

Scenario Title: SMALL LOCA INSIDE PRIMARY CONTAINMENT

Scenario Duration: 50 minutes

Scenario Number: 02-REQ-009-1DY-2-17

Revision Number: 0

Course: Licensed Operator Requal

Reviewed By: *[Signature]* / 2/16/90  
Operations Training Supervisor Date

Reviewed By: *R. T. Seyfried* / 2-17-90  
Assistant Training Superintendent Date

Approved By: *[Signature] for M. J. Colomb* / 2/17/90  
Superintendent of Operations Date

MASTER  
CONTROLLED  
DOCUMENT  
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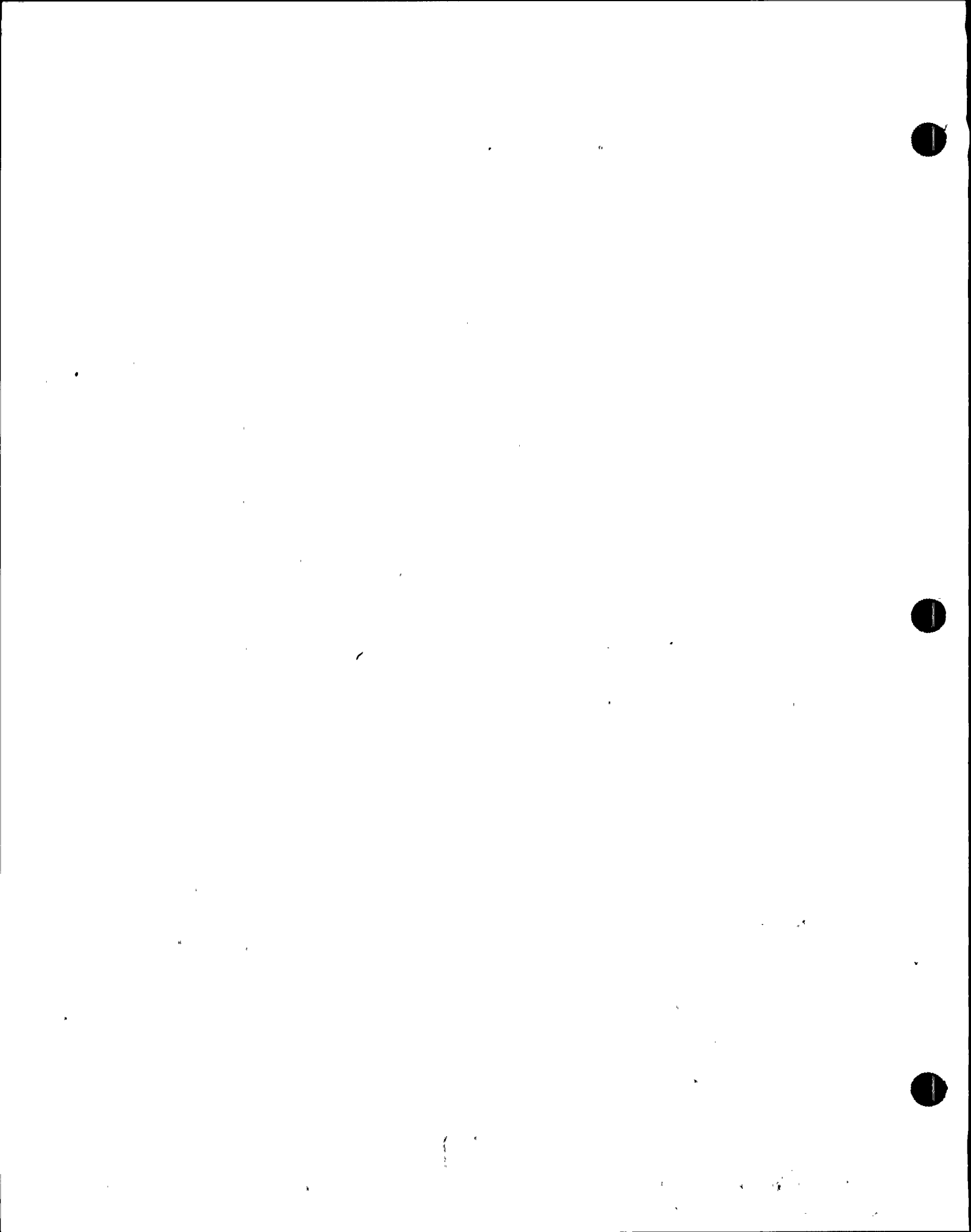
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Rev. 0

