

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-REQ-009-TRA-2-24 Revision 1

07-190-91

TITLE: OFF-SITE RADIOACTIVITY RELEASE

PREPARED BY	<u>Clint Sherman</u>	<u>12-12-90</u>
VALIDATED BY	<u>J. Kaminski</u>	<u>12-12-90</u>
UNIT OPERATIONS TRAINING SUPERVISOR	<u>[Signature]</u>	<u>12/17/90</u>
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	<u>[Signature]</u>	

Summary of Pages

(Effective Date: 12-12-90)

Number of Pages: 20

<u>Date</u>	<u>Pages</u>
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TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

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RECORDS: _____

CONTROLLED

DOCUMENT

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I. TRAINING DESCRIPTION

- A. Title of Lesson: Off-Site Radioactivity Release
- B. Lesson Description: Using the Nine Mile Point Unit 2 Simulator the Instructor will facilitate proper operator performance of all NMP-Unit 2 procedures and guidelines for conduct of operations during each scenario. The Instructor may use Freeze, Backtrack and or Reset the Simulator from any point in this scenario to aid in the facilitation of this lesson.
- C. Estimate of the Duration of the Lesson: 1 hour
- D. Method of Evaluation, Grade Format, and Standard of Evaluation: Simulator Performance.
- E. Prerequisites:
 - 1. Instructor:
 - a. Qualified as a Simulator instructor per NTP-16.1
 - 2. Trainee:
 - a. Meet the eligibility requirements per 10CFR55, or
 - b. Be recommended for this training by the Operations Superintendent, his designee, or the Manager of Training.
- F. References:
 - 1. N2-EOP's - Emergency Operating Procedures
 - 2. Site Emergency Action Plan (EAP-2)
- G. Annual/Biennial
 - 1. O2-REQ-MAN-A08-2-00, Large LOCA outside Primary Containment
 - 2. O2-REQ-MAN-B09-2-00, Clad failure/activity in coolant/off-gas
 - 3. O2-REQ-MAN-B13-2-00, Reactor scram

II. REQUIREMENTS

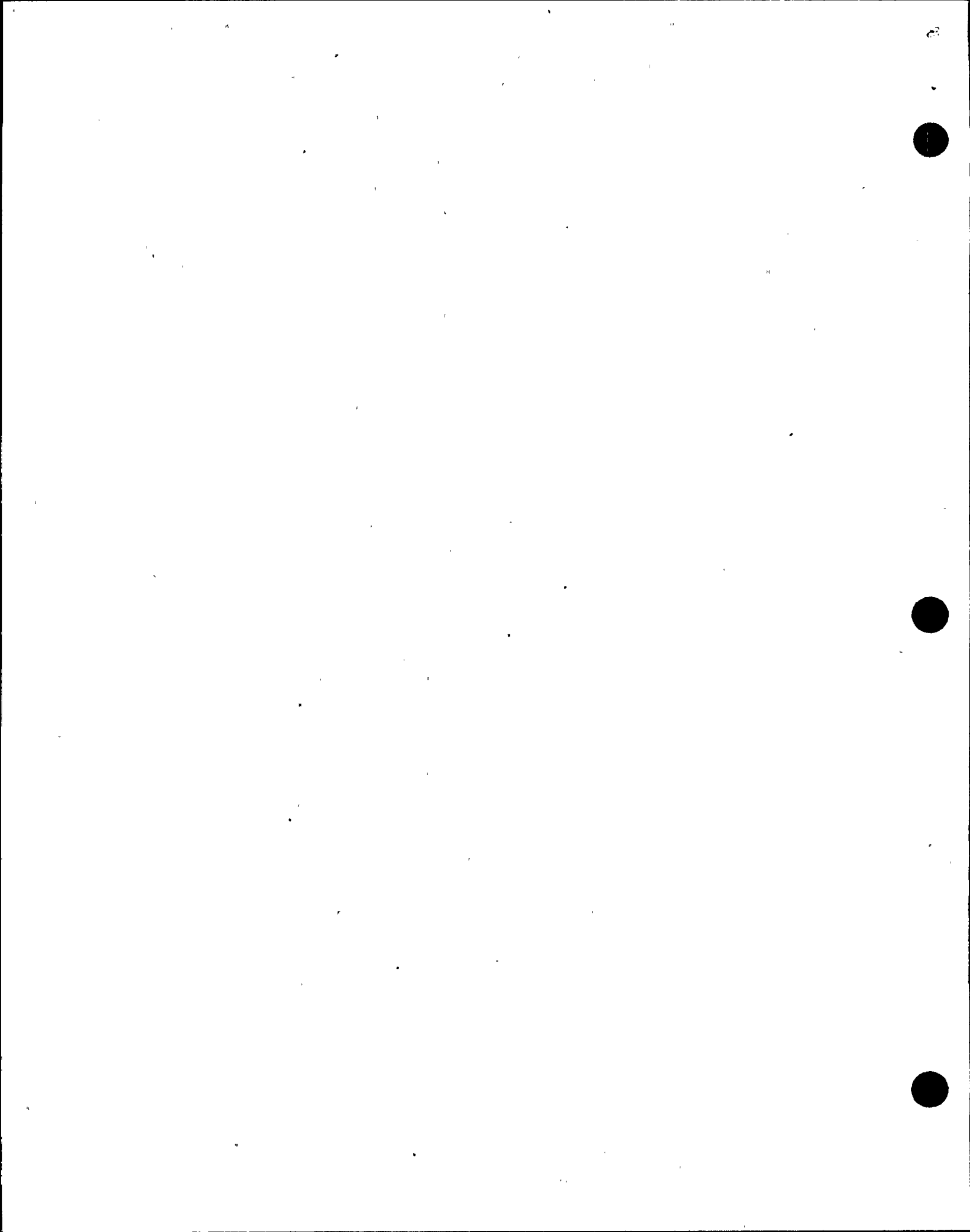
- A. AP-9, Administration of Training
- B. NTP-10, Training of Licensed Operator Candidates
- C. NTP-11, Licensed Operator Requalification Training



