

Scenario Title: INADVERTENT START OF HPCS FOLLOWED BY TURBINE TRIP WITHOUT BYPASS

Scenario Duration: 1 hour

Scenario Number: 02-REQ-009-1DY-2-08

Revision Number: 2

Course: Licensed Operator Requal

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Operations Training Supervisor Date

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Assistant Training Superintendent Date

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Superintendent of Operations Date

MASTER
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Rev. 2

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SCENARIO SUMMARY

INADVERTENT START OF HPCS FOLLOWED BY TURBINE TRIP WITHOUT BYPASS

The crew will assume shift with the plant operating at 100% power.

At time 5, rod 18-03 will drift in. Operator response will be in accordance with OP-30, H.5. The rod should be inserted and disarmed per tech. specs.

At time 13, HPCS will spuriously initiate. Operators should verify the initiation is spurious, secure HPCS, and declare the system INOP until it is repaired.

As HPCS is secured, the Feedwater Master controller will fail "as is" with the Steam Flow/Feed Flow mismatch which will cause level to slowly decrease. Operators should assume manual control of feedwater to correct the problem.

At time 30, the EHC pressure controllers will both fail low. The B steam pressure meter will stick "as is" and the bypass valves are stuck closed. A turbine trip without bypass event ultimately results in Reactor Scram. Operators should carry out scram actions and recognize that some control rods failed to insert. They should establish pressure control with SRVs per EOP-RP.

Before time 35, the Reactor Feed Pumps will trip resulting in a loss of all feedwater. If repaired, HPCS will initiate to restore level. RCIC will fail to initiate. Operator action to start RCIC manually, (secure HPCS), or use condensate booster pumps will be required to regain level control.

The scenario will be terminated when level control is established IAW the EOPs, RHS is in suppression pool cooling, and an UNUSUAL EVENT has been declared because of the valid ECCS initiation and injection.



SCENARIO OBJECTIVES

The Licensed Control Room Reactor Operations (CSO and NAOE):

Perform the Actions Required for a Control Rod Drift

Task Number 2000490501 K/A Rating 3.20

Requal TIF 3.51 Class, Simulator

Perform the Actions Required for a Complete Loss of Feedwater

Task Number 2009080501 K/A Rating 3.60

Requal TIF 3.81 Class, Simulator

Perform Mode Switch Transfer in Accordance with Requirements of OP-101A, B, C

Task Number 2019230101 K/A Rating 4.00

Requal TIF 3.18 Simulator

Return the HPCS System to Standby after an Initiation

Task Number 2060030101 K/A Rating 3.60

Requal TIF 3.42 Class, Simulator

Respond to a Feedwater LCV Lockup/Hydraulic Failure

Task Number 2599110401 K/A Rating 3.70

Requal TIF 3.12

The Licensed Senior Reactor Operators (SSS and ASSS):

Classify Emergency Events Requiring Emergency Plan Implementation

Task Number 3440190303 K/A Rating 4.70

Requal TIF 4.28 Simulator

Direct the Actions Required per EOP-RPV Section RQ

Task Number 3449390603 K/A Rating 4.70

Requal TIF 4.40 Class, Simulator

Direct the Actions Required Per EOP-RPV Section RL

Task Number 3449400603 K/A Rating 4.70

Requal TIF 4.33 Class, Simulator

Direct the Actions Required per EOP-RPV Section RP

Task Number 3449410603 K/A Rating 4.70

Requal TIF 4.33 Class, Simulator

Respond to a control Rod Drift

Task Number 3449740403 K/A Rating 3.70

Requal TIF

(*) Individual Simulator Critical Task

(**) Crew Simulator Critical Task



NMP 2 CONTROL ROOM REFERENCES

PROCEDURES:

OP-30, H.5.0, Control Rod Drive
OP-31, E.7.0, Residual Heat Removal System
OP-33, G.2.0, High Pressure Core Spray
OP-35, E.3.0, Reactor Core Isolation Cooling
OP-35, F.2.0, Reactor Core Isolation Cooling
OP-101C, H, Scram and Scram Recovery

EOP-RQ, RPV Power Control
EOP-RL, RPV Water Level Control
EOP-RP, RPV Pressure Control
EAP-2, Classification of Emergency Conditions
EPP-20, Emergency Notifications
EPP-25, Emergency Reclassification and Recovery

TECHNICAL SPECIFICATIONS:

3.1.3.1
3.3.1 and Table 3.3.1-1, Note C
3.5



TIME

EVENT

INSTRUCTOR ACTIVITY

PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

Special Instructions:

Markup as out-of-service:

None

Simulator Operation:

Initialize: IC-20

100%, BOL, Above 100% Rod Line

Preset Malfunctions:

1,RC01

RCIC Auto Start Fail

2,RD17DF,0

Control Rods Stuck

3,RD041803,,0005

Rod 18-03 Drift in

Preset Remote Functions:

None

Preset I/O Overrides

1,ES1A-537-A,20:00,DAM

RCIC Man Init PB Fails as is

Distribute and discuss

Turnover sheets

Initial Conditions:

100%, BOL, maintaining

power in OP-101D

RWM GR-147, Rod 38-15

Out-of-service equipment:

None

Surveillances scheduled:

None



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
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Allow not more than five minutes to walk down the panels.

Walk panels.

T = 0

Commence the scenario

Assume the shift; continue power operation.

T = 5

1

Malfunction 3 effective

Control Rod 18-03
Drift in

RO

Report/respond to alarms 1a;6a

CSO/RO

Enters OP-30, H.5 3a

(*)1. Identifies rod/reports to SSS. 4a Sat/Unsat

Task #2000490501

K/A Rating: 3.20

2. Selects rod for display 5a,b

3. Withdraws rod 1 notch 5a,b

Team

(**) 1. Notifies reactor analyst 6b Sat/Unsat

Task #3449740403

K/A Rating 3.70

ROLE PLAY: As Reactor Analyst, suggest that rod be withdrawn.



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		<p>ROLE PLAY: As AOE, report that everything looks normal.</p> <p>ROLE PLAY: As AOE, wait several minutes before reporting back that the rod 18-03 is valved out. Clear Malfunction #3 1 minute after 2RDS*V102 is shut.</p>		<p>SSS/ASSS</p> <p>Reviews TS (3.1.3.1)</p> <p>CSO/RO</p> <ol style="list-style-type: none"> 1. Directs plant operator to check scram valves for leak, DCV for proper operation. 2. After check, directs RO to fully insert rod 18-03. 3. Directs plant operators to valve out or electrically disarm rod 18-03. 	<p>3d</p> <p>3b;4b</p> <p>3b</p> <p>6b</p>
T = 13		<p>Set Malfunction HPCS</p> <p>Inadvertent Initiation</p> <p>MF; 4,CS01,,,0015</p>			
T = 15	2	<p>Malfunction 4 effective; high level alarm within 30 seconds</p>	<p>Reactor level increases as HPCS injects</p>	<p>CSO/RO</p> <p>Report/respond to alarms</p>	<p>1a;6a</p>



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		<p>ROLE PLAY: As "requested", if asked; cause of failure is a short between jacks D and F on test block J1</p> <p>When block is ordered removed, Clear Malfunction #4</p> <p>As BOP secures HPCS, Set Malfunction FW Master Controller Fails As Is</p> <p>HF; 5,FW15</p>		<p>(**) Team</p> <p>1. Reports HPCS initiation</p> <p>2. Determine HPCS initiation not required</p> <p>Task #2060030101</p> <p>K/A Rating 3.60</p>	<p>Sat/Unsat</p> <p>4a,6a</p> <p>6a,c</p>
3			<p>Level decreases as HPCS is CSO/RO secured</p>	<p>Responds to level decrease</p> <p>1. Verifies FW valves not responding</p> <p>(*)2. Takes manual control</p> <p>Master manual</p> <p>or</p> <p>Individual loop valves</p> <p>Task #2599110401</p> <p>K/A Rating 3.70</p> <p>3. Restore and maintain level between 178" and 187".</p>	<p>2a;6a</p> <p>5c Sat/Unsat</p> <p>4a;5a,b</p>