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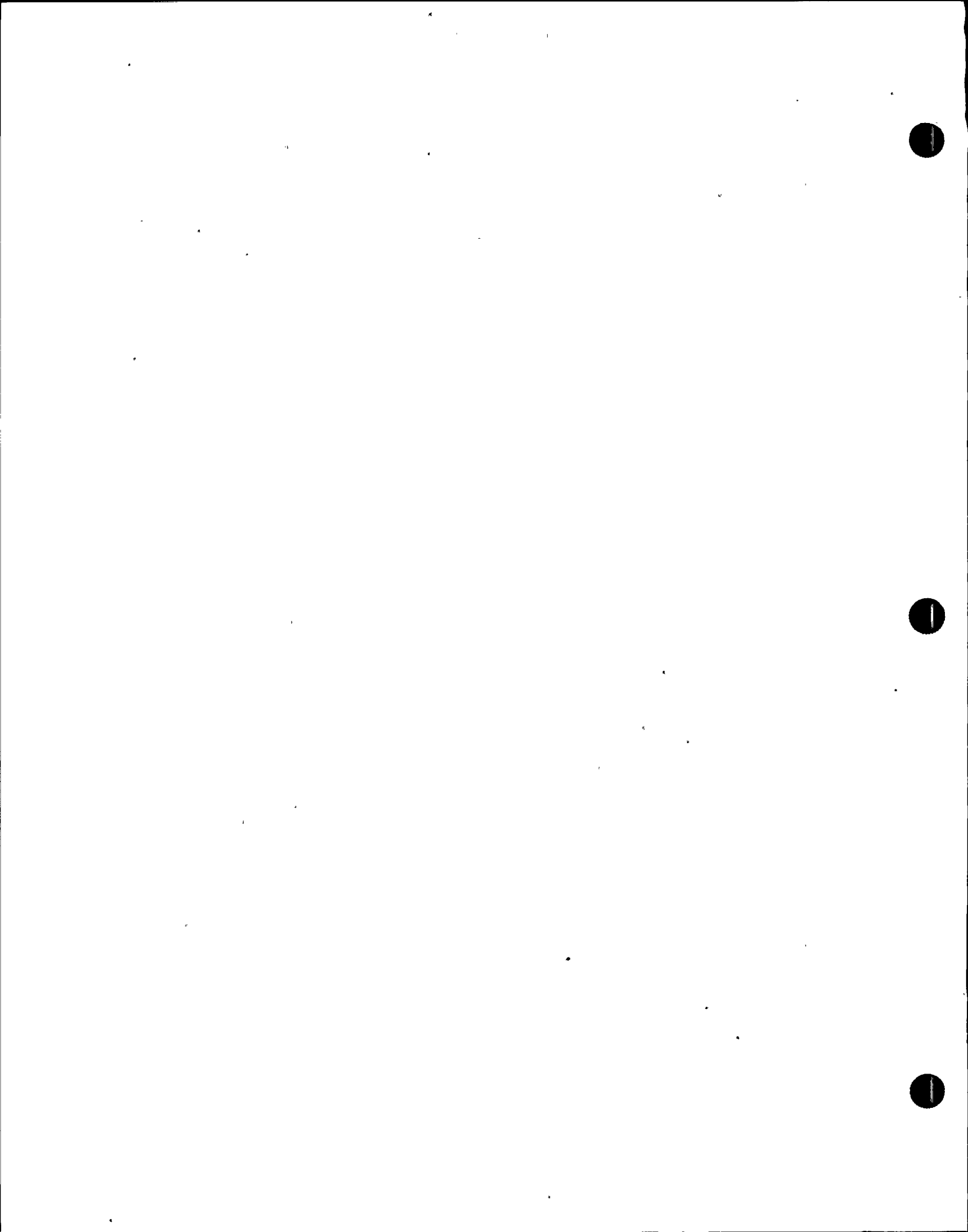
## SCENARIO SUMMARY