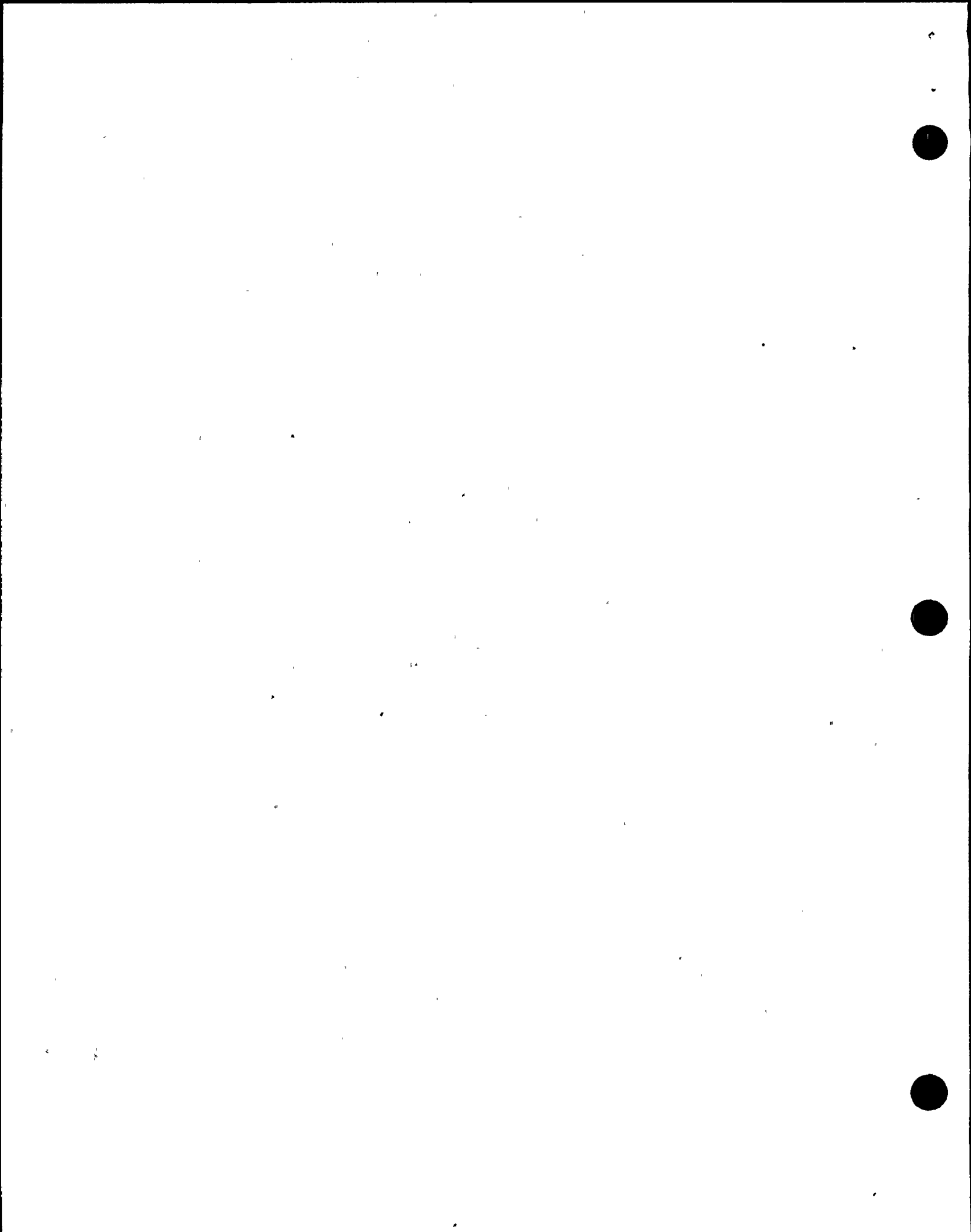
III. LEARNING OBJECTIVES

A. SSS/ASSS Objectives:

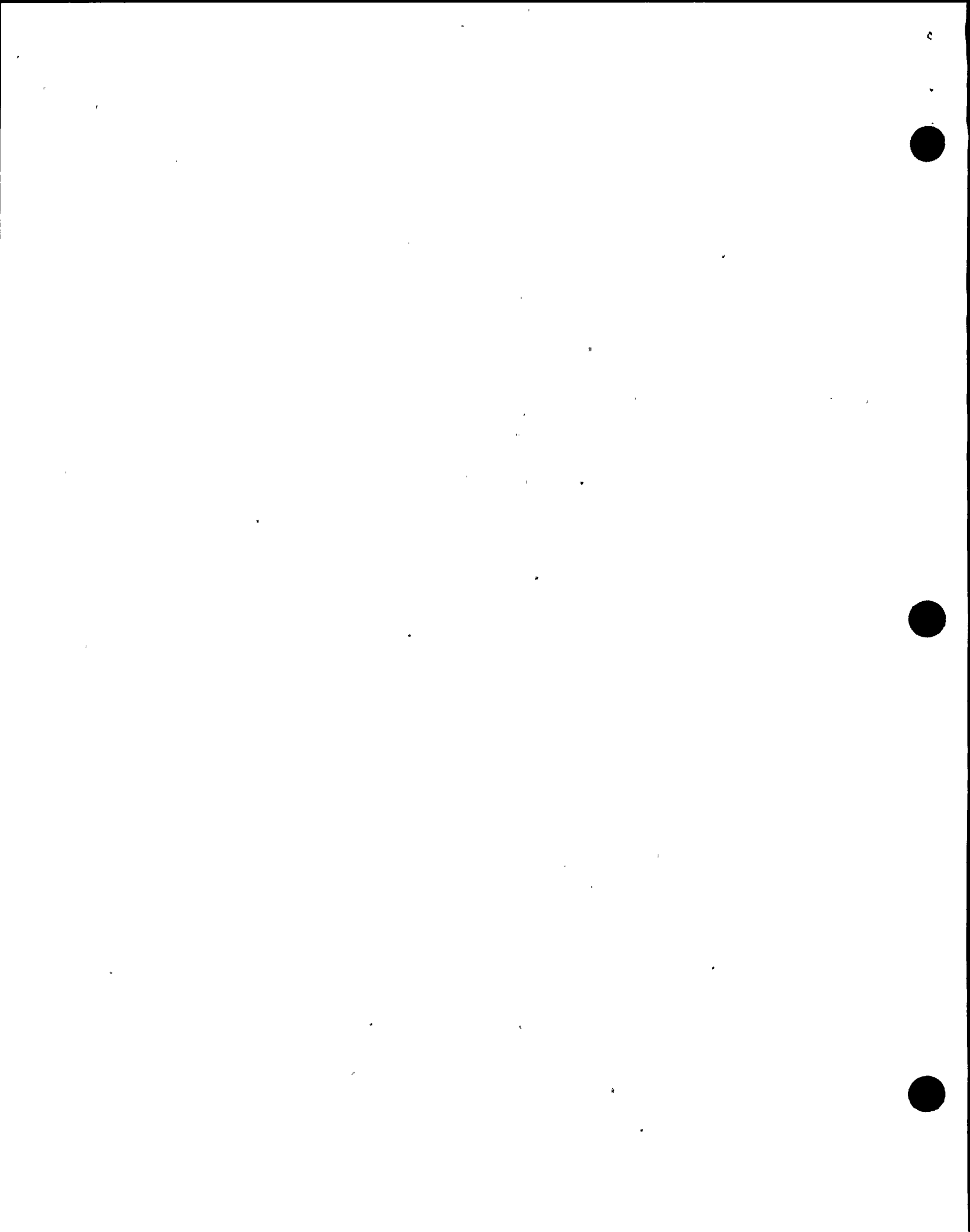
- TO-1.0 3440240303 Direct corrective actions to mitigate the consequences of the emergency event.
 - EO-1.1 Given the Simulator in the conditions established evaluate the emergency event to determine that conditions are following the expected sequence.
- TO-2.0 2239010103 Verify Primary and Secondary Containment integrity.
 - EO-2.1 Given the Simulator in the conditions established verify Primary and Secondary Containment integrity.
- TO-3.0 3449390603 Direct the actions required per EOP-RPV Section RQ.
 - EO-3.1 Given N2-EOP-RPV control and the Simulator in the conditions established direct operators to monitor and control reactor power.
 - EO-3.2 Given N2-EOP-RPV control and the Simulator in the conditions established determine if the Reactor is shutdown.
 - EO-3.3 Given N2-EOP-RPV control and the Simulator in the conditions established direct operators to exit Section RQ and enter N2-OP-101C, Section H.1.
- TO-4.0 3449400603 Direct the actions required per EOP-RPV Section RL.
 - EO-4.1 Given N2-EOP-RPV control and the Simulator in the conditions established direct operators to monitor and control Reactor water level.
 - EO-4.2 Given N2-EOP-RPV control and the Simulator in the conditions established determine if an RPV water level instrument may be used to determine RPV water level.
 - EO-4.3 Given N2-EOP-RPV control and the Simulator in the conditions established direct operators to initiate any isolations or ECCS actuations that should have initiated but did not. (EOP-6)
 - EO-4.4 Given N2-EOP-RPV control and the Simulator in the conditions established determine if the Reactor is shutdown.



