technical Specifications for the steam leak detection failure and the HPCI isolation or when directed by the lead evaluator:

Depress **P-1**, modifying remote function DC102149 OPEN.

This opens the supply breaker to the 1D115 inverter.

When directed to transfer the HSE-111505 at 1C661:

Depress **P-2**, modifying remote function DB157001 ALT

This transfers HSE-111505 to alternate.

ROLE PLAY:

As NPO sent to inverter 1D115, wait two minutes then report that all of the lights on the inverter are out.

As NPO sent to 1D614030, wait two minutes then report the breaker is tripped.

As electrical maintenance contacted about the 1D115 inverter, wait five minutes then report it will take a while to evaluate the problem.

SCENARIO EVENT FORM (EVALUATION)

Event No: 4

Brief Description: Failure of HPCI pipe routing area division 1 temperature element upscale

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOX		Acknowledges leak detection alarm on HPCI and reports the timer has initiated		
		Evaluates leak detection temperatures and reports the div. 1 temperature is in alarm and reads upscale.		
		Checks temperature recorder for the pipe routing area div. 2 elements and reports normal temperatures.		
		Places the keyswitch for the inboard valve to close.		
		Reports steam line pressure doesn't decrease when valve fully close		
PCOU		Dispatches an NPO to check the HPCI pipe routing area.		
		Checks computer display for radiation levels and determines them to be normal		
US		Contacts I&C to investigate the failure		
		Evaluates Technical Specifications and determines LCO, Table 3.3.2-1 item 6.g and 3.5.1		
		May direct manual isolation prior to timer timing out		
		May contact HP for supprt		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 4

Brief Description: Failure of HPCI pipe routing area division 1 temperature element upscale

INSTRUCTOR ACTIVITY:

After the crew has completed removing the RFPT from service or when directed by the lead evaluator:

Depress P-3, inserting malfunction TH02:TEE51N25C 350

This fails the div. 1 HPCI equipment area temperature element upscale.

ROLE PLAY:

As NPO sent to HPCI pipe routing area, wait two minutes then report temperatures are normal and there is no sign of a leak

As HP contacted to accompany NPO to HPCI room, acknowledge that a technician will meet the NPO at the HPCI pipe routing area door.

As I&C, wait five minutes then report it appears that the TE-E51-1N025C temperature element has failed and must be replaced. This will take about 2 to 3 hours to complete. Tell the US that you will be up to control room with the paperwork to begin the repair.

SCENARIO EVENT FORM (EVALUATION)

Event No: 5
 Brief Description: Loss of instrument air

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOX		Acknowledges instrument air low pressure annunciators, AR-124-A01 & B01.		
		Recognizes air pressure is dropping.		
		Checks white lights illuminated for the instrument air compressors		
		Transfers auxiliary buses and notifies PCC of impending scram		
		Verifies 13 inch isolations.		
		Reports MSIVs closed and matches switches.		
PCOU		Dispatches an NPO to check out the air compressors.		
		Dispatches an NPO to cross-tie U1 to U2 instrument air.		
		Reduces core flow to 55 Mibm/hr and starts turbine oil pumps		
		Manually scrams the reactor when pressure reaches 65 psig.		
		Verifies all control rods are inserted.		
		Inserts SRMs and IRMs.		
US		Controls RPV level between 13 and 54 inches.		
		Contacts SS to cross-tie U1-U2 instrument air		
		Directs manual scram at 65 psig.		
		Directs performing scram imminent actions.		
		Contacts maintenance about instrument air problem.		
	Enters and directs actions per EO-100-102 on low RPV level.			

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5
Brief Description: Loss of instrument air

INSTRUCTOR ACTIVITY:

After the crew has finished initiating corrective action for the electrical fault or when the lead evaluator directs:

Depress **P-4**, inserting malfunction IA118004 20 3:00

This ruptures the instrument air header in the reactor building.

When the instrument air low pressure annunciators alarm:

Reduce the severity of the leak to 12%

AND

Depress **P-5**, inserting malfunction RR164010 0.5 5:00

This causes a small leak into the drywell.

When the reactor is scrammed:

Depress **P-6**, inserting malfunction IA118004 100

This totally ruptures the header in the reactor building

When the MSIVs close:

Depress **P-7**, inserting malfunction MV07:HV:41F019 0

This closes the F019 steam line drain, preventing feedwater from controlling level.

ROLE PLAY:

As NPO sent to check out the instrument air compressors, wait two minutes then report both air compressors are running loaded constantly.

As AUS, wait two minutes then report there is a large rupture on the instrument air header in the reactor building at the turbine building wall and it needs to be isolated.

SCENARIO EVENT FORM (EVALUATION)

Event No: 5
 Brief Description: Loss of coolant

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Aligns feedwater for startup level control		
		Resets the main generator lockouts		
		Shuts down drywell coolers.		
PCOX		Controls RPV pressure with SRVs		
		Reports drywell pressure greater than 1.72 psig.		
		Sprays SP.		
		Sprays DW.		
		Initiates RCIC for level control and corrects failure of the RCIC injection valve opening.		
		Initiates SLC for level control.		
		Maximizes CRD for level control.		
		Reduces RPV pressure with SRVs.		
US		Initiates SP cooling		
		Reenters EO-100-102, RPV Control and enters EO-100-103, Primary containment control.		
		Directs pressure control with SRVs after MSIVs close		
		Directs level control with RCIC and CRD after RFPTs exhaust crossaround steam		
		Directs SP sprays when >1.72 psig SP pressure.		
	Directs DW sprays when SP pressure is >13 psig.			

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5
Brief Description: Loss of coolant

INSTRUCTOR ACTIVITY:

When the crew manually scrams the reactor:

Depress P-8, inserting malfunction RR164010 10

This breaks the bottom head drain 10%.

ROLE PLAY:

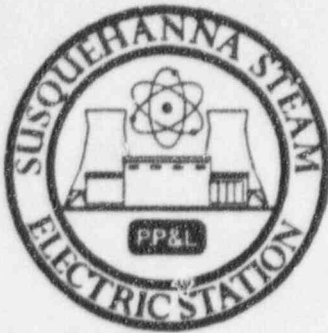
As AUS directed to implement ES-134-001, wait 15 minutes then report the ES is completed.

As NPO directed to place RHRSW radiation monitors in service, wait 3 minutes then place the radiation monitors in service and report the same.

Role play as necessary.

TERMINATION CUE:

The scenario is completed after the crew has stabilized R^DV pressure and level and has commenced spraying the drywell.



**PP&L-SUSQUEHANNA
TRAINING CENTER**

Attachment 1
STCP-QA-612
Rev. 1
Page 1 of 17

SIMULATOR SCENARIO

Scenario Title: RWCU NRHX Temperature Element Failure, Remove Feedwater Heater String, H2/O2 Analyzer Failure, Recirculation Pump Trip, Core Flux Oscillations, ATWS

Scenario Duration: One hour

Scenario Number: 2/2

Revision/Date: 0, 9/26/96

Prepared By:

Instructor

9/26/96

Date

Reviewed By:

Nuclear Operations Training Supervisor

9/26/96

Date

Approved By:

Supervising Manager/Shift Supervisor

9/26/96

Date

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SCENARIO SUMMARY

The reactor is operating at 75% power, preparing to remove feedwater heater string B from service for maintenance activity. APRM A is failed upscale and is bypassed. HPCI is isolated for auxiliary oil pump motor replacement.

The first activity is a failure of the RWCU NRHX outlet temperature element high. RWCU will isolate (outboard valve). The crew will respond to the failure, diagnosing it as an instrument problem. The crew will get I&C involved. The US will evaluate the Technical Specifications actions required for this failure. ***The PCOU and US are primarily involved in this instrument failure.***

The second activity is removing the "B" feedwater heater string from service. The PCOX will isolate extraction steam to the heater string per OP-147-001, Feedwater Heaters, and isolate the string per OP-144-001, Condensate. ***The PCOX is primarily involved in this normal activity.***

The third activity is a loss of power to the "A" H2/O2 panel. The crew will respond to the loss per annunciator response procedures and diagnose the problem as a breaker trip. Maintenance will be contacted to evaluate the cause of the breaker trip. The US will evaluate the Technical Specifications actions required by the loss of H2/O2 analyzer. ***Both PCOs and the US are involved in this instrument failure.***

The fourth activity is a loss of oil pumps for the "B" recirculation pump MG set. This trips the "B" recirculation pump MG set. The crew will respond per ON-164-002, Loss Of Reactor Recirculation Flow. They will determine the reactor is operating in Region II of the power-flow map. The US will evaluate the Technical Specifications actions required for single loop operation. ***Both PCOs and the US are involved in this component failure.***

The fifth activity is inserting control rods to lower power to below the 70% rod line because of the recirculation pump trip. The crew will insert control rods via the shutdown sequence. ***The PCOU is primarily involved in this reactivity manipulation.***

The sixth activity is core flux oscillations. While inserting control rods, reactor power will begin oscillating. The crew will respond per ON-164-002, Loss Of Reactor Recirculation Flow and scram the reactor. ***The PCOU and the US are primarily involved in this component failure.***

The seventh activity is an electrical ATWS condition when "A" RPS fails to initiate to shutdown the reactor. The crew responds per EO-100-113, Level/Power Control. The crew will initiate ARI but it will fail to vent the scram air header. The crew will initiate SLC and lower RPV level to < -60 inches to shutdown the reactor. When CRD is maximized, the control rods will drift into the core. Once RPV level and pressure are stabilized and all rods have been inserted, the scenario is completed. ***Both PCOs and the US are involved in this major transient.***

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SCENARIO KNOWLEDGES AND ABILITIES

General:

294001 A102	4.2/4.2	294001 A104	3.1/3.2
294001 A105	3.4/3.8	294001 A109	3.3/4.2
294001 A110	3.6/4.2	294001 A111	3.3/4.3
294001 A112	3.5/4.2	294001 A113	4.5/4.3
294001 A115	3.2/3.4		

Event 1: RWCU NRHX temperature element fails high

204000 A303	3.6/3.6	204000 A407	3.1/3.1
204000 G011	3.1/3.1		

Event 2: Remove feedwater heater string from service

259001 A202	3.1/3.3	259001 A403	2.9/3.0
259001 G013	3.6/3.4		

Event 3: H2/O2 analyzer A power loss

223001 A404	3.5/3.6	223001 A405	3.6/3.6
223001 G011	3.3/4.2	223001 G013	3.7/3.7

Event 4 and 6: Recirculation pump B low oil pressure trip and core flux oscillations

202002 A203	3.6/3.7	202002 A401	3.7/3.7
202002 A404	3.7/3.7	202002 A403	4.1/4.1
202002 G011	3.4/4.2	202002 G012	3.6/3.3
202002 G015	4.0/4.2		

Event 5: Reduce power with control rods to <70% rod line

201002 A102	3.4/3.3	201002 A103	3.0/2.9
201002 A104	3.6/3.5	201002 A105	3.4/3.6
201002 A401	3.5/3.4	201002 A405	3.1/3.0

Event 7: ATWS

295037 EA101	4.6/4.6	295037 EA103	4.1/4.1
295037 EA104	4.5/4.5	295037 EA105	3.7/4.0
295037 EA106	4.1/4.1	295037 EA201	4.2/4.3
295037 EA202	4.1/4.2	295037 G010	3.9/3.8
295037 G012	3.9/4.6		

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REFERENCES

1. EO-100-102, RPV Control
2. EO-100-113, Level/Power Control
3. ES-158-001, Deenergizing Scram Solenoids
4. ON-100-101, SCRAM
5. ON-164-002, Loss Of Reactor Recirculation Flow
6. OP-144-001, Condensate
7. OP-147-001, Feedwater Heaters And Extraction Steam
8. AR-109-D02, Core Spray Loop A Inleakage-Hi Press
9. AR-102-B05, Recirc MG B Drive Motor Trip
10. AR-114-H05, HPCI Leak Detect Logic B Power Failure

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SCENARIO SPECIAL INSTRUCTIONS

1. Reset the simulator to IC-18 and:
 - lower recirculation flow to 62%
 - isolate HPCI and depressurize its steam line
2. Execute preference file, **YPB.SCENSPARE**, establishing the following conditions:

Malfunctions: 4:4

- | | |
|------------------|---|
| • NM178007A 125 | APRM A failed upscale |
| • AV01:HV155F100 | HPCI inboard isolation bypass fail closed |
| • RR164007D | Recirculation pump B standby AC oil pump trip |
| • RP158007A | RPS A failure to scram |

Remote Functions: 9

- | | |
|-----------------|--|
| • DB106236 OPEN | HPCI inboard isolation valve breaker open |
| • DC188113 OPEN | HPCI outboard isolation valve breaker open |
| • LC188128 OPEN | HPCI auxiliary oil pump breaker open |
| • RD155018 100 | ARI isolation bypass open |
| • RD155030 0 | ARI vent isolation closed |

Overrides: 0:0

Triggers: 0

Pushbuttons Assignments

- | | |
|----------------------------|--|
| 1. IMF TH02.TEG331N007 600 | NRHX Outlet Temperature Element Fails High |
| 2. BAT PCB.H2O2AOFF | Deenergizes H2O2 Analyzer A |
| 3. IMF RR164007C | Recirculation Pump B AC Oil Pump Trips |
| 4. BAT NMB.FLUX_OSC1 | Flux Oscillations On LPRMs |
| 5. BAT NMB.FLUX_OSC2 | Flux Oscillations On LPRMs |
| 6. BAT NMB.FLUX_OSC3 | Flux Oscillations On LPRMs, APRMs, And Full Core Display |

5. Turnover Information:

Prepare a turnover sheet indicating power is 75% ready to remove feedwater heater string B from service to repair a drain leak on the 4B heater requiring depressurizing the heater string. HPCI is tagged out of service for auxiliary oil pump motor replacement.
6. Place a status control tags on HPCI isolation valves and auxiliary oil pump.

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SCENARIO EVENT FORM (EVALUATION)

Event No: 1

Brief Description: RWCU NRHX outlet temperature element fails high closing the RWCU outboard isolation valve

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Acknowledge RCWU high temperature annunciator		
		Report the outboard valve is isolating		
		Report NRHX outlet temperature is white on CRT display		
PCOX		Reads NRHX outlet temperature is upscale at indicator on the SIP		
		Dispatches NPO to RWCU to investigate		
		Diagnoses problem as an instrument problem		
US		Evaluates Technical Specifications 3.4.3.1		
		Contacts I&C		
		Contacts chemistry to be begin grab samples of coolant conductivity		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 1

Brief Description: RWCU NRHX outlet temperature element fails high closing the RWCU outboard isolation valve

INSTRUCTOR ACTIVITY:

About two minutes after the crew has assumed the shift:

Depress P-1, inserting malfunction TH02:TEG331N007 600

This fails the NRHX outlet temperature thermocouple high.

ROLE PLAY:

As I&C when contacted to investigate the upscale temperature element, wait three minutes then report that the temperature element output is high and that you will need about an hour to determine the cause.

As the NPO sent to RWCU for the demineralizers, wait five minutes and report the demineralizers are on hold.

As chemistry, report you will commence sampling for conductivity.

SCENARIO EVENT FORM (EVALUATION)

Event No: 2

Brief Description: Remove feedwater heater string B from service

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Monitors reactor power and feedwater temperatures as string is removed		
PCOX		Removes extraction steam from the feedwater heater string per OP-147-001, Feedwater Heaters.		
		Close extraction steam isolation to 5B heater		
		Close MSEP drains to 4B heater		
		Close extraction steam isolation to the 3B and 4B heaters		
		Close SSE drain to 2B heater		
		Isolates the feedwater heater string per OP-144-001, Condensate		
		Opens heater string B bypass valve		
		Closes heater string B inlet isolation valve		
		Closes heater string B discharge isolation valve		
		Closes heater string B bypass valve		
US		Directs actions to remove feedwater heater string.		
		Confirms MCPR margin with Rx Engineering		
		Notifies maintenance when string is removed		

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES
--

Event No: 2

Brief Description: Remove feedwater heater string B from service

INSTRUCTOR ACTIVITY:

There are no instructor activities for this event.

ROLE PLAY:

As Reactor Engineering when contacted to verify MCPR margin, wait one minute then confirm that MCPR has greater than 0.03 margin.

SCENARIO EVENT FORM (EVALUATION)

Event No: 3

Brief Description: H2/O2 analyzer A deenergizes

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Monitor reactor parameters		
		Checks H2/O2 analyzer A and reports all lights off.		
PCOX		Acknowledge annunciator AR-111-F01, H2/O2 Analyzer Loop A Common Failure		
		Dispatch NPO to 1C226 to check out H2O2 analyzer A		
		Dispatch NPO to 1B217 to check breaker 23		
		Reports all lights out at 1C226		
		Places H2O2 analyzer B in service per OP-173-001, Containment Atmosphere Control.		
US		Evaluates Technical Specifications 3.3.7.5		
		May direct 1B226-11 be reclosed		
		Contact I&C and electrical maintenance to investigate problem with the div. 2 steam leak detection panel. Notify duty manager		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 3

Brief Description: H2/O2 analyzer A deenergizes

INSTRUCTOR ACTIVITY:

When the crew has completed actions to remove feedwater heater string B from service or as directed by the lead evaluator:

Depress P-2, executes batch file PCB.H2O2AOFF

This deenergizes H2O2 analyzer A.

ROLE PLAY:

As I&C directed to investigate the H2/O2 analyzer failure, wait three minutes then report the panel is deenergized.

As the NPO sent 1C226 to check out the analyzer locally, wait two minutes then report all lights are out and the meters are downscale.

As the NPO dispatched to 1B217, wait two minutes then report that breaker 23 is tripped. If directed to reclose the breaker, report it immediately retrips.

As electrical maintenance, report there is no apparent problem with the breaker. It will take an hour to determine why it is tripping.

SCENARIO EVENT FORM (EVALUATION)

Event No: 4

Brief Description: Recirculation pump B trip

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Acknowledge annunciators AR-102-D04, MG Set B Low Oil Pressure and AR-102-B05, Recirc MG B Drive Motor Trip		
		Respond per ON-164-002, Loss Of Reactor Recirculation Flow		
		Plot power-flow map and determine the reactor is operating in region 2 (near region 1)		
		Select a control rod to allow monitoring for flux oscillations		
		Monitor LPRMs and APRMs for flux oscillations		
PCOX		Dispatch an operator to determine why oil pumps tripped		
		Notify PCC about the reduction in power		
US		Direct actions per ON-164-002, Loss Of Reactor Recirculation Flow		
		Evaluate Technical Specifications 3.4.1		
		Notify plant management about the problem		
		Notify HP and chemistry about the power change		
	Contacts Reactor Engineering			

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 4

Brief Description: **Recirculation pump B trip**

INSTRUCTOR ACTIVITY:

After the crew has completed evaluating Technical Specifications actions for the loss of steam leak detection panel or as directed by the lead evaluator:

Depress P-3, inserting malfunction RR164007C

This trips the operating AC lube oil pump for the "B" recirculation pump MG set

ROLE PLAY:

As Reactor Engineering, report that you will evaluate thermal limits and get back to the US after you have completed this.

As the NPO sent to the B MG set, wait two minutes then report the DC oil pump is operating and the B1 oil pump motor is very hot to the touch. The B2 pump is not running.

SCENARIO EVENT FORM (EVALUATION)

Event No: 5

Brief Description: Reduce power with control rods

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Insert control rods per the pull sheet.		
		Continue monitoring for core instabilities		
		Plot position on the power-flow map		
US		Direct power reduction with control rods		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5

Brief Description: Reduce power with control rods

INSTRUCTOR ACTIVITY:

There are no activities required for this event.

ROLE PLAY:

As necessary

SCENARIO EVENT FORM (EVALUATION)

Event No: 6

Brief Description: Core flux oscillations require a scram

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Recognize LPRM and APRM oscillations		
		Recognize LPRM downscale and upscale lights on the full core display		
		Report oscillations to the US		
		Manually scram the reactor		
		Direct the mode switch be placed to shutdown		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6

Brief Description: Core flux oscillations require a scram and ATWS occurs

INSTRUCTOR ACTIVITY:

While the PCOU is inserting control rods and before exiting region 2:

Depress P-4, executing batch file NMB.FLUX_OSC1

30 seconds later:

Depress P-5, executing batch file NMB.FLUX_OSC2

One minute later:

Depress P-6, executing batch file NMB.FLUX_OSC3

These actions will cause power indications to oscillate.

ROLE PLAY:

As necessary

SCENARIO EVENT FORM (EVALUATION)

Event No: 6
 Brief Description: ATWS

POSITION	TIME	STUDENT ACTIVITIES	P	N/P
PCOU		Report failure of control rods to insert		
		Arm and depress manual scram pushbuttons		
		Trip "A" recirculation pump		
		Throttle feedwater injection and lower level to < -60 inches		
PCOX		Arm and depress ARI pushbuttons		
		Initiate SLC and inhibit ADS		
		Prevent injection from HPCI and RCIC		
		Dispatch NPO to vent the scram air header		
		Maximize CRD flow		
		Terminate boron injection		
US		Enter and direct actions per EO-100-113, Level/Power Control		
		Enter and direct actions per EO-100-102, RPV Control		
		Classify the emergency as an alert		
		Direct ES-158-001, Deenergizing Scram Solenoids		
		Direct venting scram air header		

NOTES:	

**INSTRUCTOR ACTIVITIES, ROLE PLAY,
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6

Brief Description: Core flux oscillations require a scram and ATWS occurs

INSTRUCTOR ACTIVITY:

Respond to requests for actions as necessary

ROLE PLAY:

As the AUS directed to pull RPS fuses, wait five minutes then report you are ready to pull the fuses.

As the NPO sent to vent the scram air header, wait five minutes then report you are ready to vent the air header.

TERMINATION CUE:

All rods are inserted after maximizing CRD flow and RPV level and pressure are stable.

12/3/96

REACTOR OPERATOR TEST OUTLINE

o/1

A075

Reactor Operator

		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Total	Required
Plant Wide Generics												13	13	13
Plant Systems	Group 1	2	3	1	8			3	6	2	2	2	29	28
	Group 2		2		3	2	1	2	3	3	1	1	18	19
	Group 3					1			2	1			4	4
Plant Systems Total												51	51	
Emergency and Abnormal Plant Evolutions	Group 1	1	2	1				2				6	12	13
	Group 2	1	3	2				4	4			5	19	19
	Group 3	1	1					2				1	5	4
Emergency and Abnormal Plant Evolutions Total												36	36	
Examination Total												100	100	

RO Question Information

Section Title Plant Wide Generics

RO Group						
System/Evolution	K/A	RO	SRD	KA Statement	Level	Question Topic
	294001A102	4.2	4.2	Ability to execute procedural steps	B	Definition of "Confirm."
	294001A102	4.2	4.2	Ability to execute procedural steps	B	Activities that can be performed without reference to the procedure.
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	B	Overtime restrictions.
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	R	Temporary absence from the ATC by the Plant Control Operator.
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	B	Permission required to voluntarily enter Technical Specification LCO 3.0.3
	294001A106	3.4	3.6	Ability to maintain accurate, clear and concise logs, records, status boards and reports	B	Aborted Evolution Control Log requirements.
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	R	When accountability is required to be performed.
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	B	Who fills the roll of the control room communicator?
	294001K101	3.7	3.7	Knowledge of how to conduct and verify valve lineups	R	Valve lineup
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	R	Operation of an MOV for protective blocking.
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	B	Use of Status Control Tags.
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	B	Dose limits
	294001K105	3.2	3.7	Knowledge of facility requirements for controlling access to vital/control areas	R	Control of access to the control room area.

RO Question Information

Section Title Plant Systems

RO Group 1

System/Evolution	K/A	RO	SRD	KA Statement	Level	Question Topic
Control Rod Drive Hydraulic	201001A102	2.9	2.9	CRD cooling water header pressure	R	Effects of an adjustment of drive header flow.
Control Rod Drive Hydraulic	201001K203	3.5	3.6	Backup SCRAM valve solenoids	B	What will prevent the backup scram valves from venting the scram air header.
Control Rod Drive Hydraulic	201001K303	3.1	3.2	Control rod drive mechanisms	R	Effect of a scram inlet valve failing to open on a SCRAM.
Reactor Manual Control	201002G010	3.9	3.9	Ability to explain and apply all system limits and precautions	B	Action required if a rod that is withdrawn 2 notches beyond rod sheet position.
Recirculation Flow Control	202002G010	3.3	3.3	Ability to explain and apply all system limits and precautions	B	Personnel limitations placed on local operation of the scoop tube.
Recirculation Flow Control	202002K103	3.7	3.7	Reactor core flow	R	Effect on core flow by inserting control rods at 100%.
RHR/LPCI: Injection Mode	203000A214	3.8	3.9	Initiating logic failure	B	Effect of a single logic train operating.
RHR/LPCI: Injection Mode	203000A301	3.8	3.7	Valve operation	B	Response to a LOCA signal while in the test mode.
High Pressure Coolant Inject.	206000A413	4.1	4	Turbine reset control: BWR-2,3,4	R	Method of shutting down HPCI.
High Pressure Coolant Inject.	206000K402	3.9	4	System isolation: BWR-2,3,4	B	Vacuum breaker isolation conditions
Low Pressure Core Spray	209001A201	3.4	3.4	Pump trips	B	Effects of LOCA signal from opposite unit on Core Spray Pumps.
Low Pressure Core Spray	209001K404	3	3.2	Line break detection	R	Indications of a break using the CS leak detection system.
Standby Liquid Control	211000A101	3.6	3.7	Tank level	R	Level effects during operation. Effect of air on determination of when to secure SLC injection.
Reactor Protection	212000A214	3.9	4	High SCRAM instrument volume water level	R	Scram Discharge Volume scram logic.
Reactor Protection	212000A219	3.8	3.9	Partial system activation (half-SCRAM)	R	Transferring of power supplies and a failed group fuse on the transfer.
Reactor Protection	212000K412	3.9	4.1	Bypassing of selected SCRAM signals (manually and automatically): Plant-Specific	B	Reactor power is at 8% during a reactor startup. What condition will cause a scram?

RO Question Information

Section Title Plant Systems

RO Group 1

System/Evolution	K/A	RO	SCB	KA Statement	Level	Question Topic
Intermediate Range Monitor	215003A407	3.6	3.6	Verification of proper functioning/ operability	R	Overlap with the SRMs.
Intermediate Range Monitor	215003K401	3.7	3.7	Rod withdrawal blocks	B	IRM rod blocks and scram.
Average Power Range Monitor/Local Power Range Monitor	215005A308	3.7	3.6	Control rod block status	B	R=recirculation flow comparators and upscale rod blocks.
Average Power Range Monitor/Local Power Range Monitor	215005K202	2.6	2.8	APRM channels	R	Power supplies to the APRMs.
Average Power Range Monitor/Local Power Range Monitor	215005K401	3.7	3.7	Rod withdrawal blocks	B	Effect of bypassing more than the maximum LPRMs to an APRM
Nuclear Boiler Instrumentation	216000A211	3.2	3.3	Heatup or cooldown of the reactor vessel	B	Temperature effects on Fuel Zone instrumentation.
Reactor Core Isolation Cooling	217000K201	2.8	2.8	Motor operated valves	B	Effect on operation of RCIC if F059 open indication is lost.
Automatic Depressurization	218000K403	3.8	4	ADS logic control	B	Response of the ADS logic to level, time and available ECCS.
Primary Containment and Aux.	223001K103	3.2	3.3	Containment/drywell atmosphere control	B	Automatic operation of the Containment Cooling ventilation fans.
Reactor Feedwater	259001A104	2.8	2.7	RFP turbine speed: Turbine-Driven-Only	B	Turbine speed control operation.
Reactor Water Level Control	259002A203	3.6	3.7	Loss of reactor water level input	B	Failure of reactor water level instrument
Emergency Generators	264000K402	4	4.2	Emergency generator trips (emergency/LOCA)	B	Trips during emergency operation.
Emergency Generators	264000K407	3.3	3.4	Local operation and control	B	Effect of resetting the local annunciators during shutdown.

RO Question Information

Section Title Plant Systems

RO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Rod Sequence Control	201004A201	3.3	3.6	Loss of rod position information: BWR-4,5	R	RSCS actions if two reed switches are bad
Rod Worth Minimizer	201006K509	3.2	3.2	Select error: P-Spec(Not-BWR6)	R	Effects of selecting incorrect rod.
Rod Worth Minimizer	201006K514	3	3	Alternate withdraw and insert limits: P-Spec(Not-BWR6)	R	Alternate limits for RWM.
Recirculation	202001A109	3.3	3.3	Recirculation pump seal pressures	R	Indications of seal failure.
Recirculation	202001A214	3.9	4.2	High reactor pressure (ATWS circuitry initiation): Plant-Specific	B	Conditions that will cause an ATWS trip.
Recirculation	202001G010	3.5	3.7	Ability to explain and apply all system limits and precautions	B	Pump starting limitations.
Reactor Water Cleanup	204000K403	2.9	2.9	Over temperature protection for system components	R	Response to a non regenerative heat exchanger hi outlet temperature.
Shutdown Cooling System (RHR Shutdown Cooling Mode)	205000K202	2.5	2.7	Motor operated valves	B	480 swing bus loads
Shutdown Cooling System (RHR Shutdown Cooling Mode)	205000K403	3.8	3.8	Low reactor water level: Plant-Specific	B	Shutdown Cooling Isolation Signal
Rod Position Information	214000A402	3.8	3.8	Control rod position	B	Positive determination of rod position following loss of SIP or CRT SDS 4 Rod position displays.
Rod Block Monitor	215002A304	3.6	3.5	Verification or proper functioning/ operability: BWR-3,4,5	R	Determination of RBM setpoints based on flow and APRM bypass switch positions.
Main and Reheat Steam	239001K609	3.9	4.1	PCIS/NSSSS	B	A leak has occurred on the line to feedpumps. What signal will cause the MSIVs to close?
AC Electrical Distribution	262001A211	3.2	3.6	Degraded system voltages	B	Response of ESS bus to low voltage and manual closure of breakers.
AC Electrical Distribution	262001A302	3.2	3.3	Automatic bus transfer	B	Swing bus automatic transfers. (Swing Bus)
AC Electrical Distribution	262001A304	3.4	3.6	Load sequencing	B	Load sequencing times
DC Electrical Distribution	263000A101	2.5	2.8	Battery charging/discharging rate	R	Capacity of the 125 VDC batteries.

RO Question Information

Section Title Plant Systems

RO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
DC Electrical Distribution	263000K201	3.1	3.4	Major D.C. loads	B	Power supply to Control Room Annunciators
Control Room HVAC	290003K401	3.1	3.2	System initiations/reconfiguration: Plant-Specific	B	CREOASS response to initiation signal.

RO Group 3

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Traversing In-Core Probe	215001A207	3.4	3.7	Failure to retract during accident conditions: Mark-I&II(Not-BWR1)	B	Required actions to withdraw a TIP if an isolation signal is not generated.
Fuel Handling Equipment	234000K502	3.1	3.7	Fuel handling equipment interlocks	B	Refuel Bridge Interlocks
Plant Ventilation	288000K104	2.6	2.6	Applicable component cooling water system: Plant-Specific	B	Start signals for the RHR/CS fan cooler and cooling source
Reactor Vessel Internals	290002A204	3.7	4.1	Excessive heatup/cool-down rate	R	Maximum allowable heat up rate per GO-100-002

RO Question Information

Section Title Emergency and Abnormal Plant Evolutions

RO Group 1

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
SCRAM	295006A101	4.2	4.2	RPS	B	Reason for placing mode switch to shutdown.
SCRAM	295006G010	4.1	4.2	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Required action for three rods at positions greater than 00 and an EOP entry on low RPV level
High Reactor Pressure	295007G011	4.1	4.3	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	B	Required action if an SRV opens at power due to pressure.
Low Reactor Water Level	295009G008	3.6	4.4	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification Leakage Limits
Low Reactor Water Level	295009K202	3.9	3.9	Reactor water level control	B	Vessel level control conditions that can result in low level.
Inadvertent Reactivity Add.	295014G010	4	3.9	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Required actions on a loss of feedwater heating.
Inadvertent Reactivity Add.	295014K104	3	3.4	PCIOMR: Plant-Specific	B	Reason for reducing power by 20%.
Power Above APRM DownScale or Incomplete SCRAM	295015G011	4.2	4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	B	What conditions constitute determination that the reactor will remain shutdown during all conditions.
High Drywell Pressure	295024K215	3.8	3.9	Containment spray logic: Plant-Specific	B	Drywell spray logic.
High Reactor Pressure	295025A103	4.4	4.4	Safety/relief valves: Plant-Specific	B	With an SRV cycling what action should be taken.
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037G007	3.7	3.9	Ability to explain and apply all system limits and precautions	R	System prohibited from being used in Level/Power Control.
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K306	3.8	4.1	Maintaining heat sinks external to the containment	B	Temperature effects on the usability of RPV water level instruments

RO Question Information

Section Title Emergency and Abnormal Plant Evolutions

RO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Partial or Complete Loss of Forced Core Flow Circulation	295001A201	3.5	3.8	Power/flow map	B	Required action on a recirculation runback that places in region 1 of the Power to Flow Map.
Partial or Complete Loss of Forced Core Flow Circulation	295001G008	3.5	4.2	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification entry condition for single loop operation.
Partial or Complete Loss of Forced Core Flow Circulation	295001K306	2.9	3	Core flow indication	B	Determine the total core flow rate in single loop.
Loss of Main Condenser Vacuum	295002K301	3.7	3.8	Reactor SCRAM: Plant-Specific	B	When a reactor scram will occur without any operator action (low power).
Part/Complete Loss of AC Power	295003A102	4.2	4.3	Emergency generators	B	How long diesels can operate without ESW.
Part/Complete Loss of AC Power	295003A103	4.4	4.4	Systems necessary to assure safe plant shutdown	B	How HPCI and RCIC should be used during a station blackout.
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	B	Effects of a sustained loss of 4KV ESS bus 1D on the drywell.
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	B	Available indications of a leaking SRV during a station blackout.
Part/Complete Loss of DC Power	295004K203	3.3	3.3	D.C. bus loads	B	Affect on diesel generator by a loss of 125 VDC power
High Reactor Water Level	295008K206	3.4	3.6	RCIC: Plant-Specific	B	Required actions to restart RCIC after a high level shutdown
High Suppression Pool Temp.	295013G008	3.5	4.4	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification entry condition on high suppression pool temperature.
Control Room Abandonment	295016A101	3.8	3.9	RPS	B	What mechanism is being used to close the MSIVs if they are not closed before evacuating the control room.
Control Room Abandonment	295016A108	4	4	Reactor pressure	B	Location of where ADS valves can be operated.

RO Question Information

Section Title Emergency and Abnormal Plant Evolutions

RO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Control Room Abandonment	295016A203	4.3	4.4	Reactor pressure	B	How reactor pressure will be controlled following control room evacuation with all actions taken
High Off-Site Release Rate	295017G011	4.2	4.5	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	R	Radiological Release Entry Condition.
Part/Complete Loss of Component Cooling Water	295018K101	3.5	3.6	Effects on component/system operations	B	How a Main steam isolation can result from loss of RBCCW.
Part/Complete Loss Instrument Air	295019G010	3.7	3.4	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Conditions requiring a scram on a loss of instrument air. (Possibly including basis)
Loss of CRD Pumps	295022A201	3.5	3.6	Accumulator pressure	B	Requirement to scram the reactor on loss of CRD.
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	B	Use of vortex limits.

RO Group 3

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Loss of Shutdown Cooling	295021K104	3.6	3.7	Natural circulation	R	RPV Level required to assure cooling due to circulation.
Loss of Shutdown Cooling	295021K203	3.6	3.6	RHR/shutdown cooling	B	Available Shutdown Cooling loops on a loss of RPS.
Refueling Accidents	295023G001	3.3	4.2	Knowledge of system status criteria which require the notification of plant personnel	B	Required action for a refuel floor high exhaust radiation.
High Secondary Containment Area Temperature	295032A104	3.3	3.4	Fire protection system	B	Indications available that temperature on 749' exceeds 149 F and affect on level indication.
High Secondary Containment Area Temperature	295032A105	3.7	3.9	Affected systems so as to isolate damaged portions	B	Systems that can be secured to protect the secondary containment.

SENIOR REACTOR OPERATOR TEST OUTLINE

Senior Reactor Operator

		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Total	Required
Plant Wide Generics													17	17
Plant Systems	Group 1	1	1		7				5	4			3	23
	Group 2			1	3	1		1	1			2	4	13
	Group 3						1		2	1				4
Plant Systems Total													40	40
Emergency and Abnormal Plant Evolutions	Group 1	2	5	2				5	4				10	26
	Group 2		3	3				4	2				3	17
Emergency and Abnormal Plant Evolutions Total													43	43
Examination Total													100	100

SRO Question Information

Section Title Plant Wide Generics

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
	294001A101	2.9	3.4	Ability to obtain and verify control procedure copy	S	Method of verifying that procedures that have changes are complete and current.
	294001A102	4.2	4.2	Ability to execute procedural steps	B	Activities that can be performed without reference to the procedure.
	294001A102	4.2	4.2	Ability to execute procedural steps	B	Definition of "Confirm."
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	B	Overtime restrictions.
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	S	Control Room command function with Shift Supervisor absent.
	294001A103	2.7	3.7	Ability to locate and use procedures and station directives related to shift staffing and activities	B	Permission required to voluntarily enter Technical Specification LCO 3.0.3
	294001A105	3.4	3.8	Ability to make accurate, clear, and concise verbal reports	S	Definition of "Promptly Reportable"
	294001A106	3.4	3.6	Ability to maintain accurate, clear and concise logs, records, status boards and reports	B	Aborted Evolution Control Log requirements.
	294001A112	3.5	4.2	Ability to direct personnel activities outside the control room	S	Refuel Supervisor and Refuel Manager duties during operations key activities.
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	S	Site Accountability is required to be performed at the Alert level for which of the following conditions?
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	S	Action for immediately entering and exiting an Emergency Action Level.
	294001A116	2.9	4.7	Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coordinator	B	Who fills the roll of the control room communicator?
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	S	Control of Bypass
	294001K102	3.9	4.5	Knowledge of tagging and clearance procedures	B	Use of Status Control Tags.
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	B	Dose limits

SRO Question Information

Section Title Plant Wide Generics

SRO Group						
System/Evolution	K/A	RD	SRO	KA Statement	Level	Question Topic
	294001K103	3.3	3.8	Knowledge of 10 CFR 20 and related facility radiation control requirements	S	Maximum elevation for personnel access when moving fuel from vessel.
	294001K116	3.5	3.8	Knowledge of facility protection requirements, including fire brigade and portable fire-fighting equipment usage	S	Fire Brigade Leader

SRO Question Information

Section Title Plant Systems

SRO Group 1

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Recirculation Flow Control	202002G010	3.3	3.3	Ability to explain and apply all system limits and precautions	B	Personnel limitations placed on local operation of the scoop tube.
Recirculation Flow Control	202002K403	3.0	3.0	Signal failure detection: Plant-Specific	S	Effect of low control signal on the recirculation pumps
RHR/LPCI: Injection Mode	203000A214	3.8	3.9	Initiating logic failure	B	Effect of a single logic train operating.
RHR/LPCI: Injection Mode	203000A301	3.8	3.7	Valve operation	B	Response to a LOCA signal while in the test mode.
High Pressure Coolant Inject.	206000K402	3.9	4.0	System isolation: BWR-2,3,4	B	Vacuum breaker isolation conditions
Low Pressure Core Spray	209001A201	3.4	3.4	Pump trips	B	Effects of LOCA signal from opposite unit on Core Spray Pumps.
Standby Liquid Control	211000G006	3.1	4.2	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits	S	Discharge relief valve open on running pump what plant condition cannot be assured.
Reactor Protection	212000G005	3.8	4.5	Knowledge of limiting conditions for operations and safety limits	S	SDV Technical Specifications
Reactor Protection	212000K412	3.9	4.1	Bypassing of selected SCRAM signals (manually and automatically): Plant-Specific	B	Reactor power is at 8% during a reactor startup. What condition will cause a scram?
Average Power Range Monitor/Local Power Range Monitor	215005A308	3.7	3.6	Control rod block status	B	Recirculation flow comparators and upscale rod blocks.
Average Power Range Monitor/Local Power Range Monitor	215005K401	3.7	3.7	Rod withdrawal blocks	B	Effect of bypassing more than the maximum LPRMs to an APRM
Nuclear Boiler Instrumentation	216000A211	3.2	3.3	Heatup or cooldown of the reactor vessel	B	Temperature effects on Fuel Zone instrumentation.
Reactor Core Isolation Cooling	217000K201	2.8	2.8	Motor operated valves	B	Effect on operation of RCIC if F059 open indication is lost.
Automatic Depressurization	218000K403	3.8	4.0	ADS logic control	B	Response of the ADS logic to level, time and available ECCS.
Primary Containment and Aux.	223001K103	3.2	3.3	Containment/drywell atmosphere control	B	Automatic operation of the Containment Cooling ventilation fans.