### SMALL LOCA INSIDE PRIMARY CONTAINMENT

The scenario begins at power. While at power the Feedwater Master Controller fails as is, followed by a loss of extraction steam to the B 6th point heater. When reducing power a reactor water level high condition is discovered and corrected.

A drywell floor drain high leak rate is discovered with increasing drywell temperatures and pressures. When scrambling the reactor, the bypass valves fail to open and the SRVs lift.

The Operators should enter the scram procedure and RPV control and primary containment control and primary containment control EOPs. Suppression chamber spray and drywell spray should be established to control drywell pressure and temperature as the LOCA becomes more severe.



## SCENARIO OBJECTIVES

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

Perform Post Scram Recovery Actions in Accordance with N2-OP-101C

Task Number 2019250101 K/A Rating 4.30

Requal TIF 3.35 Class, Simulator

Task Number 2010130101 K/A Rating 4.10

Requal TIF 3.67 Class, Simulator

Perform Lineups on the RHR System

Task Number 2050010101 K/A Rating 3.80

Requal TIF

Operate the Containment Spray System

Task Number 2050150101 K/A Rating 3.80

Requal TIF 3.44 Class, Simulator

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

Direct the Actions Required per EOP-PC Section DWT

Task Number 3449420603 K/A Rating 4.70

Requal TIF 4.36 Class, Simulator

Direct the Actions Required per EOP-PC Section PCP

Task Number 3449430603 K/A Rating 4.70

Requal TIF 4.36 Class, Simulator

Direct the Actions Required per EOP-PC Section SPL

Task Number 3449440603 K/A Rating 4.70

Requal TIF 4.36 Class, Simulator

Direct the Actions Required per EOP-PC Section SPT

Task Number 3449450603 K/A Rating 4.70

Requal TIF 4.33 Class, Simulator



SCENARIO OBJECTIVES (Cont'd)

Direct the Operator Actions for an Increasing Drywell Pressure  
Task Number 3449900403 K/A Rating 4.10  
Requal TIF