- EO-4.5 Given N2-EOP-RPV control and the Simulator in the conditions established direct operators to restore and maintain water level between 159.3 in. and 202.3 in. using the systems listed in Section RL of RPV control.
- TO-5.0 3449410603 Direct the actions required per EOP-RPV Section RP.
- EO-5.1 Given N2-EOP-RPV control and the Simulator in the conditions stated, direct operators to monitor and control Reactor pressure.
- EO-5.2 Given N2-EOP-RPV control and the Simulator in the conditions stated, determine if a high drywell pressure ECCS initiation signal exists.
- EO-5.3 Given N2-EOP-RPV control and the Simulator in the conditions stated, determine if the Reactor is shutdown.
- EO-5.4 Given N2-EOP-RPV control and the Simulator in the conditions stated, determine if emergency RPV depressurization is required.
- EO-5.5 Given N2-EOP-RPV control and the Simulator in the conditions stated, exit Section RP of RPV control and enter C2 (Emergency RPV depressurization).
- EO-5.6 Given N2-EOP-RPV control and the Simulator in the conditions stated, determine if there has been gross fuel failure or a main steam line break.
- TO-6.0 3440270303 Determine if indications of fuel element damage are present.
- EO-6.1 Given the Simulator in the conditions established determine if indications of fuel element damage are present.
- TO-7.0 3449490603 Direct the actions required per EOP-RR.
- EO-7.1 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established activate the emergency plan if required IAW EAP-1.
- EO-7.2 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established determine if Turbine Buildings HVAC is shutdown.



- EO-7.3 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established direct operators to restart Turbine Building HVAC IAW N2-OP-55.
- EO-7.4 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established direct operators to isolate all Primary Systems that are discharging into areas outside the Primary and Secondary Containments except as specified in N2-EOP-RR.
- EO-7.5 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established determine if the off-site radioactivity release rate approaches or exceeds the emergency plan General Emergency level.
- EO-7.6 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established determine if a Primary System is discharging into an area outside the Primary and Secondary Containments.
- EO-7.7 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established determine if emergency RPV depressurization is required.
- EO-7.8 Given N2-EOP-Radioactivity release control and the Simulator in the conditions established enter N2-EOP-RPV control and execute it concurrently with N2-EOP-RR.
- TO-8.0 3449040503 Perform actions required for a radiation emergency.
- EO-8.1 Given the Simulator in the conditions established perform actions required for a radiation emergency.
- TO-9.0 3440180303 Direct shift personnel actions to ensure plant safety during emergency conditions.
- EO-9.1 Given the Simulator in the conditions established direct shift personnel actions to ensure plant safety during emergency conditions.
- TO-10.0 3449520603 Direct the actions required per EOP-C2, emergency RPV depressurization.
- EO-10.1 Given N2-EOP-C2 and the Simulator in the conditions established determine if the Reactor is shutdown.



- EO-10.2 Given N2-EOP-C2 and the Simulator in the conditions established determine which injection systems are injecting into the RPV.
- EO-10.3 Given N2-EOP-C2 and the Simulator in the conditions established determine if a high drywell pressure ECCS initiation signal exists.
- EO-10.4 Given N2-EOP-C2 and the Simulator in the conditions established determine suppression pool water level.
- EO-10.5 Given N2-EOP-C2 and the Simulator in the conditions established direct operators to open all seven ADS valves.
- EO-10.6 Given N2-EOP-C2 and the Simulator in the conditions established determine the number of ADS valves that are open.
- EO-10.7 Given N2-EOP-C2 and the Simulator in the conditions established determine if RPV water level can be determined.
- EO-10.8 Given N2-EOP-C2 and the Simulator in the conditions established determine if RPV water level can be determined.
- EO-10.9 Given N2-EOP-C2 and the Simulator in the conditions established exit C2 and enter N2-EOP-RPV control Section RP.

B. RO/CSO Objectives:

- TO-11.0 2009130501 Perform the actions required for a small break LOCA, outside the Primary Containment.
- EO-11.1 Given NMP-2 operating procedures and the Simulator in the conditions established perform the actions required for a small break LOCA, outside the Primary Containment as directed by the SSS.
- TO-12.0 2000690501 Perform the actions required for a loss of containment integrity.
- EO-12.1 Given NMP-2 operating procedures and the Simulator in the conditions established perform the actions required for a loss of containment integrity as directed by the SSS.
- TO-13.0 2000610501 Perform the actions required for a Radiation Monitoring System alarm.
- EO-13.1 Given NMP-2 operating procedures and the Simulator in the conditions established perform the actions required for a Radiation Monitoring System alarm as directed by the SSS.

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TO-14.0 2180020101 Manually initiate the ADS System and monitor while activated.

EO-14.1 Given NMP-2 operating procedures and the Simulator in the conditions established manually initiate the ADS System and monitor while activated as directed by the SSS.

C. Team Objectives:

- TO-15.0 Demonstrate effective communication in accordance with the Operating Department instruction on verbal communications (NMP2 Requal Action Plan, Rev. 2, 4.B.1).
- TO-16.0 Demonstrate the use of the Emergency Plan, an understanding of the roles and responsibilities of an SSS, ASSS/STA, CSO/NAOE in accordance with the Operating Department Instruction on Roles and Responsibilities. (NMP2 Requal Action Plan, Rev. 2, 5.B.A, 6.B.6).
- TO-17.0 Demonstrate an understanding of command and control, EOP place keeping techniques and effective use of Control Room Operators during emergency conditions. (NMP2 Requal Action Plan, rev. 2, 6.B.6, SRO only).
- TO-18.0 Demonstrate "self-verification" work practices techniques in accordance with the Operating Department instruction for all control actions. (LER50-410/88-50) (NRC IR50-410/88-01).



ATTACHMENT 1
PRE-EXERCISE BRIEFING

IV. LESSON CONTENT
LESSON CONTENT

DELIVERY NOTES

OBJECTIVES/
NOTES

A. Exercise Overview

Present the following:

During this session, plant conditions begin at 100% power operation. A small steam leak in the steam tunnel occurs and a group one MSIV isolation signal results. All MSIVs do not isolate, however, and one MSL remains open. Eventually, the transient results in breakage of fuel pins and radioactivity is released into Secondary Containment. RR is entered when vent GEMS is 10 times above the alarm setpoint. Emergency RPV depressurization is performed when off-site radioactivity release rate reaches the general emergency level.