SRO Question Information

Section Title Plant Systems

SRO Group 1

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Reactor Water Level Control	259002A203	3.6	3.7	Loss of reactor water level input	B	Failure of reactor water level instrument
AC Electrical Distribution	262001A211	3.2	3.6	Degraded system voltages	B	Response of ESS bus to low voltage and manual closure of breakers.
AC Electrical Distribution	262001A302	3.2	3.3	Automatic bus transfer	B	Swing bus automatic transfers. (Swing Bus)
AC Electrical Distribution	262001A304	3.4	3.6	Load sequencing	B	Load sequencing times
Emergency Generators	264000K402	4.0	4.2	Emergency generator trips (emergency/LOCA)	B	Trips during emergency operation.
Emergency Generators	264000K407	3.3	3.4	Local operation and control	B	Effect of resetting the local annunciators during shutdown.

SRO Question Information

Section Title Plant Systems

SRO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Control Rod Drive Hydraulic	201001K203	3.5	3.6	Backup SCRAM valve solenoids	B	What will prevent the backup scram valves from venting the scram air header.
Reactor Manual Control	201002G010	3.9	3.9	Ability to explain and apply all system limits and precautions	B	Action required if a rod that is withdrawn 2 notches beyond rod sheet position.
Rod Sequence Control	201004G005	3.4	4.1	Knowledge of limiting conditions for operations and safety limits	S	Determine required actions for bypassed rod.
Recirculation	202001A214	3.9	4.2	High reactor pressure (ATWS circuitry initiation): Plant-Specific	B	Conditions that will cause an ATWS trip.
Recirculation	202001G010	3.5	3.7	Ability to explain and apply all system limits and precautions	B	Pump starting limitations.
Shutdown Cooling System (RHR Shutdown Cooling Mode)	205000K202	2.5	2.7	Motor operated valves	B	480 swing bus loads
Shutdown Cooling System (RHR Shutdown Cooling Mode)	205000K403	3.8	3.8	Low reactor water level: Plant-Specific	B	Shutdown Cooling Isolation Signal
Rod Position Information	214000A402	3.8	3.8	Control rod position	B	Positive determination of rod position following loss of SIP or CRT SDS 4 Rod position displays.
Intermediate Range Monitor	215003A407	3.6	3.6	Verification of proper functioning/ operability	S	Give the overlap data that was observed and ask what the required action is?
Intermediate Range Monitor	215003K401	3.7	3.7	Rod withdrawal blocks	B	IRM rod blocks and scram.
Fuel Handling Equipment	234000K502	3.1	3.7	Fuel handling equipment interlocks	B	Refuel Bridge Interlocks
Reactor Feedwater	259001A104	2.8	2.7	RFP turbine speed: Turbine-Driven-Only	B	Turbine speed control operation.
DC Electrical Distribution	263000G005	3.1	3.8	Knowledge of limiting conditions for operations and safety limits	S	Operability determination for 125 VDC.
DC Electrical Distribution	263000K201	3.1	3.4	Major D.C. loads	B	Power supply to Control Room Annunciators
Control Room HVAC	290003K401	3.1	3.2	System initiations/reconfiguration: Plant-Specific	B	CREOASS response to initiation signal.

SRO Question Information

Section Title Plant Systems

SRO Group 3

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Traversing In-Core Probe	215001A207	3.4	3.7	Failure to retract during accident conditions: Mark-I&II(Not-BWR1)	B	Required actions to withdraw a TIP if an isolation signal is not generated.
Main and Reheat Steam	239001K609	3.9	4.1	PCIS/NSSSS	B	A leak has occurred on the line to feedpumps. What signal will cause the MSIVs to close?
Plant Ventilation	288000K104	2.6	2.6	Applicable component cooling water system: Plant-Specific	B	Start signals for the RHR/CS fan cooler and cooling source
Reactor Vessel Internals	290002A204	3.7	4.1	Excessive heatup/cooldown rate	S	Maximum allowable heatup rate as allowed by GO-100-002.

SRO Question Information

Section Title Emergency and Abnormal Plant Evolutions

SRO Group 1

System/Evolution	K/A	RB	SRO	KA Statement	Level	Question Topic
Partial or Complete Loss of Forced Core Flow Circulation	295001A201	3.5	3.8	Power/flow map	B	Required action on a recirculation runback that places in region 1 of the Power to Flow Map.
Partial or Complete Loss of Forced Core Flow Circulation	295001G003	3.2	4.1	Knowledge of limiting conditions for operations and safety limits	S	Safety limit that may be violated on core instability.
Partial or Complete Loss of Forced Core Flow Circulation	295001G008	3.5	4.2	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification entry condition for single loop operation.
Partial or Complete Loss of Forced Core Flow Circulation	295001K306	2.9	3.0	Core flow indication	B	Determine the total core flow rate in single loop.
Loss of Main Condenser Vacuum	295002K301	3.7	3.8	Reactor SCRAM: Plant-Specific	B	When a reactor scram will occur without any operator action (low power).
Part/Complete Loss of AC Power	295003A102	4.2	4.3	Emergency generators	B	How long diesels can operate without ESW.
Part/Complete Loss of AC Power	295003A103	4.4	4.4	Systems necessary to assure safe plant shutdown	B	How HPCI and RCIC should be used during a station blackout.
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	B	Effects of a sustained loss of 4KV ESS bus 1D on the drywell.
Part/Complete Loss of AC Power	295003A204	3.5	3.7	System lineups	S	Purpose of sequence and time delays used in starting loads in EG-000-031.
Part/Complete Loss of AC Power	295003G007	3.2	3.6	Ability to explain and apply all system limits and precautions	S	Time limits and basis for securing Lube Oil Pumps
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	B	Available indications of a leaking SRV during a station blackout.
Part/Complete Loss of AC Power	295003K204	3.4	3.5	A.C. electrical loads	S	HPCI component affected by loss of 480 volt power supply
Part/Complete Loss of DC Power	295004K203	3.3	3.3	D.C. bus loads	B	Affect on diesel generator by a loss of 125 VDC power
SCRAM	295006A101	4.2	4.2	RPS	B	Reason for placing mode switch to shutdown.

SRO Question Information

Section Title Emergency and Abnormal Plant Evolutions

SRO Group 1

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
SCRAM	295006G010	4.1	4.2	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Required action for three rods at positions greater than 00 and an EOP entry on low RPV level
High Reactor Pressure	295007G011	4.1	4.3	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	B	Required action if an SRV opens at power due to pressure.
High Reactor Water Level	295008K206	3.4	3.6	RCIC: Plant-Specific	B	Required actions to restart RCIC after a high level shutdown
Low Reactor Water Level	295009G008	3.6	4.4	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification Leakage Limits
Low Reactor Water Level	295009K202	3.9	3.9	Reactor water level control	B	Vessel level control conditions that can result in low level.
High Suppression Pool Temp.	295013G008	3.5	4.4	Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications	B	Technical Specification entry condition on high suppression pool temperature.
Inadvertent Reactivity Add.	295014G010	4.0	3.9	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Required actions on a loss of feedwater heating.
Inadvertent Reactivity Add.	295014K104	3.0	3.4	PCIOMR: Plant-Specific	B	Reason for reducing power by 20%.
Power Above APRM DownScale or Incomplete SCRAM	295015G011	4.2	4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	B	What conditions constitute determination that the reactor will remain shutdown during all conditions.
Control Room Abandonment	295016A101	3.8	3.9	RPS	B	What mechanism is being used to close the MSIVs if they are not closed before evacuating the control room.
Control Room Abandonment	295016A108	4.0	4.0	Reactor pressure	B	Location of where ADS valves can be operated.
Control Room Abandonment	295016A203	4.3	4.4	Reactor pressure	B	How reactor pressure will be controlled following control room evacuation with all actions taken.
Part/Complete Loss of Component Cooling Water	295018K101	3.5	3.6	Effects on component/system operations	B	How a Main steam isolation can result from loss of RBCCW.

SRO Question Information

Section Title Emergency and Abnormal Plant Evolutions

SRO Group 1

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Part/Complete Loss Instrument Air	295019G010	3.7	3.4	Ability to perform without reference to procedures those actions that require immediate operation of system components or controls	B	Conditions requiring a scram on a loss of instrument air. (Possibly including basis)

SRO Question Information

Section Title Emergency and Abnormal Plant Evolutions

SRO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
Loss of Shutdown Cooling	295021A206	3.2	3.3	Reactor pressure	S	Definition of alternate heat removal method.
Loss of Shutdown Cooling	295021K203	3.6	3.6	RHR/shutdown cooling	B	Available Shutdown Cooling loops on a loss of RPS.
Loss of CRD Pumps	295022A201	3.5	3.6	Accumulator pressure	B	Requirement to scram the reactor on loss of CRD.
Refueling Accidents	295023G001	3.3	4.2	Knowledge of system status criteria which require the notification of plant personnel	B	Required action for a refuel floor high exhaust radiation.
High Drywell Pressure	295024K215	3.8	3.9	Containment spray logic: Plant-Specific	B	Drywell spray logic.
High Reactor Pressure	295025A103	4.4	4.4	Safety/relief valves: Plant-Specific	B	With an SRV cycling what action should be taken.
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	S	Suppression pool level that requires a scram.
Low Suppression Pool Water Level	295030G012	3.7	4.4	Ability to utilize symptom based procedures	B	Use of vortex limits.
Reactor Low Water Level	295031A102	4.5	4.5	High pressure (feedwater) coolant injection: Plant-Specific	S	Interlocks that can be bypassed in RPV Control.
High Secondary Containment Area Temperature	295032A104	3.3	3.4	Fire protection system	B	Indications available that temperature on 749' exceeds 149 F and affect on level indication.
High Secondary Containment Area Temperature	295032A105	3.7	3.9	Affected systems so as to isolate damaged portions	B	Systems that can be secured to protect the secondary containment.
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K209	4.0	4.2	Reactor water level	S	Level band during a failure to scram and use of the target band.
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K303	4.1	4.5	Lowering reactor water level	S	Basis for reducing level per step LQ/L-6 of Level Power Control

SRO Question Information

Section Title Emergency and Abnormal Plant Evolutions

SRO Group 2

System/Evolution	K/A	RO	SRO	KA Statement	Level	Question Topic
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K306	3.8	4.1	Maintaining heat sinks external to the containment	S	Opening and bypassing interlocks for the Main Steam Isolation valves during a failure to scram.
SCRAM Condition Present & Reactor Power Above APRM Downscale or Unknown	295037K306	3.8	4.1	Maintaining heat sinks external to the containment	B	Temperature effects on the usability of RPV water level instruments

PLANT WIDE GENERICS

K/A 294001A101 RQ Value: 2.9 SRO Value: 3.4

KA Statement: Ability to obtain and verify control procedure copy

Topic Method of verifying that procedures that have changes are complete and current.

Question A surveillance is to be performed by a Nuclear Plant Operator(NPO) in the field.

Select the required method for assuring that the working copy is current.

- a. Page checking the procedure against a control room copy.
- b. Verifying Procedure Change Control Form (PCAF) are the same as the control room copy.
- c. Verifying the PCAF's are the same a list of PCAF's provided by the Document Control Center.
- d. Verifying the working copy against the current controlled index.

Answer d Exam Level S Question Value 1.0

Reference 1 NDAP-QA-0300, page 48, rev. 4.

Reference 2

Reference 3

Learning Objective

NI

History New

Comments

K/A 294001A102 RO Value: 4.2 SRO Value: 4.2

KA Statement: Ability to execute procedural steps

Topic Definition of "Confirm."

Question A procedure requires that a specific valve be confirmed in the closed position before starting a pump.

Which of the following describes the required action to "confirm" the position of the valve?

- a. Before starting the pump the operator verifies the valve is closed. Initialing the step is required by the operator.
- b. Before starting the pump another operator verifies the valve is closed. The other operator is required to initial the step.
- c. Before starting the pump the operator self checks that the valve is closed by pointing to the valve indication.
- d. Before starting the pump another operator is required to verbally confirm that the valve is closed.

Answer a Exam Level B Question Value 1.0

Reference 1 OP-AD-001, page 8, rev. 5

Reference 2

Reference 3

Learning Objective AD044

VI.A.D.1

History New

Comments

K/A 294001A102 RO Value: 4.2 SRO Value: 4.2

KA Statement: Ability to execute procedural steps

Topic: Activities that can be performed without reference to the procedure.

Question: Which activity may be performed without reference to the procedure?

- a. Initiation of Suppression Pool Spray due to suppression chamber pressure approaching 13 psig.
- b. Initiation of Suppression Pool Cooling to support HPCI testing.
- c. Resetting a reactor scram when directed by ON-100-101, Scram.
- d. Bypassing RSCS when directed by EO-100-113, Level/Power Control.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: OP-AD-001, page 69, rev. 5.

Reference 2:

Reference 3:

Learning Objective:

History: New

Comments: Check "C" to make sure this is not allowed by another procedure or by "skill of the craft"

K/A 294001A103 RO Value: 2.7 SRO Value: 3.7

KA Statement: Ability to locate and use procedures and station directives related to shift staffing and activities

Topic: Permission required to voluntarily enter Technical Specification LCO 3.0.3

Question: Given the following conditions:

- One ADS valve has been inoperable for 14 days.
- A surveillance is required on HPCI which will require HPCI to be declared inoperable.
- Performance of the surveillance will require entry into Technical Specifications 3.0.3.

Who is required to give permission to voluntarily enter Technical Specification 3.0.3?

a. Manager - Nuclear Operations

b. Plant Operations Review Committee

c. Vice President - Nuclear Operations

d. Nuclear Regulatory Commission - Region I

Answer: a Exam Level: B Question Value: 1.0

Reference 1: OP-AD-001, Page 49, rev. 5.

Reference 2:

Reference 3:

Learning Objective:

History: New

Comments:

K/A 294001A103 RO Value: 2.7 SRO Value: 3.7

KA Statement: Ability to locate and use procedures and station directives related to shift staffing and activities

Topic Temporary absence from the ATC by the Plant Control Operator.

Question The Unit 1 Plant Control Operator assigned the AT THE CONTROLS (ATC) duties is required to discuss the results of a test in the Shift Supervisor office. It is expected to take approximately 30 minutes for the discussion.

Select the allowable action for the operator to attend the meeting in the Shift Supervisors office.

The PCO with the ATC duties is required to:

- a. turn over responsibility to an extra PCO not assigned to either unit.
- b. turn over responsibility to the Unit Supervisor, provided the other PCO assigned to the unit is in the control room.
- c. conduct a formal turnover to the other PCO assigned to the unit.
- d. Inform the Unit Supervisor of his/her location during the absence.

Answer c Exam Level R Question Value 1.0

Reference 1 NDAP-QA-0300, page 16, rev 5.

Reference 2

Reference 3

Learning Objective AD044 VI.B.2

History New

Comments

K/A 294001A103 RO Value: 2.7 SRO Value: 3.7

KA Statement: Ability to locate and use procedures and station directives related to shift staffing and activities

Topic Overtime restrictions.

Question An operator accepts 4 hours of overtime on the first day back to work following a weeks vacation.

What is the maximum time the operator can work the next day?

- a. 4 hours.
- b. 8 hours.
- c. 12 hours.
- d. 16 hours.

Answer b Exam Level B Question Value 1.0

Reference 1 OP-AD-001, page 28, rev. 5.

Reference 2

Reference 3

Learning Objective

History new.

Comments replaced SPDS question.

K/A 294001A103 RO Value: 2.7 SRO Value: 3.7

KA Statement: Ability to locate and use procedures and station directives related to shift staffing and activities

Topic Control Room command function with Shift Supervisor absent

Question The Shift Supervisor is absent from the control room to meet with the Day Shift Supervisor when both feed pumps trip on one unit causing it to trip from 98% power. The other unit is at 83% power.

Who is to assume the control room command function for Emergency Operating Procedures?

- a. Unit supervisor for the affected unit.
- b. Unit supervisor for the unaffected unit.
- c. Unit supervisor for Unit 1.
- d. Unit supervisor for Unit 2.

Answer c Exam Level S Question Value 1.0

Reference 1 NDAP-QA-0300, page 16, revision 4

Reference 2

Reference 3

Learning Objective ADO44 VI.B.1.e

History new

Comments

K/A 294001A105 RO Value: 3.4 SRO Value: 3.8

KA Statement: Ability to make accurate, clear, and concise verbal reports

Topic Definition of "Promptly Reportable"

Question A promptly reportable event is defined as an event that requires verbal notification of the NRC within:

a. 1 hour

b. 4 hours

c. 24 hours

d. 72 hours

Answer c Exam Level S Question Value 1.0

Reference 1 NDAP-QA-0720, page 9, rev. 1.

Reference 2

Reference 3

Learning Objective AD044

XXI.C.2

History New

Comments

K/A 294001A106 RO Value: 3.4 SRO Value: 3.6

KA Statement: Ability to maintain accurate, clear and concise logs, records, status boards and reports

Topic Aborted Evolution Control Log requirements.

Question Given the following conditions:

- Conditions are being established to perform a surveillance on a diesel generator.
- A situation requires the engineer who will observe the test to leave the plant.
- The engineer is expected to return later in the day.
- The test cannot be performed without the engineers presence.

An Aborted Evolution Control Log is required to be completed when it is determined that:

a. the test will be delayed.

b. the diesel will NOT be immediately returned to a normal lineup.

c. test will NOT be restarted until the next shift.

d. the test will NOT be restarted within one hour.

Answer c Exam Level B Question Value 1.0

Reference 1 NDAP-QA-302, page 33, rev. 5.

Reference 2

Reference 3

Learning Objective AD044 XIV.B.4.j

History New

Comments

K/A 294001A112 RO Value: 3.5 SRO Value: 4.2

KA Statement: Ability to direct personnel activities outside the control room

Topic Refuel Supervisor and Refuel Manager duties during operations key activities

Question The core is being refueled following an outage. When is the Refuel Supervisor required to be on the refuel floor?

- a. At all times, except for break periods.
- b. At times specified by the Refueling Manager.
- c. All times when the Refueling Manager is NOT on the refuel floor.
- d. All times unless the Refueling Manager is an SRO with an active license.

Answer a Exam Level S Question Value 1.0

Reference 1 NDAP-QA-0301, page 12, rev. 1.

Reference 2

Reference 3

Learning Objective AD044 VI.C.1

History New

Comments

K/A 294001A116 RO Value: 2.9 SRO Value: 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coor

Topic Action for immediately entering and exiting an Emergency Action Level.

Question Given the following conditions:

- A main steam line isolation occurred due to a resin intrusion into the vessel.
- The main steam line isolation is determined to require an Alert declaration.
- Following closure of the MSIVs no condition exists that would indicate an emergency condition continues to exist.

Which of the following actions should be taken?

- a. Declare an Alert. Allow Technical Support Center to evaluate if additional actions need to be taken before terminating the emergency.
- b. Provide courtesy notifications to agencies that an emergency condition had occurred, but was terminated prior to notification.
- c. Declare an Alert and complete required notifications, but include termination of the emergency in the same notification.
- d. Declare an Alert. Allow the Emergency Director - TSC to terminate the event.

Answer c Exam Level S Question Value 1.0

Reference 1 EP-PS-100-6, page 3, rev 7.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 294001A116 RO Value: 2.9 SRO Value: 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coo

Topic: When accountability is required to be performed.

Question: What emergency classification requires accountability to be performed?

- a. An Unusual Event or above.
- b. An Alert or above.
- c. A Site Area Emergency or above.
- d. Any classification when the potential for release exists.

Answer: b Exam Level: R Question Value: 1.0

Reference 1: EP-PS-100-C, Rev. 4, page 1.

Reference 2:

Reference 3:

Learning Objective:

History: new

Comments:

K/A 294001A116 RO Value: 2.9 SRC Value: 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coor

Topic Site Accountability is required to be performed at the Alert level for which of the following conditions?

Question Site Accountability is required to be performed at the Alert level for:

- a. any Alert declaration.
- b. only declarations with potential for core damage.
- c. only declarations with potential for radiological release.
- d. only declarations where the Emergency Director deems it necessary.

Answer a Exam Level S Question Value 1.0

Reference 1 EP-PS-100-C

Reference 2

Reference 3

Learning Objective

History New

Comments

K/A 294001A116 RO Value: 2.9 SRO Value: 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the Emergency Coo

Topic Who fills the roll of the control room communicator?

Question The control room communicator is the:

- a. the second PCO from the unaffected unit.
- b. the Assistant Unit Supervisor.
- c. a designated Nuclear Plant Operator from the unaffected unit.
- d. the Shift Technical Advisor.

Answer a Exam Level B Question Value 1.0

Reference 1 NDAP-QA-0300, page 53, rev. 4.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 294001K101 RO Value: 3.7 SRO Value: 3.7

KA Statement: Knowledge of how to conduct and verify valve lineups

Topic Valve lineup

Question You are directed to unlock and close a normally locked open RHR valve.

After the valve is closed the locking device:

- a. be reapplied to the valve locking it in the closed position.
- b. be locked to the operator or a fixed object in close proximity of the component.
- c. be tagged and turned over to the shift supervisor.
- d. be tagged and turned over to the system operating engineer.

Answer b Exam Level R Question Value 1.0

Reference 1 OP-AD-001, page 54, rev. 5

Reference 2

Reference 3

Learning Objective

History 1991 exam

Comments

KA Statement: Knowledge of tagging and clearance procedures

Topic Control of Bypass

Question Which of the following items will require a bypass to be documented in accordance with NDAP-QA-0484?

- a. Maintenance is to be performed on a temperature control valve controller. A temporary controller is installed. Maintenance is expected to take 21 days due to parts NOT being available.
- b. A temporary hose is installed per a work authorization for 4 days to flush newly installed fire water piping.
- c. Test instrumentation is installed to monitor the performance of a heat exchanger. Existing system isolation valves are used to place the test instrumentation in service.
- d. An instrumentation technician installs a test gauge in accordance with a Surveillance Operations procedure.

Answer a Exam Level 5 Question Value 1.0

Reference 1 NDAP-QA-0484, page 4, revision 2.

Reference 2

Reference 3

Learning Objective AD044 XIII B.3

History New

Comments

K/A 294001K102 RO Value: 3.9 SRO Value: 4.5

KA Statement: Knowledge of tagging and clearance procedures

Topic Use of Status Control Tags

Question A valve is tagged with a pink tag during an outage. Operation of the valve can be approved by which one of the following individuals or combinations of individuals?

[Empty answer box]

- a. The work group supervisor
- b. The work group supervisor or the Operations Outage Group Supervisor
- c. The Shift Supervisor
- d. The work group supervisor and the Shift Supervisor

Answer d Exam Level B Question Value 1.0

Reference 1 NDAP-QA-0302, page 12.

Reference 2

Reference 3

Learning Objective AD044 XIV.B.5

History New

Comments

K/A 294001K102 RO Value: 3.9 SRO Value: 4.5

KA Statement: Knowledge of tagging and clearance procedures

Topic: Operation of an MOV for protective blocking.

Question: A motor operated valve is required to be used for protective blocking.

Which of the following is an acceptable method for closing the valve?

- a. Close the valve until closed indication appears. Hold the control switch in closed position for 5 seconds.
- b. Place torque switch in the circuit. Close the valve from the Control Room until closed indication appears.
- c. Close the valve from the control room, then manually close the valve locally.
- d. Close the valve from the control room, then verify closed indication locally.

Answer: c Exam Level: R Question Value: 1.0

Reference 1: OP-AD-001, page 56, rev. 5.

Reference 2:

Reference 3:

Learning Objective: ADO44 XIV.B.10

History: New

Comments:

K/A 294001K103 RO Value: 3.3 SRC Value: 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Topic Dose limits

Question Without a dose extension in place, what is your maximum annual dose limit at Susquehanna?

a. 1000 mrem.

b. 2000 mrem.

c. 4000 mrem

d. 5000 mrem.

Answer b Exam Level B Question Value 1.0

Reference 1 NDAP-00-0625, page 25, rev. 5.

Reference 2

Reference 3

Learning Objective

History new

Comments Need Procedure

K/A 294001K103 RO Value: 3.3 SRO Value: 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Topic Maximum elevation for personnel access when moving fuel from vessel.

Question The bundle from location 23-03 is being transferred from the core during core off-load. A leak has occurred requiring an operator to enter containment to investigate.

What is the maximum elevation that the operator can go to in the containment?

a. 738'

b. 752'

c. 767'

d. 779'

Answer b Exam Level S Question Value 1.0

Reference 1 NDAP-00-0626, page 25, rev. 4.

Reference 2

Reference 3

Learning Objective AD044

V.B.1

History New

Comments

K/A 294001K105 RO Value: 3.2 SRO Value: 3.7

KA Statement: Knowledge of facility requirements for controlling access to vital/control areas

Topic: Control of access to the control room area.

Question: During normal plant conditions, who is responsible for controlling access and conduct of personnel in the Unit Control Room?

a. PCO assigned at the controls responsibility.

b. Second PCO assigned to the unit.

c. Unit Supervisor.

d. Shift supervisor.

Answer: c Exam Level: R Question Value: 1.0

Reference 1: OP-AD-001, page 12, rev. 5.

Reference 2:

Reference 3:

Learning Objective: AD044 Not Identified

History: new

Comments: Replaced fire report question.

K/A 294001K116 RO Value: 3.5 SRO Value: 3.8

KA Statement: Knowledge of facility protection requirements, including fire brigade and portable fire-fighting equipment usage

Topic Fire Brigade Leader

Question Given the following conditions:

- The Assistant Unit Supervisor(AUS) has had to leave site due to illness.
- A replacement AUS has not arrived.
- A fire has occurred on Unit 2.

Who will function as the fire brigade leader?

a. One of the Unit Supervisors.

b. The senior Nuclear Plant Operator on the fire brigade.

c. The senior individual from the security department on the fire brigade.

d. The Plant Control Operator designated as the backup fire brigade leader.

Answer a Exam Level S Question Value 1.0

Reference 1 NDAP-QA-0300, page 16, rev. 4.

Reference 2

Reference 3

Learning Objective AD044

VI.B.1

History new

Comments

PLANT SYSTEMS

K/A 201001A102 RO Value: 2.9 SRO Value: 2.9

KA Statement: CRD cooling water header pressure

Topic: Effects of an adjustment of drive header flow.

Question: Control rod hydraulic system is aligned for normal operation. The drive water pressure control valve is throttled in the closed direction for 2 seconds.

Which parameter will increase?

a. Drive water pressure

b. Cooling water pressure

c. Drive water flow

d. Cooling water flow

Answer: a Exam Level: R Question Value: 1.0

Reference 1: SY017 K-2, page 15, rev. 1

Reference 2:

Reference 3:

Learning Objective: SY017 K-2 3.g

History: new

Comments:

K/A 201001K203 RO Value: 3.5 SRO Value: 3.6

KA Statement: Backup SCRAM valve solenoids

Topic What will prevent the backup scram valves from venting the scram air header.

Question The reactor is operating at 95% power when a scram signal is generated due to a turbine trip.

Which condition will PREVENT the backup scram valves from venting the scram air header?

- a. 125 VDC to ONE of the backup scram valves is deenergized.
- b. The check valve bypassing one of the backup scram valves is fails closed.
- c. RPS Trip System "B" does NOT deenergize.
- d. Backup scram valve 110A fails to reposition. 110A is the backup scram valve closest in the air flow path to the scram pilot valves.

Answer c Exam Level B Question Value 1.0

Reference 1 SY017 C-3, figure 3, Information page 3.

Reference 2

Reference 3

Learning Objective SY017 K-2 3.0

History new

Comments

K/A 201001K303 RO Value: 3.1 SRO Value: 3.2

KA Statement: Control rod drive mechanisms

Topic Effect of a scram inlet valve failing to open on a SCRAM

Question What is the minimum reactor pressure where control rod insertion is assured when the scram inlet valve fails to open on a scram?

a. 250 psig.

b. 400 psig

c. 600 psig

d. 800 psig

Answer b Exam Level R Question Value 1.0

Reference 1 Exam Bank SY017K02/C 024 (modified)

Reference 2

Reference 3

Learning Objective

History Exam Bank - significantly modified.

Comments

K/A 201002G010 RO Value: 3.9 SRO Value: 3.9

KA Statement: Ability to explain and apply all system limits and precautions

Topic Action required if a rod that is withdrawn 2 notches beyond rod sheet position.

Question Given the following conditions:

- Reactor power is being raised from 35% to 40% using control rods.
- Rods are being withdrawn in a group with withdrawal limits of 24.
- A rod is withdrawn to position 28.

Select the required action for the rod that is withdrawn to position 28.

a. Insert to 00.

b. Leave at 28 and contact the Reactor Engineer.

c. Immediately reposition back to 24, then continue rod withdrawal.

d. Position to 24, then contact Reactor Engineer for direction.

Answer a Exam Level B Question Value 1.0

Reference 1 NDAP-QA-0338, page 13 and 36. PCAFI-95-1026.

Reference 2

Reference 3

Learning Objective

History New

Comments

K/A 201004A201 RO Value: 3.3 SRO Value: 3.6

KA Statement: Loss of rod position information: BWR-4,5

Topic RSCS actions if two reed switches are bad

Question Given the following conditions:

- Reactor power is 8%.
- A control rod is withdrawn from position 12 to 24.
- The rod has failed reed switches at position 18 and 20.

Which of the following describes the actions required to withdraw the control rod?

- a. The rod will NOT have to be bypassed in RSCS to withdraw to position 20 but will have to be bypassed to withdraw to position 22.
- b. The rod will have to be bypassed in RSCS to withdraw to position 20.
- c. A substitute position will be required to withdraw to position 22.
- d. A substitute position will be required to withdraw to both positions 20 and 22.

Answer a Exam Level R Question Value 1.0

Reference 1 SY017 K-4, page 13.

Reference 2

Reference 3

Learning Objective SY017 K-4

4

History New

Comments

K/A 201004G005 RO Value: 3.4 SRO Value: 4.1

KA Statement: Knowledge of limiting conditions for operations and safety limits

Topic Determine required actions for bypassed rod.

Question Given the following conditions:

- Reactor power is 48%.
- Current date is 10/21/96.
- Current time is 0930.
- Rod 30-47 is at position 48.
- Rod 30-47 was determined to be stuck at 1130 on 10/20/96.
- All required Technical Specifications were completed for rod 30-47.
- An accumulator alarm is received for rod 26-39 due to a nitrogen leak.
- Repair time for the nitrogen leak is 12 hours.

What is the maximum time that rod 26-39 can remain withdrawn from the core?

a. 1 hour

b. 8 hours

c. 9 hours

d. 12 hours

Answer b Exam Level S Question Value 1.0

Reference 1 Technical Specifications 3.1.3.5, 3.1.3.1

Reference 2

Reference 3

Learning Objective SY017 K-4

7

History new

Comments

K/A 201006K509 RO Value: 3.2 SRO Value: 3.2

KA Statement: Select error: P-Spec(Not-BWR6)

Topic Effects of selecting incorrect rod.

Question Given the following conditions:

- Reactor is subcritical.
- Rods are being withdrawn for startup.
- All RWM group 9 rods have been withdrawn to the withdrawal limit.
- Rod 14-19 is assigned to RWM group 11.
- The PCO selects rod 14-19.

The RWM will:

- a. latch up to group 11.
- b. display a SELECT error and a WITHDRAW error.
- c. display ONLY a SELECT error.
- d. display a SELECT error and an INSERT error.

Answer c Exam Level R Question Value 1.0

Reference 1 SY017K6/11/002

Reference 2

Reference 3

Learning Objective

History Exam bank - modified.

Comments

K/A 201006K514 RO Value: 3.0 SRO Value: 3.0

KA Statement: Alternate withdraw and insert limits. P-Spec(Not-BWR6)

Topic Alternate limits for RWM.

Question Given the following:

- A Rod Worth Minimizer rod group has insert and withdrawal limits of notch 12 and 24.
- Rod withdrawal is being performed.

To prevent withdrawal errors from being generated when the next rod group is latched, all rods in this rod group are required to be at:

a. position 24.

b. position 22 or 24.

c. position 24 or 26.

d. positions 22, 24 or 26.

Answer b Exam Level R Question Value 1.0

Reference 1 SY017 K-6, INFO page 15, rev. 0.

Reference 2

Reference 3

Learning Objective SY017 K-6

NI

History new

Comments

K/A 202001A109 RO Value: 3.3 SRO Value: 3.3

KA Statement: Recirculation pump seal pressures

Topic: Indications of seal failure.

Question: Given the following conditions:

- Reactor power is 63%.
- RECIRC PUMP A SEAL STAGE HI/LO FLOW annunciator has just been received.
- Second stage seal pressure is 475 psig.

These parameters are an indication of:

a. failure of the second stage seal.

b. failure of both seals

c. blockage of the second stage seal.

d. blockage of the first stage seal.

Answer: d Exam Level: R Question Value: 1.0

Reference 1: SY017 L8

Reference 2: AR-102-001, page 41, rev. 6.

Reference 3:

Learning Objective: SY017 L-8 10

History: new

Comments:

KA Statement: High reactor pressure (ATWS circuitry initiation): Plant-Specific

Topic: Conditions that will cause an ATWS trip.

Question: Given the following conditions:

- Reactor power is 20%.
- An EIC fluid leak has occurred.
- The recirculation pumps trip.

What caused the recirculation pumps to trip?

- a. Low ETS pressure.
- b. Turbine stop valve closure.
- c. Reactor vessel water level decreasing to -5 inches.
- d. Reactor pressure increasing to 1150 psig.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: Modify SY017L8/07/003

Reference 2: SY017 L-8, INFO page 28.

Reference 3:

Learning Objective: SY017 L-8 7

History: Exam Bank - significantly modified

Comments:

K/A 202001G010 RO Value: 3.5 SRO Value: 3.7

KA Statement: Ability to explain and apply all system limits and precautions

Topic Pump starting limitations.

Question Given the following conditions:

- A reactor cooldown is progress.
- Recirculation pump 1A was secured at 0815 due to concerns with seal leakage.
- At 0930 Recirculation pump 1B was inadvertently tripped.
- At 0945 the pump is restarted.
- The pump is tripped again at 0950.

When can a pump start be attempted?

a. 1000

b. 1005

c. 1030

d. 1035

Answer d Exam Level B Question Value 1.0

Reference 1 Modify SY017L8/05/001

Reference 2 OP-164-001, page 13, rev 24.

Reference 3

Learning Objective SY017 L-8

5

History Exam bank - significantly modified.

Comments

K/A 202002G010 RO Value: 3.3 SRO Value: 3.3

KA Statement: Ability to explain and apply all system limits and precautions

Topic Personnel limitations placed on local operation of the scoop tube.

Question Due to an instrumentation failure, Reactor Recirculation pump 1A speed cannot be changed from the control room.

Which of the following an acceptable combination for adjusting recirculation flow locally?

- a. The Reactor Engineer monitors a licensed operator raising flow.
- b. An SRO supervises an NPO decreasing flow to comply with an off normal procedure.
- c. A licensed operator decreases flow.
- d. A non-licensed operator is on the phones with the PCO to reduce flow.

Answer c Exam Level B Question Value 1.0

Reference 1 NDAP-QA-0338, page 20, rev. 1.

Reference 2

Reference 3

Learning Objective AD044 XXXIII.B.3

History new

Comments

K/A 202002K103 RO Value: 3.7 SRO Value: 3.7

KA Statement: Reactor core flow

Topic Effect on core flow by inserting control rods at 100%.

Question Given the following:

- Reactor power is 90%.
- Total core flow is 90 Mlbm/hr.
- Operating on the 100% rod line.
- 8 control rods are inserted from position 24 to 12.

Which of the following can be the expected value for core flow?

a. 86 Mlbm/hr

b. 88 Mlbm/hr

c. 90 Mlbm/hr

d. 92 Mlbm/hr

Answer d Exam Level R Question Value 1.0

Reference 1 SY017 L-9, page 32, rev. 0.

Reference 2

Reference 3

Learning Objective SY017 L-9 8

History New

Comments

K/A 202002K403 RO Value: 3.0 SRO Value: 3.0

KA Statement: Signal failure detection: Plant-Specific

Topic: Effect of low control signal on the recirculation pumps

Question: A "Recirc MG Speed Control Signal Failure" alarm has annunciated for the "B" recirculation pump.

The effect on operation of the "B" recirculation pump is that pump speed:

- a. can ONLY be varied by the individual controller in manual.
- b. will run to minimum due to the low output signal from the controller.
- c. will remain at its present value due to a scoop tube lock.
- d. will remain at its present value due to loss of power to the scoop tube positioning motor.

Answer: c Exam Level: S Question Value: 1.0

Reference 1: SY017 L-9, page 10, rev. 0

Reference 2:

Reference 3:

Learning Objective: SY017 L-9 6

History: 1991 exam

Comments:

K/A 203000A214 RO Value: 3.8 SRO Value: 3.9

KA Statement: Initiating logic failure

Topic Effect of a single logic train operating

Question The RHR System I Manual Initiation (S20A) switch has been operated. If the operator performs NO other actions, which components will be operating without cooling?

a. RHR pumps A and D

b. RHR pumps B and C.

c. Diesel generator A and C.

d. Diesel generator B and D.

Answer b Exam Level B Question Value 1.0

Reference 1 SY017, C-1

Reference 2 Modify SY017C01/C 064

Reference 3 SY017 M-I Figure 1.

Learning Objective SY017 C-1 B?

History Exam bank - significantly modified

Comments

KA Statement: Valve operation

Topic Response to a LOCA signal while in the test mode

Question Given the following conditions:

- Unit 2 power is 49 %.
- SO-249-002, "Quarterly RIIR System Flow Verification is in progress on loop A.
- System flow is 9800 gpm.
- The heat exchanger bypass valve is closed.
- A manual LPCI initiation signal is received.

Which valve will immediately reposition?

a. Heat exchanger bypass valve (F048).

b. LPCI injection flow control valve (F017).

c. LPCI injection outboard valve (F015).

d. Minimum flow valve (F007).

Answer a Exam Level B Question Value 1.0

Reference 1 SY017 C-1, Fact Sheet, page 3

Reference 2

Reference 3

Learning Objective SY017 C-1 12

History new

Comments

K/A 204000K403 RO Value: 2.9 SRO Value: 2.9

KA Statement: Over temperature protection for system components

Topic: Response to a non regenerative heat exchanger hi outlet temperature

Question: Given the following conditions:

- Reactor water cleanup isolation valve (F004) is closed.
- Reactor water cleanup isolation valve (F001) is open.

Which of the following occurred?

- a. RWCU equipment room temperature increased to 138 F.
- b. Standby liquid control switch was placed to START.
- c. RPV level decreased to +2 inches.
- d. Non-regenerative heat exchanger outlet temperature reached 135 F.

Answer: b Exam Level: R Question Value: 1.0

Reference 1: SY017 L-1, Fact Sheet page 2.

Reference 2:

Reference 3:

Learning Objective: SY017 L-1

4

History: new

Comments:

K/A 205000K202 RO Value: 2.5 SRO Value: 2.7

KA Statement: Motor operated valves

Topic 480 swing bus loads

Question Which of the following components is powered from 480 VAC swing bus 1B219?

- a. RHR Injection Flow Control Valve (F017A).
- b. Drywell Spray Outboard Isolation Valve (F016A).
- c. RHR Outboard Injection Valve (F015A).
- d. Reactor Recirculation Pump A Suction Valve (F023A).

Answer c Exam Level B Question Value 1.0

Reference 1 Modify SY017G5C/04/001

Reference 2 SY017 G05C, page 24, rev. 0.

Reference 3

Learning Objective SY-017 G-5C 4

History Exam Bank - Significantly Modified.

Comments

KA Statement: Low reactor water level: Plant-Specific

Topic Shutdown Cooling Isolation Signal

Question Given the following conditions:

- Reactor pressure is 65 psig
- RIR loop A is operating in Shutdown Cooling
- RHR loop B is aligned for automatic LPCI injection
- RPV level decreases to -4 inches before cause is corrected

What condition will cause the isolation signal to the RHR Outboard Injection Valve (F015B) to be reset?

a. Reactor pressure increases to 145 psig.

b. The operator depresses the "A" isolation reset pushbutton.

c. Reactor water level is returned to 24 inches.

d. Drywell pressure increases to 2.2 psig.

Answer a Exam Level B Question Value 1.0

Reference 1 SYS017 C-1, Fact Sheets, page 4.

Reference 2

Reference 3

Learning Objective SY017 C-1

8

History new

Comments

K/A 206000A413 RO Value: 4.1 SRO Value: 4.0

KA Statement: Turbine reset control: BWR-2,3,4

Topic Method of shutting down HPCI.

Question Given the following conditions:

- HPCI initiated on low water level.
- Level has been restored to the normal band with feedwater.
- Drywell pressure is .02 psig.
- HPCI initiation signal has been reset.

What is the required method to shutdown HPCI?