(\*) Individual Simulator Critical Task  
(\*\*) Crew Simulator Critical Task





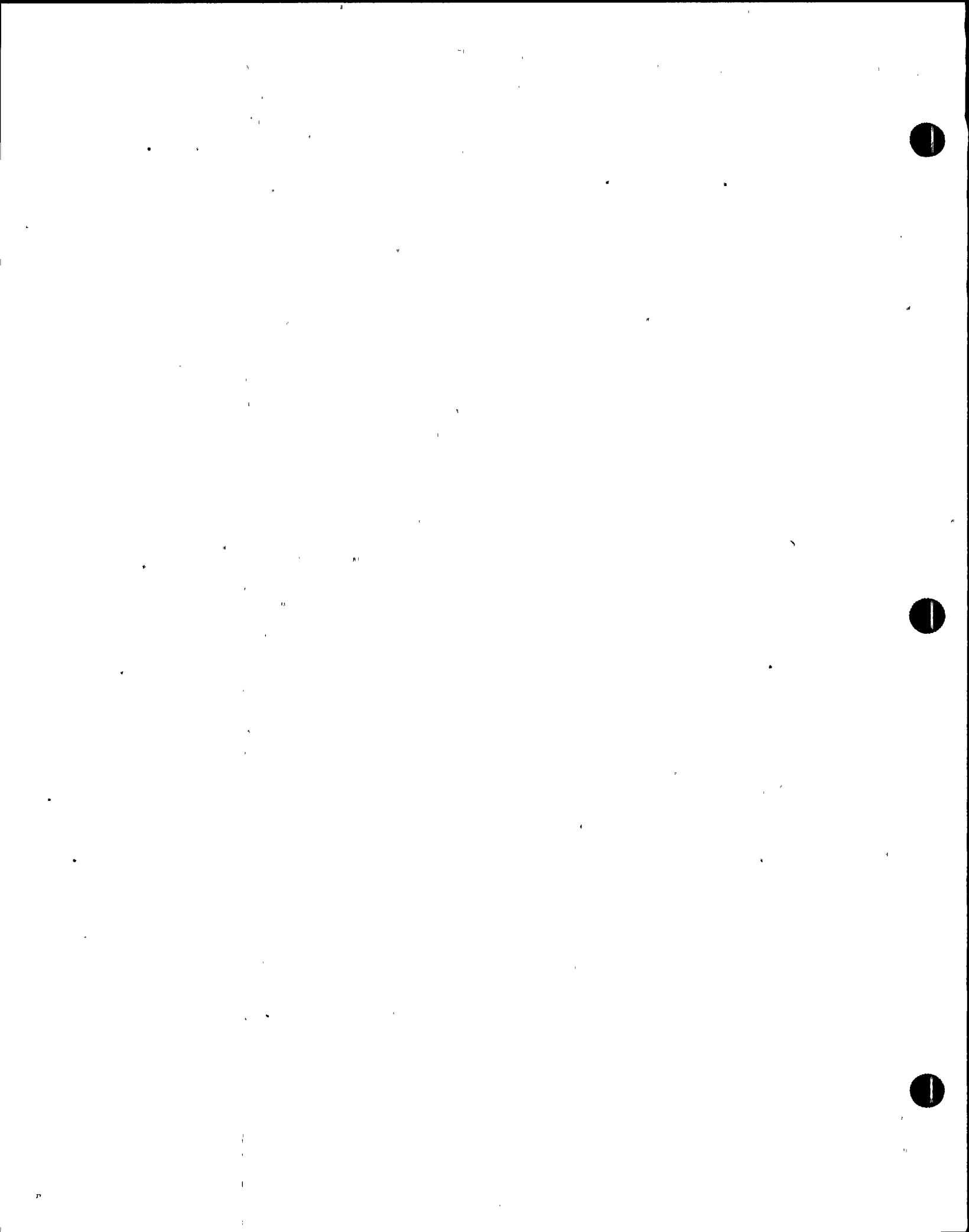
## NMP 2 CONTROL ROOM REFERENCES

### PROCEDURES:

- N2-OP-3, Condensate and Feedwater System
- N2-OP-8, Feedwater Heaters and Extraction Steam Systems
- N2-OP-13, Reactor Building Closed Loop Cooling
- N2-OP-21, Main Turbine
- N2-OP-29, Reactor Recirculation System
- N2-OP-31, Residual Heat Removal System
- N2-OP-34, Nuclear Boiler, Automatic Depressurization and Safety Relief Valves
- N2-OP-35, Reactor Core Isolation Cooling
- N2-OP-37, Reactor Water Cleanup System
- N2-OP-61B, Standby Gas Treatment
- N2-OP-67, Drywell Equipment and Floor Drains System
- N2-OP-92, Neutron Monitoring
- N2-OP-101C, Plant Shutdown
- N2-EOP-RPV, RPV Control
- N2-EOP-PC, Primary Containment Control
- EAP-2, Classification of Emergency Conditions
- EPP-20, Emergency Notifications

### TECHNICAL SPECIFICATIONS:

- 3.4.3.2 Reactor Coolant System Leakage
- 3.6.1.5 Drywell and Suppression Chamber Internal Pressure



TIME

EVENT

INSTRUCTOR ACTIVITY

PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

Special Instructions:

None

Simulator Operation:

Initialize: IC-20

100%, BOL

Preset Malfunctions:

None

Preset Remote Functions:

None

Preset I/O Overrides

None

Distribute and discuss turnover  
sheets .