Discuss plant conditions.

B. Prerequisite Knowledge Review

The Rev. 4 RPV Control, Radioactivity Release and Emergency RPV Depressurization EOPs have been presented in classroom training and should be reviewed prior to the Simulator exercise.

Discuss prior classroom coverage.

Review the performance and knowledge objectives with participants as the scenario is discussed.

Discuss performance and knowledge objectives while describing scenario.



ATTACHMENT 1
PRE-EXERCISE BRIEFING

LESSON CONTENT

DELIVERY NOTES

OBJECTIVES/
NOTES

C. Scenario Preview

1. The following is an overview of the conditions and actions that will occur during the scenario:

- a. Recognize/respond to steam leak in steam tunnel.
- b. Recognize/respond to failure to isolate the MSIVs.
- c. Recognize/respond to high radioactivity and release rate. (per EOP-RR)
- d. Recognize indications for fuel damage.
- e. Recognize/respond to high area radiation levels.
- f. Perform emergency RPV depressurization.

EOPs exercised:

RP

RQ

RL

C2

RR

MSIV Leakage Control

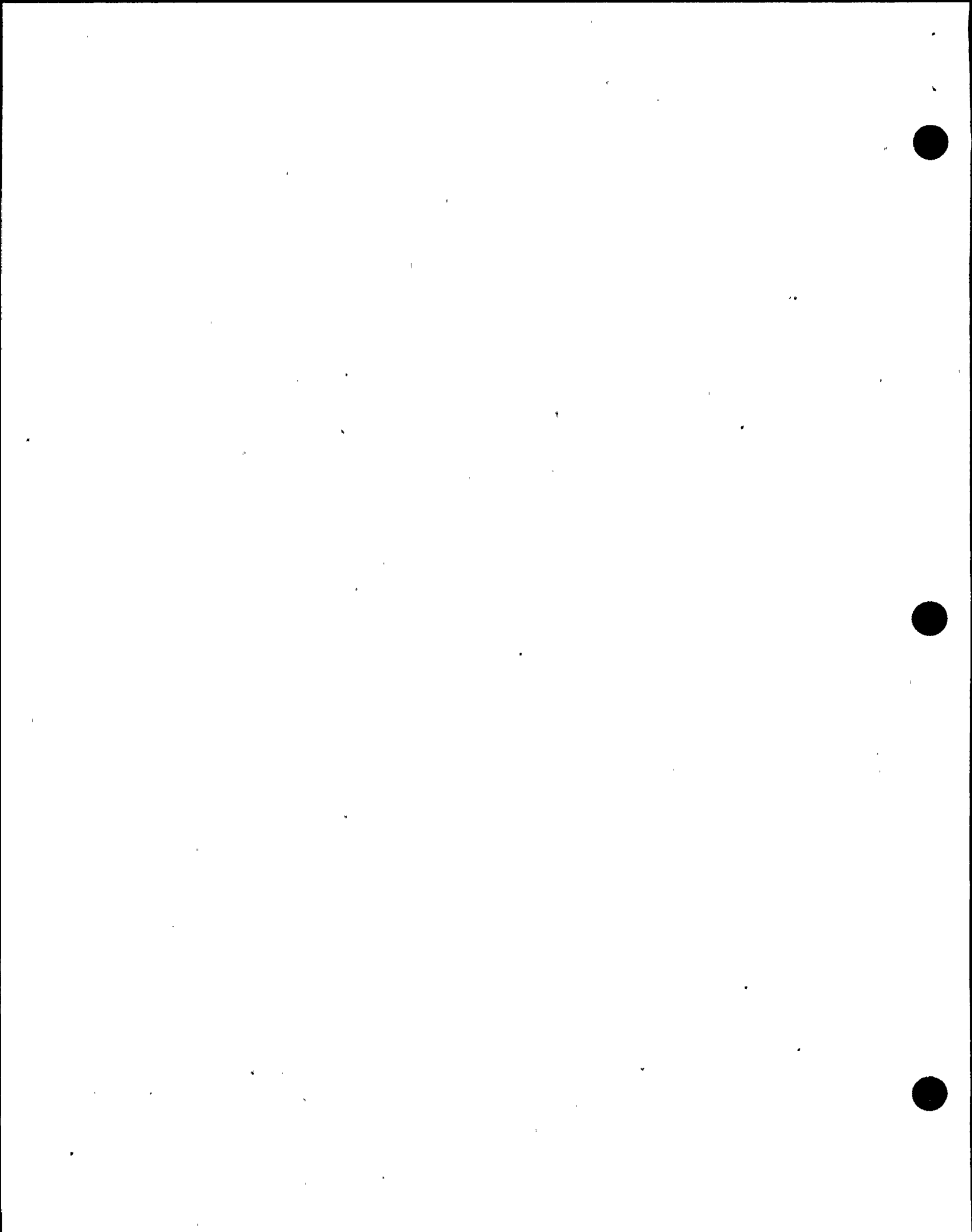
2. Initial conditions

Plant status is given in shift turnover information, listed below.

3. Expected actions

The participants, acting as a team, will:

- respond to appropriate annunciators
- use the appropriate annunciator response procedure
- make appropriate reports to the SSS
- perform indicated operations



ATTACHMENT 1
PRE-EXERCISE BRIEFING

LESSON CONTENT

DELIVERY NOTES

OBJECTIVES/
NOTES

- use the instructor as all plant personnel to perform Local Operator Actions (LOAs)
- observe system indications
- use appropriate emergency operating procedures
- place the plant in a stable shutdown depressurization condition

The instructors perform all LOAs when requested by the participants.

D. Operating Concerns

Reviews with the participants any NRC/INPO operating concerns that relate to the training session as directed by the Training Program Coordinator.