- a. Depress the HPCI manual isolation pushbuttons.
- b. Close the HPCI Turbine Steam Supply valve.
- c. Trip the HPCI Turbine, then close HPCI Turbine steam supply valve.
- d. Trip the HPCI Turbine.

Answer c Exam Level R Question Value 1.0

Reference 1 SY017C06/C 043

Reference 2 OP0152-001, page 26, rev. 21.

Reference 3

Learning Objective SY017 C-6

History Exam Bank - significantly modified.

Comments

K/A 206000K402 RO Value: 3.9 SRO Value: 4.0

KA Statement: System isolation: BWR-2,3,4

Topic Vacuum breaker isolation conditions

Question The HPCI vacuum breaker isolation valves, F079 and F075, will isolate on a high drywell pressure concurrent with what other condition?

- a. Turbine exhaust pressure of 122 psig.
- b. Steam supply Pressure of 75 psig.
- c. Steam line flow of 375" water.
- d. Suppression pool level of 25 ft.

Answer b Exam Level B Question Value 1.0

Reference 1 SY017C06/C 034

Reference 2 SY017 C-6, page 12, rev. 1.

Reference 3

Learning Objective SY017 C-6 5.d

History Exam bank - modified.

Comments

K/A 209001A201 RO Value: 3.4 SRO Value: 3.4

KA Statement: Pump trips

Topic: Effects of LOCA signal from opposite unit on Core Spray Pumps.

Question: Given the following conditions:

- A LOCA signal has been generated on Unit 1 due to a loss of drywell cooling.
- Core spray responds correctly to this condition.
- A LOCA signal is generated on Unit 2.

Select the response of Unit 1 and Unit 2 Core Spray Pumps.

- a. Core Spray Pumps 1A and 1C trip. Core Spray Pumps 2A, 2B, 2C and 2D start.
- b. Core Spray Pumps 1A and 1C trip. Core Spray Pumps 2A and 2C start.
- c. Core Spray Pumps 1A and 1C trip. Core Spray Pumps 2B and 2D start.
- d. Core Spray Pumps 1B and 1D trip. Core Spray Pumps 2B and 2D start.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: SY017 C-2, Information, page 15, rev. 2

Reference 2:

Reference 3:

Learning Objective: SY017 C-2 5

History: New

Comments:

K/A 209001K404 RO Value: 3.0 SRO Value: 3.2

KA Statement: Line break detection

Topic: Indications of a break using the CS leak detection system.

Question: The differential pressure measured by the core spray header leak detection differential pressure cell:

- a. is approx. +3.5 psi at power and goes to a negative value if a break occurs between the vessel wall and the core shroud.
- b. is approx. -3.5 psi at power and goes to a positive value if a break occurs between the vessel wall and the core shroud.
- c. is approx. -3.5 psi at power and goes to 0 if a break occurs between the vessel wall and the core shroud.
- d. is approx. 0 psi at power and goes to a negative value if a break occurs between the vessel wall and the core shroud.

Answer: b Exam Level: R Question Value: 1.0

Reference 1: SY017 C-2, page 12.

Reference 2:

Reference 3:

Learning Objective: SY017 C-2 4

History: 1991 exam

Comments:

K/A 211000A101 RO Value: 3.6 SRO Value: 3.7

KA Statement: Tank level

Topic Level effects during operation. Effect of air on determination of when to secure SLC injection.

Question Given the following conditions:

- An ATWS has occurred.
- Standby liquid control was initiated.
- Instrument air has been lost to the Reactor Building.

Which indication(s) will provide valid indication of when to secure Standby Liquid Control?

- a. Local digital indication.
- b. Local analog indication.
- c. Control room indication.
- d. Either the local digital indication or the control room indication.

Answer a Exam Level R Question Value 1.0

Reference 1 SY017 C-3, figure 8.

Reference 2

Reference 3

Learning Objective SY017 C-3

5

History New

Comments

K/A 211000G006 RO Value: 3.1 SRO Value: 4.2

KA Statement: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits

Topic Discharge relief valve open on running pump what plant condition cannot be assured.

Question Given the following conditions:

- Standby liquid control was initiated per the EOP's.
- The "B" SLC pump tripped.
- Boron injection flow rate is 38 gpm.

Which of the following CANNOT be assured?

- a. That SLC will be able to inject sufficient boron to achieve Hot Shutdown Boron Weight.
- b. That suppression pool temperature will remain below the Heat Capacity Temperature Limit.
- c. That boron will be injected fast enough to overcome reactivity addition due to xenon and cooldown.
- d. That adequate shutdown margin can be achieved when the reactor is at 100 F.

Answer c Exam Level S Question Value 1.0

Reference 1 SY017 C-3, Fact sheet page 1, rev. 0.

Reference 2

Reference 3

Learning Objective SY017 C-3 2

History New.

Comments

K/A 212000A214 RO Value: 3.9 SRO Value: 4.0

KA Statement: High SCRAM instrument volume water level

Topic: Scram Discharge Volume scram logic.

Question: Which of the following describes the Scram Discharge Volume high level logic for the reactor protection system?

- a. Both the "A" level transmitter on the north SDV and the "A" level transmitter on the south SDV must sense high level to cause RPS Trip Logic "A1" to trip.
- b. If the "B" level switch on the north SDV and the "D" level switch on the south SDV sense high level a full scram will occur.
- c. If the "C" level transmitter on the north SDV and the "B" level switch on the south volume sense high level then NO trip logics will trip.
- d. If the "A" level transmitter on the north SDV and the "D" level switch on the north volume sense high level then a full scram will occur.

Answer: d Exam Level: R Question Value: 1.0

Reference 1: SY017 L-5 page 18, rev. 0, figure 19.

Reference 2:

Reference 3:

Learning Objective: SY017 L-5 NI

History: new

Comments:

K/A 212000A219 RO Value: 3.8 SRO Value: 3.9

KA Statement: Partial system activation (half-SCRAM)

Topic: Transferring of power supplies and a failed group fuse on the transfer.

Question: The "A1" scram group light for RPS "A" is NOT lit on 1C609 and a BACKUP SCRAM/GROUP PILOT SCRAM SYSTEM "A" POWER FAILURE alarm is in on 1C651.

What will be the effect if RPS "B" power is transferred from the alternate source to normal ?

- a. 1/4 of the scram pilot valves for RPS "B" will deenergize.
- b. 1/2 of the scram pilot valves for RPS "A" will deenergize.
- c. 1/4 of the control rods will scram.
- d. 1/2 of the control rods will scram.

Answer: c Exam Level: R Question Value: 1.0

Reference 1: SY017 L-5, rev. 0., figure 9.

Reference 2:

Reference 3:

Learning Objective: SY017 L-5 10,13, 9

History: new

Comments:

K/A 212000G005 RO Value: 3.8 SRO Value: 4.5

KA Statement: Knowledge of limiting conditions for operations and safety limits

Topic: SDV Technical Specifications

Question: Level transmitter "A" for the north SDV is determined to be inoperable and level switch "B" for the south SDV is determined to be inoperable.

What action, if any, is required to be taken?

a. NO action required.

b. Trip RPS "A" within 6 hours.

c. Per action 1 of Table 3.3.1-1 be in Hot Shutdown within 12 hours.

d. Enter LCO 3.0.3.

Answer: b Exam Level: S Question Value: 1.0

Reference 1: Technical Specifications, 3.3.1.

Reference 2:

Reference 3:

Learning Objective: SY017 18

History: new

Comments:

K/A 212000K412 RO Value: 3.9 SRO Value: 4.1

KA Statement: Bypassing of selected SCRAM signals (manually and automatically): Plant-Specific

Topic: Reactor power is at 8% during a reactor startup. What condition will cause a scram?

Question: Given the following:

- Unit 2 reactor power is 4%.
- The reactor mode switch is in STARTUP.

Which of the following will cause a scram signal to be generated?

a. The turbine is tripped during the turbine startup process.

b. The MSIVs close due to a loss of vacuum signal.

c. Reactor pressure reaches 1050 psig.

d. Drywell pressure reaches 1.8 psig.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: SY017 L-5, fact sheet L-5, and figure 12.

Reference 2:

Reference 3:

Learning Objective: SY017 L-5 5, 6

History: new.

Comments:

K/A 214000A402 RO Value: 3.8 SRO Value: 3.8

KA Statement: Control rod position

Topic Positive determination of rod position following loss of SIP or CRT SDS 4 Rod position displays.

Question Given the following conditions:

- Unit 1 is at 30%.
- A control rod is attempted to be moved from position 8 to 12.
- NO rod movement is observed on the Standby Information Panel (SIP).

Which of the following is can be used for positive determination of rod movement?

- a. OD-7 live data.
- b. Full core display FULL IN- FULL OUT.
- c. RWM indication.
- d. RSCS Indication.

Answer a Exam Level B Question Value 1.0

Reference 1 NDAP-QA-0338, page 7, TCAF 1-95-1026.

Reference 2 ON-155-001, Stuck Control Rod,

Reference 3

Learning Objective

History new

Comments

K/A 215001A207 RO Value: 3.4 SRO Value: 3.7

KA Statement: Failure to retract during accident conditions. Marx-I&II(Not-BWR1)

Topic Required actions to withdraw a TIP if an isolation signal is not generated.

Question Given the following conditions:

- TIP traces are being performed.
- RPV level decreases to -5 inches on a level transient.
- An isolation signal is NOT generated.

Which of the following describes the actions required to withdraw the TIP?

- a. Place the MANUAL switch to REV. The ball valve should automatically close when the TIP is withdrawn.
- b. Place the MODE switch to MANUAL, then place the MANUAL switch to REV. The ball valve should automatically close when the TIP is withdrawn.
- c. Place the MANUAL switch to REV. The ball valve will have to be manually closed.
- d. Place the MODE switch to MANUAL, then place the MANUAL switch to REV. The ball valve will have to be manually closed.

Answer c Exam Level B Question Value 1.0

Reference 1 SY017 I-5

Reference 2

Reference 3

Learning Objective SY017 I-5 6

History new

Comments Give figure SY017 I-5.

K/A 215002A304 RO Value: 3.6 SRO Value: 3.5

KA Statement: Verification or proper functioning/ operability: BWR-3,4,5

Topic Determination of RBM setpoints based on flow and APRM bypass switch positions.

Question: Given the following conditions:

- Recirculation flow unit A - 50%.
- Recirculation flow unit C - 55%.
- Control rod 22-27 is withdrawn.

Without setting up the Rod Block Monitor Setpoint, the Rod Block Monitor "A" will block rod withdrawal at:

a. 58%.

b. 61%.

c. 63%.

d. 64%.

Answer a Exam Level R Question Value 1.0

Reference 1 SY017 K-5, rev. 0., Fact Sheet page 2.

Reference 2

Reference 3

Learning Objective SY017 K-5

3

History new.

Comments did not include the APRM switch positions in the question.

JJA 215003A407 RO Value: 3.6 SRO Value: 3.6

KA Statement: Verification of proper functioning/ operability

Topic Give the overlap data that was observed and ask what the required action is?

Question Given the following overlap data:

- A IRM is marked at 50/125 on Range 2 and 16/40 on Range 3.
- C IRM is marked at 75/125 on Range 2 and 24/40 on Range 3.
- F IRM is marked on 60/125 on Range 2 and 15/40 on Range 3.
- H IRM is marked on 25/125 on Range 2 and 8/40 on Range 3.

What action should be taken?

- a. Continue the reactor startup.
- b. Within 6 hours trip the "B" RPS channel.
- c. Within 12 hours be in at least HOT SHUTDOWN.
- d. Within 1 hour insert all control rods and lock the mode switch in Shutdown

Answer a Exam Level S Question Value 1.0

Reference 1 SY017 I-2 page 18, rev. 0

Reference 2 GO-100-002, page 21.

Reference 3 Technical Specifications

Learning Objective AD046 9
SY017 I-2 10

History Exam Bank - Significantly Modified.

Comments Will need technical specifications.

K/A 215003A407 RO Value: 3.6 SRO Value: 3.6

KA Statement: Verification of proper functioning/ operability

Topic: Overlap with the SRMs.

Question: Given the following overlap data:

- A IRM is marked at 50/125 on Range 2 and 16/40 on Range 3.
- C IRM is marked at 75/125 on Range 2 and 24/40 on Range 3.
- F IRM is marked on 60/125 on Range 2 and 15/40 on Range 3.
- H IRM is marked on 25/125 on Range 2 and 8/40 on Range 3.

Which of the these IRMs are operable?

a. IRM A

b. IRM A & C

c. IRM A, C & F

d. IRM A, C & H

Answer: d Exam Level: R Question Value: 1.0

Reference 1: SY017 I-2 page 18, rev. 0

Reference 2: GO-100-002, page 21.

Reference 3:

Learning Objective: AD046

9

History: Exam Bank-modified

Comments: Similar to SY017I2/09/002

K/A 215003K401 RO Value: 3.7 SRO Value: 3.7

KA Statement: Rod withdrawal blocks

Topic IRM rod blocks and scram.

Question Given the following conditions:

- Unit 1 is at 5%.
- The mode switch is in STARTUP.
- All IRMs are on Range 9.
- Recirculation flow is increased raising APRM power to 11%.

Select the alarms and protective signals received for this condition.

a. APRM UPSCALE alarm and ROD BLOCK.

b. APRM UPSCALE alarm, ROD BLOCK and SCRAM.

c. IRM UPSCALE alarm and ROD BLOCK.

d. IRM UPSCALE alarm, ROD BLOCK and SCRAM.

Answer c Exam Level B Question Value 1.0

Reference 1 SY017I02/C 040

Reference 2

Reference 3

Learning Objective SY017 1-2

3

History Exam Bank

Comments

K/A 215005A306 RO Value: 3.7 SRQ Value: 3.6

KA Statement: Control rod block status

Topic: Recirculation flow comparators and upscale rod blocks.

Question: Given the following conditions:

- Unit 2 is at 73% power.
- Flow unit A output fails downscale.

Placing the Division I Flow Unit bypass joystick to "A" will:

- a. bypass all existing rod blocks.
- b. bypass only the comparator mismatch rod block.
- c. change the flow input to APRM "A", "C" and "E" to flow unit "C".
- d. change the flow input to APRM "A" to flow unit "C".

Answer: b Exam Level: B Question Value: 1.0

Reference 1: SY017 I4, Fact Sheet, page 3.

Reference 2:

Reference 3:

Learning Objective: SY017 I-4

2

History: new

Comments:

K/A 215005K202 RO Value: 2.6 SRO Value: 2.8

KA Statement: APRM channels

Topic Power supplies to the APRMs.

Question On a loss of "A" ESS bus what will be the status of power to the Division I APRMs.?

- a. Deenergized, but can be energized from Aux Bus 11A.
- b. Deenergized, but can be energized from ESS Bus "C".
- c. Energized from ESS Bus "C".
- d. Energized from Aux Bus 11A.

Answer a Exam Level R Question Value 1.0

Reference 1 Modify SY017G5C/03/001

Reference 2 SY017 G-5C, figure 9.

Reference 3

Learning Objective SY017 I-4 4

History Exam Bank - Significantly Modified.

Comments

K/A 215005K401 RO Value: 3.7 SRO Value: 3.7

KA Statement: Rod withdrawal blocks

Topic Effect of bypassing more than the maximum LPRMs to an APRM

Question Given the following conditions:

- Unit 2 reactor power is 38%.
- LPRM 48-33 fails upscale.
- Bypassed LPRMs: 16-33, 40-57, 32-33, 56-25, 32-49.

What is the response to bypassing LPRM 48-33?

- a. The rod block will clear and rod withdrawal can continue.
- b. APRM "A" will be inoperable causing a rod block and half scram.
- c. APRM "A" will be inoperable but NO rod block will be generated.
- d. The rod block will clear after the function switch is returned to OPERATE.

Answer c Exam Level B Question Value 1.0

Reference 1 Modify SY017I04/C 024

Reference 2

Reference 3

Learning Objective SY017 I-4 2, 6

History Exam bank - modified.

Comments Provide Attachment A to RE-OTP-017. (SY017 I-4 Attachment I).

K/A 216000A211 RD Value: 3.2 SRO Value: 3.3

KA Statement: Heatup or cooldown of the reactor vessel

Topic: Temperature effects on Fuel Zone instrumentation.

Question: Given the following conditions:

- A Loss of Coolant Accident occurred.
- A cooldown is in progress.
- During the cooldown fuel zone level indication was constant at -150 inches.

During the cooldown actual water level:

a. was constant at -150 inches.

b. decreased from -150 inches.

c. decreased to -150 inches.

d. increased from -150 inches.

Answer: c Exam Level: B Question Value: 1.0

Reference 1: SY017 J-2, page 15, rev. 1

Reference 2: ON-145-004, page 7

Reference 3:

Learning Objective: SY017 J-2 6

History: new

Comments:

KA Statement: Motor operated valves

Topic Effect on operation of RCIC if F059 open indication is lost.

Question During a surveillance, RCIC Turbine Exhaust to Suppression Pool Valve (F059) trips before the amber light goes out when the valve is being opened.

What will be the effect on RCIC if an initiation signal is received?

- a. The trip throttle valve will be tripped.
- b. The turbine will startup, then trip on high exhaust pressure.
- c. The turbine will operate at a lower speed due to the exhaust pressure.
- d. The Steam to RCIC Turbine valve (F045) will NOT open.

Answer d Exam Level: B Question Value 1.0

Reference 1 SY017 C-5 Facts page 3

Reference 2

Reference 3

Learning Objective SY017 C-5 5

History new

Comments

K/A 218000K403 RO Value: 3.8 SRO Value: 4.0

KA Statement: ADS logic control

Topic: Response of the ADS logic to level, time and available ECCS.

Question: Given the following:

- t=0 sec LOCA occurs
- t=20 sec ECCS LOOP A & B RX LO LEVEL (-129) alarms.
- t=48 sec ECCS LOOP A & B RX LO LEVEL (-129) clears.
- t=60 sec ECCS LOOP A & B RX LO LEVEL (-129) alarms.
- Core spray pump "A" running.

When will ADS initiate?

a. t=122 sec.

b. t=142 sec.

c. t=150 sec.

d. t=162 sec.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: SY017 C-4, page 12

Reference 2:

Reference 3:

Learning Objective: SY017 C-4 3 & 6

History: new

Comments:

K/A 223001K103 RO Value: 3.2 SRO Value: 3.3

KA Statement: Containment/drywell atmosphere control

Topic Automatic operation of the Containment Cooling ventilation fans.

Question With a LOCA signal present, the drywell ventilation fans:

- a. will run automatically in slow speed.
- b. can be manually operated in slow speed.
- c. CANNOT be operated.
- d. can be manually operated if the LOCA signal is overridden.

Answer b Exam Level B Question Value 1.0

Reference 1 SY017 E-6 page 7

Reference 2

Reference 3

Learning Objective SY017 E-6 8?

History new

Comments

KA Statement: Fuel handling equipment interlocks

Topic Refuel Bridge Interlocks

Question Given the following conditions:

- Refueling is in progress
- Mode switch is placed in STARTUP.

Which of the following describes restriction on refuel platform operation?

- a. The refuel platform can be moved over the core, but the fuel hoist CANNOT be raised if loaded.
- b. The refuel platform can be moved over the core, but the fuel hoist CANNOT be lowered.
- c. If all control rods are inserted, the refuel platform CAN be moved over the core.
- d. The refuel platform CANNOT be moved over the core.

Answer d Exam Level B Question Value 1.0

Reference 1 Modify SY017M02/C 068

Reference 2

Reference 3

Learning Objective SY017 M-2 12

History new

Comments

K/A 239001K609 RO Value: 3.9 SRO Value: 4.1

KA Statement: PCIS/NSSSS

Topic: A leak has occurred on the line to feedpumps. What signal will cause the MSIVs to close?

Question: Given the following conditions:

- Unit 2 is operating at 48%.
- A steam leak occurs on the steam line to the reactor feed pumps.
- A reactor scram occurs on low water level.
- The operator takes all immediate actions for a scram.

Which of the following will cause a main steam line isolation?

- a. Main steam line pressure decreases to 850 psig.
- b. Condenser vacuum decreases to 15" hg.
- c. Turbine building tunnel temperature increases to 168 F.
- d. The operator arms and depresses PCIS switches A and B.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: SY017 H-2 page 23

Reference 2:

Reference 3:

Learning Objective: SY017 H-2

6

History: new.

Comments:

K/A 259001A104 RO Value: 2.8 SRO Value: 2.7

KA Statement: RFP turbine speed: Turbine-Driven-Only

Topic Turbine speed control operation.

Question RCIC is operating to maintain level following a Main Steam Line Isolation. A hydraulic leak occurs on the line to the governor valve.

Which of the following describes the response of the governor valve?

- a. Governor valve will close as oil pressure is lost.
- b. Governor valve will open as oil pressure is lost.
- c. Turbine speed will decrease, but RCIC will attempt to reopen the governor valve.
- d. Governor valve position will remain constant.

Answer b Exam Level B Question Value 1.0

Reference 1 SY017 D-3, page 12

Reference 2

Reference 3

Learning Objective SY017 D-3 9

History new.

Comments

K/A 259002A203 RO Value: 3.6 SRO Value: 3.7

KA Statement: Loss of reactor water level input

Topic: Failure of reactor water level instrument

Question: Given the following conditions:

- Unit 1 is at 84% power.
- Narrow Range level "A" is selected for input to the Feedwater level control.
- Testing is performed on Narrow Range Level channel "C".
- The instrument technician inserts a zero differential pressure signal to the "A" Narrow Range Level instrument instead of Narrow Range Level "C".

Select the response to this condition.

a. A feedpump trip and turbine trip due to the I & C signal input.

b. A reactor scram due to low RPV level.

c. A high vessel level condition causes a feedpump and turbine trip.

d. A high vessel level condition without a feedpump and turbine trip.

Answer: b Exam Level: B Question Value: 1.0

Reference 1: SY017 D-3, page 22

Reference 2: SY017 J-2, page 20.

Reference 3:

Learning Objective: SY017 D-3 8

History: new

Comments:

K/A 262001A211 RO Value: 3.2 SRO Value: 3.6

KA Statement: Degraded system voltages

Topic: Response of ESS bus to low voltage and manual closure of breaker.

Question: Given the following:

- ESS Bus 1A201 has just been transferred from T-101 to T-201.
- The NORMAL supply breaker control switch is in the NORMAL AFTER CLOSE position.

Select the response to loss of ESS T-201.

- a. Normal Supply breaker 1A20101 will close immediately on the trip of T-101.
- b. Normal Supply breaker 1A20101 will close after ESS bus voltage is < 20% for .5 sec.
- c. Normal Supply breaker 1A20101 will close after a 25 second time delay.
- d. Diesel Generator Emergency Source breaker will close after its interlocks for automatic closing are met.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: SY017 G-5C, Information page 8, rev. 0,

Reference 2:

Reference 3:

Learning Objective: SY017 G-5C 3

History: new - Similar to 1991 question

Comments:

K/A 262001A302 RO Value: 3.2 SRO Value: 3.3

KA Statement: Automatic bus transfer

Topic Swing bus automatic transfers. (Swing Bus)

Question Which of the following describes the operation of the automatic transfer switches used to supply 480 volt busses 1(2)B219 and 1(2)B229?

- a. The ATS transfers to alternate immediately on a loss of normal power. It must be manually returned to the normal supply.
- b. The ATS transfers to alternate immediately on a loss of normal power. It will transfer to normal immediately upon restoration of power to the normal bus.
- c. The ATS transfers to alternate following a time delay to allow the diesel to reenergize the bus. It must be manually returned to the normal supply.
- d. The ATS transfers to alternate following a time delay to allow the diesel to reenergize the bus. It automatically transfers to the normal supply following a 5 minute delay after reenergizing the bus.

Answer d Exam Level B Question Value 1.0

Reference 1 SY017 G-5C page 25

Reference 2

Reference 3

Learning Objective SY017 G-5C Not Identified

History new

Comments

K/A 262001A304 RO Value: 3.4 SRO Value: 3.6

KA Statement: Load sequencing

Topic Load sequencing times

Question Given the following conditions:

- A loss of off-site power has occurred.
- A LOCA signal was generated on UNIT 2 when the LOOP occurred.
- All diesel started and tied to their respective busses.
- The ESW pumps have completed starting.

Which of the following loads will start next in the load sequencing.

- a. CREOASS
- b. Diesel Generator HVAC for DG "A"
- c. Control Structure Chiller
- d. Unit 2 ESS switchgear fans

Answer a Exam Level B Question Value 1.0

Reference 1 SY017 G-1, Fact Sheets page 6, rev. 1.

Reference 2

Reference 3

Learning Objective SY017 G-1 4

History new

Comments

K/A 263000A101 RO Value: 2.5 SRO Value: 2.8

KA Statement: Battery charging/discharging rate

Topic Capacity of the 125 VDC batteries

Question Without the charger, the 125 VDC battery bank is designed to have sufficient capacity to supply loads for:

a. 2 hours.

b. 4 hours.

c. 8 hours.

d. 12 hours.

Answer b Exam Level R Question Value 1.0

Reference 1 SY017 G-3, page 2, rev. 1.

Reference 2

Reference 3

Learning Objective SY017 G-3,

3

History Exam bank - modified.

Comments

K/A 263000G005 RO Value: 3.1 SRO Value: 3.8

KA Statement: Knowledge of limiting conditions for operations and safety limits

Topic Operability determination for 125 VDC.

Question A surveillance performed on Division I 125 VDC battery 1D610 provided the following results:

- Maximum pilot cell float voltage - 2.18 volts.
- Minimum pilot cell float voltage - 2.12 volts.
- Maximum float voltage for all cells - 2.19 volts.
- Minimum float voltage for all cells - 2.08 volts.

How long is allowed before all float voltages must be greater than or equal to 2.13 volts?

a. 12 hours.

b. 24 hours.

c. 6 days.

d. 7 days.

Answer d Exam Level S Question Value 1.0

Reference 1 SY017G03/C-0 001

Reference 2 Technical Specifications section 3.8.2

Reference 3

Learning Objective SY017 G-3 10

History Exam bank - significantly modified.

Comments

K/A 263000K201 RO Value: 3.1 SRO Value: 3.4

KA Statement: Major D.C. loads

Topic Power supply to Control Room Annunciators

Question Which of the following list the power supplies used by the control room annunciators?

- a. 24 VDC and 125 VDC.
- b. 125 VDC and 250 VDC.
- c. 120 VAC instrument power and 125 VDC.
- d. 120 VAC instrument power and 24 VDC.

Answer c Exam Level B Question Value 1.0

Reference 1 SY017 G-3, page 19, rev. 1.

Reference 2

Reference 3

Learning Objective SY017 G-3 5

History new

Comments

K/A 264000K402 RO Value: 4.0 SRO Value: 4.2

KA Statement: Emergency generator trips (emergency/LOCA)

Topic: Trips during emergency operation.

Question: A diesel generator has started due to a LOCA signal.

Which of the following will cause the diesel generator to trip?

- a. A governor failure causes the engine to speed up to 675 rpm.
- b. The operator depresses the stop pushbutton in the control room.
- c. Excessive loads are placed on the diesel.
- d. The jacket water cooling pump fails.

Answer: a Exam Level: B Question Value: 1.0

Reference 1: SY017 G-1, page 22, rev. 1.

Reference 2:

Reference 3:

Learning Objective: SY017 G-1 6

History: new

Comments: Changed from the outline due to a potential conflict with the walkthrough.

K/A 264000K407 RO Value: 3.3 SRO Value: 3.4

KA Statement: Local operation and control

Topic Effect of resetting the local annunciators during shutdown.

Question A diesel engine is being shutdown from panel 0C653 following a start from an inadvertent LOCA signal.

Resetting the local annunciators is prohibited because:

- a. the diesel will stop without a proper cooldown.
- b. the fuel racks will cycle.
- c. all trips will be bypassed.
- d. the HI PRIORITY TROUBLE annunciator in the control room will be bypassed.

Answer b Exam Level B Question Value 1.0

Reference 1 SY017 G-1 Fact Sheets page 6

Reference 2

Reference 3

Learning Objective SY017 G-1 NI

History new

Comments

K/A 288000K104 RO Value: 2.6 SRO Value: 2.6

KA Statement: Applicable component cooling water system Plant-Specific

Topic: Normal source of cooling for Unit 1 Emergency switchgear room coolers.

Question: Select the alternate source of cooling for the Unit 1 Emergency Switchgear Room Coolers.

a. Reactor Building Chilled Water

b. Control Structure Chilled Water

c. Emergency Service Water

d. Service Water

Answer: b Exam Level: B Question Value: 1.0

Reference 1: SY017E02/C 027

Reference 2:

Reference 3:

Learning Objective:

History: exam bank

Comments: Question replaced a question concerning start signals for the RHR/CS fan coolers and cooling source. Same KA number.

K/A 290002A204 RO Value: 3.7 SRO Value: 4.1

KA Statement: Excessive heatup/cooldown rate

Topic: Maximum allowable heatup rate as allowed by GO-100-002.

Question: Which of the following is the maximum allowable temperature change in one hour per GO-100-002?
Temperatures are reactor steam dome.

a. 185 F to 245 F

b. 205 F to 290 F

c. 310 F to 400 F

d. 280 F to 275 F

Answer: c Exam Level: S Question Value: 1.0

Reference 1: GO-100-002, page 12 and 22, rev. 24.

Reference 2: SO-100-011, page 6, rev. 9.

Reference 3:

Learning Objective: AD046 II.A.3

SY017 J-1, rev. 2 9

History: new

Comments: Reactor steam dome temperature is not a valid indicator below 212 F.

K/A 290002A204 RO Value: 3.7 SRO Value: 4.1

KA Statement: Excessive heatup/cool-down rate

Topic Maximum allowable heat up rate per GO-100-002

Question Given the following temperature readings for Reactor Steam Dome Temperature during a heatup:

- 0800 - 242 F
- 0815 - 263 F
- 0830 - 289 F
- 0845 - 313 F

Per GO-100-002, what is the maximum allowable temperature at 0900?

a. 332 F.

b. 338 F.

c. 342 F.

d. 363 F.

Answer a Exam Level R Question Value 1.0

Reference 1 GO-100-002, page 12, rev. 24.

Reference 2 SO-100-011, page 6, rev. 9.

Reference 3

Learning Objective AD046

II.A.3

SY017 J-1

9 & 11

History new

Comments

K/A 290003K401 RO Value: 3.1 SRD Value: 3.2

KA Statement: System initiations/reconfiguration: Plant-Specific

Topic CREOASS response to initiation signal.

Question A zone III isolation signal has been generated.

Which of the following describes the response of the Control Room Emergency Outside Air Supply System (CREOASS) filter unit response?

- a. Both CROEASS units start and take a suction both outside air and the control room.
- b. One CROEASS unit starts and takes a suction ONLY on outside air.
- c. One CROEASS unit starts and takes a suction on outside air and the control room.
- d. Both CROEASS units start but ONLY one takes a suction on outside air.

Answer c Exam Level B Question Value 1.0

Reference 1 SY017 L-11, page 12, rev. 0, Info page 2 and 3.

Reference 2

Reference 3

Learning Objective SY017 L-11

3

History new

Comments

**EMERGENCY AND ABNORMAL
EVOLUTIONS**

K/A 295001A201 RO Value: 3.5 SRO Value: 3.8

KA Statement: Power/flow map

Topic Required action on a recirculation runback that places in region 1 of the Power to Flow Map.

Question Given the following conditions:

- A reactor recirculation pump has tripped.
- Core flow is 42 Mlbm/hr.
- Reactor power is 45%.
- APRM oscillations are observed to be approx. 5% peak to peak, but appear to be increasing.

Which of the following is the first action that should be taken to suppress the flux oscillations?

- a. Restart the tripped recirculation pump.
- b. Increase core flow to 45 Mlbm/hr.
- c. Insert CRAM rods.
- d. Insert control rods using Shutdown Control Rod Sequence.

Answer c Exam Level B Question Value 1.0

Reference 1 On-178-002, page 2.

Reference 2

Reference 3

Learning Objective

History new.

Comments

KA Statement: Knowledge of limiting conditions for operations and safety limits

Topic Safety limit that may be violated on core instability

Question Which of the following limits can be exceeded if power oscillations are NOT immediately suppressed?

a. MCPR safety limit

b. FDLRX limit

c. APLHGR safety limit

d. LHGR safety limit

Answer a Exam Level S Question Value 1.0

Reference 1 On-178-002, page 4

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295001G008 RO Value: 3.5 SRO Value: 4.2

KA Statement: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications

Topic Technical Specification entry condition for single loop operation.

Question Which of the following describes the Technical Specification entry condition(s) for single loop operation?

- a. Anytime the single loop operation is occurring.
- b. Single loop operation when operating in Region I or II of the power to flow map.
- c. Single loop operation when recirculation speed is greater than 80 of rated pump speed.
- d. Single loop operation when operating in Region I or II or when pumps speed is greater than 80% of the rated speed.

Answer a Exam Level B Question Value 1.0

Reference 1: Technical Specifications, 3.4.1.1.2

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295001K306 RO Value: 2.9 SRO Value: 3.0

KA Statement: Core flow indication

Topic Determine the total core flow rate in single loop.

Question Given the following conditions:

- Reactor Recirculation pump B is tripped.
- Total core flow recorder reads 34 Mlbm/hr.
- Loop A Loop flow indicator reads 37 Mlbm/hr.
- Loop B Loop flow indicator reads 3 Mlbm/hr.

What is actual core flow?

a. 31 Mlbm/hr.

b. 34 Mlbm/hr.

c. 37 Mlbm/hr.

d. 40 Mlbm/hr.

Answer d Exam Level B Question Value 1.0

Reference 1 GO-100-009, page 4, rev. 7, PCAF 1-95-0310.

Reference 2 SY017 L-8 page 8, rev. 0

Reference 3

Learning Objective AD044

E.3

History new

Comments

K/A 295002K301 RO Value: 3.7 SRO Value: 3.8

KA Statement: Reactor SCRAM. Plant-Specific

Topic When a reactor scram will occur without any operator action (low power).

Question The reactor is operating at 37% power when a loss of vacuum occurs. With NO operator action the reactor will scram when vacuum reaches:

- a. 8.2" Hg. Absolute
- b. 12.5" Hg. Absolute
- c. 19.7" Hg. Absolute.
- d. 22.9" Hg. Absolute.

Answer a Exam Level B Question Value 1.0

Reference 1 On-143-001, page 2

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295003A102 RO Value: 4.2 SRO Value: 4.3

KA Statement: Emergency generators

Topic How long diesels can operate without ESW.

Question Given the following conditions:

- Unit 2 is shutdown.
- 2A RBCCW and 2A TBCCW are aligned to ESW.
- Loop A of ESW is isolated from the diesel generators.
- A loss of off-site power occurs.
- Diesel generator output breaker 1D20104 fails to close.
- ESW pump "B" fails to start when required.
- Assume no operator actions are taken.

If diesel generators "B" and "D" are required to be tripped, indicate when they must be tripped? Base tripping time from the time that ESW pump "B" fails to start.

a. DG "B" - 3.5 minutes DG "D" - 3.5 minutes.

b. DG "B" - 7 minutes DG "D" - 7 minutes.

c. DG "B" - 3.5 minutes DG "D" can continue to run.

d. DG "B" - 7 minutes DG "D" - 3.5 minutes.

Answer a Exam Level B Question Value 1.0

Reference 1 EO-100-030, page 2 and 3.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295003A103 RO Value: 4.4 SRO Value: 4.4

KA Statement: Systems necessary to assure safe plant shutdown

Topic: How HPCI and RCIC should be used during a station blackout.

Question: A station blackout has occurred. RCIC should be operated by:

- a. at maximum flow, allowing it to automatically shutdown on high level and restart on low level.
- b. at maximum flow, manually starting and stopping RCIC as needed to maintain level.
- c. by closing the injection valve when injection is NOT required.
- d. minimizing starting and stopping of RCIC.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: E0-100-033, page 2 & 6.

Reference 2:

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295003A204 RO Value: 3.5 SRO Value: 3.7

KA Statement: System lineups

Topic Purpose of sequence and time delays used in starting loads in EO-000-031.

Question Station Power Restoration, EO-000-031, provides a specific sequence for reenergizing busses from an off-site source to AVOID:

- a. diesel generators tripping on overspeed when loads are transferred to off-site power.
- b. underfrequency condition on off-site sources due to manually reenergizing non-emergency busses.
- c. undervoltage condition caused when a ECCS initiation signal is present.
- d. starting equipment automatically without operator action.

Answer c Exam Level S Question Value 1.0

Reference 1 EO-000-031, page 17

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295003A204 RO Value: 3.5 SRO Value: 3.7

KA Statement: System lineups

Topic: Effects of a sustained loss of 4KV ESS bus 1D on the drywell.

Question: During a transfer of 4KV ESS Bus 1D(1A204) from alternate to normal power the bus is momentarily deenergized then reenergized.

With NO operator action, a reactor scram will occur:

a. when the bus is reenergized.

b. due to loss of containment cooling.

c. due to loss of RBCCW to the recirculation pump.

d. due to loss of containment instrument gas.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: ON-104-204, page 6,

Reference 2:

Reference 3:

Learning Objective: AD045

NI

History: new

Comments: Did not use PCIS actuation because could be argued for item d.

K/A 295003G007 RO Value: 3.2 SRC Value: 3.6

KA Statement: Ability to explain and apply all system limits and precautions

Topic Time limits and basis for securing Lube Oil Pumps

Question During a station blackout on Unit 1, emergency lube oil pumps for RFPT, Reactor Recirculation Motor Generator Sets, and the Turbine Generator should be secured:

- a. immediately following the loss of off-site power.
- b. as soon as the equipment supplied stops rotating.
- c. based on other equipment being supplied by the 250 VDC battery.
- d. within 30 minutes of the station blackout.

Answer d Exam Level S Question Value 1.0

Reference 1 EO-100-030, pag4

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 299003K204 RO Use: 3.4 SRO Value: 3.5

KA Statement: A.C. electrical loads

Topic: HPCI component affected by loss of 480 volt power supply

Question: With HPCI in operation, loss of a single 480 VAC bus that supplies HPCI component(s) will:

- a. prevent restarting HPCI on a loss of power.
- b. prevent isolation of HPCI on a break in the steam line.
- c. limit the available cooling to the HPCI room.
- d. cause a loss of governor control.

Answer: c Exam Level: S Question Value: 1.0

Reference 1: SY017 C-6 page 24

Reference 2:

Reference 3:

Learning Objective: SY017 C-6 4

History: new

Comments:

K/A 295003K204 RO Value: 3.4 SRO Value: 3.5

KA Statement: A.C electrical loads

Topic Available indications of a leaking SRV during a station blackout.

Question Given the following:

- A station blackout has occurred.
- MAIN STEAM SRV LEAKING is alarming.
- MAIN STEAM DIV 1 SRV OPEN is clear.
- MAIN STEAM DIV 2 SRV OPEN is clear.

Based on this information, what is the status of SRVs and equipment to monitor SRVs?

- a. An SRV is leaking. The acoustic monitors fail during a station blackout.
- b. All SRVs are closed. Tailpipe temperature indications fail high during a station blackout.
- c. Status of the SRVs is unknown because the annunciators are indications of loss of power to instrumentation.
- d. An SRV has opened, then reclosed, causing the acoustic monitors to clear.

Answer a Exam Level B Question Value 1.0

Reference 1 EO-100-030, page 8

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295004K203 RO Value: 3.3 SRO Value: 3.3

K/A State/req: D.C. bus loads

Topic Affect on diesel generator by a loss of 125 VDC power

Question 125 VDC bus 1D634 is deenergized and a start signal is received.

Which of the following describes the effect on Diesel Generator "C"?

- a. The diesel will automatically start but the output breaker can only be shut manually.
- b. The diesel generator will NOT start.
- c. The diesel generator can be manually started locally and the output breaker locally closed.
- d. The diesel generator will start but the automatic trips will be disabled.

Answer b Exam Level B Question Value 1.0

Reference 1 On-102-630, page 7.

Reference 2

Reference 3

Learning Objective

History new.

Comments

K/A 295006A101 RO Value: 4.2 SRO Value: 4.2

KA Statement: RPS

Topic Reason for placing mode switch to shutdown.

Question: Following an automatic scram signal, the goal of placing the reactor MODE switch to SHUTDOWN is :

- a. shift full core display to Full In - Full Out.
- b. ensure that a scram signal seals in for 10 seconds.
- c. ensure the Main Steam Isolation valves CLOSE to prevent rapid cooldown.
- d. ensure a signal is generated to close the Scram Discharge Volume Vent and Drain valves.

Answer b Exam Level B Question Value 1.0

Reference 1 ON-100-101, page 7

Reference 2

Reference 3

Learning Objective

History new

Comments

KA Statement: Ability to perform without reference to procedures those actions that require immediate operation of system components or cc

Topic Required action for three rods at positions greater than 00 and an EOP entry on low RPV level

Question Given the following conditions:

- A reactor scram occurs due to both feedpumps tripping at 84% power.
- Reactor water level is -5 inches and recovering due to IPCI
- Rods remain at positions 18, 42 and 26.
- The Shift Supervisor announces that EOPs are being entered before any immediate actions of ON-100-101, Scram are performed.