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				SSS/ASSS	
				Enter Technical Specifications for LCOs and action statements (3/4.5)	3d
T = 30		Set I/O override IO; 3,H8,,92 Set Malfunction Turbine Bypass Valves Fail Shut MF; 6,TC06,,,0034 Set Malfunction EHC Press Reg B Fails Low MF; 7,TC02B,,,0034 Set Malfunction EHC Press Reg A Fails Low MF; 8,TC02A,,,0035 Set Malfunction Feed Pumps Trip MF; 9,FW03,,,0035	EHC B Steam Pressure meter remains at constant value regardless of following malfunction		
T = 35	4	Malfunctions 8 & 9 effective	Turbine trip without bypass; scram	CS0/R0 Performs actions of OP-101C, H.1.0	3b



TIME

EVENT

INSTRUCTOR ACTIVITY

PLANT RESPONSE

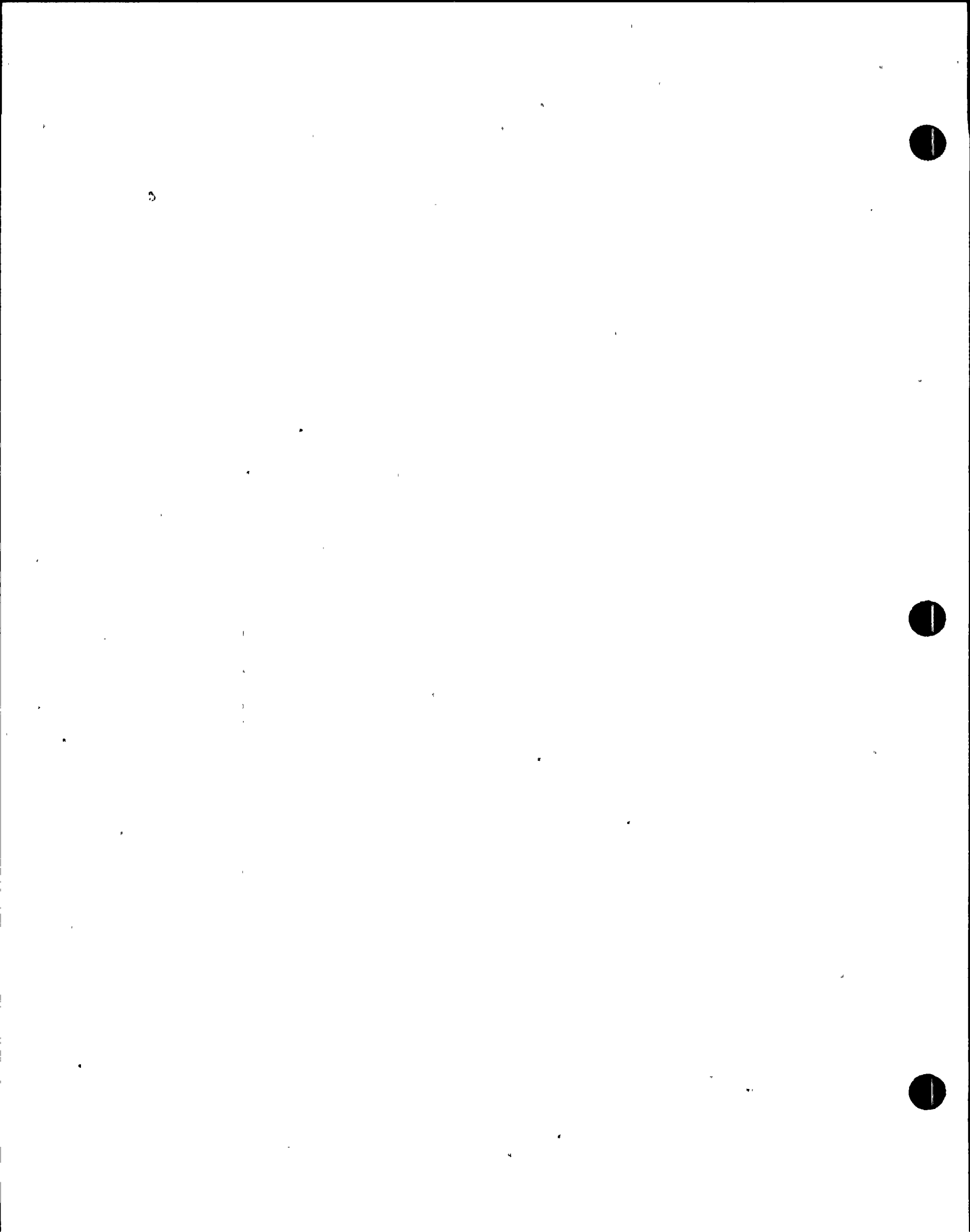
OPERATOR ACTIONS

EVALUATOR COMMENTS

- (*)1. Mode switch to S/D 5a,b Sat/Unsat
 Task #2019230101
 K/A Rating 4.00
- 2. Ensure scram 4a
 Full core display
 RSCS
 RWM
 OD-7
- 3. Report some rods out, 4a
 but APRMs decreasing
- 4. Insert SRM/IRM 5a,b
- 5. Verify turbine trip 5a,b
- 6. Verify/transfer house 4a;5a,b
 loads
- 7. Verify/report SDV 4a;6a
 vents/drains shut
- 8. Verify/report recirc at 4a;6a
 low speed

Team

- 1. Recognize pressure is controlled with SRV's.



TIME

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INSTRUCTOR ACTIVITY

PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

SSS