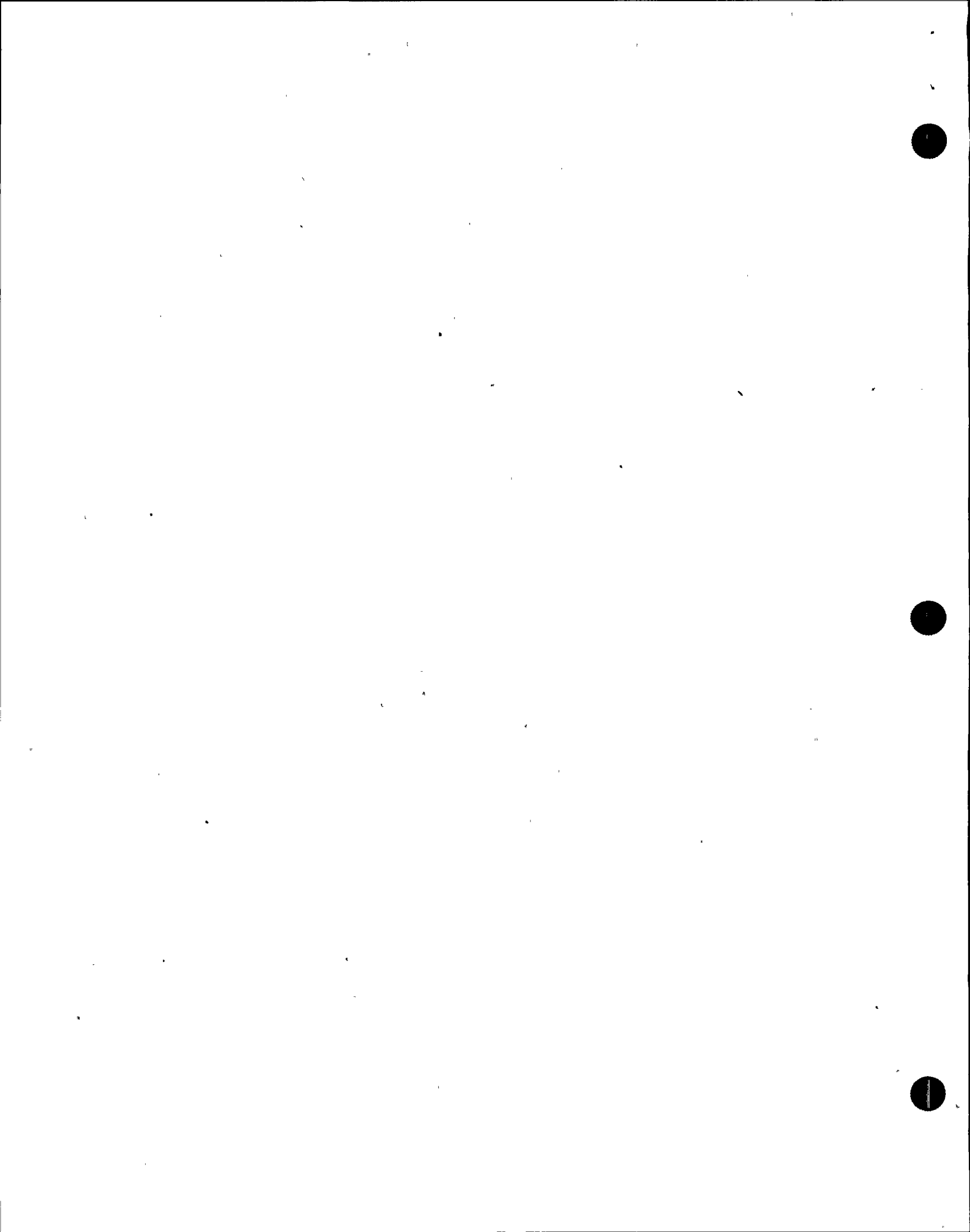
E. Performance Review

1. Obtain and discuss with the participants those areas documented on the Post Training Summary from previous Simulator training. Reinforce good performances and areas for improvement.

F. Ground Rules

Discuss performance expectations relative to:

- a. Professionalism
- b. Realism
- c. Log keeping
- d. Team work



ATTACHMENT 1
PRE-EXERCISE BRIEFING

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
<ul style="list-style-type: none">e. Communicationf. Procedure useg. Notificationsh. Self verification techniques <p>G. Shift Turnover Information</p> <ul style="list-style-type: none">1. Plant status The plant is operating at 100% Reactor power, following startup from RFO-1. The MSIV pilot valves and stems were reworked during RFO. On startup, they performed as expected. <p>H. Sequence of Events</p> <p>Conduct Simulator activities as prescribed by the attached floor instructor and console operators guide, Attachment 2.</p> <p>Ensure video taping is conducted for all sessions to allow for its use in the post exercise assessment, if necessary.</p>		



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

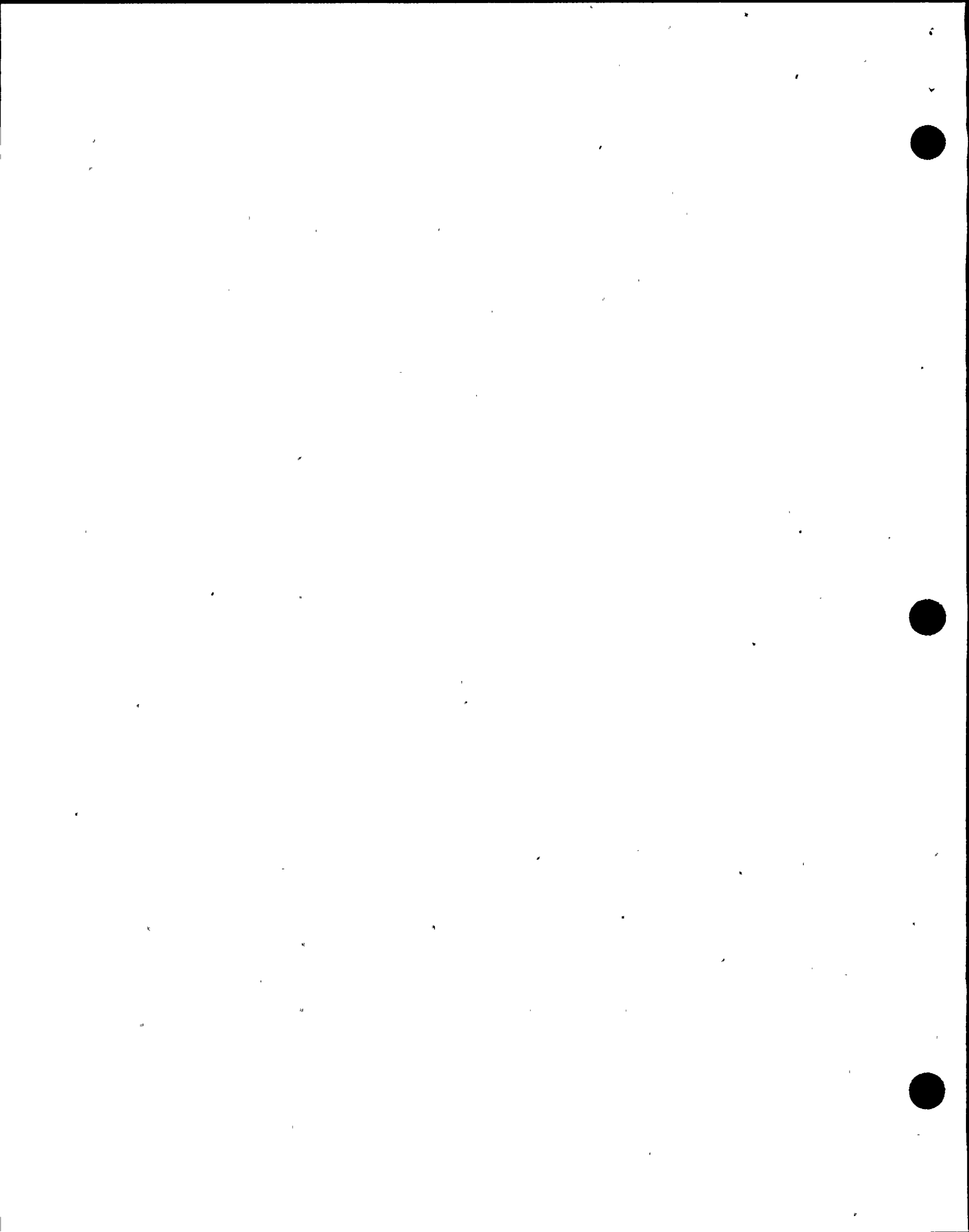
TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
		<p>Special Instructions:</p> <p>Plant just started up post RFO. MSIV pilot valves and stems were all reworked during the outage.</p> <p>Simulator Operation:</p> <p>Initialize to IC-20</p> <p>Preset malfunctions:</p> <p>1, MS05A 2, MS05E 3, MS05C 4, MS05H</p> <p>Preset remote functions:</p> <p>None</p> <p>Preset I/O overrides:</p> <p>1, 1A-2MSSB18-B,,ON 2, 1A-2MSSD12-A,,ON</p>	<p>100% BOL</p> <p>These MSIVs will not close: Inbd and Outbd A Inbd C Outbd D (A MSL will remain open.)</p>		
			<p>Open lights on for outbd B and inbd D MSIVs. (appear in mid-position).</p>		