The reactor operator should initiate ARI:

- a. when directed by ON-100-101, to enter Level/Power Control at step LQ/Q-7.
- b. as an immediate action of OP-AD-001, Operations Policies and Work Practices.
- c. as an immediate action of EO-100-102, RPV Control.
- d. when directed by the steps of EO-100-113, Level/Power Control.

Answer b Exam Level B Question Value 1.0

Reference 1 ON-100-101, page 3, 7

Reference 2 OP-AD-001, Art. B.

Reference 3

Learning Objective AD044

History new

Comments

K/A 295007G011 RO Value: 4.1 SRO Value: 4.3

KA Statement: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and ab

Topic: Required action if an SRV opens at power due to pressure.

Question: Given the following conditions:

- Unit 2 reactor power is 92%.
- An oscillation occurred on turbine control system.
- SRV PSV-2F013G has lifted at its required setpoint but failed to fully reclose.
- Reactor power increased to 97% but then returned to 93%.

When is the reactor required to be scrammed?

- a. immediately.
- b. after attempts to close the valve from the control room are unsuccessful.
- c. within 2 minutes.
- d. before suppression pool temperature reaches 105 F.

Answer: a Exam Level: B Question Value: 1.0

Reference 1: SY017 C-4, Table 2

Reference 2: EO-100-102 Entry Conditions.

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295008K206 RO Value: 3.4 SRO Value: 3.6

KA Statement: RCIC Plant-Specific

Topic Required actions to restart RCIC after a high level shutdown

Question The Reactor Core Isolation Cooling (RCIC) system initiated at -30 inches due to NO other injection systems operating. RCIC then raised level to +54 inches.

Identify the response of the RCIC to the high level and subsequent level decrease to -30 inches.

- a. RCIC turbine trips on high level and must be manually reset to allow the turbine to restart at -30 inches.
- b. Steam to RCIC Turbine valve (F045) will close on high level and the high level seal-in must be manually reset to allow F045 to reopen at -30 inches.
- c. The RCIC Steam Supply Outboard Isolation Valve (F008) goes shut on high level and reopens at -30 inches.
- d. Steam to RCIC Turbine valve (F045) will close on high level and the high level seal-in is automatically reset to allow F045 to reopen at -30 inches.

Answer d Exam Level B Question Value 1.0

Reference 1 SY017 C-5, figure 23, page 18

Reference 2

Reference 3

Learning Objective SY017 C-5

5

History 1994 exam and 1996 exam.

Comments

K/A 295009G008 RO Value: 3.6 SRO Value: 4.4

KA Statement: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications

Topic Technical Specification Leakage Limits

Question Given the following conditions:

- Unit 1 is operating at 97% power.
- CORE SPRAY LOOP A IN LEAKAGE-HI PRESS annunciator has alarmed.
- Prior to the annunciator unidentified leakage was 3.5 gpm.
- Prior to the annunciator identified leakage was 22 gpm.
- Leak rate to core spray is determined to be 1.3 gpm.

Technical specifications will:

- a. NOT be entered.
- b. will be entered due to exceeding the unidentified leakage limit.
- c. will be entered due to exceeding the identified leakage limit.
- d. will be entered due to exceeding limit for leakage to core spray and exceeding the total leakage limit.

Answer d Exam Level B Question Value 1.0

Reference 1 Technical Specifications 3.4.3.2

Reference 2

Reference 3

Learning Objective NI

History new.

Comments This needs to be known from memory so need to remove from the TS set.

K/A 295009K202 RO Value: 3.9 SRO Value: 3.9

KA Statement: Reactor water level control

Topic: Vessel level control conditions that can result in low level.

Question: Unit 1 is operating at 98% power when a steam flow input signal to the Feedwater Level Control System fails to 0 output.

With no operator action reactor vessel level will:

- a. increase to greater than the high level alarm but less than the feedpump and turbine trip.
- b. increase to greater than the feedpump and turbine trip.
- c. decrease to less than the low level alarm but above the scram setpoint.
- d. decrease to less than the scram setpoint.

Answer: c Exam Level: B Question Value: 1.0

Reference 1: SYS017 D-3, attachment 5

Reference 2:

Reference 3:

Learning Objective: SY017 D-3 8.c

History: new

Comments:

K/A 295013G008 RO Value: 3.5 SRO Value: 4.4

KA Statement: Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications

Topic Technical Specification entry condition on high suppression pool temperature.

Question Given the following conditions:

- HPCI is being operated for a surveillance.
- Suppression pool temperature is 94 F.

Select the status of performing EO-100-103, and Technical Specification LCO entry.

a. PC Control, EO-100-103, has been entered but LCO entry is not required.

b. PC Control, EO-100-103, has been entered and LCO entry is required.

c. PC Control, EO-100-103, has NOT been entered and LCO entry is NOT required.

d. PC Control, EO-100-103, has NOT been entered, but LCO entry is required.

Answer a Exam Level B Question Value 1.0

Reference 1 Technical Specifications 3.6.2.1

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295014G010 RO Value: 4.0 SRO Value: 3.9

KA Statement: Ability to perform without reference to procedures those actions that require immediate operation of system components or contr

Topic Required actions on a loss of feedwater heating.

Question Given the following conditions:

- Reactor Power is 65%.
- Core flow is 60 Mlbm/hr.
- A loss of feedwater heating has occurred.

Recirculation flow is required to immediately be reduced to:

a. core flow is 55 Mlbm/hr.

b. core flow is 45 Mlbm/hr.

c. as low as possible without entering Region I of the Power to Flow curve.

d. until power is 45%.

Answer a Exam Level B Question Value 1.0

Reference 1 On-147-001, page 3.

Reference 2 ON-147-001, page 4.

Reference 3

Learning Objective

History new

Comments

K/A 295014K104 RO Value: 3.0 SRO Value: 3.4

KA Statement: PCIOMR: Plant-Specific

Topic Reason for reducing power by 20%

Question A loss of feedwater heating has occurred. Reducing recirculation flow is performed to:

- a. avoid exceeding 100% power.
- b. preclude the possibility of fuel failure due to Pellet Clad Interaction.
- c. reduce the subcooling of the feedwater entering the reactor.
- d. reduce local power faster than can be performed by control rod insertion.

Answer b Exam Level B Question Value 1.0

Reference 1 ON-147-00i, page 7.

Reference 2

Reference 3

Learning Objective

History new

Comments

KA Statement: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and

Topic: What conditions constitute determination that the reactor will remain shutdown during all conditions

Question: Given the following conditions:

- A reactor startup is in progress
- Reactor pressure is 825 psig and being increased with rod withdrawal
- A reactor scram occurs due to failing to vent the drywell during the heatup.
- Two control rods are at position 10 and 12.

Entry into EO-100-113, Level/Power Control, from EO-100-102, RPV Control, is:

- a. required because with two rods out the ability to remain shutdown without boron is not assured.
- b. required until both control rods are fully inserted to assure the ability to remain shutdown without boron.
- c. NOT required because the worth of the two rods is less than the assumption of one rod being fully withdrawn.
- d. NOT required because initially power was below a level constituting an emergency.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: EO-100-102, page 5

Reference 2: EO-100-102, entry conditions.

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295016A101 RO Value: 3.8 SRO Value: 3.9

KA Statement: RPS

Topic What mechanism is being used to close the MSIVs if they are not closed before evacuating the control room.

Question Following a control room evacuation what mechanism is used to close the MSIVs?

a. Pull fuses for AC & DC to the MSIV solenoids.

b. Isolate and bleed off air to outboard MSIVs.

c. Trip NSSS with jumpers.

d. Deenergize RPS power.

Answer a Exam Level B Question Value 1.0

Reference 1 ON-100-009, page 3

Reference 2

Reference 3

Learning Objective AD045 NI

History new

Comments

K/A 295016A108 RO Value: 4.0 SRO Value: 4.0

KA Statement: Reactor pressure

Topic Location of where ADS valves can be operated

Question Placing the Control Transfer Switches on the Remote Shutdown Panel in EMERG will defeat the auto initiation operation of how many SRVs?

a. 2

b. 3

c. 6

d. all

Answer b Exam Level B Question Value 1.0

Reference 1 ON-100-009, page 8.

Reference 2

Reference 3

Learning Objective SY017 C-4 10

History new

Comments

K/A 295016A203 RO Value: 4.3 SRO Value: 4.4

KA Statement: Reactor pressure

Topic: How reactor pressure will be controlled following control room evacuation with all actions taken

Question: Given the following conditions:

- A control room evacuation has occurred.
- All actions were taken prior to evacuating the control room.

What will be the method of pressure control prior to transferring control to the Remote Shutdown Panel?

- a. Turbine bypass valves.
- b. HPCI operating in CST to CST mode.
- c. SRVs operating in relief mode.
- d. SRVs operating in safety mode.

Answer: c Exam Level: B Question Value: 1.0

Reference 1: ON-100-009, page 2

Reference 2:

Reference 3:

Learning Objective: AD045

NI

History: 1996 exam.

Comments:

K/A 295017G011 RO Value: 4.2 SRO Value: 4.5

KA Statement: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and ab

Topic Radiological Release Entry Condition.

Question Radioactivity Release Control, EO-100-105, is entered on which of the following conditions?

- a. A Site Area Emergency is declared due to radiological release rates.
- b. An Alert is declared due to off-site radiological release.
- c. Projected dose is approaching the Site Area Emergency declaration criteria.
- d. Projected dose is approaching the General Emergency declaration criteria.

Answer b Exam Level R Question Value 1.0

Reference 1 EO-100-104

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295018K101 RO Value: 3.5 SRO Value: 3.6

KA Statement: Effects on component/system operations

Topic: How a Main steam isolation can result from loss of RBCCW.

Question: Which of the following describes how a loss of RBCCW can result in a Main Steam Line Isolation?

- a. Containment Instrument Gas will be lost resulting in closure of the inboard MSIVs.
- b. Instrument Air will be lost resulting in closure of the outboard MSIVs.
- c. Main Steam Line Tunnel High temperature will result due to the loss of cooling to the tunnel area.
- d. Main Steam Line Tunnel High temperature will result due to loss of cooling to the tunnel area.

Answer: a Exam Level: B Question Value: 1.0

Reference 1: ON-114-001, page 9

Reference 2:

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295019G010 RO Value: 3.7 SRO Value: 3.4

KA Statement: Ability to perform without reference to procedures those actions that require immediate operation of system components or contr

Topic Conditions requiring a scram on a loss of instrument air. (Possibly including basis)

Question On a loss of instrument air the reactor should be scrammed at what pressure to avoid what conditions from occurring.

- a. 80 psig to prevent erratic operation of air operated valves.
- b. 80 psig to prevent abnormal flux patterns from drifting control rods.
- c. 65 psig to ensure the scram occurs prior to significant scram discharge volume inleakage from occurring.
- d. 65 psig to ensure drifting rods do not occur due to outlet scram valves opening without the inlet scram valves opening.

Answer c Exam Level B Question Value 1.0

Reference 1 ON-118-001, page 2

Reference 2

Reference 3

Learning Objective

History new

Comments

KA Statement: Reactor pressure

Topic Definition of alternate heat removal method

Question ON-149-001, Loss of Shutdown Cooling Mode, requires that alternate methods of decay heat removal be verified based on plant conditions.

Systems are identified as an alternate method of decay heat removal must be capable of removing sufficient heat to

- a. prevent core damage.
- b. prevent changing plant modes.
- c. remove the entire decay heat load of the core.
- d. allow time to restore RHR flow.

Answer c Exam Level S Question Value 1.0

Reference 1 ON-149-001, page 28

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295021K104 RO Value: 3.6 SRO Value: 3.7

KA Statement: Natural circulation

Topic: RPV Level required to assure cooling due to circulation.

Question: Given the following conditions:

- Cooldown is in progress.
- Temperature is 284 F.
- Both recirculation pumps are out of service.
- Reactor water level is 18 inches.
- A loss of the running RHR pump has occurred.

Select the minimum acceptable water level that can exist one hour after the RHR pump is lost?

a. 32"

b. 40"

c. 48"

d. 55"

Answer: c Exam Level: R Question Value: 1.0

Reference 1: On-149-001, page 4 and 28

Reference 2:

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295021K203 RC Value: 3.6 SRO Value: 3.6

KA Statement: RHR/shutdown cooling

Topic Available Shutdown Cooling loops on a loss of RPS.

Question With a complete loss of RPS "B" power, which of the following identifies ALL RHR loops available to provide shutdown cooling?

- a. RHR "A" from the control room.
- b. RHR "A" from the control room and RHR "B" from the Remote Shutdown Panel.
- c. RHR "B" from the Remote Shutdown Panel.
- d. Either loop of RHR from the control room and RHR "B" from the Remote Shutdown Panel.

Answer c Exam Level B Question Value 1.0

Reference 1 On-149-001, page 4.

Reference 2 ON-149-001, page 29.

Reference 3

Learning Objective

History new

Comments

K/A 295022A201 RO Value: 3.5 SRO Value: 3.6

KA Statement: Accumulator pressure

Topic Requirement to scram the reactor on loss of CRD.

Question Given the following conditions:

- Unit 1 power is 95%.
- All control rods are withdrawn.
- 1A CRD pump is inoperable.
- 1B CRD pump has tripped on overcurrent.
- Rod 27-14 has an accumulator alarm due to water leakage.

Which of the following conditions requires scrambling the reactor.

a. High temperature alarms are received on two control rods.

b. 10 minutes has elapsed without CRD flow.

c. An accumulator alarm is received on rod 23-42.

d. Following one attempt to restart the 1B CRD pump.

Answer c Exam Level B Question Value 1.0

Reference 1 ON-155-007, page 2

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295023G001 RO Value: 3.3 SRO Value: 4.2

KA Statement: Knowledge of system status criteria which require the notification of plant personnel

Topic Required action for a refuel floor high exhaust radiation.

Question The Refueling SRO indicates that a bundle has been damaged in movement. The control room observes increasing radiation levels on the refuel floor and in the ventilation.

Which of the following describes the evacuations that should be performed?

- a. Evacuate the refuel floor except for those persons attempting to place the bundle in a safe location.
- b. Upon receiving a recommendation from HP evacuate the refuel floor.
- c. Immediately evacuate the refuel floor.
- d. Evacuate the refuel floor and the affected unit's reactor building.

Answer c Exam Level B Question Value 1.0

Reference 1 ON-181-001, page 3, rev. 1.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295024K215 RO Value: 3.8 SRO Value: 3.9

KA Statement: Containment spray logic: Plant-Specific

Topic Drywell spray logic.

Question Which of the following describes operation of the Drywell Spray Outboard Isolation Valve (F016A/B)?

- a. F016A/B can be opened using only the valve control switch under any condition.
- b. F016A/B can only be opened if the Drywell Spray Inboard Isolation Valve F021A/B is opened first.
- c. F016A/B will automatically close when drywell pressure decreases to less than 1.72 psig.
- d. F016A/B will open with a LOCA signal present when the white light above the "LOCA ISOLATION MANUAL OVERRIDE" switch is illuminated.

Answer d Exam Level B Question Value 1.0

Reference 1 SY017 C-1

Reference 2

Reference 3

Learning Objective SY017 C-1

9

History new

Comments

K/A :95025A103 RO Value: 4.4 SRO Value: 4.4

KA Statement: Safety/relief valves: Plant-Specific

Topic With an SRV cycling what action should be taken.

Question Given the following conditions:

- Unit 1 was operating at 98% power.
- A spurious Main Steam Line isolation occurred.
- SRVs are cycling on high RPV pressure.

Which of the following describes how RPV pressure is to be controlled?

- a. Allowing SRVs to operate automatically to control pressure.
- b. Manually opening the SRVs that are cycling to reduce pressure.
- c. Manually opening the SRVs in alphabetical order to reduce pressure.
- d. Manually opening SRVs that discharge to the lowest temperature area of the suppression pool.

Answer c Exam Level B Question Value 1.0

Reference 1 EO-100-102, page 34,

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295030G012 RO Value: 3.7 SRO Value: 4.4

KA Statement: Ability to utilize symptom based procedures

Topic Suppression pool level that requires a scram.

Question While operating at 98%, a leak has occurred on piping connected to the Suppression Pool causing a suppression pool level to decrease.

Select the condition that will require a reactor scram to be inserted. (Assume all other actions of EOPs are performed when required).

- a. Primary Containment Control is entered on low suppression pool level.
- b. Suppression pool temperature results in delta Thc being exceeded.
- c. Suppression pool level is approaching 12".
- d. Within one hour of entering Primary Containment control on low suppression pool level.

Answer c Exam Level S Question Value 1.0

Reference 1 EO-100-103

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295030G012 RO Value: 3.7 SRO Value: 4.4

KA Statement: Ability to utilize symptom based procedures

Topic Use of vortex limits.

Question Given the following conditions:

- A LOCA has occurred.
- Suppression pool level is 18 ft.
- Core Spray flow is 8000 gpm.
- RHR "A" loop flow is 12,000 gpm with RHR "A" pump in operation.
- RHR "B" loop is not inservice.
- RPV level is -155 inches and stable.

Which of the following is an acceptable change in flow or suppression pool level?

- a. Decrease core spray flow to 5500 gpm.
- b. Raise Suppression Pool level to 19 " and increase RHR loop "A" flow maximum. Decrease core spray flow until RPV level is constant.
- c. Trip the core spray pump and start RHR "C". Increase RHR flow to maintain level constant.
- d. Decrease core spray flow and RHR flow to maintain level above -205 inches.

Answer B Exam Level B Question Value 1.0

Reference 1 EO-100-103, page 12.

Reference 2

Reference 3

Learning Objective

History new.

Comments Include a copy of Figure 7 for the RO.

K/A 295031A102 RO Value: 4.5 SRO Value: 4.5

KA Statement: High pressure (feedwater) coolant injection: Plant-Specific

Topic Interlocks that can be bypassed in RPV Control.

Question When using RCIC for level control in RPV Control, which of the following protective features can be bypassed?

- a. Low RPV pressure isolation.
- b. High exhaust pressure trip.
- c. RCIC automatic suction transfer to suppression pool.
- d. RCIC isolation signals on low suction pressure.

Answer a Exam Level S Question Value 1.0

Reference 1 EO-100-102

Reference 2

Reference 3

Learning Objective

History new.

Comments

K/A 295032A104 RO Value: 3.3 SRO Value: 3.4

KA Statement: Fire protection system

Topic: Indications available that temperature on 749' exceeds 149 F and affect on level indication.

Question: Given the following conditions:

- A LOCA has occurred.
- Wide range level indication is -130 inches.

Which of the following is used to determine if Wide Range level indication is usable?

- a. A fire is reported on elevation 749'.
- b. Reactor Building Temperature indicators indicate a fire on 749'.
- c. Fire Protection Detection Alarm (Priority 2) for elevation 749' in alarm.
- d. Fire Protection Suppression Alarm (Priority 1) for elevation 749' in alarm.

Answer: d Exam Level: B Question Value: 1.0

Reference 1: EO-100-104, page 14

Reference 2: EO-100-100

Reference 3:

Learning Objective:

History: new

Comments:

K/A 295032A105 RO Value: 3.7 SRO Value: 3.9

KA Statement: Affected systems so as to isolate damaged portions

Topic Systems that can be secured to protect the secondary containment.

Question Given the following conditions:

- An MSIV isolation occurred.
- The reactor failed to scram on the isolation and power is approximately 20%.
- The pressure transient caused a leak in the HPCI pipe routing area.
- RPV level is being maintained constant at -145".
- SLC failed to inject requiring the backup method of boron injection to be initiated.
- Control rods are being inserted manually.
- Temperature in the RCIC and HPCI routing area is 170 F.

Which of the following systems can be secured?

a. HPCI

b. RCIC

c. RWCU

d. CRD

Answer c Exam Level B Question Value 1.0

Reference 1 EO-100-104.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295037G007 RO Value: 3.7 SRO Value: 3.9

KA Statement: Ability to explain and apply all system limits and precautions

Topic System prohibited from being used in Level/Power Control.

Question Which of the following systems is PROHIBITED from use when implementing Level/Power Control, EO-100-113?

a. Feedwater

b. RCIC

c. LPCI

d. Core Spray

Answer d Exam Level R Question Value 1.0

Reference 1 EO-100-113 Table 15.

Reference 2

Reference 3

Learning Objective

History new

Comments

KA Statement: Reactor water level

Topic Level band during a failure to scram and use of the target band

Question During a failure to scram water level was lowered to -70 inches and maintained.

Which of the following is an adverse effect of maintaining level at -70 inches instead of -90 inches?

a. Increased power oscillations will occur.

b. Power reduction will be less than at lower levels.

c. RPV level control will be more difficult.

d. Natural circulation flow will be less.

Answer b Exam Level S Question Value 1.0

Reference 1 EO-100-113, page 22 to 26.

Reference 2

Reference 3

Learning Objective

History new

Comments

K/A 295037K303 RO Value: 4.1 SRO Value: 4.5

KA Statement: Lowering reactor water level

Topic Basis for reducing level per step LQ/L-6 of Level Power Control

Question Step LQ/L-6 of Level Power Control requires reducing water level to less than -60 inches.

Select the reason for taking this action.

- a. Reduce natural circulation driving force.
- b. Concentrate the boron in the core region.
- c. Reduce core inlet subcooling by uncovering feedwater spargers.
- d. Reduce natural circulation flow by reducing level below the steam separators.

Answer c Exam Level S Question Value 1.0

Reference 1 EO-100-113, page 18.

Reference 2

Reference 3

Learning Objective

History new

Comments Check distracters to be sure they cannot be considered correct.

K/A 295037K306 PO Value: 3.8 SRO Value: 4.1

KA Statement: Maintaining heat sinks external to the containment.

Topic Temperature effects on the usability of RPV water level instruments

Question Given the following conditions:

- A LOCA has occurred causing elevated Drywell Temperatures.
- Extended Range instruments are indicating -110.
- Drywell temperature is 190 F.

Which of the following describes the status of Extended Range instruments?

- a. Extended range level CANNOT be used because indicated level is less than -85".
- b. Based on drywell temperature ONLY, indicated level can be determined to be above the lower instrument tap.
- c. Based on drywell temperature the Extended Range Level is usable.
- d. Based on drywell temperature the Extended Range is NOT usable.

Answer c Exam Level Question Value 1.0

Reference 1 ON-145-004, page 15.

Reference 2 EO-100-100

Reference 3

Learning Objective

History new.

Comments Give attachment C.

K/A 295037K306 RO Value: 3.8 SRO Value: 4.1

KA Statement: Maintaining heat sinks external to the containment

Topic: Opening and bypassing interlocks for the Main Steam Isolation valves during a failure to scram.

Question: Select the condition when Main Steam Line isolations can be bypassed and the main steam lines reopened?

- a. If water level is be deliberately lowered to the target zone.
- b. If necessary to stabilize pressure below 1087 psig.
- c. If the main steam lines isolated on conditions other than high radiation or high flow.
- d. If necessary to rapidly depressurize the reactor.

Answer: a Exam Level: S Question Value: 1.0

Reference 1: EO-100-113

Reference 2: EO-100-112

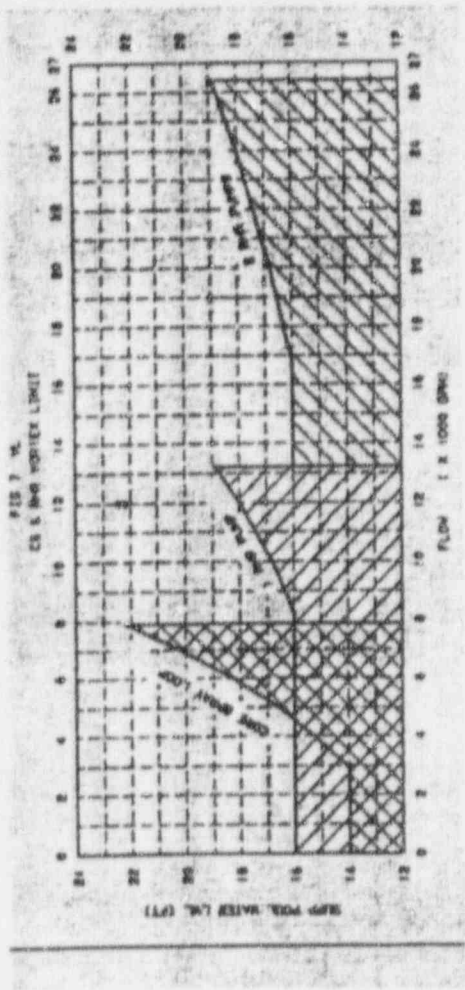
Reference 3:

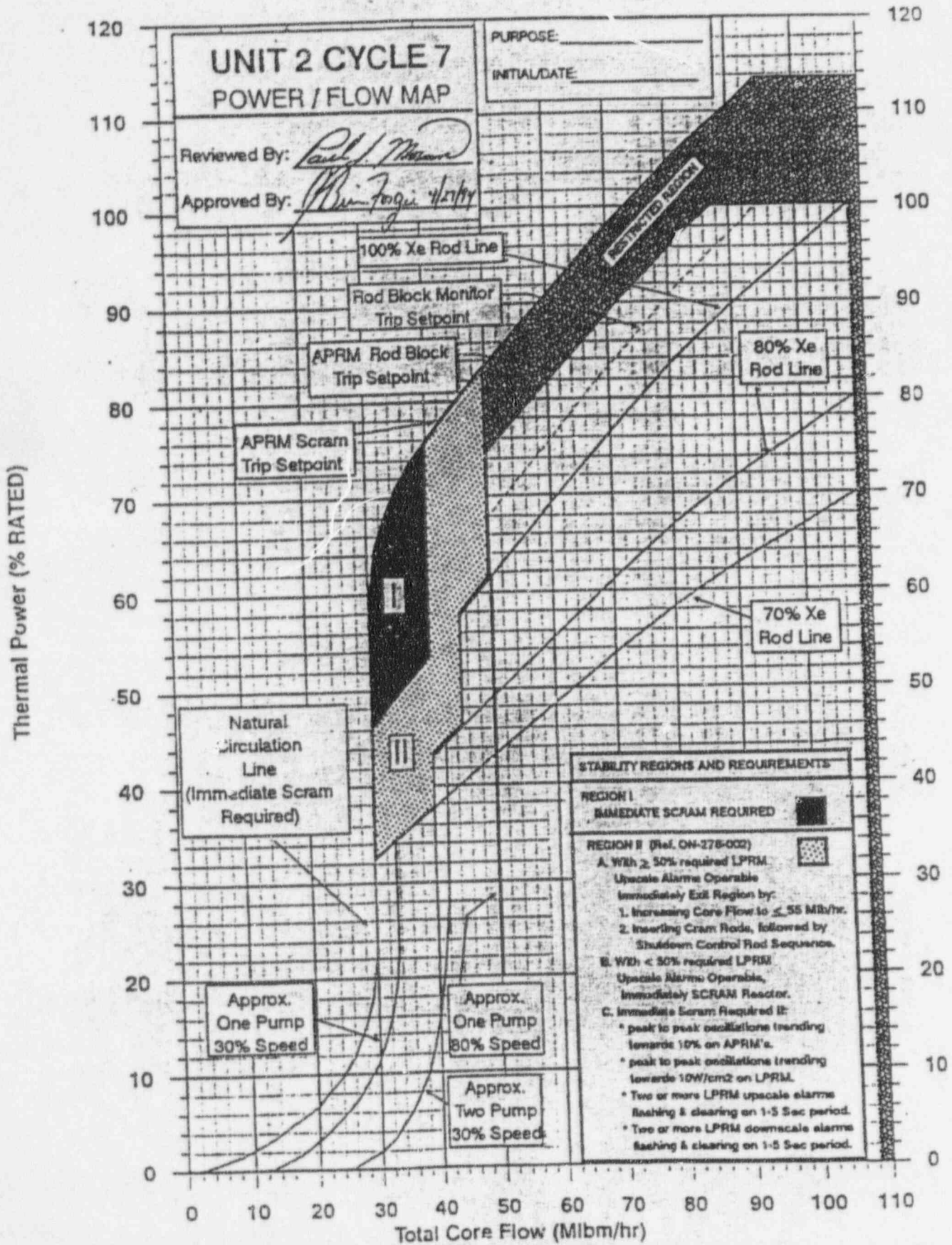
Learning Objective:

History: new.

Comments:

ATTACHMENTS





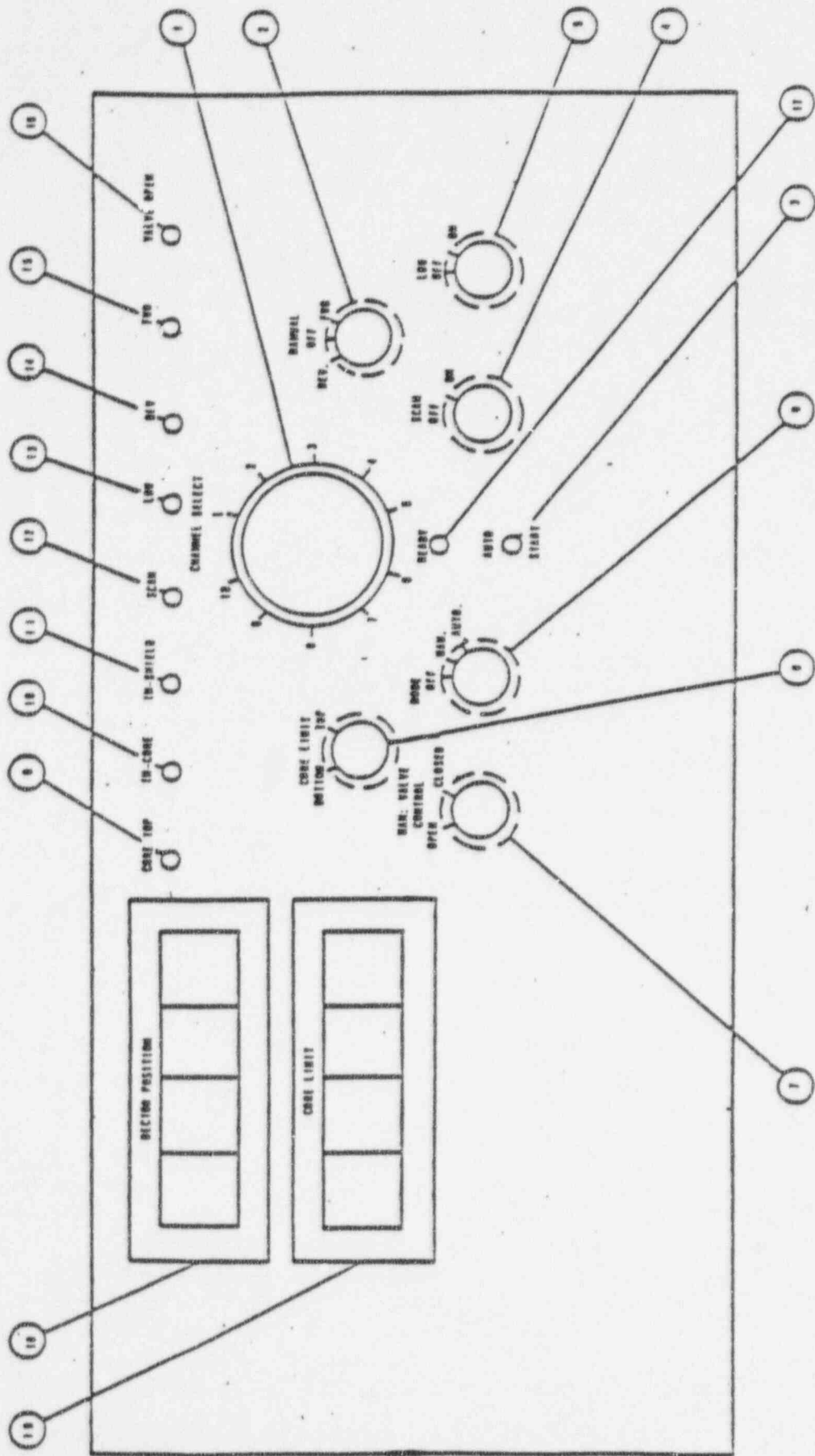


FIGURE 15
 FLUX MAPPING AND CALIBRATION DRIVE CONTROL UNIT

Attachment A
RE-OTP-017
Revision 0
Page 5 of 5

APRM CHANNELS VS LPRM LOCATIONS

APRM CHANNEL	LPRM LOCATIONS			
	A - Levels	B - Levels	C-Levels	D-Levels
APRM A (Panel 1C608 Page AR31)	24-57	32-49	40-57	16-49
	08-41	16-33	24-41	48-49
	40-41	48-33	56-41	32-33
	24-25	32-17	08-25	16-17
	56-25		40-25	48-17
	40-09		24-09	
APRM B (Panel 1C608 Page AR32)	32-57	08-49		24-49
	16-41	40-49	16-57	08-33
	48-41	24-33	32-41	40-33
	32-25	56-33	16-25	24-17
	16-09	08-17	48-25	56-17
	48-09	40-17	32-09	
APRM C (Panel 1C608 Page AR41)	16-49	24-57	32-49	40-57
	48-49	08-41	16-33	24-41
	32-33	40-41	48-33	56-41
	16-17	24-25	32-17	08-25
	48-17	56-25		40-25
	40-09		24-09	
APRM D (Panel 1C608 Page AR22)	24-49	32-57	08-49	16-57
	08-33	16-41	40-49	32-41
	40-33	48-41	24-33	16-25
	24-17	32-25	56-33	48-25
	56-17	16-09	08-17	32-09
	48-09	40-17		
APRM E (Panel 1C608 Page AR51)	40-57	16-49	24-57	32-49
	24-41	48-49	08-41	
	56-41	32-33	40-41	16-33
	08-25	16-17	24-25	48-33
	40-25	48-17	56-25	32-17
	24-09	40-09		
APRM F (Panel 1C608 Page AR12)	16-57	24-49	32-57	08-49
	32-41	08-33	16-41	40-49
	16-25	40-33	48-41	24-33
	48-25	24-17	32-25	56-33
	32-09	56-17	16-09	08-17
		48-09	40-17	

TEMPERATURE AFFECT ON THE USABILITY
 OF
 RPV WATER LEVEL INSTRUMENTS

RPV water level indication is affected by RPV pressure and instrument run temperatures. Figures 1 - 7 provide pressure and temperature limitations to be considered in determining whether level indication is "usable." Per EOP Caution #1, an RPV water level instrument may be usable when determined usable in accordance with ON-145-004, or it reads within the prescribed band.

Figure 1 is a saturation temperature curve. When temperatures near instrument runs are above Figure 1, flashing of water in the instrument runs will cause unreliable water level indication.

Figures 2 - 7 are graphs of indicated RPV water level vs temperature near the reference leg vertical runs. Below the curves, indicated level could be caused by off-calibration Drywell and Reactor Building temperatures which may result in on-scale indication even when water level is below the instrument tap.

The "prescribed band" of Caution #1 is a result of simplifying information from Figures 2 - 7. The upper end of the "prescribed band" is the upper limit of the instrument indicator range. The lower end of the "prescribed band" is the "Minimum Indicated Level (MIL)." MIL is derived from Figures 2 - 7 assuming a maximum Drywell temperature of 350°F near the reference leg vertical runs (except for Fuel Zone which is assumed to be 100°F). 350°F is assumed because EO-100-103, Primary Containment Control, requires Rapid Depressurization before exceeding 340°F.

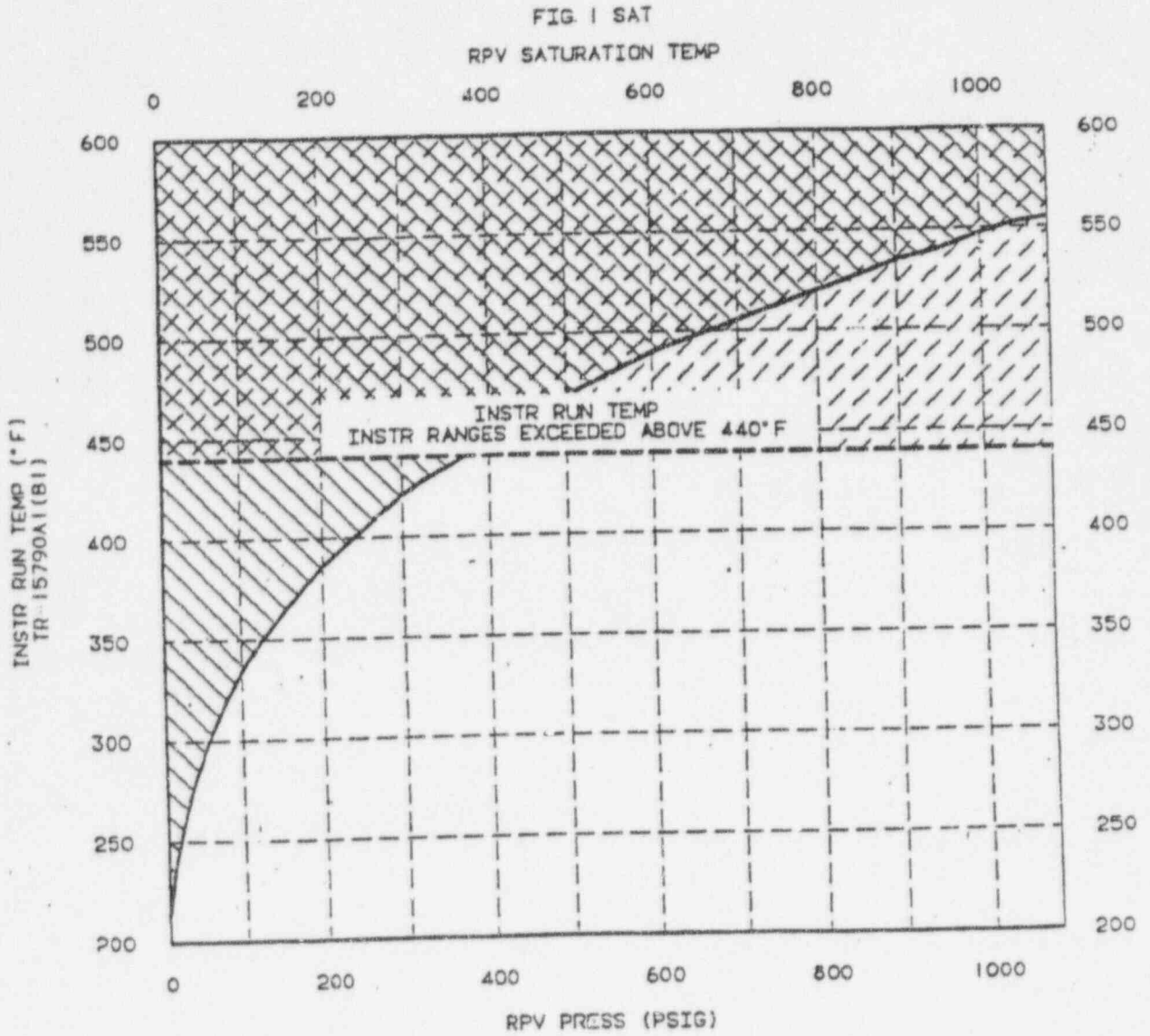
Instrument	MIL	Caution 1	Assumed DW temp	Limiting RB temp
Narrow Range A (B) (C)	2.1	2	350	350
Wide Range A(B)	-126.8	-125	350	350
Extended Range A	-88	-85	350	350
Extended Range B	-87.7		350	350
Fuel Zone A	-304.3	-290*	100	350
Fuel Zone B	-293.8		100	350
Shutdown Range	46.5	50	350	70
Upset Range	42.1	45	350	70

* Fuel Zone is calibrated for drywell temp of 212° F and is effected inversely by elevated Drywell temperatures.