Initial Conditions:

100% power, BOL, maintaining

power per N2-OP-101A

RHM Gp - 147

Operating above the 100%

rod line

Out-Of-Service Equipment

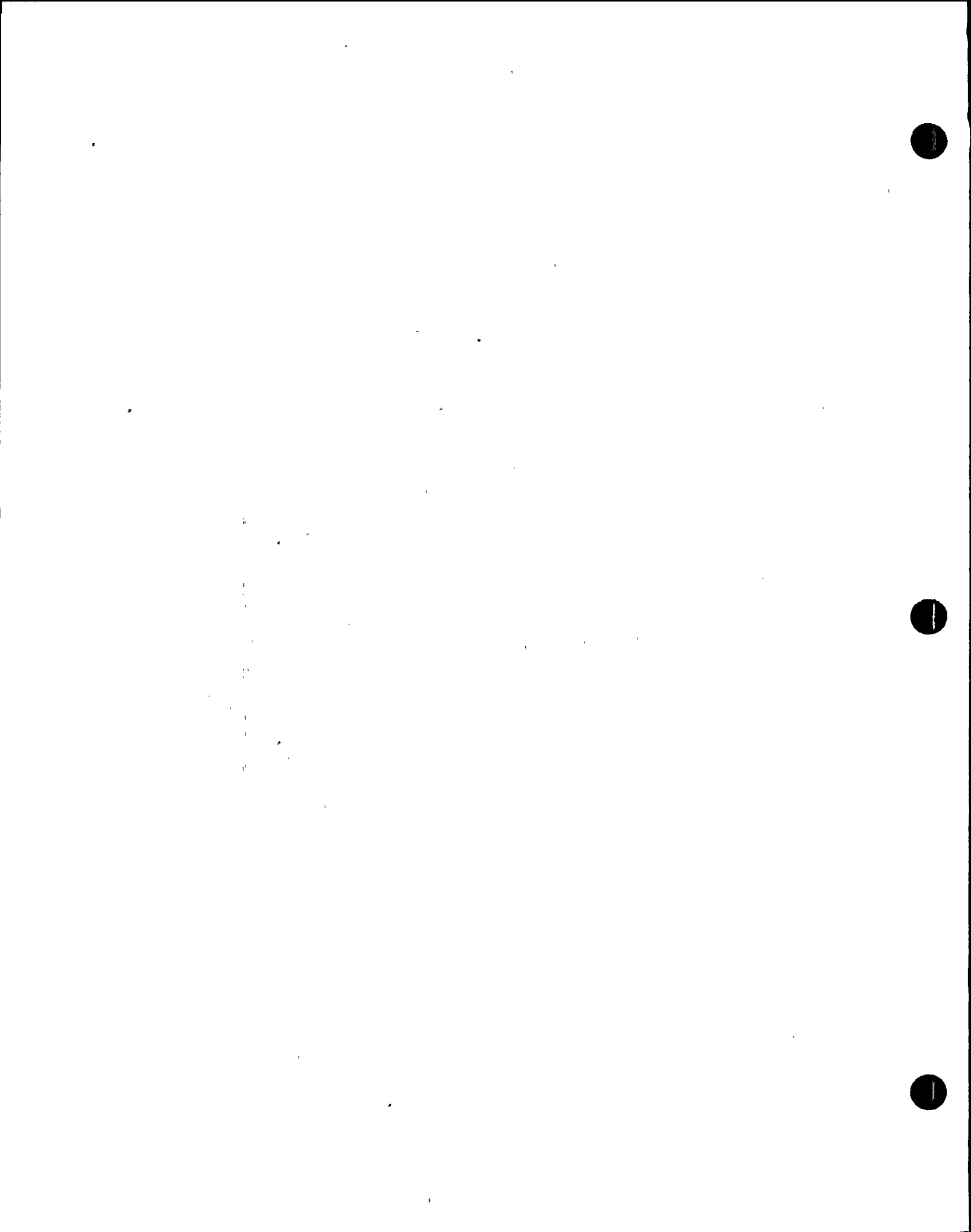
None



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Surveillances scheduled None			
		Allow not more than five minutes for panel walkdown.		Walk control boards	
T = 0		Commence the scenario		Assume the shift Continue power operation	
T = 3		Insert Malfunction: 1,FW15	Feedwater Master Controller failed as is		
		2,HS10B,,,4	Loss of extraction steam to B 6th point heater		
T = 4	1	Malfunction 2 is effective.  <u>ROLE PLAY:</u> As AOE respond to event as directed by Control Room Operators	2ESS-MOV3B goes shut. Gradual reduction in feedwater temperature into the vessel causing increase in reactor power and generator MWt	<u>TEAM</u> Recognize generator power change and identify loss of feedwater heating. Take action IAW OP-8 Section H  <u>SSS</u> Direct power reduction IAW OP-8	2a,b,3a



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				<u>CSO/E</u> Reduce power with recirculation flow by 20% of rated below that of pre-transient power level.	5a,b
T = 8	2		Reactor water level high due to reduced steam flow and failed controller	<u>IFAM</u> Recognize high water level	4a,b
				<u>CSO/E</u> 1. Take manual feedwater control on master controller and control water level in the normal band	5a,b
		ROLE PLAY: As an I&C technician, when called "Will investigate the Feedwater Master Controller problem"			
T = 15		Insert Malfunction: 3,RR19,10	Drywell floor drain leak rate increasing	2. Investigate floor drain high leak rate 3. Report leakage is at 10 gpm 4. Check drywell cooling lineup	4a 6a 4a
				<u>ASSS</u> Report containment parameters to SSS	6a





TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				<u>SSS</u> Directs CSO to place GTS in service with suction on the drywell	
		Increase severity of MALF;3 HF;3,22	Drywell leak rate increases to 118 gpm Drywell pressure and temperature continue to rise	<u>ASSS</u> Monitor and report changing containment parameters	4a,b,6a