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
		Distribute and discuss shift turnover sheets.		Review shift turnover sheets.	
		Initial Conditions: 100% BOL RWM group-147			
		Out of service equipment: None			
		Surveillances scheduled: None			
		Allow not more than 5 minutes to walkdown panels.		Walkdown control room panels.	



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

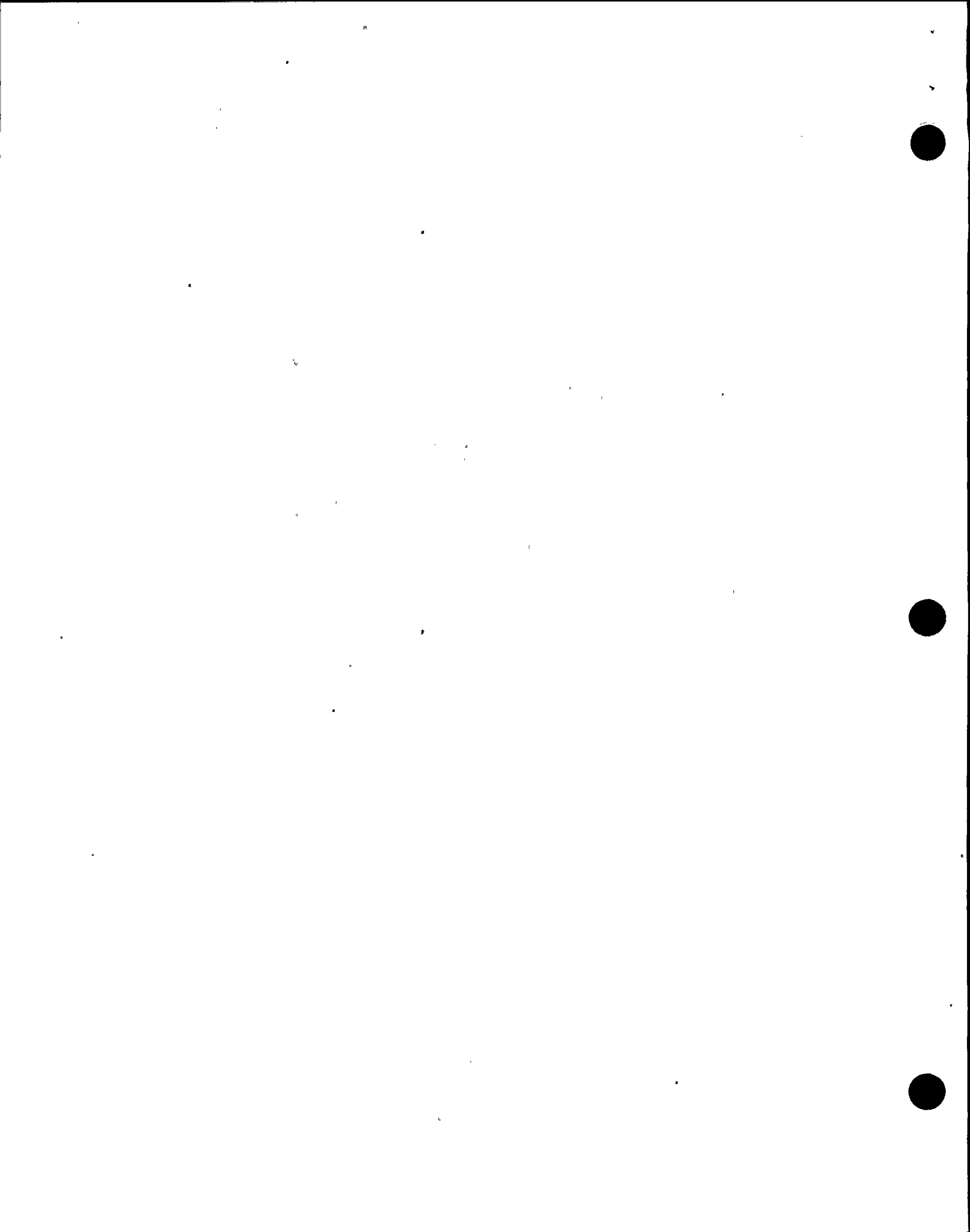
TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
T=0		Begin the scenario		<u>Crew</u> Assume the shift.	
T=3 min.		Insert malfunction: 5, MS01, 3	Steam leak in steam tunnel. Increase area temperatures.	<u>RO/BOP</u> Identify high steam tunnel temperature. Report steam leak to SSS.	T0-11.0
				<u>SSS</u> Prepare crew for MSIV closure and scram. Have Aux. Operator go to RB to investigate leak in steam tunnel.	T0-1.0
T=When MS tunnel reaches the group one isol setpoint (159°)			A group one isolation signal will be generated. MSIV full isolation will not occur.	<u>RO/BOP</u> Recognize MSIV group one isolation and failure of all MSLs to isolate. Report to SSS.	T0-12.0