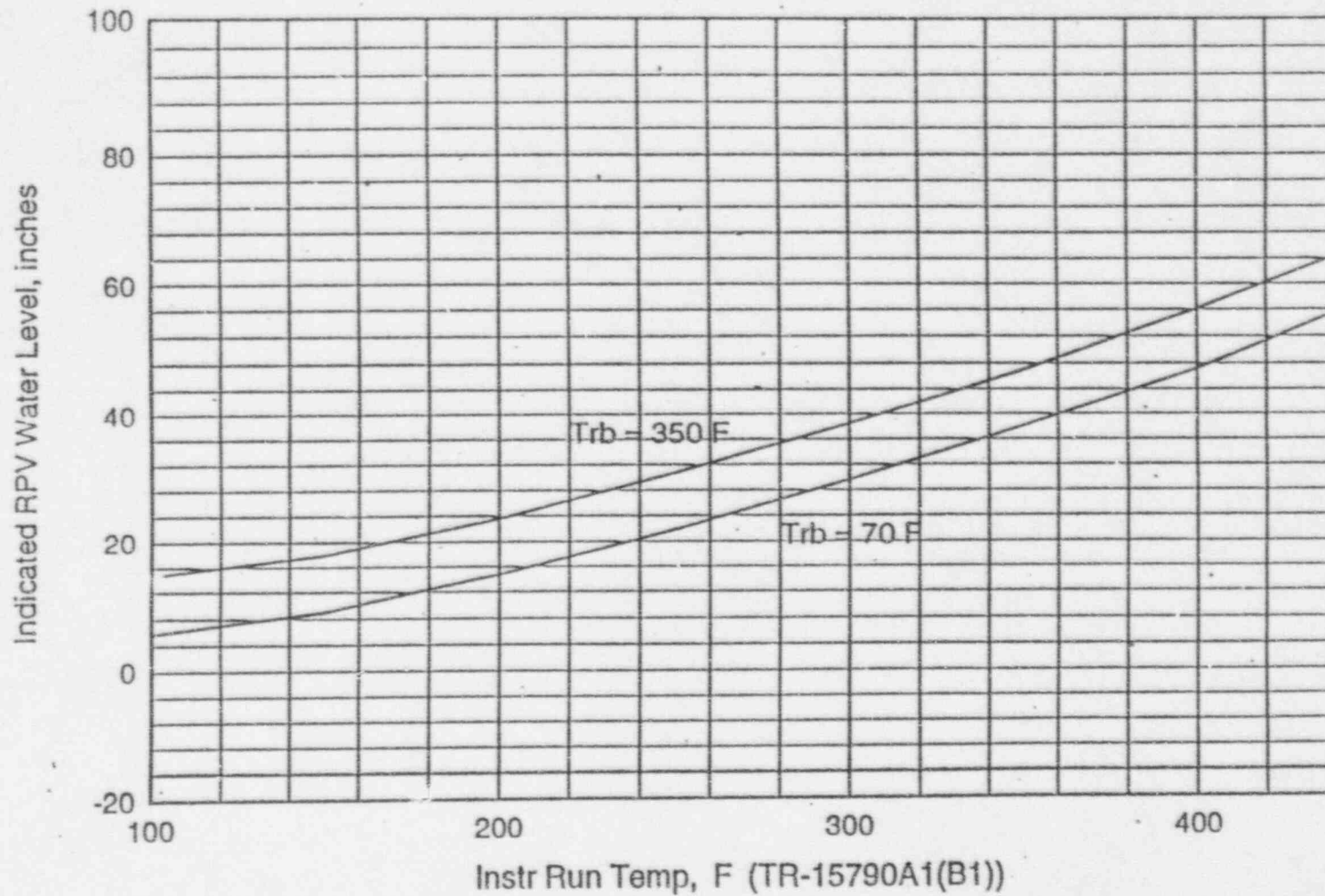
If average Drywell temperature exceeds 340°F (10°F margin to 350°F), EO-100-103, Primary Containment Control, requires use of Figures 2 - 7 to determine usability of RPV water level instruments. Likewise, if indicated level is below the bands of Caution #1, expanded bands may be obtained by using Figures 2 - 7 and the actual Drywell temperature.

Temperature indication near instrument runs in the Drywell is provided by TR-15790A1(B1) on 1C601. Temperature elements feeding these recorders are located relatively high in the Drywell near the RPV water level instrument runs. If TR-15790A1(B1) is unavailable, highest indicated rather than average Drywell temperature indication is most appropriate to use.

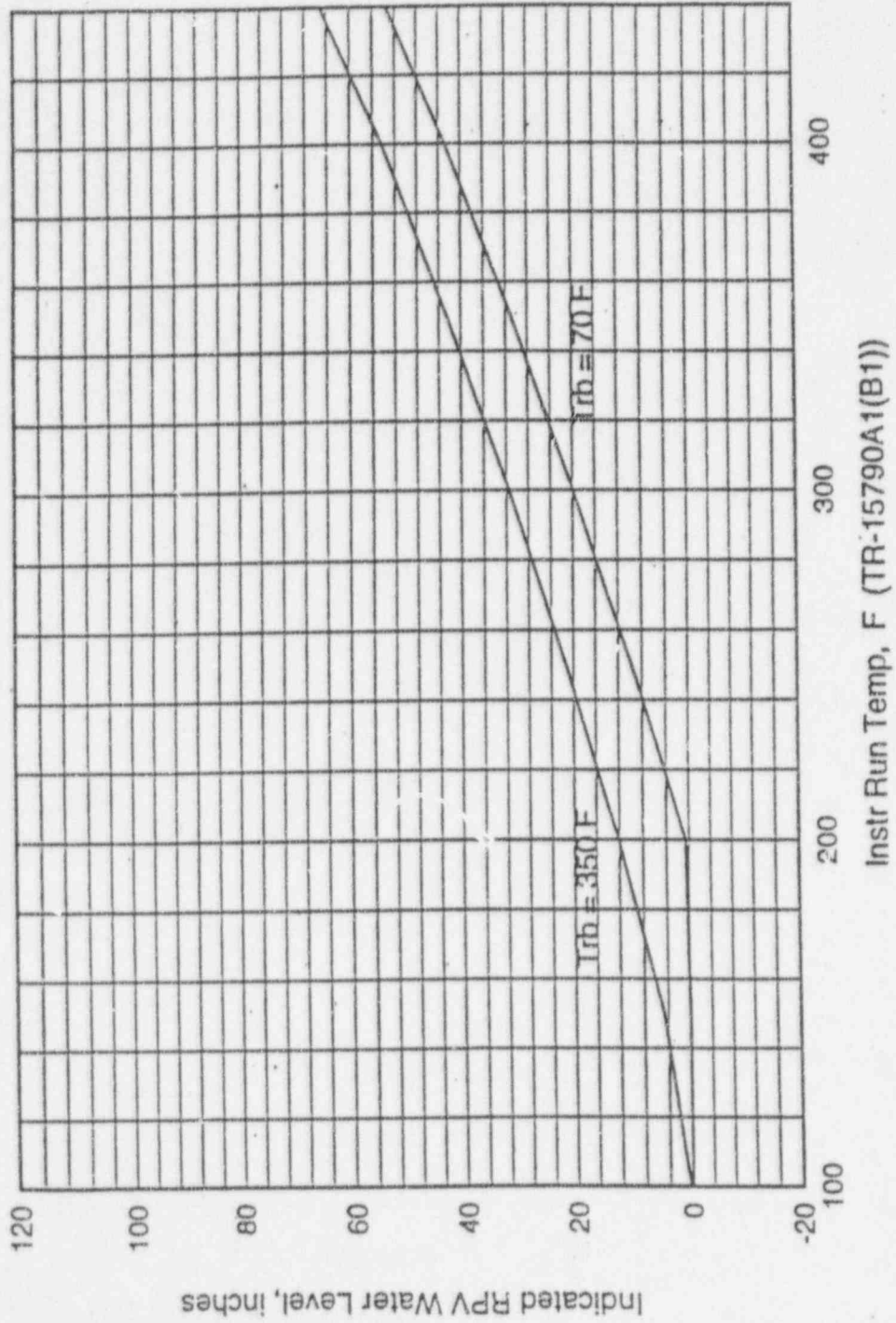
Reactor Building temperature indication is unavailable via installed instrumentation. Temperature indication near instrument runs in the reactor building may be estimated based on 749' elevation leak detection instrumentation, secondary containment fire detection instrumentation, and portable temperature monitoring equipment. If reactor building access is restricted, worst case temperature should be assumed and the 350°F curve should be used to obtain minimum indicated level.



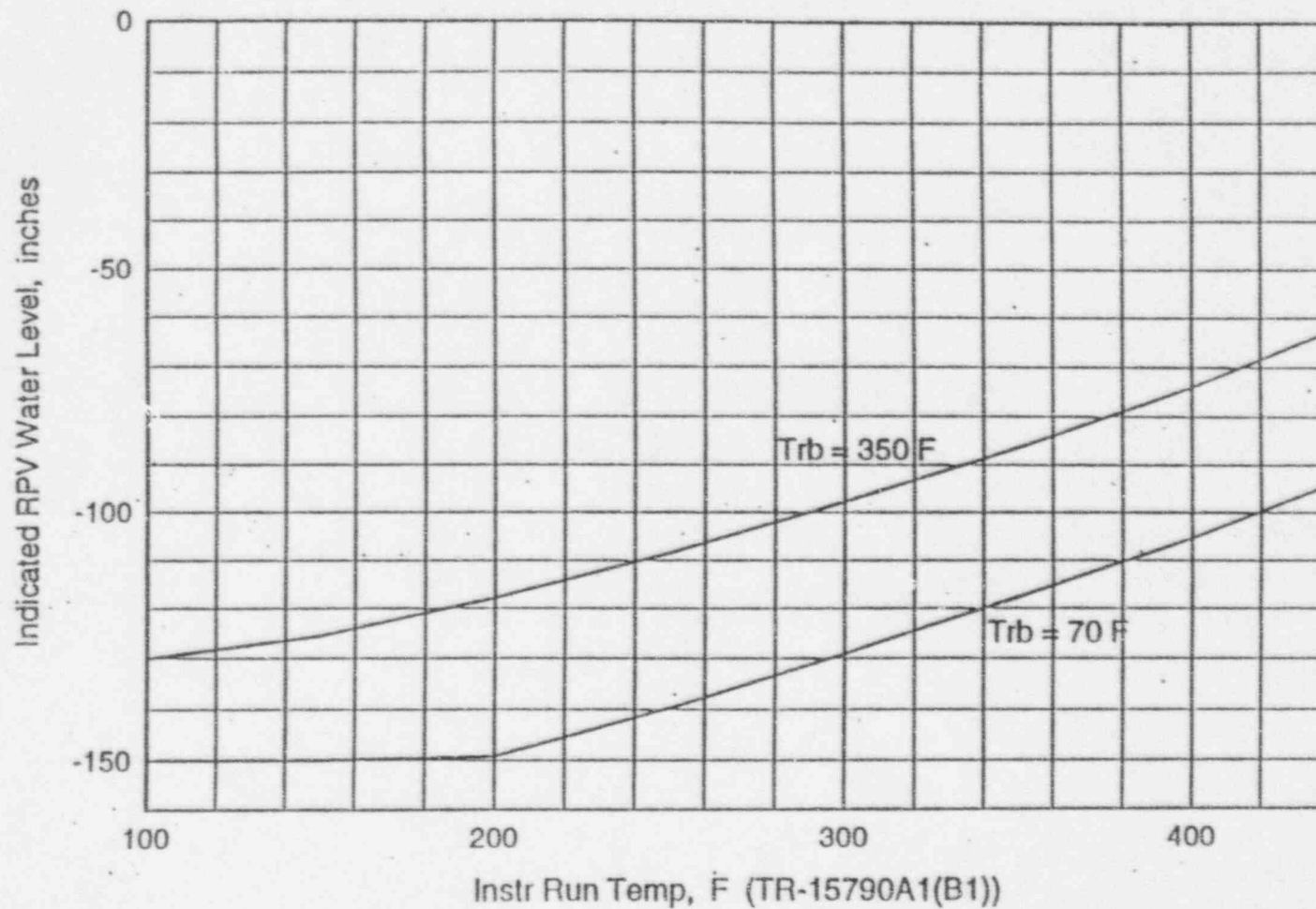
UNIT 1 - SHUTDOWN RANGE WATER LEVEL INSTRUMENTATION



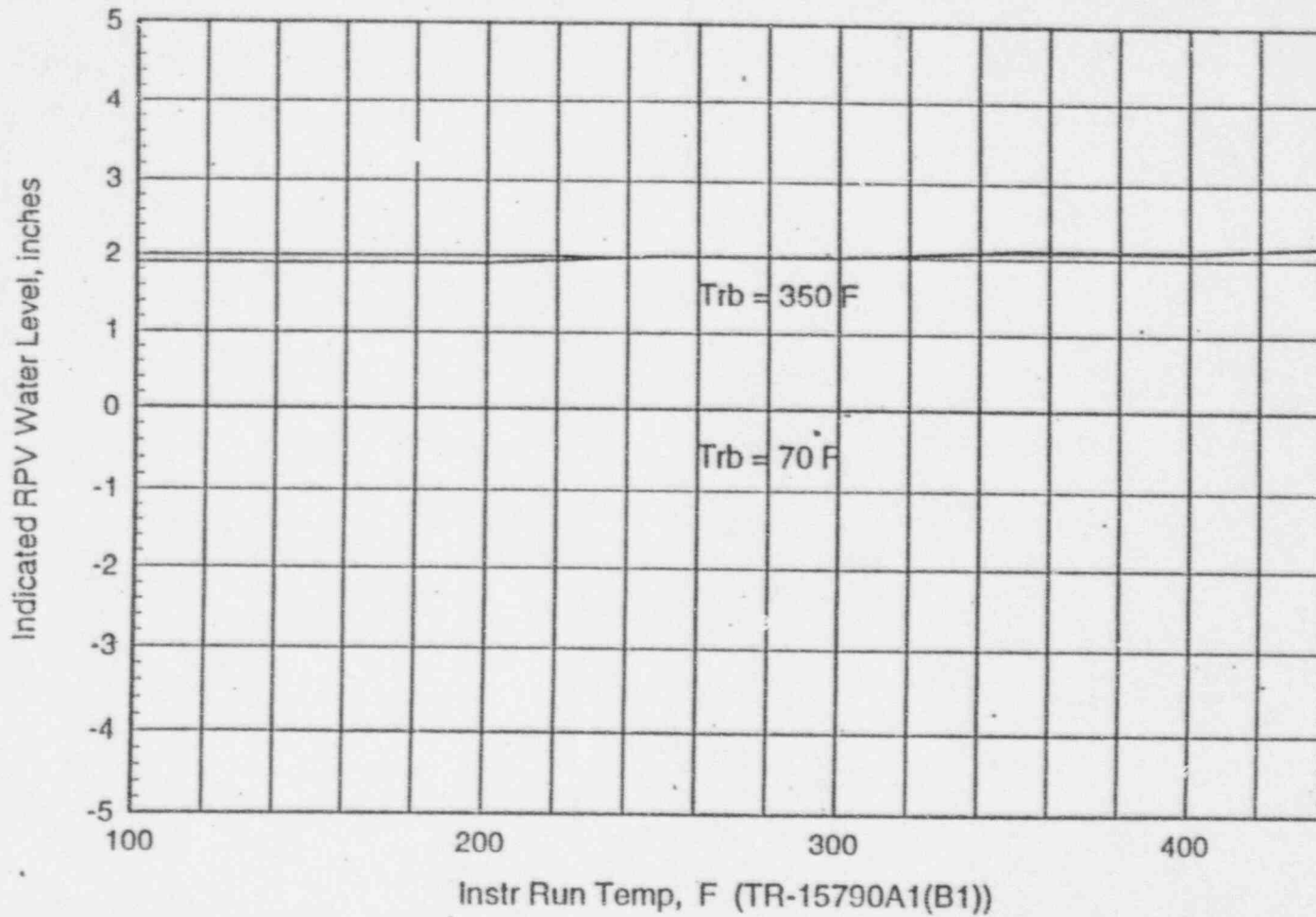
UNIT 1 - UPSET RANGE WATER LEVEL INSTRUMENTATION



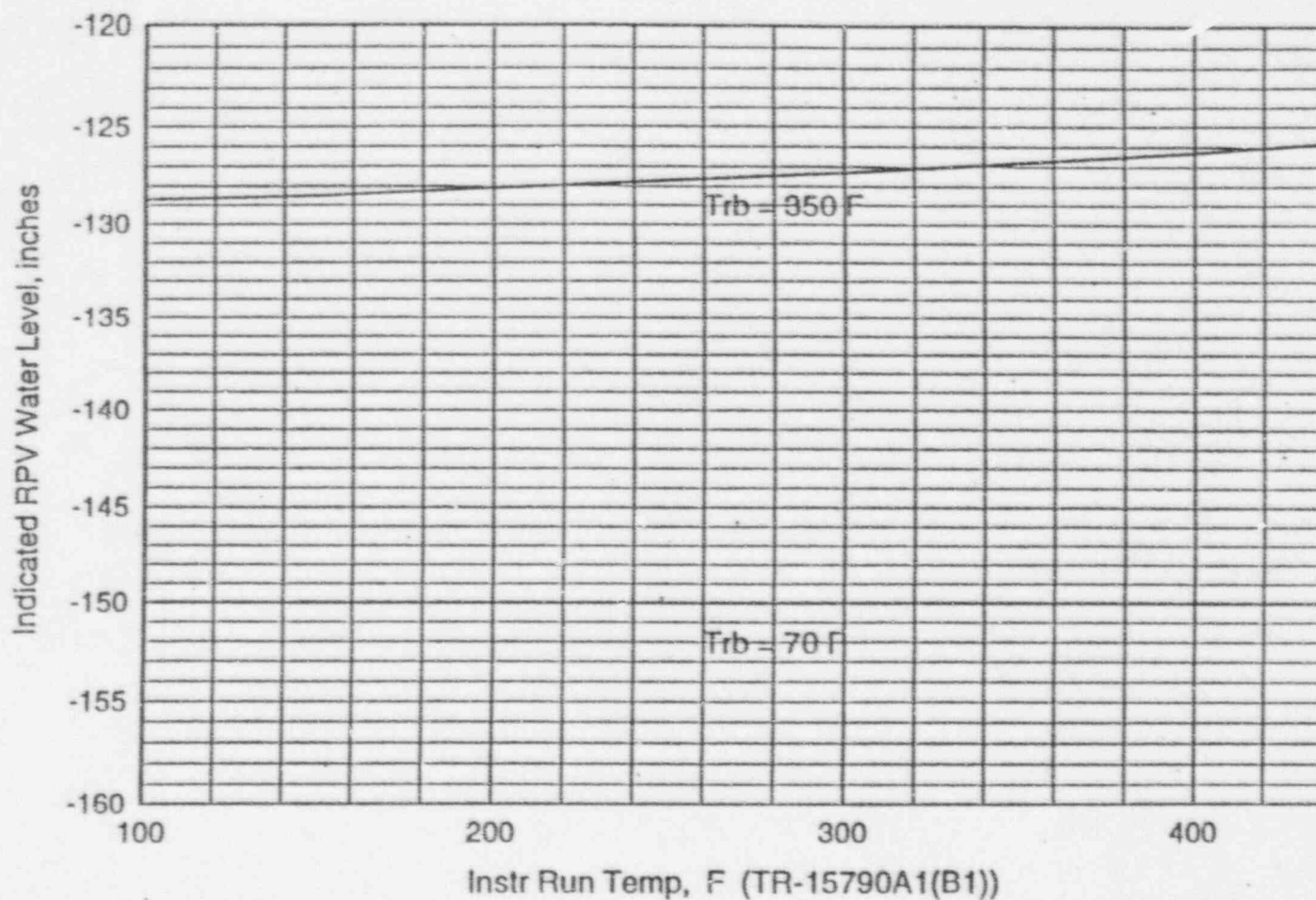
UNIT 1 - EXTENDED RANGE WATER LEVEL INSTRUMENTATION



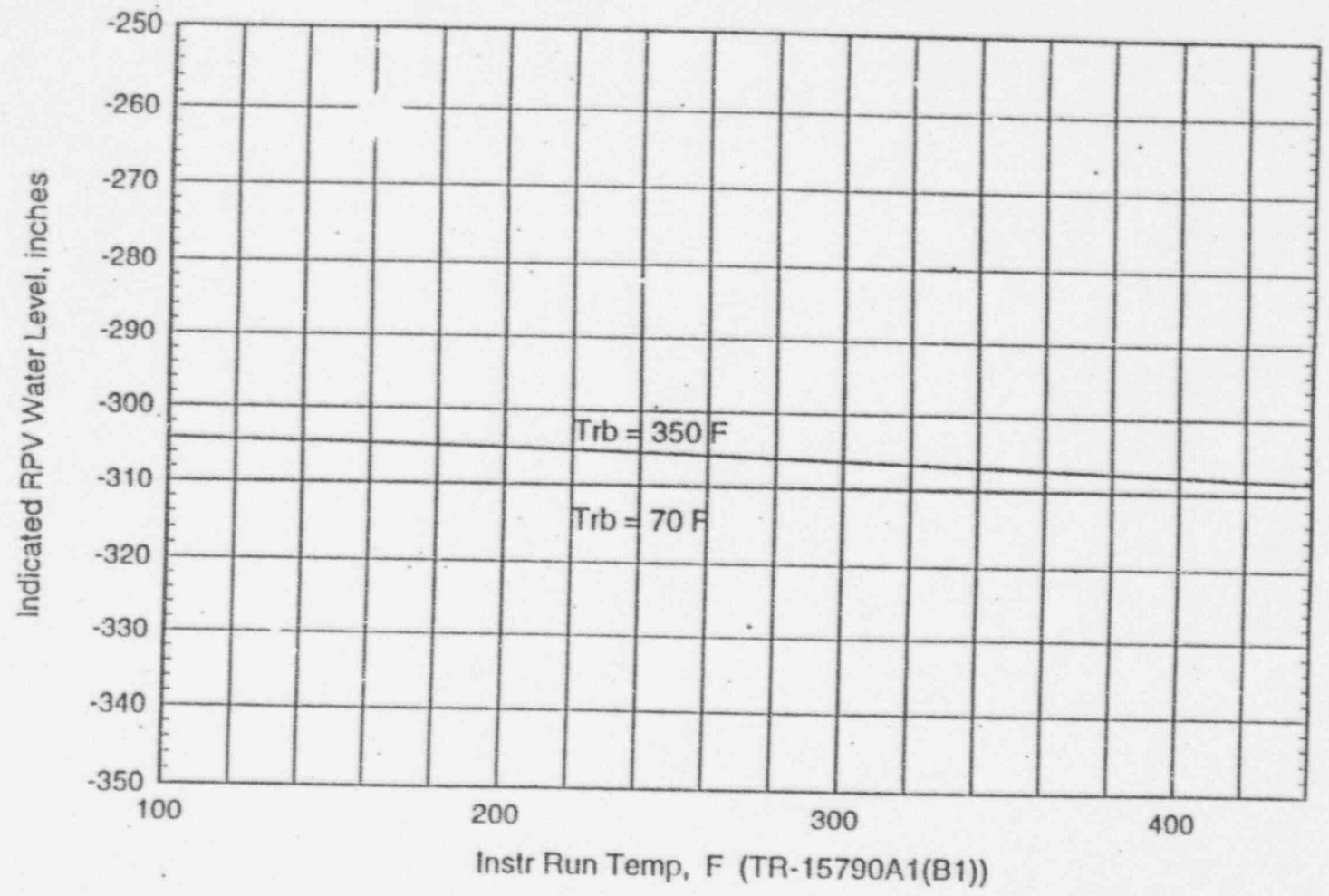
UNIT 1 - NARROW RANGE WATER LEVEL INSTRUMENTATION



UNIT 1 - WIDE RANGE WATER LEVEL INSTRUMENTATION



UNIT 1 - FUEL ZONE RANGE WATER LEVEL INSTRUMENTATION



Facility: Susquehanna 1 and 2
Exam Level: SRO

Exam Week of 10/21/96
Examiner: Region I

Topic	Method	Subject Description	JPM Description or Question Description
1	Conduct of Operations	Question Refueling	Required Actions when directed to cease refueling. Refueling SRO required verifications
A. 1	Conduct of Operations	JPM Reportability Requirements individuals	Evaluate and document reportability and contact required
A. 2	Equipment Control	Question Surveillance Requirements	Actions when a surveillance is determined to be out of date. Required action if one component fails on a surveillance.
A. 3	Radiation Control	Question High Radiation Areas	High Radiation Entry requirements RWCU Holdup room blocking requirements
4	Emergency Plan	JPM General Emergency Classification	Classify a General Emergency and determine required PAR

6/1
A070

Exam Level: S

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: Evaluate and document reportability and contact required individuals

Question:

Answer:

KA: 294001A106 **RO Value:** 3.4 **SRO Value:** 3.6

KA Statement: Ability to maintain accurate, clear and concise logs, records, status boards and reports

Reference: Facility JPM 1.724.01.001

Reference:

Comments: NDAP-QA-0724

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 1.724.01.001 1 09/25/96 203000 4.6
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Evaluate and Document Reportability and Contact Required Individuals in Accordance with NDAP-QA-0720

Completed By:

John J. Petrilla
 Writer

09/25/96
 Date

Reviews:

John Petrilla III
 Instructor/Writer

9/27/96
 Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/30/96
 Date

[Signature]
 Nuclear Training Supv.

9/30/96
 Date

Date of Performance:

20 Min
 Allowed Time (Min)

_____ Time Taken (Min)

JPM Performed By:

_____ Last

_____ First

_____ M.I.

_____ Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ Signature

_____ Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 1.724.01.001

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

- A. NDAP-QA-0720 Station Report Matrix and Reportability Evaluation Guidance
- B. NDAP-QA-0702 Condition Reports

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 1.724.01.001

IV. TASK CONDITIONS

- A. A plant shutdown was in progress when a RHR Shutdown Cooling isolation occurred.
- B. The plant was in Condition 3 with reactor pressure at 75 psig.
- C. The isolation signal was RHR Pipe Routing Area high temperature.
- D. A packing leak on the Shutdown Cooling outboard isolation valve (HV-151-F008) allowed steam to blow into the Pipe Routing Area and caused the elevated temperatures.
- E. All components responded properly to the isolation signal.
- F. The packing leak was repaired about 30 minutes after the system isolation.
- G. RHR Shutdown Cooling has been returned to service and the cooldown has resumed.
- H. Suppression Pool temperature remained below 90° F during this event.
- I. Entry into the Emergency Plan was not required.

V. INITIATING CUE

- A. Evaluate this event for reportability.
- B. Document the reportability determination on the appropriate form.
- C. If the event is reportable, determine the external agencies/individuals and PP&L Management that should be notified.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 1.724.01.001

Student Name: _____

Step	Action	Standard	Eval	Comments
*1.	<p><u>Evaluator:</u> Prior to beginning this JPM, prepare a CR for the event described in the Task Conditions. Complete the Consequences of the Event, Event Detected by, and Event Description sections as a minimum.</p> <p><u>Evaluator:</u> Ensure a copy of NDAP-QA-0720 is available for student referencing during performance of this JPM.</p> <p><u>Evaluator:</u> To begin this JPM, provide the student with the Task Conditions/Initiating Cue Sheet and the CR.</p> <p>Determine event reportability.</p>	<p>Reviews NDAP-QA-0720 Attachment F Reporting Requirements.</p> <p>Determines event: 1) Is an ESF actuation 2) Requires NRC notification within four (4) hours</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

App'l. To/JPM No.: S/RO 1.724.01.001

Student Name: _____

Step	Action	Standard	Eval	Comments
2.	<p>Document reportability determination.</p> <p><u>Evaluator:</u> When the student determines which individuals must be contacted, inform him that the notifications need not be made. Tell the student that telling the Evaluator which individuals/agencies must be contacted is sufficient.</p>	<p>On Attachment P, Reportability Determination Form: 1) Indicates prompt NRC reporting is required by circling yes. 2) Indicates reporting is required per 10 CFR 50.72(b)(2)(ii) by entering the reference. 3) Indicates report type is four hour by circling 4 HR.</p>		
*3.	<p>Determine NRC personnel/offices which must be notified.</p> <p><u>Evaluator:</u> If the student states that the NRC must be contacted, this is sufficient for the NRC Operations Center. The student must still indicate that the Senior Resident must be notified.</p>	<p>Reviews NDAP-QA-0720, Section 6.3.</p> <p>Determines that NRC Operations Center must be notified.</p> <p>Determines that NRC Senior Resident Inspector must be notified.</p>		

* Critical Step

Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 1.724.01.001

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	<p><u>Evaluator:</u> If the student begins to complete an Event Notification Worksheet, inform him that this is not necessary for this JPM.</p> <p>Determine PP&L personnel which must be notified.</p> <p><u>Evaluator:</u> The student may also indicate that Operations Section Management (Day Shift Supervisor, Operations Coordinator, Operations Duty Section Head) notification is required. Notification of these individuals: 1) Is required by NDAP-QA-0300 and OP-AD-001. 2) Is not necessary for this JPM.</p> <p><u>Evaluator:</u> Inform the student that this JPM is completed.</p>	<p>Reviews NDAP-QA-0720, Section 6.3.7.</p> <p>Determines that VP-Nuclear Operations or Duty Manager must be notified.</p>		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. A plant shutdown was in progress when a RHR Shutdown Cooling isolation occurred.
- B. The plant was in Condition 3 with reactor pressure at 75 psig.
- C. The isolation signal was RHR Pipe Routing Area high temperature.
- D. A packing leak on the Shutdown Cooling outboard isolation valve (HV-151-F008) allowed steam to blow into the Pipe Routing Area and caused the elevated temperatures.
- E. All components responded properly to the isolation signal.
- F. The packing leak was repaired about 30 minutes after the system isolation.
- G. RHR Shutdown Cooling has been returned to service and the cooldown has resumed.
- H. Suppression Pool temperature remained below 90° F during this event.
- I. Entry into the Emergency Plan was not required.

V. INITIATING CUE

- A. Evaluate this event for reportability.
- B. Document the reportability determination on the appropriate form.
- C. If the event is reportable, determine the external agencies/individuals and PP&L Management that should be notified.

TASK CONDITIONS:

- A. A plant shutdown was in progress when a RHR Shutdown Cooling isolation occurred.
- B. The plant was in Condition 3 with reactor pressure at 75 psig.
- C. The isolation signal was RHR Pipe Routing Area high temperature.
- D. A packing leak on the Shutdown Cooling outboard isolation valve (HV-151-F008) allowed steam to blow into the Pipe Routing Area and caused the elevated temperatures.
- E. All components responded properly to the isolation signal.
- F. The packing leak was repaired about 30 minutes after the system isolation.
- G. RHR Shutdown Cooling has been returned to service and the cooldown has resumed.
- H. Suppression Pool temperature remained below 90° F during this event.
- I. Entry into the Emergency Plan was not required.

V. INITIATING CUE

- A. Evaluate this event for reportability.
- B. Document the reportability determination on the appropriate form.
- C. If the event is reportable, determine the external agencies/individuals and PP&L Management that should be notified.

Exam Level: S

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: Refueling SRO required verifications

Question:

When a fuel bundle is placed in the core what verifications is the Refueling SRO required to perform and how are those verifications performed?

Answer:

1. Correct location using digital display, FACCTAS and core map.
2. Correct orientation using core map with bail handles illustrated (Attachment D to OP-ORF-005).

KA: 234000G001 **RO Value:** 3.4 **SRO Value:** 3.8

KA Statement: Knowledge of operator responsibilities during all modes of plant operation

Reference: OP-ORF-005, page 12, rev. 3.

Reference:

Comments:

Exam Level: S

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: Required Actions when directed to cease refueling.

Question:

Given the following:

- Refueling operations are in progress.
- A bundle has just been grappled and platform motion has just commenced towards the core.
- Evacuation of the refuel floor is required.
- The Refueling Manager has notified you to cease further activity

What action should be taken with the fuel bundle?

Answer:

Place the grappled bundle in a safe location.

KA: 234000G010 RO Value: 2.9 SRO Value: 3.5

KA Statement: Ability to explain and apply all system limits and precautions

Reference: NDAP-QA-0301, page 14, rev. 1.

Reference:

Comments:

Exam Level: S

Topic Name: Equipment Control

Reference Usage: Yes

JPM Description or Question Description: Actions when a surveillance is determined to be out of date.

Question:

Given the following information:

- DG A is inoperable.
- SO-024-001, Monthly Diesel Generator Operability Testing, was last performed on the DG C on 9/19/96.
- As of today the surveillance has not been performed.

1. What action is required at this time?
2. When must action be initiated to perform action d of Technical Specification 1.1?

Answer:

1. Track by operations to ensure that a violation of TS surveillance requirements does not occur.
2. 24 hours after the violation date.

KA: 209001G005 **RO Value:** 3.3 **SRO Value:** 4.2

KA Statement: Knowledge of limiting conditions for operations and safety limits

Reference: NDAP-QA-0722, page 34 and 35, rev. 4.

Reference:

Comments:

Exam Level: S

Topic Name: Equipment Control

Reference Usage: Yes

JPM Description or Question Description

Required action if one component fails on a surveillance.

Question:

During performance of a valve operability surveillance for Core Spray the injection valve fails to operate with the required time. It is determined that the valve cannot be repaired for 36 hours.

Describe the actions that are taken by the Shift Supervision and responsible individual to close the surveillance?

Answer:

1. Shift Supervisor declares Core Spray inoperable and completes the LCO log.
2. Responsible individual restores system to safe operating condition.
3. Responsible individual initiates a WA.
4. On the cover sheet document the problem and enter a statement that the "surveillance was complete except for the inboard injection valve."
5. Close the SA.

KA: 209001A106 **RO Value:** 3.3 **SRO Value:** 4.2

KA Statement: Ability to maintain accurate, clear and concise logs, records status boards and reports.

Reference: NDAP-QA-0722, page 23 and 24, rev. 4.

Reference:

Comments: (NDAP-QA-0722, page 33 and 35).

Exam Level: Both

Topic Name: Radiation Control

Reference Usage: Yes

Job Description or Question Description: High Radiation Areas

Question:

An operator must enter a high radiation area with a maximum dose rate of 650 mrem to reposition a valve.

What are the requirements for entry into the area?

Answer:

RWP and pre-job briefing

Health Physics intermittent coverage.

Programmable alarming dosimeter with alarm preset based upon the RWP being used and individual allowable dose.

100 mrem or greater of available annual dose.

KA: 294001K102 **RO Value:** 3.3 **SRO Value:** 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Reference: NDAP-00-0626, page 15 and 16, rev. 4.

Reference:

Comments:

Exam Level: S

Topic Name: Radiation Control

Reference Usage: Yes

JPM Description or Question Description: Radiological requirements for entry into RWCU Holdup room

Question:

What action must be taken to prevent introduction of used demineralizer resin into the Reactor Water Cleanup Room Hold Pump Room while work is being performed?

Answer:

Blocking must be applied to prevent introduction of resin.

KA: 294001K103 **RO Value:** 3.3 **SRO Value:** 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Reference: NDAP-00-0626, page 19, revision 4.

Reference:

Comments: Check on the requirements of NDAP-QA-323

Exam Level: S

Topic Name: Emergency Plan

Reference Usage: Yes

JPM Description or Question Description: Classify a General Emergency and determine required PAR

Question:

Answer:

KA: 294001A116 **RO Value:** 2.9 **SRO Value:** 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the

Reference:

Reference:

Comments: Facility JPM 9.100.01.081.

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 9.100.01.081 00 05/18/93 294001 4.7
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Classifying and Directing a General Emergency

Completed By:

Sidney W. Morgan
 Writer

05/18/93
 Date

Reviews:

John Patrick III
 Instructor/Writer

9/25/94
 Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/20/94
 Date

[Signature]
 Nuclear Training Supv.

9/20/94
 Date

Date of Performance:

30 Min
 Allowed Time (Min)

 Time Taken (Min)

JPM Performed By:

 Last First M.I.

 Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

 Signature

 Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 9.100.01.081

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

- A. EP-PS-100
- B. EP-PS-126
- C. Emergency Plan Units 1 and 2

III. TOOLS AND EQUIPMENT

None

IV. TASK CONDITIONS

- A. Unit 1 was in the process of shutting down due to indication of fuel failure.
- B. Dose Equivalent I¹³¹ is 380 μ Ci/cc.
- C. A break in Main Steam Line "D" at the Average Manifold occurred.
- D. Main Steam Line "D" failed to isolate.
- E. A release is in progress from the Turbine Building.
- F. Projected Dose Rates at the Plant Boundary by field measurement is 700 mrem/hr whole body and 1,900 mrem/hr child thyroid.
- G. The release is expected to continue for four hours.

V. INITIATING CUE

Classify the Event and take appropriate actions, IAW the E-Plan.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 9.100.01.081

Student Name: _____

Step	Action	Standard	Eval	Comments
*1.	<p>The following JTAs are embedded in this JPM: 9.100.01 - Classify the Emergency as Conditions Indicate 9.100.02 - Activate PPL Emergency Response Organization 9.100.03 - Recommend PAR to Safeguard the Public</p> <p><u>Evaluator:</u> After student has read the Task Conditions and Initiating Cure, inform him/her that this is a TIME CRITICAL JPM.</p> <p>Classify the emergency as conditions indicate.</p> <p><u>Evaluator:</u> if asked, conditions have not changed.</p>	<ul style="list-style-type: none"> - Evaluate latest information. - Review classification TAB 6 of EP-PS-100. - Declare a GENERAL EMERGENCY IAW eal 15.4. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 9.100.01.081

Student Name: _____

Step	Action	Standard	Eval	Comments
2.	Document and communicate the classification.	<ul style="list-style-type: none"> - Document in the Unit Log. - Appoint a CR Communicator. - Instruct the CR Communicator to announce the classification over the page: General Emergency. - Instruct the CR Communicator to initiate notifications. - Announce to Control Room personnel that you are the ED. - Initiate Accountability. - Initiate Site Evacuation of nonessential personnel after accountability. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 9.100.01.081

Student Name: _____

Step	Action	Standard	Eval	Comments
*3.	<p>When a General Emergency is declared, make a Public Protective Action Recommendation within 15 minutes.</p> <p><u>Evaluator:</u> ED may not complete RAF for initial notification. He may include the PAR on ENF.</p> <p><u>Evaluator:</u> The ED will do this by completing Step 2 in TAB B, Step #5 of this JPM.</p>	<ul style="list-style-type: none"> - Refer to EP-PS-100 TAB 7 for PARs. - Complete a RAF. - Recommend Evacuation two (2) miles radius and Sheltering two (2) to ten (10) miles radius of the plant. - Direct CR Communicator to notify DER/BRP of the Public Protective Action Recommendation. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 9.100.01.081

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	Activate the Emergency Response Organizations.	<ul style="list-style-type: none"> - Notify HP and Chemistry to report to the OSC. - Direct CR Communicator to initiate TSC Staff. - Direct CR Communicator to initiate EOF Staff. - Notify the Duty Manager. - Notify the Recovery Manager. 		<p><u>Evaluator:</u> Expected onsite dose is less than 10R.</p>
*5.	<p>Direct CR Communicator to notify offsite agencies and internal management as necessary.</p> <p><u>Evaluator:</u> Provide a filled out copy of the Emergency Notification Form.</p> <p><u>Evaluator:</u> SS/ED may fill out his own ENF.</p> <p><u>NOTE:</u> <i>The JPM is complete when the PAR is made and communicated to offsite agencies.</i></p>	<ul style="list-style-type: none"> - Direct CR Communicator to complete the Emergency Notification Report within 15 minutes using guidelines in EP-AD-000-201. - Direct CR Communicator to complete the Radiological Assessment Form. - Approve all Emergency Notification Reports, Radiation Forms, and Press Releases prior to transmission. 		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. Unit 1 was in the process of shutting down due to indication of fuel failure.
- B. Dose Equivalent I¹³¹ is 380 μ Ci/cc.
- C. A break in Main Steam Line "D" at the Average Manifold occurred.
- D. Main Steam Line "D" failed to isolate.
- E. A release is in progress from the Turbine Building.
- F. Projected Dose Rates at the Plant Boundary by field measurement is 700 mrem/hr whole body and 1,900 mrem/hr child thyroid.
- G. The release is expected to continue for four hours.

V. INITIATING CUE

Classify the Event and take appropriate actions, IAW the E-Plan.

TASK CONDITIONS:

- A. Unit 1 was in the process of shutting down due to indication of fuel failure.
- B. Dose Equivalent I¹³¹ is 380 $\mu\text{Ci/cc}$.
- C. A break in Main Steam Line "D" at the Average Manifold occurred.
- D. Main Steam Line "D" failed to isolate.
- E. A release is in progress from the Turbine Building.
- F. Projected Dose Rates at the Plant Boundary by field measurement is 700 mrem/hr whole body and 1,900 mrem/hr child thyroid.
- G. The release is expected to continue for four hours.

V. INITIATING CUE

Classify the Event and take appropriate actions, IAW the E-Plan.

Topic	Method	Subject Description	JPM Description or Question Description
1 Conduct of Operations	Question	Refueling	Required communications during a fuel bundle movement. SRM requirements during refueling.
A. 1 Conduct of Operations	Question	Review a Power Plex	Thermal limits. APRM Gain Adjustment Factors
A. 2 Equipment Control	Question	Motor Operated Valves	Requirements for electrical stroking of MOVs Allowed time period for overloads to be placed in the circuit.
A. 3 Radiation Control	Question	High Radiation Areas	High Radiation Area definition High Radiation Entry requirements
A. 4 Emergency Plan	JPM	Emergency Notification	Control Room Communicator

Exam Level: R

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: Thermal limits.

Question:

Refer to a copy of the Core Performance Log.

- 1 Is the current value of Minimum Core Power Ratio (MCPR) greater than, less than, or equal to the current MCPR limit?
- 2 What parameter on the Core Performance Log is used to determine the status of MCPR?
- 3 What action would be required if the Core Performance Log indicated that the limit was being exceeded?

Answer:

1. The current MCPR is greater than the limit.
2. CMFLCPR
3. Enter LCO 3.2.3 and initiate action to restore within the limit within 15 minutes.

KA: 293009K128 RO Value: 3.0 SRO Value: 3.5

KA Statement: MCPR - Define FLCPR

Reference: SY017 K-1 Figure 21, page 19. SR-100-001

Reference: TS 3.2.3, ARP

Comments:

Exam Level: R

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: APRM Gain Adjustment Factors

Question:

Given a Core Performance Log, determine what the APRMs were reading when the powerplex edit was performed and whether or not the APRMs are set conservatively.

Answer:

Use the value for the AGAFs and multiply by GMWT to determine APRMs. If AGAFs are less than 1.0 then they are conservative and greater than 1.0 they are non-conservative.

KA: 215005A107 RO Value: 3.0 SRO Value: 3.4

KA Statement: APRM (gain adjustment factor)

Reference: SY017 K-1, figure 21.

Reference:

Comments:

Exam Level: R

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: Required communications during a fuel bundle movement.

Question:

A fuel bundle is to be moved from the fuel pool to the core. What information about the fuel bundle being moved is the PCO assigned to Control Room Refueling Activities required to communicate to the Refueling Platform operator?

Answer:

1. Fuel pool location
2. Core location
3. Bundle orientation

KA: 234000G001 **RO Value:** 3.4 **SRO Value:** 3.8

KA Statement: Knowledge of operator responsibilities during all modes of plant operation

Reference: OP-ORF-005, page 11 and 12, revision 3.

Reference:

Comments:

Exam Level: R

Topic Name: Conduct of Operations

Reference Usage: Yes

JPM Description or Question Description: SRM requirements during refueling.

Question:

Given the following conditions:

- Core refueling is in progress.
- Bundle 12-49 is to be moved from the fuel pool to the core.
- 33 bundles have been loaded into the core.
- All SRM's are operational.

Can refueling continue if SRM D fails downscale?

Answer:

Refueling can continue because the SRM in the quadrant and one adjacent quadrant are operable.

KA: 234000G005 RO Value: 3.0 SRO Value: 4.1

KA Statement: Knowledge of limiting conditions for operations and safety limits

Reference: SY017 11 Figure 2, SY017 K-1 Figure 5.

Reference: Technical Specifications 3.9.2.

Comments: SRM C is in the quadrant that fuel is being moved to and SRM D and B are in adjacent quadrants.

Exam Level: R

Topic Name: Equipment Control

Reference Usage: Yes

JPM Description or Question Description: Allowed time period for overloads to be placed in the circuit.

Question:

What is the allowed time period that a MOV Test Switch can be placed in TEST position?

Answer:

8 hours

KA: 294001K101 **RO Value:** 3.7 **SRO Value:** 3.7

KA Statement: Knowledge of how to conduct and verify valve lineups

Reference: OP-AD-001, page 21, revision 6.

Reference: Technical Specifications 3.8.4.2.2

Comments:

Exam Level: R

Topic Name: Equipment Control

Reference Usage: Yes

JPM Description or Question Description: Requirements for electrical stroking of MOVs

Question:

A MOV was closed for blocking under the Permit and Tag System. The Permit has been cleared and the MOV reenergized.

What action is required to restore the valve to operability and what documentation is required of the actions?

Answer:

The MOV must be stroked electrically and documented by either:

a. In accordance with applicable portions of valve operability surveillances,

OR

b. In the Unit Log, station valve number, PCO by who stroked it, and method used to determine valve stroke, such as, but not limited to the following: local observation including operator's name-, flow indication-, pressure indication.

KA: 294001K101 RO Value: 3.7 SRO Value: 3.7

KA Statement: Knowledge of how to conduct and verify valve lineups

Reference: NDAP-QA-0302, page 55, revision 6.

Reference:

Comments:

Exam Level: R

Topic Name: Radiation Control

Reference Usage: Yes

JPM Description or Question Description: High radiation area definition

Question:

An operator must enter an area with a maximum dose rate of 1250 mrem/hr.

1. What physical controls exist for controlling entry to the area and describe the impacts on sending an operator into the area.
2. Can higher dose rates exist in the area?
3. How would the higher dose rates be designated?

Answer:

1. The area is a high radiation area that is locked requiring HP to unlock the area for operator entry.
2. Yes
3. Hot Spot

KA: 294001K103 RO Value: 3.3 SRO Value: 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Reference: NDAP-00-626, page 14, revision 5.

Reference:

Comments:

Exam Level: Both

Topic Name: Radiation Control

Reference Usage: Yes

JPM Description or Question Description: High Radiation Areas

Question:

An operator must enter a high radiation area with a maximum dose rate of 650 mrem to reposition a valve.

What are the requirements for entry into the area?

Answer:

RWP and pre-job briefing

Health Physics intermittent coverage.

Programmable alarming dosimeter with alarm preset based upon the RWP being used and individual allowable dose.

100 mrem or greater of available annual dose.

KA: 294001K102 **RO Value:** 3.3 **SRO Value:** 3.8

KA Statement: Knowledge of 10 CFR 20 and related facility radiation control requirements

Reference: NDAP-00-0626, page 15 and 16, rev. 4.

Reference:

Comments:

Exam Level: R

Topic Name: Emergency Plan

Reference Usage: Yes

JPM Description or Question Description: Control Room Communicator

Question:

Answer:

KA: 294001K116 **RO Value:** 2.9 **SRO Value:** 4.7

KA Statement: Ability to take actions called for in the Facility Emergency Plan, including (if required) supporting or acting as the

Reference:

Reference:

Comments: Facility JPM9.00.126.051

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 9.00.126.051 00 05/21/93 294001 4.7
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: CR-COMMUNICATOR Emergency Notification

Completed By:

Sidney W. Morgan
Writer

05/21/93
Date

Reviews:

John Petrella III
Instructor/Writer

9/22/94
Date

Approval:

[Signature]
Requesting Supv./C.A. Head

9/30/94
Date

[Signature]
Nuclear Training Supv.

9/30/94
Date

Date of Performance:

30 Min
Allowed Time (Min)

_____ Time Taken (Min)

JPM Performed By:

_____ Last _____ First _____ M.I.

_____ Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ Signature

_____ Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 9.00.126.051

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

- A. EP-PS-100
- B. EP-PS-126

III. TOOLS AND EQUIPMENT

None

IV. TASK CONDITIONS

- A. Unit 1 scrammed on High DW pressure.
- B. HPCI initiated and subsequently tripped on high level.
- C. Current plant conditions are:
 - Reactor Pressure - 510 psig
 - Reactor Water Level - +37 inches
 - DW Pressure - 2.6 psig
 - DW Temperature - 141° F
- D. RPV level is being maintained by condensate and RPV pressure by BPV, which are closed at this time.
- E. An Unusual Event has been declared based on EAL 12.1 B Loss of Reactor Vessel Inventory.

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 9.00.126.051

V. INITIATING CUE

You have been assigned as the CR-Communicator. Prepare and transmit information about the emergency condition to required organizations.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 9.00.126.051

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	Complete the Emergency Notification Report. Evaluator: Provide ENR form and log sheet to student.	<ul style="list-style-type: none"> - Write the EAL number and a "Brief Non-Technical Description of the EAL" using guidance in TAB 6. - Forms are easy to understand and contain no acronyms or abbreviations. - All forms are approved by the Emergency Director prior to transmission. 		See ATTACHMENT 1 Emergency Notification Report.
2.	Begin notification when directed by the Emergency Director.	<ul style="list-style-type: none"> - Begin notification when directed by the Emergency Director. 		
3.	Make the PA announcement notifying plant personnel of the emergency.	<ul style="list-style-type: none"> - Announce: "Attention all personnel, an Unusual Event has been declared at SSES." - Repeat the message. 		
4.	Notify key managers.	<ul style="list-style-type: none"> - Call Security to initiate scenario #11 Code A. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 9.00.126.051

Student Name: _____

Step	Action	Standard	Eval	Comments
*5.	Within 15 minutes, notify county agencies and MOC Communicator. NOTE: CTN NETWORK FAILURE: PHONE DOES NOT RING.	- Within 15 minutes, dial "191" on CTN to access the conference call, simultaneously contacting: 1. PEMA 2. LCEMA 3. CEMA 4. MOC Communicator (only if phone is answered)		
*6.	Use backup method.	- Use the backup method: Use telephone lines and numbers in TAB 4 or on Flow Chart. - Transmit the information and only the information, on the Emergency Notification Report. - Record agencies you contacted, times, message in your log.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 9.00.126.051

Student Name: _____

Step	Action	Standard	Eval	Comments
7.	Call Security Control Center to page personnel.	<ul style="list-style-type: none"> - Use the SCC Hotline. - Call SCC (CTN 4917) and request Security to page: <ol style="list-style-type: none"> 1. Emergency Director (ED) 2. TSC personnel for activation of TSC, at direction of SS or ED 3. Recovery Manager (RM) 4. Public Information Manger (PIM) 5. EOF personnel for activation of EOF, at the direction of the RM or ED. - Log the call. 		
8.	Call PCC to give classification.	<ul style="list-style-type: none"> - Use the PCC Hotline. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 9.00.126.051

Student Name: _____

Step	Action	Standard	Eval	Comments
*9.	Transmit information to the NRC as soon as possible, but within 60 minutes.	<ul style="list-style-type: none"> - Use the ENS telephone. - Transmit Emergency Notification Report. - Transmit Radiological Assessment Form. (Not required) - Record contact time and transmission in log. 		
<u>Evaluator:</u> JPM is complete.				

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. Unit 1 scrammed on High DW pressure.
- B. HPCI initiated and subsequently tripped on high level.
- C. Current plant conditions are:
 - Reactor Pressure - 510 psig
 - Reactor Water Level - +37 inches
 - DW Pressure - 2.6 psig
 - DW Temperature - 141° F
- D. RPV level is being maintained by condensate and RPV pressure by BPV, which are closed at this time.
- E. An Unusual Event has been declared based on EAL 12.1 B Loss of Reactor Vessel Inventory.

INITIATING CUE:

You have been assigned as the CR-Communicator. Prepare and transmit information about the emergency condition to required organizations.

TASK CONDITIONS:

- A. Unit 1 scrammed on High DW pressure.
- B. HPCI initiated and subsequently tripped on high level.
- C. Current plant conditions are:
 - Reactor Pressure - 510 psig
 - Reactor Water Level - +37 inches
 - DW Pressure - 2.6 psig
 - DW Temperature - 141° F
- D. RPV level is being maintained by condensate and RPV pressure by BPV, which are closed at this time.
- E. An Unusual Event has been declared based on EAL 12.1 B Loss of Reactor Vessel Inventory.

INITIATING CL.

You have been assigned as the CR-Communicator. Prepare and transmit information about the emergency condition to required organizations.

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: RO

Examiner: Region I

JPM Title: Reset Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path.) OP-164-001,

Source: Bank Facility Number: 64.OP.004.152

Safety Function: 1 Alternate Path: Yes Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
202002G005	3.3	4.0	Limitations in raising flow in other loop if cannot reset runback.
202002K402	3.0	3.0	Conditions that will cause the runback and basis.

JPM Title: Override an inadvertent start of the HPCI system in accordance with OP-152-001 OP-152-001

Source: Bank Facility Number: 206.017.51

Safety Function: 2 Alternate Path: Yes Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
206000K106	3.7	3.7	Basis for prohibiting HPCI startup above 26' in the suppression pool.
206000A203	3.5	3.5	Effect of starting up in automatic with the flow controller set below min. flow

JPM Title: Reopen MSIV's and MSL Drain Isolations ES-184-002, section 4.8

Source: New Facility Number:

Safety Function: 3 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
239001K401	3.8	3.8	RPV parameter that will isolate Main Steam and Cont. Inst. G's. (Include
239001A208	3.6	3.6	Low Condenser Vacuum Bypass

JPM Title: Restore RHR in Shutdown Cooling IAW OP-149-002 OP-149-002, page 46, section 3.5.7

Source: New Facility Number:

Safety Function: 4 Alternate Path: No Shutdown/Low Power: Yes

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
205000K403	3.8	3.8	Isolation signals for Shutdown Cooling.
205000K102	3.6	3.6	Interlocks to prevent draining the vessel

o/h
A070

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: RO

Examiner: Region I

JPM Title: Venting Suppression Chamber within Offsite Release Limits

ES-173-001, Section 4.3.

Source: Bank Facility Number: 73.EO.001.102

Safety Function: 5 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
223001A302	3.4	3.4	Condition that would require venting the drywell instead of the suppression
223001G010	3.2	3.6	Why must HV-F040 and HV-F049 be manually opened?

JPM Title: Synchronize D/G "A" with the grid to restore normal power to 4.16 KV bus 1A OP-024-001

Source: Bank Facility Number: 264.012.01

Safety Function: 6 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
264000K407	3.3	3.4	Response to a loss of offsite following this evolution.
264000G009	3.8	3.9	Method for performing an emergency stop.

JPM Title: Restore SBTG after a transfer of RPS

OP-070-001, section 3.3.

Source: New Facility Number:

Safety Function: 9 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
261000GC05	3.0	4.1	SBGT Technical Specifications
290001K601	3.5	3.6	Isolation sequence for Zones 1 and 2

JPM Title: Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) from RSDP OP-150-001

Source: Bank Facility Number: 1.50.111.102

Safety Function: 2 Alternate Path: No Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR: Yes RCA Entry: No

KA	RO	SRO	JPM Question Description
217000K203	2.7	2.8	Why is it necessary to ensure that the Topaz Inverter is energized.
217000A213	2.9	3.0	What initiated room cooling.

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: RO

Examiner: Region I

JPM Title: Shift the CRD Flow Control Stations from A to B

OP-155-001

Source: Bank Facility Number:

Safety Function: 1 Alternate Path: No

Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR:

No RCA Entry: Yes

KA RO SRO JPM Question Description

201001K603 3.0 2.9 Effects on Venting Scram Air Header on Driving Control Rods

201003A208 3.8 3.7 Effect of low nitrogen pressure during startup

JPM Title: Fire Protection System Crosstie to RHRSW (At the ESW Pump House)

ES-013-001

Source: Bank Facility Number: 9.13.001.102

Safety Function: 8 Alternate Path: No

Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR:

Yes RCA Entry: No

KA RC SRO JPM Question Description

286000A301 3.4 3.4 Response of the fire protection system to initiation at a specific flow.

286000A105 3.2 3.2 Describe the flow path from the source to the core for using fire water for core

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: SRO-I

Examiner: Region I

JPM Title: Reset Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path.) OP-164-001,

Source: Bank Facility Number: 64.OP.004.152

Safety Function: 1 Alternate Path: Yes Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
202002K402	3.0	3.0	Conditions that will cause the runback and basis.
202002G005	3.3	4.0	EOC-RPT Technical Specifications

JPM Title: Perform a RCiC System Manual Startup Component by Component with a CNTRL Malfunction IAW OP-150-001 OP-150-001

Source: Bank Facility Number: 1.50.102.151

Safety Function: 2 Alternate Path: Yes Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
217000A402	3.9	3.9	Required action to restore RCIC following a trip.
217000A404	3.6	3.6	When the RCIC manual isolation switch will isolate the system and what

JPM Title: Reopen MSIV's and MSL Drain Isolations ES-184-002, section 4.8

Source: New Facility Number:

Safety Function: 3 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
239001K201	3.2	3.3	Power supplies to the solenoid on MSIVs
239001K127	4.0	4.1	Effect of closing one MSIV at 97% power.

JPM Title: Restore RHR in Shutdown Cooling IAW OP-149-002 OP-149-002, page 46, section 3.5.7.

Source: New Facility Number:

Safety Function: 4 Alternate Path: No Shutdown/Low Power: Yes

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
205000G005	3.1	3.9	Applicable TS for LPCI/Shutdown Cooling
295021A201	3.5	3.6	Determine time to reach 200F on a loss of cooling.

Facility: Susquehanna 1 and 2
Exam Level: SRO-I

Exam Week of 10/21/96
Examiner: Region I

JPM Title: Venting Suppression Chamber within Offsite Release Limits

ES-173-001, Section 4.3,

Source: Bank Facility Number: 73.EO.001.102

Safety Function: 5 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
223001A302	3.4	3.4	Condition that would require venting the drywell instead of the suppression
223001G010	3.2	3.6	Conditions that would require terminating this evolution.

JPM Title: Manually synchronize Diesel Generator "A" to 4.16 KV bus 2A

OP-024-001

Source: Bank Facility Number: 264.003.02

Safety Function: 6 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
264000K407	3.3	3.4	Response to a loss of off site following this evolution.
264000K408	3.8	3.7	Effect of tripping one train of RHR logic.

JPM Title: Restore SBTG after a transfer of RPS

OP-070-001, section 3.3.

Source: New Facility Number:

Safety Function: 9 Alternate Path: No Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR: No RCA Entry: No

KA	RO	SRO	JPM Question Description
290001K601	3.5	3.6	Isolation sequence for Zones 1 and 2
261000G010	3.1	3.3	Effect of failure of a SGTS Room Cooling Unit

JPM Title: Place RHR SPC in Suppression Pool Cooling using RHR Pump 1P202B at RSDP

OP-149-005

Source: Bank Facility Number: 1.49.505.101

Safety Function: 5 Alternate Path: No Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR: Yes RCA Entry: No

KA	RO	SRO	JPM Question Description
223001G010	3.2	3.6	Limit on suppression pool cooling flow rate.
219000K111	3.0	3.0	Effect of not starting ESW.

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: SRO-I

Examiner: Region I

JPM Title: Shift the CRD Flow Control Stations from A to B

OP-155-001

Source: Bank Facility Number:

Safety Function: 1 Alternate Path: No

Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR: No RCA Entry: Yes

KA RO SRO JPM Question Description

201001K603 3.0 2.9 Effects on Venting Scram Air Header on Driving Control Rods

201001K412 2.9 2.9 Flow rate through the FCV on a Scram and reason.

JPM Title: Fire Protection System Crosstie to RHRSW (At the ESW Pump House)

ES-013-001

Source: Bank Facility Number: 9.13.001.102

Safety Function: 8 Alternate Path: No

Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR: Yes RCA Entry: No

KA RO SRO JPM Question Description

286000A301 3.4 3.4 Response of the fire protection system to initiation at a specific flow.

286000A105 3.2 3.2 Describe the flow path from the source to the core for using fire water for core

Facility: Susquehanna 1 and 2

Exam Level: SRO-U

Exam Week of 10/21/96

Examiner: Region I

JPM Title: Reopen MSIV's and MSL Drain Isolations

ES-184-002, section 4.8

Source: New Facility Number:

Safety Function: 3 Alternate Path: No

Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR:

No

RCA Entry: No

KA	RO	SRO	JPM Question Description
239001K201	3.2	3.3	Power supplies to the solenoids on MSIVs
239001K127	4.0	4.1	Effect of closing one MSIV at 97% power.

JPM Title: Restore RHR in Shutdown Cooling IAW OP-149-002

OP-149-002, page 46, section 3.5.7.

Source: New Facility Number:

Safety Function: 4 Alternate Path: No

Shutdown/Low Power: Yes

Location: Simulator Emergency/Abnormal Outside CR:

No

RCA Entry: No

KA	RO	SRO	JPM Question Description
205000G005	3.1	3.9	Applicable TS for LPCI/Shutdown Cooling
295021A201	3.5	3.6	Determine time to reach 200F on a loss of cooling.

JPM Title: Restore SBT after a transfer of RPS

OP-070-001, section 3.3.

Source: New Facility Number:

Safety Function: 9 Alternate Path: No

Shutdown/Low Power: No

Location: Simulator Emergency/Abnormal Outside CR:

No

RCA Entry: No

KA	RO	SRO	JPM Question Description
261000G005	3.0	4.1	SBGT Technical Specifications
290001K601	3.5	3.6	Isolation sequence for Zones 1 and 2

JPM Title: Place RHR SPC in Suppression Pool Cooling using RHR Pump 1P202B at RSDP

OP-149-005

Source: Bank Facility Number: 1.49.505.101

Safety Function: 5 Alternate Path: No

Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR:

Yes

RCA Entry: No

KA	RO	SRO	JPM Question Description
223001G010	3.2	3.6	Limit on suppression pool cooling flow rate.
219000K111	3.0	3.0	Effect of not starting ESW.

Facility: Susquehanna 1 and 2

Exam Week of 10/21/96

Exam Level: SRO-U

Examiner: Region I

JPM Title: Fire Protection System Crosstie to RHRSW (At the ESW Pump House) ES-013-001

Source: Bank Facility Number: 9.13.001.102

Safety Function: 8 Alternate Path: No Shutdown/Low Power: No

Location: Plant Emergency/Abnormal Outside CR: Yes RCA Entry: No

KA	RO	RO	JPM Question Description
286000A301	3.4	3.4	Response of the fire protection system to initiation at a specific flow.
286000A105	3.2	3.2	Describe the flow path from the source to the core for using fire water for core

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 64.OP.004.152 0 03/17/95 202002 3.6
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Reset Recirculation Pump Limiter #2 Runback !AW OP-164-001

Completed By:

Kenneth L. Long
 Writer

03/17/95
 Date

Reviews:

John F. ...
 Instructor/Writer

9/25/96
 Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/25/96
 Date

[Signature]
 Nuclear Training Supv.

9/25/96
 Date

Date of Performance:

_____ 15 Min _____
 Allowed Time (Min) Time Taken (Min)

JPM Performed By:

_____ _____ _____ _____
 Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

Signature

Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 64.OP.004.152

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-164-001, Reactor Recirculation System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

36 Reset recirc pump runback

IV. TASK CONDITIONS

- A. The plant is in Condition 1.
- B. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- C. All required actions of ON-164-002 have been completed and it has been determined that Limiter #2 initiated the runback.
- D. Recirc Pumps A and B speed controllers are in manual.

V. INITIATING CUE

Reset recirculation pump runback.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 64.OP.004.152

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	<p><u>Evaluator:</u></p> <ul style="list-style-type: none"> - The FAULTED step in this JPM is preceded by a fault statement in BOLD TYPE WITH ALL CAPITAL LETTERS. - This JPM must be performed in the simulator. - Set up the JPM scenario so that Reactor Recirc Pump B Limiter #2 runback has occurred prior to start of the JPM, (IC-18). Reset Simulator to IC-18, enter RESTOREPREF YPP.JPM95-3 DEPRESS PB-1 TRG E1 RRE.1S12BRST PB-2 TRG E1 = IMF CN03:SYB311R621B 100 Place the SIMULATOR in RUN. <p>Obtain a controlled copy of OP-164-001.</p> <p><u>Evaluator:</u> The student may refer to ON-164-002 prior to selecting OP-164-001.</p>	Controlled copy obtained.		<p><u>Instructor:</u></p> <ul style="list-style-type: none"> A. Insert 'D' CWP malf for runback) (IMF PM03: 1P501D) B. Seal in alarms. C. Place recirc speed controller: SY-B31-1R621A(B) in Manual. D. Start exam.
2.	Select the correct section to perform.	Selects Section 3.5.		
3.	Review the prerequisites.	Ensures that all prerequisites have been met.		
	<p><u>Evaluator:</u> Inform the student that all prerequisites have been met.</p>			

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 64.OP.004.152

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	Review the precautions. <u>Evaluator:</u> - Annunciators AR-102-CO1 and AR-102-CO4 should be illuminated. - The green lights above the Recirc A/B Loss of FW PP Runback Reset pushbuttons, HS-B31-1S12A/B should be illuminated.	Follows precautions as applicable.		
5.	Ensure that the Recirc Pump speed controllers are in manual.	Notes that the amber M (manual) lights on both of the following are ILLUMINATED: - Reactor Recirc Pump A SY-B31-1R621A - Reactor Recirc Pump B SY-B31-1R621B		
6.	Ensure Gen 1A demand is adjusted to ~45%.	Depresses the DEC pushbutton on Reactor Recirc Pump A SY-B31-1R621A controller until Gen 1A Demand XI-14032A and Gen 1A Speed SI-14032A starts to decrease.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 64.OP.004.152

Student Name: _____

Step	Action	Standard	Eval	Comments
7.	Ensure Gen 1B demand is adjusted to ~45%.	Depresses the DEC pushbutton on Reactor Recirc Pump B SY-B31-1R621B controller until Gen 1B Demand X1-14032B and Gen 1B Speed SI-14032B starts to decrease.		NOTE: May be performed after resetting the "1A" runback.
*8.	Reset RRP 1A runback.	Depresses the Recirc A Loss of FW PP Runback Reset HS-B31-1S12A pushbutton.		
9.	Monitor RRP 1A speed.	Monitor Gen 1A Speed SI-14032A.		
10.	Observe the green light above the reset pushbutton.	Notes that the green light above the Recirc A Loss of FW PP Runback Reset HS-B31-1S12A pushbutton has extinguished.		
*11.	<p>FAULT STATEMENT: RRP B WILL EXPERIENCE AN UNCONTROLLED SPEED INCREASE AFTER THE STUDENT HAS RESET THE RUNBACK.</p> <p>Reset RRP 1B runback.</p>	Depresses the Recirc B Loss of FW PP Runback Reset HS-B31-1S12B pushbutton.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 64.OP.004.152

Student Name: _____

Step	Action	Standard	Eval	Comments
*12.	Monitor RRP 1B speed.	<p>Monitors Gen 1B Speed SI-14032B and notes that speed is increasing rapidly.</p> <p>Depresses the Scoop Tube B Lock or Reset HS-B31-1S03B Trip pushbutton.</p>		
13.	Notify Shift Supervision of the status of RRP B.	<p>States the requirement to notify Shift Supervision of the uncontrolled speed increase on B RRP.</p>		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. The plant is in Condition 1.
- B. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- C. All required actions of ON-164-002 have been completed and it has been determined that Limiter #2 initiated the runback.
- D. Recirc Pumps A and B speed controllers are in manual.

INITIATING CUE:

Reset the recirculation pump runback.

TASK CONDITIONS:

- A. The plant is in Condition 1.
- B. A trip of CWP 1D has caused a Reactor Recirculation runback to occur.
- C. All required actions of ON-164-002 have been completed and it has been determined that Limiter #2 initiated the runback.
- D. Recirc Pumps A and B speed controllers are in manual.

INITIATING CUE:

Reset the recirculation pump runback.

JPM Title Reset: Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path.)

Facility Number: 64.OP.004.152

JPM Question Description: Conditions that will cause the runback and basis.

Question

1. Other than the condition of the JPM, what conditions will cause a Limiter #2 runback?
2. What is the basis for the runback occurring at these setpoints?

Answer

1. Condensate pump trip (as measured by discharge pressure of 100 psig)
or
Individual feedwater pump flow is 20 %
or
1 or 2 F. W. heater hi hi level
and
Reactor water level is below the low level alarm point of 30"
2. Reduce power to within the capacity of two feedwater pumps or strings.

Reference Use Allowed: Yes

Reference 1: SY017 L-9, page 6 & 7

Reference 2:

KA: 202002K402 **RO Value:** 3.0 **SRO Value:** 3.0

KA Statement: Recirculation pump speed control: Plant-Specific

Comments: JPM sets the conditions of a circ water pump tripping.

Exam Level: Both

JPM Title Reset Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path.)

Facility Number 64.OP.004.152

JPM Question Description EOC-RPT Technical Specifications

Question

Pressure switch C72-N003C (Turbine Control Valve Fast Closure) on the turbine control valve failed to meet its acceptance criteria for causing a trip at the required setpoint.

What actions are required by Technical Specifications?

Answer

3.3.4.2.b - place the inoperable channel in trip within 72 hours.

Table 3.1.7.1-1 - place the channel in trip within 12 hours.

Reference Use Allowed Yes

Reference 1 Technical Specifications

Reference 2

KA 202002G005 **RO Value** 3.3 **SRO Value** 4.0

KA Statement Knowledge of limiting conditions for operations and safety limits

Comments:

Exam Level: SRO

JPM Title Reset Recirculation Pump Limiter #2 Runback IAW OP-164-001 (Alt. Path)

Facility Number 64.OP.004.152

JPM Question Description Limitations in raising flow in other loop if cannot reset runback.

Question

Base your answer on conditions given at the beginning of the JPM.

The runback can only be reset on one of the recirculation pumps. Administratively what is the maximum allowed speed the other recirculation pump.

Answer

55% speed (to limit mismatch between pumps)

Reference Use Allowed Yes

Reference 1 Technical Specifications 3.4.1.3

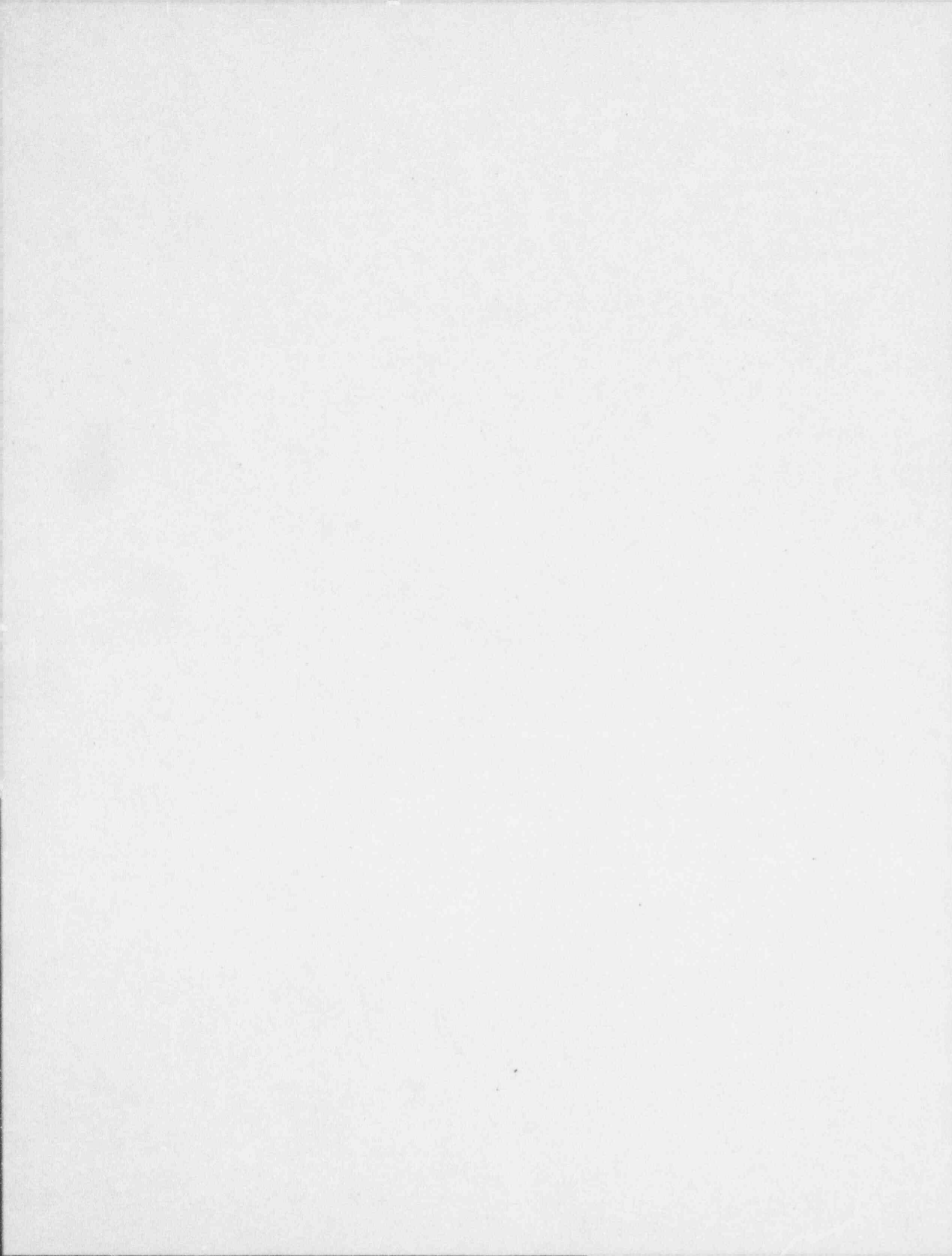
Reference 2

KA 202002G005 RO Value 3.3 SRO Value 4.0

KA Statement Knowledge of limiting conditions for operations and safety limits

Comments:

Exam Level: RO



**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

(206.017.51)
S/RO 1.52.109.101 4 10/29/92 295037 4.2
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Override an Inadvertent Start of the HPCI System in Accordance with OP-152-001

Completed By:

Jerald L. Jones
 Writer

10/29/92
 Date

Reviews:

Jacob Petrushin III 9/27/96
 Instructor/Writer Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/30/96
 Date

[Signature]
 Nuclear Training Supv.

9/20/96
 Date

Date of Performance:

15 Min
 Allowed Time (Min)

 Time Taken (Min)

JPM Performed By:

 Last First M.I.

 Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

 Signature

 Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 1.52.109.101**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-152-001, High Pressure Coolant Injection (HPCI) System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. The plant is in Condition 1 at approximately 100 percent reactor power.
- B. An inadvertent HPCI initiation has occurred.

V. INITIATING CUE

Stop injection by placing HPCI on minimum flow.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 1.52.109.101

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>NOTE:</u></p> <ul style="list-style-type: none"> - This JPM MUST be performed in the simulator. - The IC MUST be set up such that an inadvertent HPCI initiation has just occurred AND no action has yet been taken. - With the simulator in FREEZE, the student should be given the Task Conditions/Initiating Cue Sheet and allowed to observe the panel. - When the student indicates that he/she is prepared to respond to the plant conditions, the simulator should be placed in RUN. <p><u>Evaluator:</u> If this situation actually occurred in the plant, the most probable sequence of events would be:</p> <ul style="list-style-type: none"> - The PCO (student) would confirm that mis-operation had occurred, - Inform the SRO, and - Establish min flow with the HPCI System, - The SRO would instruct the PCO as to what further steps to perform. <p>You must provide all required SRO input to the student as would normally be required in actual situations such as this.</p>			<p>Reset to IC-18.</p> <ul style="list-style-type: none"> - Insert malfunction IMF HP152004. - Place simulator in RUN for ~50 seconds. - Do not reset any annunciators. - Silence alarms. - Freeze simulator. <p>Start exam.</p>

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 1.52.109.101

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	Ensure oil supply to the HPCI turbine. <u>Evaluator:</u> The auxiliary pump will not start until HPCI speed decreases to less than 2,200 RPM.	Places the control switch for HPCI Auxiliary Oil Pump 1P213 in the START position.		
*2.	Place HPCI on min flow. <u>Evaluator:</u> It is acceptable for the student to immediately run the HPCI controller to zero.	Places the Manual/Auto switch on HPCI Turbine Flow Control FC-E41-1R600 in the M position. Depresses the Close pushbutton on HPCI Turbine Flow Control FC-E41-1R600 until the HPCI pump discharge pressure is less than reactor pressure.		
3.	Ensure that HPCI minimum flow requirements are being met.	Ensure that HPCI Min Flow to Supp Pool HV-155-F012 opens.		
*4.	Ensure that injection has been stopped.	Observes that HPCI flow decreases to zero.		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. The plant is in Condition 1 at approximately 100 percent power.
- B. An inadvertent HPCI initiation has occurred

V. INITIATING CUE

Stop injection by placing HPCI on minimum flow.

TASK CONDITIONS:

- A. The plant is in Condition 1 at approximately 100 percent power.
- B. An inadvertent HPCI initiation has occurred

V. INITIATING CUE

Stop injection by placing HPCI on minimum flow.

JPM Title Override an inadvertent start of the HPCI system in accordance with OP-1 52-001

Facility Number 206.017.51

JPM Question Description Basis for prohibiting HPCI startup above 26' in the suppression pool.

Question

Why is startup of HPCI prohibited if suppression pool level is >26'?

Answer

Due to the possibility of flooding turbine exhaust header causing water to backup into the turbine.

Reference Use Allowed? Yes

Reference 1 OP-152-001, page 10, revision 21.

Reference 2

KA 206000K106 RO Value 3.7 SRO Value 3.7

KA Statement Suppression chamber: BWR-2,3,4

Comments:

Exam Level: RO

JPM Title Override an inadvertent start of the HPCI system in accordance with OP-1 52-001

Facility Number 206.017.51

JPM Question Description Effect of starting up in automatic with the flow controller set below min. flow valve close setpoint.

Question

The HPCI flow controller is in manual with the signal set to minimum. What will be the adverse effect of operating in this condition?

Answer

1. Minimum flow valve will open causing water to be transferred from the CST to the suppression pool causing a high suppression pool level.
2. HPCI operation with RPM below 2200 rpm will cause system instability (or oscillations).

NOTE: Applicant may provide additional information concerning the cause of the instabilities.

Reference Use Allowed? Yes

Reference 1 SY017 C-6, Fact Sheets, Page 3, rev. 1.

Reference 2 OP-152-001, page 9, rev. 21, EO-100-100 caution 2200.

KA 206000A203 **RO Value** 3.5 **SRO Value** 3.5

KA Statement Valve openings: BWR-2,3,4

Comments:

Exam Level: RO

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 1.50.102.151 00 10/28/93 217000 3.8
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Perform a RCIC System Manual Startup Component by Component with a CNTRL Malfunction IAW OP-150-001

Completed By:

Sidney W. Morgan
 Writer

10/28/93
 Date

Reviews:

John Petrella III 9/25/93
 Instructor/Writer Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/30/93
 Date

[Signature]
 Nuclear Training Supv.

9/25/93
 Date

Date of Performance:

20 Min
 Allowed Time (Min)

 Time Taken (Min)

JPM Performed By:

 Last First M.I.

 Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

 Signature

 Typed or Printed

Comments:

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 1.50.102.151**

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-150-001, Reactor Core Isolation Cooling (RCIC) System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. A reactor scram condition exists and RCIC injection is required for inventory control.
- B. Suppression pool cooling is in operation.
- C. ESW System is in operation.
- D. RCIC pump discharge piping has been maintained filled and pressurized.
- E. MOV Overload Bypass switches will not be required to be positioned to the "TEST" position.
- F. RCIC is aligned in its normal STANDBY condition for automatic response.

V. INITIATING CUE

Manually start up RCIC component by component and establish injection to the vessel at a rate of approximately 600 gpm.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 1.50.102.151

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>Evaluator:</u> - The FAULTED step in this JPM is proceeded by a fault statement in BOLD TYPE WITH CAPITAL LETTERS.</p>			
1.	Place RCIC turbine flow control in manual at minimum demand.	<p>Positions the manual/automatic selector switch on the RCIC Turbine Flow Control FC-E51-1R600 to the M (Manual) position.</p> <p>Depresses the CLOSE pushbutton until the controller output meter indicates zero.</p>		
2.	Open RCIC lube oil cooling water valve.	<p>Momentarily positions the RCIC L-O Clg Wtr HV-150-F046 switch to OPEN.</p>		
3.	Start the RCIC barometric condenser vacuum pump.	<p>Momentarily positions the RCIC Baro Cdsr Vacuum PP 1P219 switch to the START position.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 1.50.102.151

Student Name: _____

Step	Action	Standard	Eval	Comments
*4.	Open the RCIC turbine steam admission valve. <u>Evaluator:</u> When the RCIC steam admission valve is opened: - Turbine speed will increase to approximately 1,000 RPM. - RCIC Pump Discharge Lo Flow (AR-108-E02) will alarm when flow <75 gpm and discharge pressure is >190 psig. - RCIC low flow annunciator (AR-108-E02) will clear when flow >150 gpm. - Steam line drains F025 and F026 will CLOSE. - RCIC barometric condenser pump discharge valve F005 closes. - RCIC pump discharge pressure will increase to approximately 110 psig.	Momentarily positions the Steam to RCIC Turbine HV-150-F045 switch to the OPEN position.		
5.	Observe RCIC turbine accelerates.	Observes RCIC turbine accelerates.		
6.	<u>Evaluator:</u> The min flow valve will open when pump discharge pressure is >190 psig <u>and</u> flow <75 gpm.	Observes Min Flow to Supp Pool FV-149-F019 OPENS.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 1.50.102.151

Student Name: _____

Step	Action	Standard	Eval	Comments
7.	Increase RCiC pump discharge pressure. <u>Evaluator:</u> As the open pushbutton is depressed the following will occur: - Turbine speed will increase. - Pump discharge pressure will increase. - Minimum flow valve FV-149-F019 will open at >190 psig and flow <75 gpm.	Depresses OPEN pushbutton on RCiC Turbine Flow Control FC-E51-1R600 and increases pump discharge pressure until within 50 psig of reactor pressure.		
*8.	Open RCiC injection valve. <u>Evaluator:</u> When the RCiC injection valve opens and discharge pressure is raised greater than reactor pressure: - RCiC flow will increase. - Minimum flow to suppression pool valve F019 will close when flow is greater than 150 gpm. - RCiC Pump Discharge Lo Flow annunciator (AR-108-E02) will clear when flow >150 gpm.	Momentarily positions RCiC injection HV-149-F013 switch to the OPEN position.		
*9.	Establish the desired flowrate (~600 gpm).	Depresses OPEN or CLOSE pushbutton on RCiC Turbine Flow Control FC-E51-1R600 to achieve approximately 600 gpm RCiC flow.		