(*)Enter EOP-RPV Control
and order:

Sat/Unsat

- 1. Pressure controlled
 <1076 psig with SRVs
- 2. SP cooling initiated
- 3. Level restored and
 maintained 159.3" to
 202.3" IAW EOP-RL.

Task #3449390603

K/A Rating 4.70

Task #3449400603

K/A Rating 4.70

Task #3449410603

K/A Rating 4.70

(**) Team

Sat/Unsat

Restore and maintain level
159.3" to 202.3"

Task # 2009080501

K/A Rating 3.60



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
5			Performs in order #1 = PSV 128 #2 = PSV 133 #3 = PSV 123 #4 = PSV 124 etc.	CSO/RO 1. Opens SRV's a. Place keylock to OPEN b. Monitor reactor pressure c. Place keylock to AUTO 2. Place RHR in Suppression Pool cooling IAW OP-31, E.7.0 a. SWP to RHR HX Open SWP MOV 90 Throttle SWP MOV 33 to 7,400 gpm b. Start RHR pump c. Throttle RHS FV 38 to 7,450 gpm (Return to SP) d. Throttle HX Bypass RHS MOV 8 to vary cooling e. Monitor/report SP temp- erature	5a,b 4a 5a,b 3b 5a,b 4a;5a,b 5a,b 4a;5a,b 4a;5a,b 2a;4a;6a





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Note: The crew may opt to
use HPCS pump by
taking out of PTL.

TERMINATION CUES:

Level 159.3" to 202.3"

and

Pressure controlled <1076 psig

SSS/ASSS

(*)1. Classifies event as an

2b,c Sat/Unsat

Unusual Event based on
valid ECCS initiation and
injection

Task #3440190303

K/A Rating 4.70

2. Makes notifications

4b;6b