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

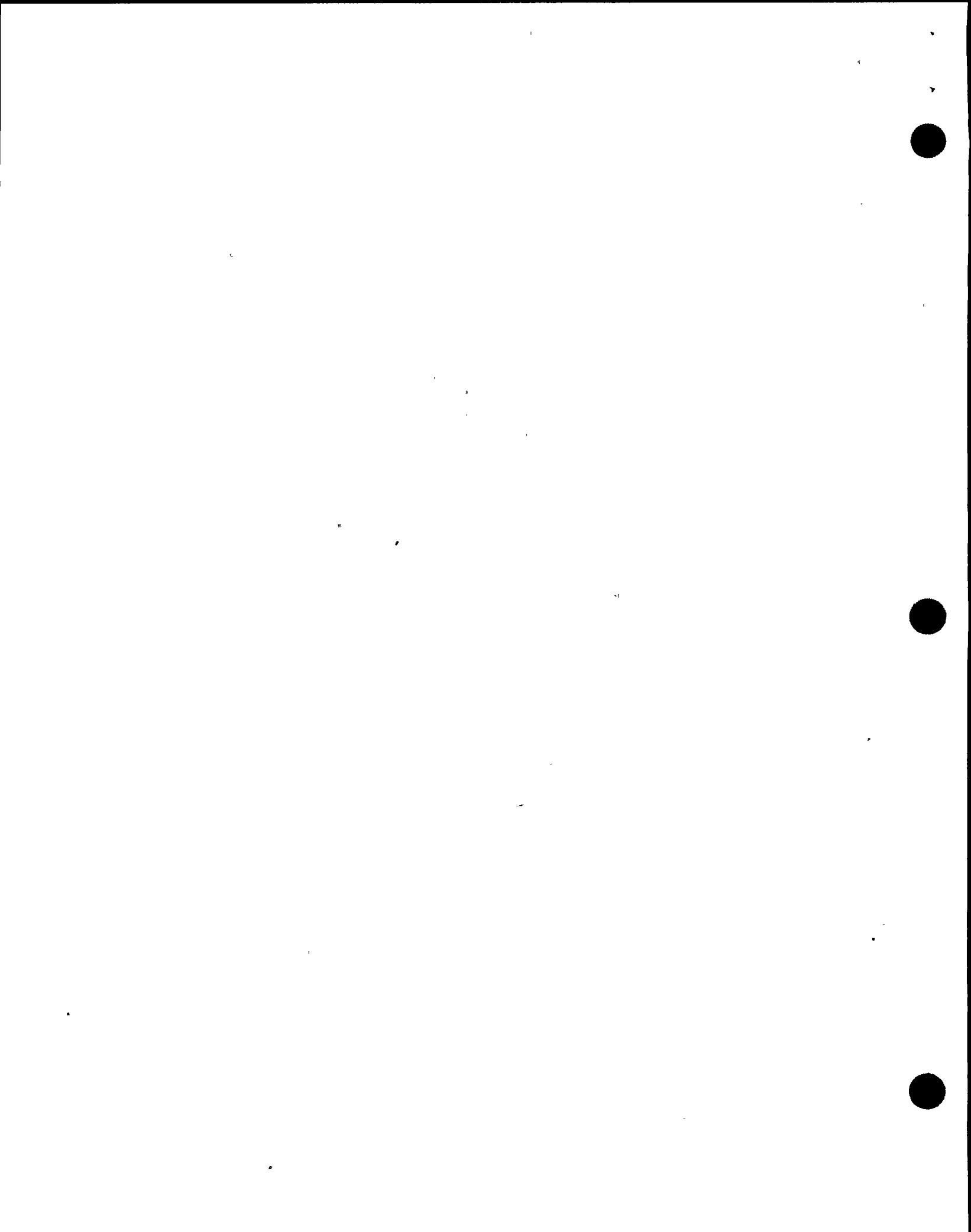
TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
				<p><u>RO</u></p> <p>Report reactor scram/all rods in.</p>	
				<p><u>SSS</u></p> <p>Order scram actions per N2-OP-101C. Order normal cooldown. Make appropriate emergency plan declarations. Enter RPV control. Recognize Primary Containment integrity lost.</p>	
				<p><u>BOP</u></p> <p>Begin normal plant cooldown.</p>	<p>T0-2.0</p> <p>T0-3.0</p> <p>T0-4.0</p> <p>T0-5.0</p> <p>By definition, <u>cannot</u> use main condenser for "Emergency Depress Anticipated."</p>



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

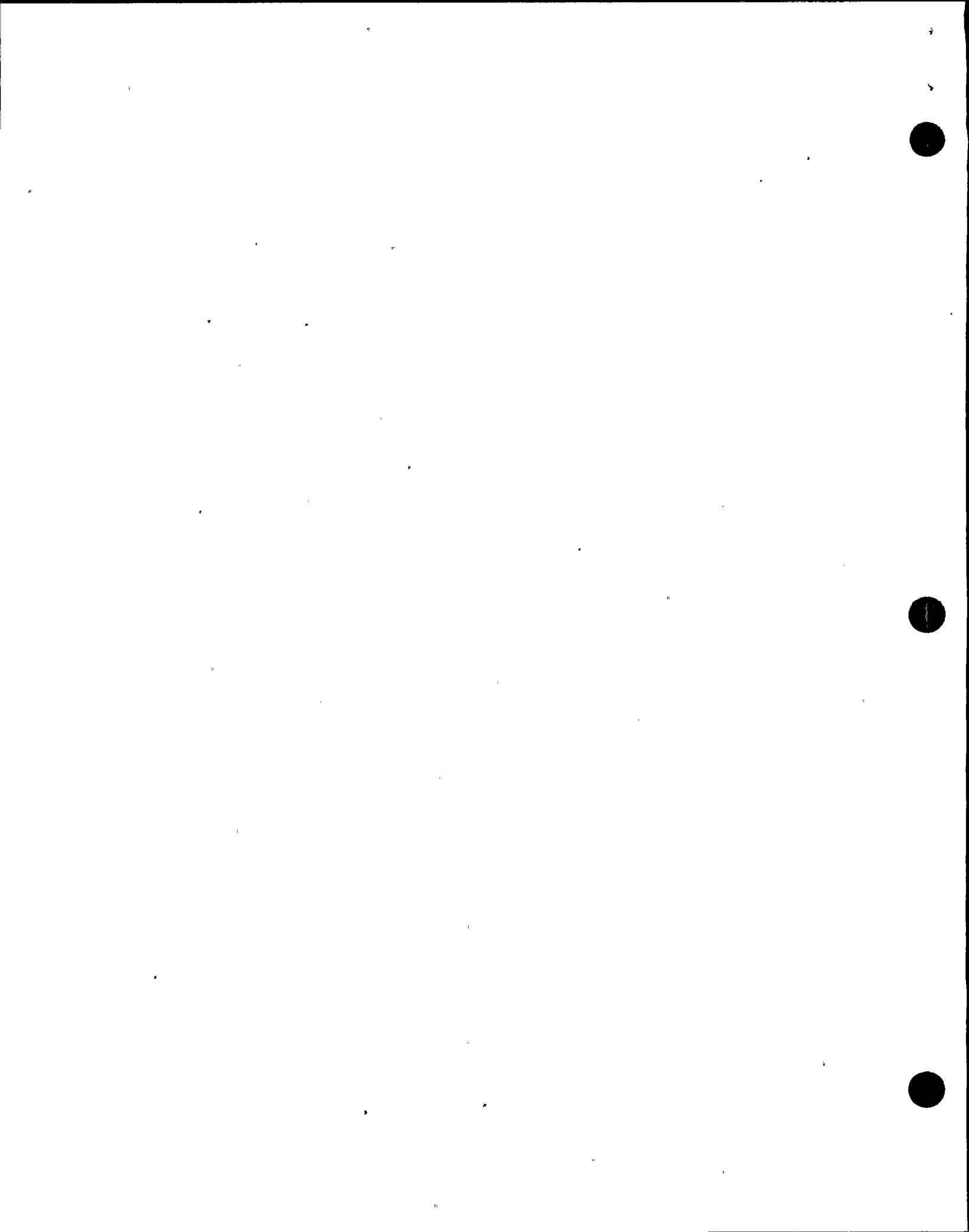
TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
T=2 min. after the group one isolation signal		Insert malfunction: 6, RX01, 50	Fuel damage increases coolant activity and radiation levels in the plant will increase.	<u>RO/BOP</u> Recognize/report increased radiation levels/indications of fuel damage.	T0-13.0
T=5 min. after in- serting malf. 6.		Insert I/O override: 3, 851201-48,,,0N	Reac/Radw Bldg. Vent effluent Radn Mon Activated annunc. activates.	<u>RO/BOP</u> Recognize/report vent GEMS activated alarm.	
T=When stack GEMS/Vent GEMS readings are re- quested (or ordered checked).		<u>Role Play:</u> (As extra operator) report that vent GEMS is reading 17,000 microcuries per second and rising and the alarm is set at 14,100 mCi/sec.		<u>SSS</u> Enter EOP-RR. Order Turbine Bldg. ventilation checked/started. EAP-2. Enter EOP-MSL. Order MSL rad level checked. Check MSL rad level limit.	Turbine Bldg. ventilation should be operating. (did not/was not shut- down) T0-6.0 T0-7.0 T0-8.0