*Critical Step

#Critical Sequence

Appl. To/JPM No.: SRO 1.53.102.151

Student Name: _____

Step	Action	Standard	Eval	Comments
10.	Ensure that the RCIC minimum flow to suppression pool valve closes. FAULT STATEMENT: WHEN RCIC TURBINE FLOW CONTROLLER FC-E51-1R600 PLACED IN AUTO, RCIC FLOW DECREASES TO 300 GPM.	Observes RCIC Min Flow to Supp Pool FV-149-F019 CLOSES.		
11.	Establish auto flow control. <u>Evaluator:</u> If this JPM is not being performed in the simulator, inform the student that RCIC flow is decreasing and stabilizes at 300 gpm.	Null the RCIC TURBINE FLOW CONTROL FC-E51-1R600 using thumbwheel or INC/DEC PB. Place RCIC TURBINE FLOW CONTROL FC-E51-1R600 in AUTO.		<u>Instructor:</u> Insert malfunction when RCIC flow controller is placed in AUTO: - IMF CN02:FCE511R600 70.5
*12.	Place RCIC FC-E51-1R600 in manual and re-establish 600 gpm.	Place the FC-E51-1R600 back to MANUAL and adjust RCIC flow for 600 gpm.		
13.	Perform the suppression chamber average water temperature surveillance. <u>Evaluator:</u> Do Not have the student perform the surveillance.	States the requirement to perform SO-159-010, Suppression Chamber Average Water Temperature Verification.		

*Critical Step

#Critical Sequence

STCP-QA-125B

Rev. 2, (9/93)

Page 1 of 1

TASK CONDITIONS:

- A. A reactor scram condition exists and RCIC injection is required for inventory control.
- B. Suppression pool cooling is in operation.
- C. ESW System is in operation.
- D. RCIC pump discharge piping has been maintained filled and pressurized.
- E. MOV Overload Bypass switches will not be required to be positioned to the "TEST" position.
- F. RCIC is aligned in its normal STANDBY condition for automatic response.

V. INITIATING CUE

Manually start up RCIC component by component and establish injection to the vessel at a rate of approximately 600 gpm.

TASK CONDITIONS:

- A. A reactor scram condition exists and RCIC injection is required for inventory control.
- B. Suppression pool cooling is in operation.
- C. ESW System is in operation.
- D. RCIC pump discharge piping has been maintained filled and pressurized.
- E. MOV Overload Bypass switches will not be required to be positioned to the "TEST" position.
- F. RCIC is aligned in its normal STANDBY condition for automatic response.

V. INITIATING CUE

Manually start up RCIC component by component and establish injection to the vessel at a rate of approximately 600 gpm.

JPM Title Perform a RCIC System Manual Startup Component by Component with a CNTRL Malfunction IAW OP-150-001

Facility Number 1.50.102.151

JPM Question Description When the RCIC manual isolation switch will isolate the system and what actions occur.

Question

Given the conditions of the JPM what actions would be required to isolate RCIC if a steam leak were to occur on RCIC?

Followup - Why won't the RCIC STM SUPPLY MAN ISO switch isolate RCIC?

Answer

Close the steam isolation valves using the keylock switch.

Follow-up Answer - An initiation signal must be present for the RCIC STM SUPPLY MAN ISO switch to operate.

Reference Use Allowed? Yes

Reference 1 SY017 C-5, page 21, figure 25

Reference 2

KA 217000A404 RO Value 3.6 SRO Value 3.6

KA Statement Manually initiated controls

Comments:

Exam Level: SRO

JPM Title Perform a RCIC System Manual Startup Component by Component with a CNTRL Malfunction IAW OP-150-001

Facility Number 1.50.102.151

JPM Question Description Required action to restore RCIC following a trip

Question

RCIC was manually tripped. What action is required to return RCIC to service?

Answer

Close, then reopen the trip throttle valve.

Reference Use Allowed? Yes

Reference 1 SY017 C-5 Facts, page 2

Reference 2 SY017EO3/C 017

KA 217000A402 **RO Value** 3.9 **SRO Value** 3.9

KA Statement Leak detection

Comments:

Exam Level: SK

JPM Title: Recpen MSIV's and MSL Drain Isolations

Date of Performance: _____

JPM Performed by: _____

Performance Evaluation: () Satisfactory () Unsatisfactory

COMMENTS:

REQUIRED TASK INFORMATION JOB PERFORMANCE MEASURE

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 1. When ever any electrical panel is opened for inspection during JPM performance.
 2. When ever entering any plant area where specific safety equipment ; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

ES-184-02, Reopening MSIVs and Bypassing Interlocks.

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

IV. TASK CONDITIONS

- A. An inadvertent isolation occurred and a failure to scram has occurred.
- B. Level/Power Control is being implemented.
- C. Step LQ/P-7 had directed reopening the MSIV's IAW ES-184-02.
- D. Main steam line isolations have been bypassed and CIG has been restored to the drywell.
- E. The other PCO will control RPV level and pressure except for actions of your task.

V. INITIATING QUE

Open the MSIV's and MSL Drain Valves and restore pressure control with the turbine bypass valves. The Shift Supervisor directs you to rapidly open the valves per step 4.8.3 instead of using OP-184-001.

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>EVALUATOR:</u> Give a copy of ES-184-002 that has been completed for performance of section 4.8.</p>			<p>INSTRUCTOR NOTE: An instructor should control RPV level and pressure (HPCI/SRV's) while the student performs this JPM. Every attempt should be made to maintain reactor pressure ~1000 psig to enable the student to take the positive actions at step 2.</p>
1.	Ensure bypass valves are closed.	Verifies closed indication.		
*2.	Verify/Raise Main Turbine EHC Pressure SET above RPV pressure	Raise pressure set to greater than RPV pressure.		
3.	Turbine Stop Valves CLOSED or Control Valves CLOSED	Verifies Turbine Stop or Control Valves Closed.		
*4.	RESET Main Steam Line Isolation	Depresses: 1. MN STM LINE DIV 1 ISO RESET HS-B21-IS32 push button. 2. MN STM LINE DIV 2 ISO RESET HS-B21-IS33 push button.		

* Critical Step

Critical Sequence

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

Step	Action	Standard	Eval	Comments	
*5.	OPEN MSL DRAIN ISO VALVES and MSIV'S in following order:	Opens the valves in the order listed			
#	1. MN STM LINE IB DRAIN HV-141-FO16(2)				
#	2. MN STM LINE OB DRAIN HV-141-FO19				
#	3. MN STM LINE WARM UP HV-141-FO20				
#	4. MN STM LINE A IB ISO HV-141-FO22A	NOTE: Only one inboard and outboard valve must be opened to meet the critical step.			
#	5. MN STM LINE B IB ISO HV-141-FO22B				
#	6. MN STM LINE C IB ISO HV-141-FO22C				
#	7. MN STM LINE D IB ISO HV-141-FO22D				
#	8. Any MN STM LINE A(B)(C)(D) OB ISO HV-141-FO28 A(B)(C)(D).				
#	9. When one main steam line is open, REMAINING MN STM LINE OB ISO HV-141-FO28 A(B)(C)(D).				
*6.	Manually open Main Turbine Bypass Valves		DEPRESS INCREASE pushbutton on BYPASS VALVE OPENING JACK		
7.	Monitor plant response.		1. OBSERVE Main Turbine Bypass Valves OPENING SEQUENTIALLY 2. Observe RPV pressure DECREASING.		
	Terminate the JPM				

* Critical Step

Critical Sequence

JPM Title Reopen MSIV's and MSL Drain Isolations

Facility Number

JPM Question Description Power supplies to the solenoids on MSIVs

Question

What are the power supplies to the solenoids on the MSIV's?

Answer

The AC solenoid and test solenoid are supplied by 120 VAC from RPS.
The DC solenoid is supplied by 125 VDC.

Reference Use Allowed? Yes

Reference 1 SY017 H-2, page 22, rev. 0.

Reference 2

KA 23900IK201 RO Value 3.2 SRO Value 3.3

KA Statement Main steam isolation valve solenoids

Comments:

Exam Level: SRO

JPM Title Reopen MSIV's and MSL Drain Isolations

Facility Number

JPM Question Description Effect of closing one MSIV at 100% power.

Question

What will cause the reactor to scram if a single main steam line is isolated at 97% reactor power.

Answer

A scram will occur because of high APRMs or high reactor pressure or MSL closure on high flow.

Reference Use Allowed? Yes

Reference 1

Reference 2

KA 239001K127 **RO Value** 4.0 **SRO Value** 4.1

KA Statement Reactor protection system

Comments: Replaced question on Mode Switch interlocks because of the written examination questions.

Exam Level: SRO

JPM Title Reopen MSIV's and MSL Drain Isolations

Facility Number

JPM Question Description RPV parameter that will isolate Main Steam and Cont. Inst. Gas. (Include Setpoints)

Question

What plant parameter will cause an isolation of both the Main Steam Isolation Valves and the Containment Instrument Gas isolation valves?

Answer

RPV water level. (MSIVs at level 1 and Containment Inst. Gas at level 2).

Reference Use Allowed? Yes

Reference 1 SY017 E-3, Table #1, page 3.

Reference 2

KA 239001K401 RO Value 3.8 SRO Value 3.8

KA Statement Automatic isolation of steam lines

Comments:

Exam Level: RO

JPM Title Reopen MSIV's and MSL Drain Isolations

Facility Number

JPM Question Description Low Condenser Vacuum Bypass

Question

What conditions must be met in order to bypass the Main Steam Line isolation on low condenser vacuum?

Answer

1. A minimum of either set of low vac. Bypass keylock switches in the upper or lower relay room in bypass.

AND

2. Mode switch not in run.

AND

3. Turbine stop valves < 90% open.

NOTE: May have to ask what effect having one set of the keylock switches not in bypass will have on the bypass signal.

Reference Use Allowed? Yes

Reference 1 SY017 H-2, page 13, rev. 0.

Reference 2 AR-111-001 B04 and AR-112-001 B04.

KA 239001A208 RO Value 3.6 SRO Value 3.6

KA Statement Low condenser vacuum

Comments:

Exam Level: SRO

JPM Title: Restore RHR in Shutdown Cooling IAW OP-149-002

Date of Performance: _____

JPM Performed by: _____

Performance Evaluation: () Satisfactory () Unsatisfactory

COMMENTS:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. When ever any electrical panel is opened for inspection during JPM performance.
 - 2. When ever entering any plant area where specific safety equipment ; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-149-002, RHR Operation in Shutdown Cooling Mode

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

IV. TASK CONDITIONS

- A. Reactor temperature is approximately 110 F.
- B. RHR is being transferred from loop A to loop B.
- C. RHR loop A has been shutdown and preparations for placing loop B in service has been performed per section 3.3. All actions up to 3.3.8 have been completed.
- D. No recirculation pumps are in service.
- E. RHRSW is in service.
- F. ESW is in service.

V. INITIATING QUE

Place loop B of the RHR in Shutdown Cooling in service per section 3.3.8 of OP-149-002 using RHR pump B. Establish 10,000 gpm flow in the RHR system.

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	1. Check temperature limits.	Checks CRT for bottom head drain temperature or loop temperatures.		
*2.	1. START RHR PUMP 2. IMMEDIATELY THROTTLE OPEN RHR INJ FLOW CTL	1. IP202B started. 2. HV-151-F017B throttled to establish flow > 4,000 gpm within 30 seconds OR if the minimum flow valve opens raise flow to close the minimum flow valve.		
3.	INCREASE RHR flow to 10,000 gpm .	Throttle RHR INJ FLOW CTL HV-151-F017B to achieve 10,000 gpm.		
4.	CHECK RHR Pump Room Cooler started.	Check IV210B running.		
5.	OPEN RHR HX B SHELL SIDE OUTLET	HV-151-F003B opened.		
6.	Lineup Reactor Building Sample Station	Open RHR SAMPLE IB SV-151-F079B and RHR SAMPLE OB ISO SV-151-F080B.		
7.	Monitor temperature Terminate the JPM	Check temperature using RHR HX inlet Point 22 on TRS E-11-1R601 on 1C601.		

JPM Title Restore RHR in Shutdown Cooling IAW OP-149-002

Facility Number

JPM Question Description Isolation signals for Shutdown Cooling.

Question

List the conditions, including setpoints, that will cause a shutdown cooling isolation.

Answer

- RPV level + 13 inches.
- RPV pressure 98 psig.
- High SDC line flow of 25,000 gpm with (2 sec. TD).
- Leak detection high area temperature.
- Leak detection high area differential temperature.
- Manual pushbutton.

Reference Use Allowed? Yes

Reference 1 SY017 C-1, Fact Sheet, page 4.

Reference 2

KA 205000K403 **RO Value** 3.8 **SRO Value** 3.8

KA Statement Low reactor water level: Plant-Specific

Comments:

Exam Level: RO

JPM Title Restore RHR in Shutdown Cooling IAW OP-149-002

Facility Number

JPM Question Description Interlocks to prevent draining the vessel

Question

How is flow from the reactor vessel to the suppression pool prevented during shutdown cooling?

Answer

Cannot open RHR pump suction valve - Suppression Pool (F004) unless Shutdown Cooling Suction (F006) valve is closed.

Shutdown Cooling Suction will not open unless F004 and Suppression Spray Test Shutoff (F028) are closed.

Minimum Flow valve - Procedural cautions require that flow in the system be maintained greater than 4000 gpm to ensure that the valve does not open.

Reference Use Allowed? Yes

Reference 1 SY017 C-1

Reference 2

KA 205000K102 **RO Value** 3.6 **SRO Value** 3.6

KA Statement Reactor water level

Comments:

Exam Level: RO

JPM Title Restore RHR in Shutdown Cooling IAW OP-149-002

Facility Number

JPM Question Description Determine time to reach 200F on a loss of cooling.

Question

Given the following conditions:

- Reactor Temperature is 135 F.
- A loss of shutdown cooling has occurred.
- Time since shutdown - 80 hours.

What is the estimated time to reach 200 F?

Answer

Accept 50 to 90 minutes.

(50 minutes is conservative and does not use interpolation.

75 minutes is interpolating the values.

90 minutes allows for reading errors and allows for the assumptions of the graph.)

Reference Use Allowed? Yes

Reference 1 ON-149-001, Attachment C, page 36A, Rev. 13.

Reference 2

KA 295021A201 RO Value 3.5 SRO Value 3.6

KA Statement Reactor water heatup/cooldown rate

Comments:

Exam Level: SRC

JPM Title Restore RHR in Shutdown. Cooling IAW OP-149-002

Facility Number

JPM Question Description Applicable TS for LPCI/Shutdown Cooling

Question

Given the following conditions:

- Unit 2 is in mode 4.
- Core Spray loop "B" is out of service for maintenance.
- RHR Loop "B" heat exchanger is being repaired.
- RHR pump 2A breaker has been declared inoperable.

Using Technical Specifications determine what restrictions, if any, are placed on plant operations.

Answer

3.5.2 Still meet the requirements of two subsystems being operable.

3.4.9.2 If the requirements were met prior to the loss of the pump, losing it should not affect Technical Specification requirements. [An alternate method of cooling would have been required prior to the pump tripping]

Reference Use Allowed? Yes

Reference 1 Technical Specifications 3.5.2 and 3.4.9.2

Reference 2

KA 205000G005 I. Value 3.1 SRO Value 3.9

KA Statement Knowledge of limiting conditions for operations and safety limits

Comments:

Exam Level: SRO

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 73.EO.001.102 1 09/25/96 223001 A2.07 4.2
Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Venting Suppression Chamber Within Offsite Release Limits - ES-173-001, Section 4.3
Vent Suppression Chamber to LRW or Main Condenser Using RHR Loop

Completed By:

John J. Petrilla
Writer

09/25/96
Date

Reviews:

John Petrilla III
Instructor/Writer

9/27/96
Date

Approval:

[Signature]
Requesting Supv./C.A. Head

9/24/96
Date

[Signature]
Nuclear Training Supv.

9/24/96
Date

Date of Performance:

35 Min
Allowed Time (Min)

Time Taken (Min)

JPM Performed By:

Last

First

M.I.

Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

Signature

Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
RO 73.EO.001.102

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

ES-173-001, Venting Suppression Chamber Within Offsite Release Limits

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. A small break LOCA has occurred.
- B. The reactor is at 500 psig and shut down with all control rods full-in.
- C. Drywell pressure is 6 psig with hydrogen concentration indicating three percent and oxygen concentration indicating four percent.
- D. Suppression pool level is indicating 23 feet.
- E. EO-100-103, Step PC/H-11 has been entered.

V. INITIATING CUE

Vent the suppression chamber IAW ES-173-001, Section 4.3 (vent to the condenser).

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>Evaluator:</u> - Prior to performing this JPM, obtain a copy of the latest revision of ES-173-003 and mark it up as if it was actually to be performed and provide it to the student along with the Task Conditions/Initiating Cue Sheet.</p>			
1.	Review Sections 1.0 through 3.0.	<p>Review all sections.</p> <p>Follows all precautions as applicable.</p>		
2.	Notes Shift Supervisor approval to perform Step 4.3.	<p>Observes Shift Supervisor signature, date, and time in the appropriate location in Section 4.1 of the procedure.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
3.	Obtain the required equipment. <u>Evaluator:</u> Have the student obtain the needed keys from the key locker in the Control Room.	Obtains the required keys from the key locker in the Control Room.		
4.	Notify Chemistry to obtain and analyze a containment Noble Gas sample. <u>Evaluator:</u> Inform the student that Chemistry has sampled the containment, and the analysis is less than 5.73 E-4 $\mu\text{Ci/cc}$ for Noble Gas.	Directs Chemistry to sample the containment.		
5.	Comply with primary containment venting requirements. <u>Evaluator:</u> - Release rates are below LCO limits: Noble Gas 6.0 E3 $\mu\text{Ci}/\text{MIN}$ I-31 50 $\mu\text{Ci}/\text{MIN}$ Particulate 150 $\mu\text{Ci}/\text{MIN}$ - Inform the student that Turbine Building SPING is operable.	Complies with primary containment venting requirements.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
6.	<p>Ensures suppression chamber Noble Gas activity is less than value specified by Chemistry.</p> <p><u>Evaluator:</u> Inform the student Noble Gas activity is less than 5.73 E-4 Ci/cc.</p>	<p>Verifies Noble Gas activity.</p>		
7.	<p>Directs a NPO to eliminate the Turbine Building unfiltered exhaust.</p> <p><u>Evaluator:</u> Inform the student the actions to eliminate the Turbine Building unfiltered exhaust have been completed IAW ES-173-001, Step 4.3.4.</p> <p><u>Evaluator:</u> Inform the student to use RHR Loop A to vent.</p>	<p>Directs a NPO to perform a lineup at the U-1 and U-2 Turbine Building HVAC control panels to eliminate the Turbine Building unfiltered exhaust IAW ES-173-001, Step 4.3.4.</p>		
*8.	<p>Override RHR pumps for Loop A to be used for vent.</p>	<ul style="list-style-type: none"> - Arm and depress RHR Loop A initiation buttons. - Place all RHR pump control switches to STOP. 		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO:73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
9.	Verify RHR pumps are not running.	Observe WHITE override lights illuminated and no RHR pumps running.		
10.	Prevent keepfill from flowing out vent path. <u>Evaluator:</u> When the student asks the NPG to close the keepfill valve, inform the student the keepfill is isolated.	Close Loop A keepfill 151F092A. or Close RHR INJ FLOW CTL HV-151-F017A.		
11.	Close RHR HX A SHELL SIDE OUTLET HV-F003A.	Close RHR HS A SHELL SIDE OUTLET HV-151-F003A.		
*12.	Place keylock LOCA ISOLATION MANUAL OVERRIDE HS-E11-1S17A switch to OVRD.	- Checks the White Lamp illuminated above the HS-E11-1S17A. - Observes AR109-C05 LOCA ISO SWITCH LOOP A MANUAL OVERRIDE annunciator alarms.		
*13.	Open keylocked SUPP CHMBR SPR TEST SHUTOFF HV-151-F028A.	Open keylocked SUPP CHMBR SPR TEST SHUTOFF HV-151-F028A.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO.73.EO.001.102

Student Name: _____

S. #	Action	Standard	Eval	Comments
14.	Close HX A SHELL SIDE BYPS HV-151-F048A.	<ul style="list-style-type: none"> - Place HX A SHELL SIDE BYPS HV-151-F048A control switch to OFF/LOCA RESET position. - When white light above control switch is illuminated, place HX A SHELL SIDE BYPS HV-151-F048A control switch to close. - Close the Amber Light illuminated and the Red Lamp extinguished. 		
*15.	Open SUPP POOL SPRAY CTL HV-151-F027A.	Open SUPP POOL SPRAY CTL HV-151-F027A.		
16.	Close Breaker 1B216022 to energize RHR LOOP A CROSSTIE HV-151-F010A. <u>Evaluator:</u> Student may contact a NPO to close the breaker.	<ul style="list-style-type: none"> - Close Breaker 1B216022A to energize RHR LOOP A CROSSTIE HV-151-F010A. - Check the Amber Light illuminated and the Red Lamp extinguished. 		
*17.	Open keylocked RHR LOOP A CROSSTIE HV-151-F010A.	<ul style="list-style-type: none"> - Open keylocked RHR LOOP A CROSSTIE HV-151-F010A. - Check the Red Lamp illuminated and the Amber Lamp extinguished. 		
18.	Close RHR RADWASTE line ISO VLV 151088.	Direct the RB NPO to manually close the 151088 valve.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO:73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
*19.	<p>Open SUPP POOL CLNUP to CDSR Iso Viv 157310.</p> <p><u>Evaluator:</u> When the NPO is called to open 157310, inform the student that the valve has been opened.</p> <p><u>Evaluator:</u> Unit Supervisor directs using the manual valve method by opening breakers for F040 and F049, Section 4.3.17.b.</p>	<p>Direct the RB NPO to manually open 157310.</p>		
20.	<p>Open Breaker 1B236062 to de-energize RADWASTE IB ISO HV-151-F040.</p>	<ul style="list-style-type: none"> - Direct the RB NPO to open breaker. - Check the Amber Light extinguishes for HV-151-F049. 		
21.	<p>Open Breaker 1D274061 to de-energize RADWASTE OB ISO HV-1510F049.</p>	<ul style="list-style-type: none"> - Direct the RB NPO to open breaker. - Check the Amber Light extinguishes for HV-151-F049. 		
22.	<p>Evacuate personnel from the Turbine Building and Radwaste Building.</p>	<p>Announce the evacuation of the Turbine Building and Radwaste Building.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 73.EO.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
*23.	Open the RADWASTE IB ISO HV-151-F040.	Open HV-151-F040 or direct the RB NPO to manually open HV-151-F040.		
*24.	Open the RADWASTE OB ISO HV-151-F049.	Open HV-151-F049 or direct the RB NPO to manually open HV-151-F049.		<p><u>Instructor:</u> When F049 is opened by the candidate delete the break malfunction.</p>
25.	When venting is no longer required, close one of the following: - RADWASTE IB ISO HV-151-F040 - RADWASTE OB ISO HV-151-F049	Close or direct the RB NPO to manually close HV-151-F040 and/or HV-151-F049.		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. A small break LOCA has occurred.
- B. The reactor is at 500 psig and shut down with all control rods full-in.
- C. Drywell pressure is 6 psig with hydrogen concentration indicating three percent and oxygen concentration indicating four percent.
- D. Suppression pool level is indicating 23 feet.
- E. EO-100-103, Step PC/H-11 has been entered.

INITIATING CUE:

Vent the suppression chamber IAW ES-173-001, Section 4.3 (vent to the condenser).

TASK CONDITIONS:

- A. A small break LOCA has occurred.
- B. The reactor is at 500 psig and shut down with all control rods full-in.
- C. Drywell pressure is 6 psig with hydrogen concentration indicating three percent and oxygen concentration indicating four percent.
- D. Suppression pool level is indicating 23 feet.
- E. EO-100-103, Step PC/H-11 has been entered.

INITIATING CUE:

Vent the suppression chamber IAW ES-173-001, Section 4.3 (vent to the condenser).

JPM Title Venting Suppression Chamber within Offsite Release Limits

Facility Number 73.EO.001.102

JPM Question Description Condition that would require venting the drywell instead of the suppression pool.

Question

1. Under what plant conditions would the drywell be vented instead of the Suppression Chamber?
2. SRO Only - What is the basis for the determination to use the drywell instead of the Suppression Chamber?

Answer

1. If Suppression Pool Level is greater than or equal to 49 ft.
2. The suppression pool vent is located at 49 ft.

Reference Use Allowed? Yes

Reference 1 EO-100-103, page 44, rev. 8.

Reference 2

KA 223001A302 RO Value 3.4 SRO Value 3.4

KA Statement Vacuum breaker/relief valve operation

Comments:

Exam Level: Both

JPM Title Venting Suppression Chamber within Offsite Release Limits

Facility Number 73.EO.001.102

JPM Question Description Why must HV-1F040 and HV-1F049 be manually opened

Question

1. During performance of the task why is required to deenergize and manually open HV-1F040 and HV-1F049 instead of opening the valves from the control room?
2. What other condition will cause an isolation of the valves?

Answer

1. A high drywell pressure signal is present.
2. Low reactor water level.

Reference Use Allowed? Yes

Reference 1 ON-159, Attachment B.

Reference 2

KA 223001K403 RO Value 3.7 SRO Value 3.8

KA Statement

Comments:

Exam Level: RO

JPM Title Venting Suppression Chamber within Offsite Release Limits

Facility Number 73.EO.001.102

JPM Question Description Conditions that would require terminating this evolution.

Question

Under what conditions would you stop venting the suppression chamber before hydrogen were reduced to less than 1%?

Answer

If radiation release levels exceed Technical Specification limits.

Reference Use Allowed? Yes

Reference 1 EO-100-103, page 43, rev. 8.

Reference 2

KA 223001G010 **RO Value** 3.2 **SRO Value** 3.6

KA Statement Ability to explain and apply all system limits and precautions

Comments:

Exam Level: SRO

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 264.012.01 4 09/25/96 264000 3.5
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Synchronize Diesel Generator 'A' with the Grid to Restore Normal Power to 4.16 KV
 Bus 1A in Accordance with OP-024-001

Completed By:

Reviews:

John P. Petrilla
 Writer

09/25/96
 Date

John Petrilla
 Instructor/Writer

9/27/96
 Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/30/96
 Date

[Signature]
 Nuclear Training Supv.

9/30/96
 Date

Date of Performance:

30 Min
 Allowed Time (Min)

_____ Time Taken (Min)

JPM Performed By:

_____ Last

_____ First

_____ M.I.

_____ Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ Signature

_____ Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 264.012.01

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-024-001, Diesel Generators

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. Diesel Generator 'A' is running in emergency mode and is carrying 4.16 KV Bus 1A.
- B. Offsite power is available.

V. INITIATING CUE

Synchronize DG 'A' to the grid to restore normal power to 4.16 KV Bus 1A and shut down the DG.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p><u>Evaluator:</u></p> <ul style="list-style-type: none"> - Any other DG may be substituted for DG 'A' in this JPM. Be aware that there are nomenclature differences between DG 'E' and the other DGs. >Set up the IC so that the DG is running in Emergency Mode (isochronous) and carrying the 4,160 VAC bus. >Preload one of the following Control Conditions on a Function Button bypass simulate placing the Synchronization Auto Control switch in BYPASS: IOR QDI43SYNA BYPASS DG A Isoch Ctl Local-BYP IOR QDI43SYNB BYPASS DG B Isoch Ctl Local-BYP IOR QDI43SYNC BYPASS DG C Isoch Ctl Local-BYP IOR QDI43SYND BYPASS DG D Isoch Ctl Local-BYP >Preload one of the following Control Conditions on a Function Button to simulate placing the Synchronization Auto Control switch in NORMAL: IOR QDI43SYNA NORM DG A Isoch Ctl Local-NORM IOR QDI43SYNB NORM DG B Isoch Ctl Local-NORM IOR QDI43SYNC NORM DG C Isoch Ctl Local-NORM IOR QDI43SYND NORM DG D Isoch Ctl Local-NORM - The Synchronization Auto Control switch allows the DG to be controlled from OC653 when it is running in isochronous (emergency) mode. 			<p>Reset to IC18:</p> <ul style="list-style-type: none"> - Place sim to run and hold open the norm and alt feed breakers for 4 KV Bus 1A. - When DG 'A' closes on Bus 1A (1A10104 closed) release the norm and alt breaker control switches. - Reset RPS Div A. - Reset N4S. - Reset rad monitors. - Place sim in Freeze. - Start CRD pump. - Start exam.

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	Obtain a controlled copy of OP-024-001.	Controlled copy obtained.		
2.	Select the correct section to perform.	Selects Section 3.9.		
3.	Review the prerequisites.	Reads the prerequisites and ensures that all have been met.		
<p><u>Evaluator:</u> Inform the student that all prerequisites have been met.</p>				
4.	Review the precautions.	Follows precautions as applicable.		
5.	<p>Transfer control of the DG from auto to manual.</p> <p><u>Evaluator:</u></p> <ul style="list-style-type: none"> - If this JPM is conducted in the simulator, enter the appropriate Control Condition to simulate placing Auto Control switch in the BYPASS position. - Inform the student that the switch is in the bypass position. 	Directs the NPO who is stationed at the local panel to place the Synchronization Auto Control switch in the BYPASS position.		
Step	Action	Standard	Eval	Comments

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

<p>*6.</p>	<p>Place the transformer 101 to Bus 1A synchronizing circuit in service. <u>Evaluator:</u> When the switch is placed in the ON position, the Synchroscope pointer will start moving (either direction), the white light on each side of the Synchroscope will flash off and on as the pointer rotates.</p>	<p>Places Xfmr 101 - Bus 1A Synch Sel control switch in the ON position.</p>	
<p>*7.</p>	<p>Adjust DG voltage.</p>	<p>Takes the DG 'A' Voltage Adjust HS-00053A switch to the RAISE or LOWER position as required to match incoming and running volts on the Diesel Gen Bus Diff Volts XI-00036 meter. (Within the "green" band.)</p>	
<p>*8.</p>	<p>Adjust DG frequency.</p>	<p>Takes the DG 'A' Speed Governor HS-00054A switch to the RAISE or LOWER position as required to cause the Synchroscope XI-00037 pointer to rotate slowly in the SLOW (counterclockwise direction).</p>	
<p>*9.</p>	<p>Close the transformer 101 to Bus 1A breaker. <u>Evaluator:</u> Both white lights above the Synchroscope will extinguish and the pointer will stop at the 12 o'clock position. DG 'A' to Bus 1A breaker 1A20104 will auto open.</p>	<p>Takes the Xfmr 101 to Bus 1A breaker 1A20101 control switch to the CLOSE position when the Synchroscope pointer is at or slightly before the 12 o'clock position.</p>	

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

Step	Action	Standard	Eval	Comments
10.	Check that the DG to Bus 1A breaker opened.	States that DG 'A' to Bus 1A breaker 1A20104 did open.		
11.	Check that Bus 1A remained energized.	States that Bus 1A remained energized.		
12.	Ensure that breaker semaphores are matched.	Rotates DG 'A' to Bus 1A breaker 1A20104 control switch to obtain a green semaphore.		
13.	Ensure that DG governor is in Droop.	States that the Gov Mode Sel HS-00055A switch is in the DROOP position.		
14.	Remove the transformer 101 to Bus 1A synchronizing circuit from service.	Places the Xfmr 101 - Bus 1A Sync Sel control switch in the OFF position.		
15.	Adjust DG voltage if necessary.	Takes the DG 'A' Voltage Adjust HS-00053A switch to the RAISE or LOWER position as required to obtain 4,250 volts indicated.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

Step	Action	Standard	Eval	Comments
16.	Cooldown DG 'A'. <u>Evaluator:</u> If necessary, prompt the student to continue.	Allows the diesel to run for at least five minutes prior to stopping it.		
17.	Start the automatic cooldown/pushbutton cycle. <u>Evaluator:</u> Depressing the stop pushbutton starts the automatic five minute cooldown cycle and trips the DG after completion. The automatic cooldown does not always go to completion.	Depresses the DG 'A' Stop HS-0052A pushbutton.		
18.	Ensure that the DG is restored to the standby automatic alignment. <u>Evaluator:</u> - If this JPM is being conducted in the simulator, enter the appropriate Control Condition to simulate placing the Synchronization Auto Control switch in the NORMAL position. - Inform the student that the switch is in the bypass position.	Instructs the NPO stationed at the DG to perform the appropriate steps of the procedure.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.012.01

Student Name: _____

Step	Action	Standard	Eval	Comments
19.	Restore the ESW System to standby alignment. <u>Evaluator:</u> Do not have the student restore ESW to standby alignment. Instruct the student to stop.	States the requirement to return the ESW System to standby alignment in accordance with OP-054-001.		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. Diesel Generator 'A' is running in emergency mode and is carrying 4.16 KV Bus 1A.
- B. Offsite power is available.

INITIATING CUE:

Synchronize DG 'A' to the grid to restore normal power to 4.16 KV Bus 1A and shut down the DG.

TASK CONDITIONS:

- A. Diesel Generator 'A' is running in emergency mode and is carrying 4.16 KV Bus 1A.
- B. Offsite power is available.

INITIATING CUE:

Synchronize DG 'A' to the grid to restore normal power to 4.16 KV Bus 1A and shut down the DG.

JPM Title Synchronize D/G "A" with the grid to restore normal power to 4.16 KV bus 1A

Facility Number 264.012.01

JPM Question Description Effect of tripping one train of core spray logic.

Question

Which diesel generators will start if the Unit 2 Division II RHR logic is tripped?

Answer

C and D.

Reference Use Allowed? Yes

Reference 1 SY017 G-1 page 16, rev. 1.

Reference 2

KA 264000K408 RO Value 3.8 SRO Value 3.7

KA Statement Automatic startup

Comments:

Exam Level: SRO

JPM Title Manually synchronize Diesel Generator "A" to 4.16 KV bus 2A

Facility Number 264.003.02

JPM Question Description Response to a loss of off site following this evolution.

Question

Given the conditions at the end of the JPM, what will be the response of the diesel generator and its output breaker(s) if a loss of off-site power occurs?

Answer

1. DG 'A' breaker to 2A bus trips open and lockout.
2. DG 'A' swaps to isocronous mode.
3. DG 'A' breaker to 1A bus closes to supply bus (if the normal and alternate breakers are open).

Reference Use: Allowed? Yes

Reference 1 SY017G01/C 013

Reference 2

KA 264000K407 RO Value 3.3 SRO Value 3.4

KA Statement Local operation and control

Comments:

Exam Level: Both

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 264.003.02 2 10/01/92 264000 3.5
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Manually Synchronize Diesel Generator 'A' to 4.16 KV Bus 2A from Panel OC653 in
 Accordance with OP-024-001

Completed By: Jerald L. Jones 10/01/92 Jacob Peter III 9/26/92
 Writer Date Instructor/Writer Date

Approval: [Signature] 9/26/92 [Signature] 9/26/92
 Requesting Supv./C.A. Head Date Nuclear Training Supv. Date

Date of Performance: _____ 20 Min _____
 Allowed Time (Min) Time Taken (Min)

JPM Performed By: _____
 Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name: _____
 Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 264.003.02

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-024-001, Diesel Generators

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. Diesel Generator 'A' was started manually from OC653 in accordance with OP-024-001 and has been running unloaded for 15 minutes.
- B. No other diesel generator is operating synchronized to the grid.
- C. An NPO is stationed at the diesel.

V. INITIATING CUE

Manually synchronize Diesel Generator 'A' with Unit 2 4.16 KV Bus 2A and pick up 4,000 KW of load.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p>NOTE: Unless otherwise stated, all controls and indicators are located on panel OC653.</p> <p>Evaluator: The following conditions exist:</p> <ul style="list-style-type: none"> - DG 'A' Watts - 0 - DG 'A' Amps - 0 - DG 'A' Freq - 60 Hz - DG 'A' Volts - 4250 VAC - READY TO RUN light - illuminated - DG 'A' Vol Reg Mode Sel HS-00056A-AUTO - Synchroscope - pointer at 12 o'clock, both white lights extinguished - Diesel Gen Bus Diff Volts - 0 - DG 'A' To Bus 2A Bkr 2A20104 - OPEN - DG 'A' To Bus 2A Sync Sel HS-000398 - OFF - The PMS CRT is displaying the DG electrical screen 			<ul style="list-style-type: none"> - Reset to IC-18. - Start ESW pumps A and B. - Put up PMS formats 49 and 53 on PMS CRTS 1 and 2. - Start Diesel Generator A. - Place simulator in freeze. - Start exam.
1.	Obtain a controlled copy of OP-024-001.	Controlled copy obtained.		
2.	Select the correct section to perform.	Selects Section 3.3.		
3.	Review the prerequisites.	Ensures that all prerequisites have been met.		
	<p>Evaluator: Inform the student that all prerequisites have been met.</p>			

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	Review the precautions. <u>Evaluator:</u> If asked, inform the student that the diesel has been running for 15 minutes unloaded.	Follows the precautions as applicable.		
5.	Obtain a key for the DG sync selector switch.	Obtains a key from the key locker (or from sub tie breaker keylock synch switch).		
*6.	Turn the sync selector switch on. <u>Evaluator:</u> When the switch is placed in the ON position, the synchroscope pointer will start moving (either direction), the white light on each side of the synchroscope will flash off and on as the pointer rotates. The lights will be off when the pointer is between 10° before the 12 o'clock position and 10° after the 12 o'clock position.	Places the DG 'A' to Bus 2A Sync Sel HS-00039B switch in the ON position.		
*7.	Adjust diesel generator voltage. <u>Evaluator:</u> Voltage is matched when the pointer is on the Diesel Gen Bus Diff Volts Meter is 0.	Takes the DG 'A' Voltage Adjust HS-00053A switch to the RAISE or LOWER position as required to match Incoming and Running volts on the Diesel Gen Bus Diff Volts XI-00036 meter.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
*8.	Adjust diesel generator speed. <u>Evaluator:</u> The FAST direction is clockwise.	Takes the DG 'A' Speed Governor HS-00054A switch to the RAISE or LOWER position to cause the synchroscope XI-00037 pointer to rotate slowly in the FAST direction.		
*9.	Close the diesel generator output breaker. <u>Evaluator:</u> - Both white lights will be extinguished and the synchroscope pointer will stop at the 12 o'clock position. - The Running Idle light will extinguish and the the Running Loaded light illuminates on the local panel (OC521A).	Takes the DG 'A' to Bus 2A Bkr 2A20104 switch to the CLOSE position when the synchroscope XI-00037 pointer is at or slightly before the 12 o'clock position.		
*10.	Pick up load on the DG.	Immediately take and hold the DG 'A' Speed Governor HS-00054A to the RAISE position until DG 'A' Watts XI-00032A meter indicates $\geq 1,000$ KW.		
11.	Turn the sync selector switch off.	Places the DG A to Bus 2A Sync Sel HS-00039B switch in the OFF position.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
12.	<p>Check the status of the DG 'A' Running Loaded light and intake air manifold temperatures.</p> <p><u>Evaluator:</u> Inform the student that:</p> <ul style="list-style-type: none"> - The Running Loaded light is illuminated. - Intake air manifold temperatures will be maintained as required. 	<p>Directs a NLO to:</p> <ul style="list-style-type: none"> - Confirm that the Running Loaded light is illuminated. - Maintain intake air manifold temperatures in accordance with the appropriate procedure step. 		
13.	<p>Maintain DG VARS as close to 0 as possible on the positive side.</p>	<p>Using the DG 'A' Voltage Adjust HS-00053A switch, maintains DG 'A' KVARs as close to 0 as possible.</p>		
14.	<p>Wait for five minutes.</p> <p><u>Evaluator:</u> Inform the student that five minutes have elapsed.</p>	<p>States the requirement to wait for five minutes.</p>		
*15.	<p>Increase load to approximately 2,000 KW.</p>	<p>Takes and holds the DG 'A' Speed Governor HS-00054A switch to the RAISE position until DG 'A' Watts XI-00032A meter indicates approximately 2,000 KW.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
16.	Maintain DG VARS as close to 0 as possible on the positive side.	Using the DG 'A' Voltage Adjust HS-00053A switch, maintains DG A KVARs as close to 0 as possible.		
17.	Wait for ten minutes. <u>Evaluator:</u> Inform the student that ten minutes have elapsed.	States the requirement to wait for ten minutes.		
*18.	Increase load to approximately 3,000 KW.	Takes and holds the DG 'A' Speed Governor HS-00054A switch to the RAISE position until DG 'A' Watts XI-00032A meter indicates approximately 3,000 KW.		
19.	Maintain DG VARS as close to 0 as possible on the positive side.	Using the DG 'A' Voltage Adjust HS-00053A switch, maintains DG 'A' KVARs as close to 0 as possible.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 264.003.02

Student Name: _____

Step	Action	Standard	Eval	Comments
20.	Waits for 10 minutes. <u>Evaluator:</u> Inform the student that 10 minutes have elapsed.	States the requirement to wait for ten minutes.		
*21.	Increase load to approximately 4,000 KW.	Takes and holds the DG 'A' Speed Governor HS-00054A switch to the RAISE position until DG 'A' Watts XI-00032A meter indicates approximately 4,000 KW.		
22.	Maintain DG VARS as close to 0 as possible on the positive side. Student states that this completes the JPM.	Using the DG 'A' Voltage Adjust HS-00053A switch, maintains DG 'A' KVARs as close to 0 as possible.		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. Diesel Generator 'A' was started manually from OC653 in accordance with OP-024.001 and has been running unloaded for 15 minutes.
- B. No other diesel generator is operating synchronized to the grid.
- C. An NPO is stationed at the diesel.

INITIATING CUE:

Manually synchronize Diesel Generator 'A' with Unit 2 4.16 KV Bus 2A and pick up 4,000 KW of load.

TASK CONDITIONS:

- A. Diesel Generator 'A' was started manually from OC653 in accordance with OP-024.001 and has been running unloaded for 15 minutes.
- B. No other diesel generator is operating synchronized to the grid.
- C. An NPO is stationed at the diesel.

INITIATING CUE:

Manually synchronize Diesel Generator 'A' with Unit 2 4.16 KV Bus 2A and pick up 4,000 KW of load.

JPM Title Manually synchronize Diesel Generator "A" to 4.16 KV bus 2A

Facility Number 264.003.02

JPM Question Description Method of performing an emergency stop.

Question

Explain how to perform an emergency shutdown from the local control panel OC521A?

Answer

Place the Control Mode selector switch to the LOCAL position and depress the Emergency Trip pushbutton.

Reference Use Allowed Yes

Reference 1 Facility JPM Question #6.

Reference 2

KA 264000G009 **RO Value** 3.8 **SRO Value** 3.9

KA Statement Ability to locate and operate components, including local controls

Comments:

Exam Level: RO

JPM Title Manually synchronize Diesel Generator "A" to 4.16 KV bus 2A

Facility Number 264.003.02

JPM Question Description Response to a loss of off site following this evolution.

Question

Given the conditions at the end of the JPM, what will be the response of the diesel generator and its output breaker(s) if a loss of off-site power occurs?

Answer

1. DG 'A' breaker to 2A bus trips open and lockout.
2. DG 'A' swaps to isocronous mode.
3. DG 'A' breaker to 1A bus closes to supply bus (if the normal and alternate breakers are open).

Reference Use Allowed? Yes

Reference 1 SY017G01/C 013

Reference 2

KA 264000K407 **RO Value** 3.3 **SRO Value** 3.4

KA Statement Local operation and control

Comments:

Exam Level: Both

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

JPM Title: Restore SGT after a transfer of RPS

Date of Performance: _____

JPM Performed by: _____

Performance Evaluation: () Satisfactory () Unsatisfactory

COMMENTS:

APPL/JPM NO. _____

Student Name: _____

**REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE****I. SAFETY CONSIDERATIONS**

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. When ever any electrical panel is opened for inspection during JPM performance.
 - 2. When ever entering any plant area where specific safety equipment ; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

a

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

IV. TASK CONDITIONS

- A. RPS "A" power was transferred from Alternate to Normal following maintenance per OP-158-001, Attachment C.
- B. SSGT A and B were placed in service per OP-070-001.

V. INITIATING QUE

The Unit Supervisor has directed you to return SSGT to a standby lineup per OP-070-001.

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

Step	Action	Standard	Eval	Comments
<p>*1.</p> <p>2.</p> <p>*3.</p>	<p>At Panel 0C681, SHUT DOWN operating Standby Gas Treatment System A</p> <p>Verify indications for shutdown of SGBT.</p> <p>At Panel 0C681, SHUT DOWN operating Standby Gas Treatment System B</p>	<p>Place selector switch for SGTS Fan 0V109 A to STOP.</p> <p>1. At Panel IC694, CHECK FAN 0V109A DISABLED annunciator ALARMING.</p> <p>2. At Panel 2C694, CHECK FAN 0V109A DISABLED annunciator ALARMING.</p> <p>3. OBSERVE Amber indicating light for SGTS Fan 0V109A ILLUMINATED and Red indicating light EXTINGUISHED.</p> <p>4. CHECK following dampers CLOSED by observing Red indicating lights EXTINGUISHED and Amber indicating lights ILLUMINATED: a) SGTS Makeup OA Dmp FDO755IA2 b) SGTS Fan Inlet Dmp HDO7552A</p> <p>5. SGTS A Inlet Dmp HDO7553A.</p> <p>Place selector switch for SGTS Fan 0V109 B to STOP.</p>		<p><u>Evaluator Note:</u> Panel 2C694 is not simulated.</p>

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

<p>4.</p>	<p>Verify indications for shutdown of SGBT.</p>	<ol style="list-style-type: none"> 1. At Panel IC694, CHECK FAN 0V109B DISABLED annunciator ALARMING. 2. At Panel 2C694, CHECK FAN 0V109B DISABLED annunciator ALARMING. 3. OBSERVE Amber indicating light for SGTS Fan 0V109B ILLUMINATED and Red indicating light EXTINGUISHED. 4. CHECK following dampers CLOSED by observing Red indicating lights EXTINGUISHED and Amber indicating lights ILLUMINATED: <ol style="list-style-type: none"> a) SGTS Makeup OA Dmp FDO7551B2 b) SGTS Fan Inlet Dmp HD07552B 5. SGTS B Inlet Dmp HD07553B. 		<p><u>Evaluator Note:</u> Panel 2C694 is not simulated.</p>
<p>5.</p>	<p>ALIGN Standby Gas Treatment System for automatic operation in accordance with section 3.1 of this procedure.</p>			
<p>*6.</p>	<p>At Panel 0C681, PLACE Standby Gas Treatment System A in Auto Lead Mode.</p>	<ol style="list-style-type: none"> 1. Place selector switch for SGTS Fan 0V109A to LEAD 2. OBSERVE white indicating light for SGTS Fan 0V109A ILLUMINATED. 		

PERFORMANCE CHECKLIST

APPL/JPM NO. _____

Student Name: _____

*7	At Panel 0C681, PLACE Standby Gas Treatment System B in Auto Lead Mode	<ol style="list-style-type: none"> 1. Place selector switch for SGTS Fan 0V109B to LEAD. 2. OBSERVE white indicating light for SGTS Fan 0V109B ILLUMINATED 		
8.	At Panel 0C681, CHECK SGTS Air flow set control set for standby.	<ol style="list-style-type: none"> 1. Checks CFM FIC-07551A and B in Auto and set at 10,100 cfm. 2. Checks Internal Cascade/Local switches in LOCAL. 		
9.	At Panel 0C681, Check differential pressure control set correctly.	Check RB Zones/Otdr lowest Press Diff In WC PDIC07554A and B set at 0.27.		
10.	Direct local verifications be performed.	Direct NPO to perform steps 3.1.11 through 3.1.22		
11.	Check valve lineup on 0C681. Terminate the JPM	Checks valves listed in step 2.1.23 in the correct position.		

JPM Title Restore SBT after a transfer of RPS

Facility Number

JPM Question Description Isolation sequence for Zones 1 and 2

Question

1. What components operate, i.e. start, stop, open, close, during the isolation sequence for Reactor Building Zones 1 and 2?
2. What will be the status of the components when the sequence is complete?

Answer

1. Supply fan - tripped.
2. Equipment Compartment Exhaust fan - tripped
3. Exhaust fan - tripped
4. Fan isolation dampers - closed
5. Dampers to recirc plenum - opened.

Reference Use Allowed? Yes

Reference 1 SY017 E-2, Fact Sheets, page 4, rev. 0.

Reference 2

KA 290001K601 RO Value 3.5 SRO Value 3.6

KA Statement Reactor building ventilation: Plant-Specific

Comments:

Exam Level: Both

JPM Title Restore SBT after a transfer of RPS

Facility Number

JPM Question Description Effect of failure of a SGTS Room Cooling Unit

Question

SGTS Room Cooling Unit OV118A fan motor has failed. What limitation(s) are placed on plant operation?

Answer

With one SGTS Room Cooling Unit non-functional, restore the affected cooling unit to functional status within 7 days or be in HOT SHUTDOWN within 12 hours and COLD SHUTDOWN within the following 24 hours.

Both units will be affected.

Reference Use Allowed? Yes

Reference 1 TSI 1-91-003, rev. 0, page 1.

Reference 2 TSI 2-91-003, rev. 0, page 1.

KA 261000G010 **RO Value** 3.1 **SRO Value** 3.3

KA Statement Ability to explain and apply all system limits and precautions

Comments:

Exam Level: SRO

JPM Title Restore SBGT after a transfer of RPS

Facility Number

JPM Question Description SBGT Technical Specifications

Question

Unit 2 is being refueled. Charcoal is being replaced in train A of SBGT. What actions are required if SBGT train B is declared inoperable?

Answer

Suspend handling of irradiated fuel in the secondary containment.

Reference Use Allowed? Yes

Reference 1 TS 3.6.5.3.

Reference 2

KA 261000G005 RO Value 3.0 SRO Value 4.1

KA Statement Knowledge of limiting conditions for operations and safety limits

Comments:

Exam Level: RO

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

S/RO 201.025.02 0 09/25/96 201001 3.5
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Shift the CRD Flow Control Stations from A to Be in Accordance with OP-255-001

Completed By:

John J. Petrilla
 Writer

09/25/96
 Date

Reviews:

John J. Petrilla III 9/27/96
 Instructor/Writer Date

Approval:

[Signature]
 Requesting Supv./C.A. Head

9/21/96
 Date

[Signature]
 Nuclear Training Supv.

9/21/96
 Date

Date of Performance:

_____ 30 Min _____
 Allowed Time (Min) Time Taken (Min)

JPM Performed By:

_____ _____ _____ _____
 Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ _____
 Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 201.025.02

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

OP-255-001, Control Rod Drive Hydraulic System

III. REACTIVITY MANIPULATIONS

This JPM satisfies the requirements of Reactivity Manipulation(s):

None

IV. TASK CONDITIONS

- A. The plant is in Condition 1 at 80 percent reactor power.
- B. CRD System is aligned for normal operation.

V. INITIATING CUE

Change CRD flow control stations from FV-2F002A to FV-2F002B.

PERFORMANCE CHECKLIST

Appi. To/JPM No.: S/RO 201.025.02

Student Name: _____

Step	Action	Standard	Eval	Comments
<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>	<p><u>Evaluator:</u> With the A flow control station in service the following conditions exist:</p> <ul style="list-style-type: none"> - M/A - 2D009A is in Auto. - Closed and Open position indicator lights for FCV A are illuminated. - M/A - 2D009B is in Man. - FCV B Closed light is ILLUMINATED and the Open light is EXTINGUISHED. <p>Obtain a controlled copy of OP-255-001.</p> <p>Select the correct section to perform.</p> <p>Review the prerequisites.</p> <p><u>Evaluator:</u> Inform the student that all prerequisites have been met.</p> <p>Review the precautions.</p>	<p>Controlled copy obtained.</p> <p>Selects Section 3.4.</p> <p>Ensures that all prerequisites have been met.</p> <p>Follows all precautions as applicable.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 201.025.02

Student Name: _____

Step	Action	Standard	Eval	Comments
5.	Ensure that the master CRD flow controller is in automatic. <u>Evaluator:</u> FC-C12-2R600 is located on panel 1C601 in the Control Room. Inform the student that the controller is in automatic.	Calls the Control Room and confirms that CRD Flow Controller FC-C12-2R600 is in automatic.		
6.	Ensure that the FCV B controller is in manual at minimum.	Ensures that the following conditions exist for M/A-2D009B Man/Auto Station Control Valve B controller: - Man/Auto switch is in the MAN position. - The red pen is at 0. - Amber light is ILLUMINATED and the red light is EXTINGUISHED.		
7.	Check that the inlet isolation valve for flow control valve B is open. <u>Evaluator:</u> Inform the student that the valve is open.	Checks that Flow Control Valve B Iso 246F046B is open.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 201.025.02

Student Name: _____

Step	Action	Standard	Eva I	Comments
*8.	<p>Open the outlet isolation valve for FCV B.</p> <p><u>Evaluator:</u></p> <ul style="list-style-type: none"> - Flow will change dramatically (20-25 gpm) if this valve is more than cracked open initially. - For training, ensure that the student understands the necessity for waiting for the flow to stabilize. 	<p>Very slowly cracks open Flow Control Valve B Iso 246F047B.</p> <p>Waits for flow to stabilize as indicated by any of the following:</p> <ul style="list-style-type: none"> - Audible sound change has stopped. - M/A-2D009A Man/Auto Station Control Valve A has completed compensating for the flow change. - Flow Control Station Total Water Flow FI-2R019-63 gpm. <p>Completes opening Flow Control Valve B Iso 246F047B.</p>		
*9.	<p>Open Flow Control Valve FV-2F002B.</p> <p><u>Evaluator:</u></p> <ul style="list-style-type: none"> - The red Open light will illuminate as the valve opens. - Both the Closed and Open lights will remain illuminated. - Flow Control Valve A will go in the closed direction as Flow Control Valve B is opened. 	<p>Slowly rotates the manual adjust knob on M/A-2D009B Man/Auto Station Control Valve B until the red and black pens are matched.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 201.025.02 _____

Student Name: _____

Step	Action	Standard	Eval	Comments
10.	Wait for flow to stabilize.	Waits for flow to stabilize as indicated by any of the following: - Audible sound change has stopped. - M/A-2D009A Man/Auto Station Control Valve A has completed compensating for the flow change. - Flow Control Station Total Water Flow on FI-2R019-63 gpm.		
11.	Adjust the inservice flow control station manual position indication. <u>Evaluator:</u> Nothing will occur when this is performed. The student should match these needles as closely as possible. The closer the match, the smaller the change, when the controller is placed in manual later.	Slowly rotates the manual adjust knob on MA-2D009A Man/Auto Station Control Valve A until the red and black pens are matched.		
12.	Check total water flow.	Notes that Flow Control Station Total Water Flow FI-2R019 indicates approximately 63 gpm.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 201.025.02

Student Name: _____

Step	Action	Standard	Eval	Comments
13.	Place Flow Control Station A in manual.	Places the Man/Auto switch on M/A-2D009A Man/Auto Station Control Valve A in the MAN position.		
14.	Place Flow Control Station B in automatic.	Rotates the Man/Auto control switch on M/A-2D009B Man/Auto Station Control Valve B to the AUTO position.		
*15	Close Flow Control Valve A. <u>Evaluator:</u> - FCV FV-2F002A will go closed and valve FV-2F002B will open farther to compensate. - The open indicator for FV-2F002A will extinguish.	Slowly rotates the manual adjust knob on M/A-2D009A Man/Auto Station Control Valve A in the counterwise direction until the red pen indicates 0.		
16.	Check total water flow.	Notes that Flow Control Station Total Water Flow FI-2R019 indicates approximately 63 gpm.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 201.025.02

Student Name: _____

Step	Action	Standard	Eval	Comments
17.	Close Flow Control Valve A Iso 246F047A.	Slowly closes Flow Control Valve A Iso 246F047A.		
18.	Check CRD System parameters.	Notes the following parameters: - Flow Control Station Total Water Flow FI-2R019~63 gpm - Downstream P-C/Rea Differential Pressure PDI-2R005 <50 psid - Upstream P-C/Rea Differential Pressure PDI-2R009 is ~250 psig		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. The plant is in Condition 1 at 80 percent reactor power.
- B. CRD System is aligned for normal operation.

INITIATING CUE:

Change CRD flow control stations from FV-2F002A to FV-2F002B.

TASK CONDITIONS:

- A. The plant is in Condition 1 at 80 percent reactor power.
- B. CRD System is aligned for normal operation.

INITIATING CUE:

Change CRD flow control stations from FV-2F002A to FV-2F002B.

JPM Title Shift the CRD Flow Control Stations from A to B

Facility Number

JPM Question Description Effect of low nitrogen pressure during startup

Question

Why does OP-155-C.11 precautions state "Do not depressurize or drain nitrogen accumulator when reactor pressure is < 600 psig with the control rod not full in."?

Answer

Reactor pressure below 600 psig may not provide enough force to insert the control rod in the time required during a scram.

Reference Use Allowed? Yes

Reference 1 Question 3 of JPM 201.012.01

Reference 2

KA 201003A208 RO Value 3.8 SRO Value 3.7

KA Statement Low HCU accumulator pressure/high level

Comments:

Exam Level: RO

JPM Title Shift the CRD Flow Control Stations from A to B

Facility Number

JPM Question Description Flow rate through the FCV on a Scram and reason.

Question

What will be the flow through the CRD drive water flow control valve following a scram and what causes this value of flow to be established?

Answer

The flow control valve receives a close signal due to high flow through the flow instrument. This signal will cause the valve to close, but the valve is designed to pass a specific flow (20 gpm) with the valve closed.

Reference Use Allowed Yes

Reference 1 SY017 K-2 page 15, rev 1.

Reference 2

KA 201001K412 **RO Value** 2.9 **SRO Value** 2.9

KA Statement Controlling CRD system flow

Comments:

Exam Level: SRO

JPM Title Shift the CRD Flow Control Stations from A to B

Facility Number

JPM Question Description Effects on Venting Scram Air Header on Driving Control Rods

Question

Following a failure to scram, the scram air header is vented and is allowed to remain vented. What effect will this have on other actions to insert control rods?

Answer

1. Will NOT be able reset the scram to allow the SDV to drain.
2. Will NOT be able to drive control rods because of no air to the FCVs.

Reference Use Allowed? Yes

Reference 1 SY017 K-2

Reference 2 P&ID 146 and 147

KA 201001K603 **RO Value** 3.0 **SRO Value** 2.9

KA Statement Plant air systems

Comments:

Exam Level: Both

PENNSYLVANIA POWER & LIGHT COMPANY

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 1.50.111.102 0 6/9/94 295016 4.0
Appl. To JPM Number Rev. No. Date NUREG 1123 Sys. No. K/A

Task Title: Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) From the RSDP

Completed By:

Kenneth L. Long 6/9/94
Writer Date

Reviews:

Kenneth L. Long 11/15/94
Instructor/Writer Date

Approval:

Ken V. Chambers 11/18/94
Requesting Supv./C.A. Head Date

B.R. Pitt 11/15/94
Nuclear Trng. Supv. Date

Date of Performance: _____ 20 Min. _____
Allowed Time (Min.) Time Taken (Min.)

JPM Performed By:

Student Name: _____
Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name: _____
Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 1.50.111.102

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc. is required and/or posted as being necessary.

II. REFERENCES

ON-100-009, Control Room Evacuation

OP-150-001, Reactor Core Isolation Cooling (RCIC) System

III. REACTIVITY MANIPULATIONS

This JPM fulfills the requirements for the following reactivity manipulation:

- A. 39 RCIC Manual Start

IV. TASK CONDITIONS

- A. A condition has occurred requiring abandonment of the control room.
- B. All required immediate operator actions of ON-100-009 have been completed prior to abandoning the control room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor vessel water level is decreasing.
- E. Reactor pressure is being maintained by SRVs cycling.
- F. RCIC is not running. There has been no initiation signal.

V. INITIATING CUE

Manually initiate RCIC to restore RPV water level.

Appl. To/JPM No.: S/RO 1.50.111.102

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p>Evaluator: If performed on the simulator:</p> <ul style="list-style-type: none"> • Establish RPV water level approximately 0 inches and stable. • Override HPCI. • Complete operator actions for control room evacuation in the control room IAW ON-100-009. • If <u>not</u> performing JPM 6.00.009.101 prior to this JPM, transfer control and instrumentation to the RSDP IAW ON-100-009. • Place simulator in freeze. • When ready, place simulator in run. 			<p><i>This will be run for same JPM IC @ 1.49.505.101</i></p>
1.	<p>Obtain a controlled copy of OP-150-001, RCIC System.</p> <p>Evaluator: Student may review previous sections of ON-100-009.</p>	<p>Controlled copy of OP-150-001, RCIC System, obtained.</p>		
2.	<p>Select correct section(s) to perform.</p>	<p>Selects section 3.11.</p>		
3.	<p>Review prerequisites.</p>	<p>Ensure prerequisites are met.</p>		

* Critical Step # Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 1.50.111.102

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	Review precautions. • RCIC min flow - will not auto open or close. • < 2200 rpm requires frequent monitoring. • When controlling RCIC speed with trip and throttle valve, make adjustments in small increments to avoid overspeed trip.	Follows precautions while performing RCIC operation.		
5.	Ensure RCIC auto speed control available.	Checks RCIC static inverter red light illuminated.		
6.	Evacuate RCIC pump room and pipe areas during start. EVALUATOR: When properly addressed, inform student "RCIC room and pipe areas are evacuated."	Ensures personnel are evacuated.		
7.	Place RCIC flow controller in manual at minimum.	Places the slide switch on RCIC turbine flow controller FIC-14903 in M (manual position). Depresses the close pushbutton until the output meter on RCIC turbine flow controller FIC-14903 indicates "0."		

* Critical Step # Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 1.50.111.102

Student Name: _____

Step	Action	Standard	Eval	Comments
8.	Start RCIC barometric condenser vacuum pump.	Places handswitch for RCIC baro cdsr vacuum pp 1P219 to start.		
9.	Startup RCIC turbine. <u>EVALUATOR:</u> As steam to RCIC turbine HV-150-F045 opens, RCIC turbine speed will increase (FI-14903).	<ul style="list-style-type: none"> • Opens steam to RCIC turbine HV-150-F045. • Observes RCIC turbine accelerates. 		
10.	Provide minimum flow protection.	Opens min flow to supp pool FV-149-F019.		
11.	Open the RCIC injection valve.	Opens RCIC injection valve HV-149-F013.		
*12.	Establish desired flow. <u>Evaluator:</u> Desired flowrate is that flow required to trend toward or maintain a RPV water level +13 to +54 inches, or 625 gpm (rated flow) if level decreasing.	<ul style="list-style-type: none"> • Adjusts the RCIC turbine flow controller FIC-14903 until desired flow rate is achieved. • When RCIC flowrate is above 250 gpm, close min flow to supp pool FV-149-F019. 		

* Critical Step # Critical Sequence

PERFORMANCE & CHECKLIST

Appl. To/JPM No.: S/RO 1.52.125.102

Student Name: _____

Step	Action	Standard	Eval	Comments
13.	Establish automatic flow control.	<ul style="list-style-type: none"> • Nulls the RCIC turbine flow controller FIC-14903 by using the open/close pushbuttons, or adjusting the tape set thumbwheel. • Places the M/A slide switch in the A (auto) position. 		
14.	Place ESW in service to supply RCIC room cooler. <u>EVALUATOR:</u> When need for ESW is identified by the student, inform the student that for the purpose of this JPM it may be assumed ESW is in operation.	Identifies the need to have ESW in service for room coolers.		
15.	Place suppression pool cooling in service. <u>Evaluator:</u> When the need for SPC is identified by the student, inform the student that for the purpose of this JPM, it may be assumed, SPC is in operation.	Identifies the need for suppression pool cooling.		

* Critical Step # Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 1.50.111.102

Student Name: _____

Step	Action	Standard	Eval	Comments
16.	Confirm local conditions for the RCIC system. <u>EVALUATOR:</u> As requested, inform the student that equipment is operating as required, CST level is 80%.	State the requirement or directs a NPO to: • Ensure RCIC room cooler fan is running. • Ensure RCIC lube oil cooling water valve HV-150-F046 is open. • Check RCIC baro cdsr cond pump 1P220 cycles as necessary. • Monitor CST level locally.		

* Critical Step # Critical Sequence

TASK CONDITIONS:

- A. A condition has occurred requiring abandonment of the control room.
- B. All required immediate operator actions of ON-100-009 have been completed prior to abandoning the control room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor vessel water level is decreasing.
- E. Reactor pressure is being maintained by SRVs cycling.
- F. RCIC is not running. There has been no initiation signal.

INITIATING CUE:

Manually initiate RCIC to restore RPV water level.

TASK CONDITIONS:

- A. A condition has occurred requiring abandonment of the control room.
- B. All required immediate operator actions of ON-100-009 have been completed prior to abandoning the control room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor vessel water level is decreasing.
- E. Reactor pressure is being maintained by SRVs cycling.
- F. RCIC is not running. There has been no initiation signal.

INITIATING CUE:

Manually initiate RCIC to restore RPV water level.

JPM Title Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) from RSDP

Facility Number 1.50.111.102

JPM Question Description Why is it necessary to ensure that the Topaz Inverter is energized.

Question

Why is the Topaz Inverter required to be is energized?

Answer

The TOPAZ inverter supplies power to the speed control circuit.

Reference Use Allowed? Yes

Reference 1 SY017 C-6, Information, page 24.

Reference 2

KA 217000K203 RO Value 2.7 SRO Value 2.8

KA Statement RCIC flow controller

Comments:

Exam Level: RO

JPM Title Establish and Maintain Reactor Vessel Level (RCIC Not Injecting) from RSDP

Facility Number 1.50.111.102

JPM Question Description What initiated room cooling.

Question

1. What is the status of RCIC area cooling?
2. What signal(s) placed the area cooler(s) in operation?

Answer

1. One cooler will be running.
2. Opening the steam admission valve started the cooler.

Reference Use Allowed? Yes

Reference 1 SY017 C-5, page 22, rev. 1.

Reference 2

KA 217000A213 **RO Value** 2.9 **SRO Value** 3.0

KA Statement Loss of room cooling

Comments:

Exam Level: RO

PENNSYLVANIA POWER & LIGHT COMPANY

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 1.49.505.101 0 6/13/94 295015 4.1
Appl. To JPM Number Rev. No. Date NUREC 1423 Sys. No. K/A

Task Title: PLACE RHR IN SUPPRESSION POOL COOLING USING RHR PUMP 1P202B
AT RSDP

Completed By:

K. L. Long 6/13/94
Writer Date

Reviews:

Kenneth J Long 9/26/94
Instructor/Writer Date

Approval:

Kenn V. Chambers 9/29/94
Requesting Supv./C.A. Head Date

B.R. Stue 9/26/94
Nuclear Trng. Supv. Date

Date of Performance: _____ 15 _____
Allowed Time (Min.) Time Taken (Min.)

JPM Performed By:

Student Name: _____
Last First M.I. Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name: _____
Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
1.49.505.101

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment ; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

- A. ON-100-009, Control Room Evacuation
- B. OP-149-005, RHR Operation in Suppression Pool Cooling Mode

III. REACTIVITY MANIPULATIONS

This JPM fulfills the requirement of the following reactivity manipulation(s):

NONE

IV. TASK CONDITIONS

- A. A condition has occurred which has required abandonment of the Control Room.
- B. All immediate operator actions of ON-100-009 were completed prior to abandoning the Control Room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor pressure is being maintained by the SRV's cycling.
- E. RPV water level is >-38" and stable.
- F. ESW System is in service IAW OP-054-001.
- G. RHRSW B Loop is in service IAW OP-116-001.

V. INITIATION CUE

Place B Loop RHR in Suppression Pool Cooling

Appl. To/JPM No.: 1.49.505.101

Student Name: _____

Step	Action	Standard	Eval	Comments
	<p>EVALUATOR: If performed on the simulator:</p> <ul style="list-style-type: none"> • Establish RPV water level approximately 0 inches. • Complete operator actions for Control Room Evacuation, in the control room IAW ON-100-009. • If NOT performing JPM 6.00.009.101 prior to this JPM, transfer control and instrumentation to the RSDP IAW ON-100-009. • Start B & D ESW Pumps. • Place B Loop RHRSW in service at 9000 gpm. • Place simulator in FREEZE. • When ready to begin, place the simulator in RUN. <p>1. Obtain controlled copy of OP-149-005.</p> <p>EVALUATOR: Student may review previous sections of ON-100-009.</p> <p>2. Select correct section(s) to perform.</p> <p>3. Review prerequisites.</p>	<p>Controlled copy obtained.</p> <p>Selects section 3.5.</p> <p>Ensures prerequisites met.</p>		

* Critical Step # Critical Sequence

Appl. To/JPM No.: 1.49.505.101

Student Name: _____

Step	Action	Standard	Eval	Comments
4.	Review precautions when controlled from RSDP: • RHR MIN FLOW 1F007B will not auto open or close. • RHR Pump B will not auto start on LPCI Signal. • RHR Loop B will not auto align for LPCI.	Follows precautions while performing RHR operations.		
5.	Ensure ESW Loop B in operation.	Notes ESW in service per task sheet.		
6.	Ensure RHRSW in operation.	Notes RHRSW in service per task sheet.		
7.	Stop 2B RHR Pump if running. EVALUATOR: When 2B RHR Pump is addressed, inform the student, RHR Pump 2B is not running.	States the requirement/ directs NPO to stop RHR Pump 2B if running.		
8.	Align RHR Loop B for a pump start.	<ul style="list-style-type: none"> • Checks HX B SHELL SIDE BYPASS HV-151-F048B open. • Opens SUPPRESSION CHAMBER SPRAY TEST SHUTOFF HV-151-F028B. • Check RHR MIN FLOW HV-151-F007B open. 		

* Critical Step # Critical Sequence

Appl. To/JPM No.: 1.49.505.101

Student Name: _____

Step	Action	Standard	Eval	Comments
9.	<p>Ensure B Loop RHR is filled and vented.</p> <p><u>EVALUATOR</u>: When requested, inform the student B Loop RHR local discharge pressure is 75 psig.</p> <p><u>EVALUATOR</u>: When requested as NLO, inform the student B Loop RHR has been manually checked filled and vented IAW OP-149-001, section 3.6 and B Loop RHR Pumps are checked ready for a start.</p>	<p>Directs NLO to obtain B Loop RHR local discharge pressure.</p> <p>Directs NLO to check RHR Loop B filled and vented.</p>		
10.	Start B RHR Pump.	Momentarily places handswitch for B RHR Pump 1P202B to START.		
*11.	Establish flow to suppression pool.	<ul style="list-style-type: none"> • Throttles TEST LINE CTL HV-151-F024B to achieve and maintain flow through the heat exchanger, not to exceed 10,000 gpm. • Closes RHR Pump MIN FLOW HV-151-F007B when at least 3000 gpm loop flow has been reached. • Throttle closed HX B SHELL SIDE BYPASS HV-151-F048B. 		

* Critical Step # Critical Sequence

Appl. To/JPM No.: 1.49.505.101

Student Name: _____

Step	Action	Standard	Eval	Comments
12.	Ensure room cooler running. EVALUATOR: When requested, inform the student RHR Room Cooler 1V202B is running.	States the requirement/ directs NLO to check RHR Room Cooler 1V202B running.		

* Critical Step # Critical Sequence

TASK CONDITIONS:

- A. A condition has occurred which has required abandonment of the Control Room.
- B. All immediate operator actions of ON-100-009 were completed prior to abandoning the Control Room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor pressure is being maintained by the SRV's cycling.
- E. RPV water level is $>-38''$ and stable.
- F. ESW System is in service IAW OP-054-001.
- G. RHRSW B Loop is in service IAW OP-116-001.

INITIATING CUE

Place B Loop RHR in Suppression Pool Cooling

TASK CONDITIONS:

- A. A condition has occurred which has required abandonment of the Control Room.
- B. All immediate operator actions of ON-100-009 were completed prior to abandoning the Control Room.
- C. Transfer switch positions have been changed on the RSDP IAW ON-100-009, section 4.3.
- D. Reactor pressure is being maintained by the SRV's cycling.
- E. RPV water level is $>-38"$ and stable.
- F. ESW System is in service IAW OP-054-001.
- G. RHRSW B Loop is in service IAW OP-116-001.

INITIATING CUE

Place B Loop RHR in Suppression Pool Cooling

JPM Title Place RHR SPC in Suppression Pool Cooling using RHR Pump IP202B at RSDP

Facility Number 1.49.505.101

JPM Question Description Effect of not starting ESW.

Question

If ESW where not started, what specific RHR coolers would not have cooling?

Answer

RHR Motor Lube Oil Cooler and RHR Pump room cooler

Reference Use Allowed Yes

Reference 1 SY017 M-1, page 5, rev. 2.

Reference 2

KA 219000K111 RO Value 3.0 SRO Value 3.0

KA Statement Component cooling water systems

Comments:

Exam Level: SRO

JPM Title Place RHR SPC in Suppression Pool Cooling using RHR Pump IP202B at RSDP

Facility Number 1.49.505.101

JPM Question Description RHR flow limitations

Question

Why is suppression pool cooling flow rate required to be maintained less than 10,000 gpm?

Answer

Flow rates greater than 10,000 gpm can adversely affect RHR heat exchanger structural integrity

Reference Use Allowed? Yes

Reference 1 OP-149-005, page 9, rev. 13.

Reference 2

KA 223001G010 RO Valve 3.2 SRO Value 3.6

KA Statement Ability to explain and apply all system limits and precautions

Comments: Replaced TS entry conditions for Supp. Pool Temp because of written examination questions.

Exam Level: SRO

**PENNSYLVANIA POWER & LIGHT COMPANY
JOB PERFORMANCE MEASURE
APPROVAL AND ADMINISTRATIVE DATA SHEET**

RO 9.013.001.102 1 09/26/96 295031 EA1.08 3.8
 Appl To JPM Number Rev No. Date NUREG 1123 Sys. No. K/A

Task Title: Fire Protection System Crosstie to RHRSW, ES-013-001 (At the ESW Pumphouse)

Completed By:

Reviews:

John J. Petrilla
Writer

09/26/96
Date

John Petrilla III
Instructor/Writer

9/27/96
Date

Approval:

[Signature]
Requesting Supv./C.A. Head

9/2/96
Date

[Signature]
Nuclear Training Supv.

9/3/96
Date

Date of Performance:

25 Min
Allowed Time (Min)

_____ Time Taken (Min)

JPM Performed By:

_____ Last

_____ First

_____ M.I.

_____ Employee #/S.S. #

Performance Evaluation: () Satisfactory () Unsatisfactory

Evaluator Name:

_____ Signature

_____ Typed or Printed

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
S/RO 9.13.001.102

I. SAFETY CONSIDERATIONS

- A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-001, Operations Shift Policies.
- B. All applicable safety precautions shall be taken in accordance with established PP&L safety policies and the Safety Rule Book, for example:
 - 1. Whenever any electrical panel is opened for inspection during JPM performance.
 - 2. Whenever entering any plant area where specific safety equipment; such as hearing or eye protection, safety shoes, hardhats, etc; is required and/or posted as being necessary.

II. REFERENCES

- A. ES-013-001, Fire Protection System Crosstie to RHRSW

III. TOOLS AND EQUIPMENT

None

IV. TASK CONDITIONS

- A. A LOCA has occurred and all control rods are full-in.
- B. A Rapid Depressurization has been manually performed IAW EO-100-112 with the reactor pressure at approximately 30 psig and stable.
- C. The EOPs direct implementing ES-013-001, Fire Protection System Crosstie to RHRSW.
- D. The Diesel Engine Driven Fire Pump OP511 is operating IAW OP-013-001.

V. INITIATING CUE

Crosstie the Fire Protection System to the 1A RHRSW Pump Discharge IAW ES-013-001, Fire Protection System Crosstie to RHRSW (at the ESW Pumphouse).

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 9.013.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
1.	<p><u>Evaluator:</u> - Prior to performing this JPM, obtain a copy of the latest revision of ES-013-001 and mark it up as if it was actually to be performed and provide it to the student along with the Task Conditions/Initiating Cue Sheet.</p> <p>Review Sections 1.0 through 3.0.</p>	<p>Review all sections.</p> <p>Follows all precautions as applicable.</p>		
2.0	<p>Notes Shift Supervisor approval to perform Section 4.0.</p>	<p>Observes Shift Supervisor signature, date, and time in Step 4.1 of the procedure.</p>		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 9.013.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
3.	Obtain the required equipment. Evaluator: With Shift Supervision permission, have the student show you the required equipment, but do not remove it from the normal storage location.			
4.	Makes proper notification.	Notify Security the ESW Pumphouse security door will be blocked open.		
5.	Locate Hose House 1FH122. Evaluator: Hose House 1FH122 is located outside the ESW Pumphouse.	Correctly identifies Hose House 1FH122.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 9.013.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
*6.	Route the 2-1/2 inch fire hose from the hydrant at the Hose House 1FH122 to RHRSW Loop A Supply Fire Hose Isolation 012062. <u>Evaluator:</u> RHRSW Loop A Supply Fire Hose Isolation 012062 valve is located on RHRSW 1A-2A discharge header inside ESSW Pumphouse pit, (southeast corner of pumphouse).	Correctly indicates the path the 2-1/2 inch hose would be routed.		
*7.	Connect the 2-1/2 inch fire hose to 012062.	Properly connects the 2-1/2 inch fire hose to 012062.		
8.	Ensure Diesel Engine Driven Fire Pump OP511 Operating IAW OP-013-001. <u>Evaluator:</u> Indicate the Diesel Engine Driven Fire Pump OP511 is operating IAW OP-013-001.	Ensures Diesel Engine Driven Fire Pump OP511 Operating IAW OP-013-001.		
9.	Perform Loop 1A valve lineup per ES-013-001, Section 3.8.1 through 3.8.7 or call Control Room to verify/position valves per these sections.	<u>Evaluator:</u> Student can perform Loop 1A valve alignment or verify with Control Room operator that valves are in correct positions.		

*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 9.013.001.102

Student Name: _____

Step	Action	Standard	Eval	Comments
*10.	At the ESSW Pumphouse, open RHRSW Loop A Supply Fire Hose Isolation 012062. <u>Evaluator:</u> Inform the student, the EOPs directs RPV Injection using Fire Protection Water.	Manually opens RHRSW Loop A Supply Fire Hose Isolation 012062.		
*11.	Open Fire Hydrant valve for 2-1/2 inch hose. <u>Evaluator:</u> Inform the student the JPM is concluded.	Manually opens Fire Hydrant valve for 2-1/2 inch hose.		

*Critical Step

#Critical Sequence

TASK CONDITIONS:

- A. A LOCA has occurred and all control rods are full-in.
- B. A Rapid Depressurization has been manually performed IAW EO-100-112 with the reactor pressure at approximately 30 psig and stable.
- C. The EOPs direct implementing ES-013-001, Fire Protection System Crosstie to RHRSW.
- D. The Diesel Engine Driven Fire Pump OP511 is operating IAW OP-013-001.

V. INITIATING CUE

Crosstie the Fire Protection System to the 1A RHRSW Pump Discharge IAW ES-013-001, Fire Protection System Crosstie to RHRSW (at the ESW Pumphouse).

TASK CONDITIONS:

- A. A LOCA has occurred and all control rods are full-in.
- B. A Rapid Depressurization has been manually performed IAW EO-100-112 with the reactor pressure at approximately 30 psig and stable.
- C. The EOPs direct implementing ES-013-001, Fire Protection System Crosstie to RHRSW.
- D. The Diesel Engine Driven Fire Pump OP511 is operating IAW OP-013-001.

V. INITIATING CUE

Crosstie the Fire Protection System to the 1A RHRSW Pump Discharge IAW ES-013-001, Fire Protection System Crosstie to RHRSW (at the ESW Pumphouse).

JPM Title Fire Protection System Crosstie to RHRSW (At the ESW Pump House)

Facility Number 9.13.001.102

JPM Question Description Describe the flow path from the source to the core for using fire water for core cooling.

Question

Illustrate the flow path, from the source to the core, established for injecting via loop B of RHR using the Fire Protection System using P&ID.

Answer

Show flow path on P&ID.

Reference Use Allowed? Yes

Reference 1 ES-013-001

Reference 2

KA 286000A105 **RO Value** 3.2 **SRO Value** 3.2

KA Statement System lineups

Comments: Add information to the answer during the on-site review.

Exam Level: Both

JPM Title Fire Protection System Crosstie to RHRSW (At the ESW Pump House)

Facility Number 9.13.001.102

JPM Question Description Response of the fire protection system to initiation at a specific flow.

Question

This procedure is completed and the operator establishes 3500 gpm to the vessel. What would be the response of the fire pumps as flow is increased?

Answer

The motor driven pump would have started when system pressure decreased (to 95 psig). (It only has a capacity of 2500 gpm). Further pressure decrease (to 85 psig), will start the diesel driven pump.

Setpoints not required.

Reference Use Allowed? Yes

Reference 1 OP-01 3-001, page 6 and 7, revision 13.

Reference 2

KA 286000A301 **RO Value** 3.4 **SRO Value** 3.4

KA Statement Fire water pump start

Comments:

Exam Level: Both