4		Set Malfunction 4 HF;4,TC06	Turbine bypass fail to open.	<u>SSS</u> (*)1. Enter EOPs PC and RPV when drywell pressure reaches 1.68 psig Task # <u>3449390603</u> K/A Rating <u>4.70</u> Task # <u>3449400603</u> K/A Rating <u>4.70</u> Task # <u>3449410603</u> K/A Rating <u>4.70</u> Task # <u>3449420603</u> K/A Rating <u>4.70</u> Task # <u>3449430603</u> K/A Rating <u>4.70</u> Task # <u>3449440603</u> K/A Rating <u>4.70</u> Task # <u>3449450603</u> K/A Rating <u>4.70</u>	Sat/Unsat



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
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2. Direct recirculation to minimum and reactor scram when drywell pressure approaches the scram setpoint

CS0/E

Control rods fully insert

- |   |              |
|---|--------------|
| 1. Run recirc to minimum  | 5a,b         |
| 2. Manually scram the reactor when directed <u>or</u> respond to automatic scram if it occurs | 5a,b         |
| 3. Carry out immediate scram actions per N2-OP-101C   | 3b,4a,b,5a,b |

(\*). Place the mode switch in shutdown. Sat/Unsat

Task # 2019250101

K/A Rating 4.30

b. Verify all rods fully inserted



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
			Bypass valves failed shut SRVs may cycle to control pressure	<ul style="list-style-type: none"> <li>c. Verify reactor power decreasing</li> <li>d. Monitor reactor pressure and level</li> <li>e. Fully insert IRMs and SRMs</li> <li>f. Verify turbine trip</li> <li>g. Verify the house loads have transferred</li> <li>h. Verify SDV vent and drain valves shut on P-603</li> <li>i. Verify RRS pumps down-shift</li> <li>j. Transfer WCS to full reject or trip the pumps and shut the discharge valves</li> </ul> <p>4. Verify group isolation from high drywell pressure</p>	
				<p><u>SSS</u></p> <ul style="list-style-type: none"> <li>1. Directs GTS be secured from drywell suction prior to drywell temperature reaching 150°F</li> </ul>	



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Increase severity of HALF;3 HF;3,40	Drywell pressure and temperature continue increasing at a faster rate	<p>2. Direct drywell cooling be restored using LOCA override</p> <p><u>CSO/E</u></p> <p>1. Secures GTS drywell suction when directed</p> <p>2. Re-establish drywell cooling using keylock LOCA overrides</p> <p><u>TEAM</u></p> <p>1. Recognize failure of turbine bypass valves 2a</p> <p>2. Inform the SSS of the condition 6a</p> <p><u>SSS</u></p> <p>1. Direct pressure control using SRVs or RHS steam condensing</p> <p>2. Inform Operator of band to control pressure 4b</p> <p><u>CSO</u></p> <p>1. Take pressure control as directed</p> <p>2. Maintain pressure in desired band 5a,b</p>	





TIME

EVENT

INSTRUCTOR ACTIVITY

PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

SSS

Direct suppression chamber  
spray prior to suppression  
chamber pressure reaching 10  
psig

CSO/E

1. Initiate Suppression Chamber 5a,b  
spray

a. Notify Rad. Protection  
to start Rad Monitor  
23A(B)

b. Open heat exchanger  
outlet valve  
RHS\*MOV90A(B)

c. Lineup service water to  
the RHS heat exchanger  
Establish at approxi-  
mately 7400 gpm

(\*d. Shut or verify shut  
LPCI injection  
valve

Task # 2050010101

K/A Rating 3.80

Sat/Unsat



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				(*)e. Start the RHS pump Task # <u>2050010101</u> K/A Rating <u>3.80</u>	Sat/Unsat
				f. Verify pump minimum flow valves open	
				g. Adjust RHS pump flow to minimum 7450 gpm using 2RHS*FV38	
				h. Verify pump minimum flow valve closes	
				(*)i. Open outlet to Suppression Pool Spray ring 2RHS*MOV33 Task # <u>2050010101</u> K/A Rating <u>3.80</u>	Sat/Unsat
				j. Verify approximately 450 gpm on suppression spray header flow meter	
				<u>SSS</u>	
		Increase severity of HALF;3 MF;3,70	Drywell leak rate increases to 3,430 gpm Drywell pressure and temperature continue to increase	Direct vessel cooldown using SRVs, steam condensing mode or MSL drains	6a



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				<u>CSO/E</u> Commence pressure reduction/ cooldown as directed by SSS	5a,b
				<u>SSS</u> 1. When suppression chamber pressure exceeds 10 psig, direct: a. Recirc pumps secured b. Drywell cooling secured c. Drywell spray commenced	
				<u>CSO/E</u> 1. Establish drywell spray a. Shut RHS to suppression pool cooling valve 2RHS*FV38 (*).b. Open DW spray valves 2RHS*MOV15 and MOV25 Task # <u>2050150101</u> K/A Rating <u>3.80</u> c. Verify pump minimum flow valve closed	5a,b 5a,b Sat/Unsat 4a



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
			Suppression pool spray valve 2RHS*MOV33 will close when DW pressure drops below 1.68 psig	d. Verify approximately 7950 gpm on DW spray header flow meter	4a
				<u>ASSS</u> 1. Report containment parameters	4a,b;6a
				<u>SSS/SPEC</u> (*).1. Declare an Alert or higher Task # <u>3440190303</u> K/A Rating <u>4.70</u>	6a
				2. Make emergency notifi- cations.	6b

Termination Cue: Reactor Shutdown, pressure being reduced through cooldown with level between 159.3" and 202.3", DW pressure less than 1.68 psig with RHS spraying the drywell.