ATTACHMENT 2

FLOOR INSTRUCTOR AND CONSOLE OPERATORS GUIDE

TIME	SCENARIO	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	INSTRUCTOR COMMENTS
T=10 min. after RR entered.		<u>Role Play:</u> As Radiation Protection, report to SSS that off-site radioactivity release rate is at 1200 mR/hr whole body exposure at the site boundary.		<u>SSS</u> Recognize need for emergency RPV T0-9.0 depressurization. Make preparations per C2. Order all ADS SRVs opened. Declare General Emergency.	T0-10.0
				<u>BOP</u> Open all seven ADS SRVs.	T0-14.0
T=When RPV is depressurized.		End scenario. freeze Simulator			



ATTACHMENT 3
POST EXERCISE ASSESSMENT

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
1. Post Exercise Assessment (Classroom) 1. Review the Learning Objectives a. The crew/individuals should state how each was met during the session.	Allow participants to evaluate themselves against learning objectives and tasks for the session.	
2. Participant's Self-Evaluation a. Discussion should focus on measurable behaviors and how these contributed to or detract from meeting the objectives	Discussion should center on performance and not personal feelings or interpretation of actions.	
3. Instructors assessment and performance (NCTS-2) recommendations.	1. Assess participants performance for those objectives and tasks not included in the crew self-assessment. Use the video tape in the assess to more effectively assess communications, teamwork, and prioritization, if necessary. 2. Provide feedback on ways to improve performance.	
4. Session and program feedback.	1. Distribute Simulator Training Evaluation Feedback Form.	
5. Document Session	2. Provide students with time to complete form.	
	1. Complete Post Training Summary, Attachment 4.	



ATTACHMENT 3
POST EXERCISE ASSESSMENT

LESSON CONTENT

DELIVERY NOTES

OBJECTIVES/
NOTES

2. Place in file for next training session.
3. Document any NRC/INPO operating concerns as an items list attached to the training record. (TR)

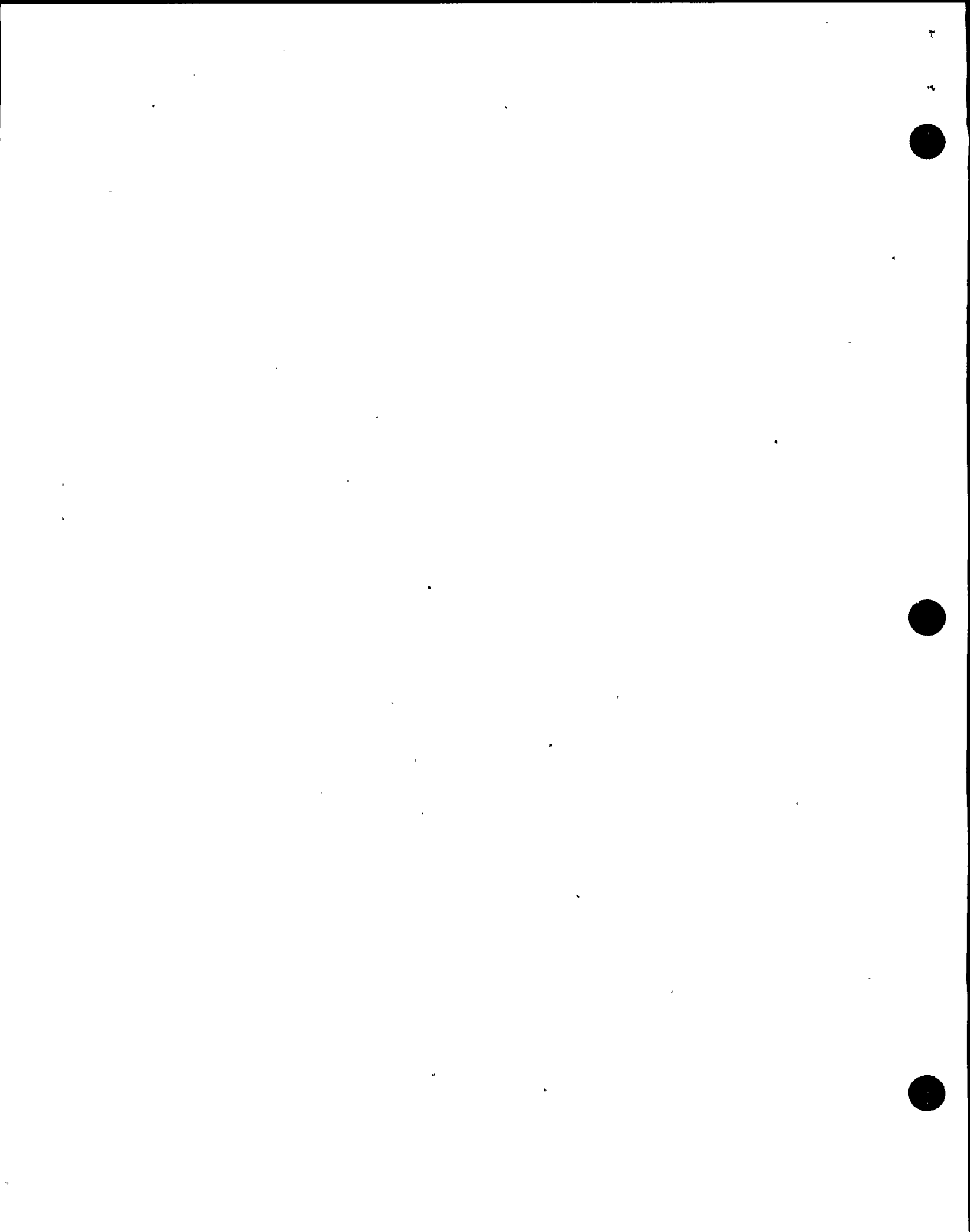


ATTACHMENT 4

POST TRAINING SUMMARY

The area below is reserved for instructor's notes regarding the implementation of this session.

1. Training Program: _____
2. Lesson Plan Number: _____
3. Date: _____
4. Instructor(s): (floor)
(Console)
5. Participants: (SSS)
(ASSS)
(CSO)
(NAOE)
(NAOE)
(SPEC)
(OTHER)
(OTHER)



6. Remarks:

