

Scenario Title: LARGE BREAK OUTSIDE CONTAINMENT WITH FUEL FAILURE (ATWS)

Scenario Duration: 50 Minutes

Scenario Number: 02-REQ-009-1DY-2-16

Revision Number: 1

Course: Licensed Operator Requal

Reviewed By: *J. Hamilton* 1 9/24/90  
Operations Training Supervisor Date

Reviewed By: *R. T. Seipried* 1 9/26/90  
Assistant Training Superintendent Date

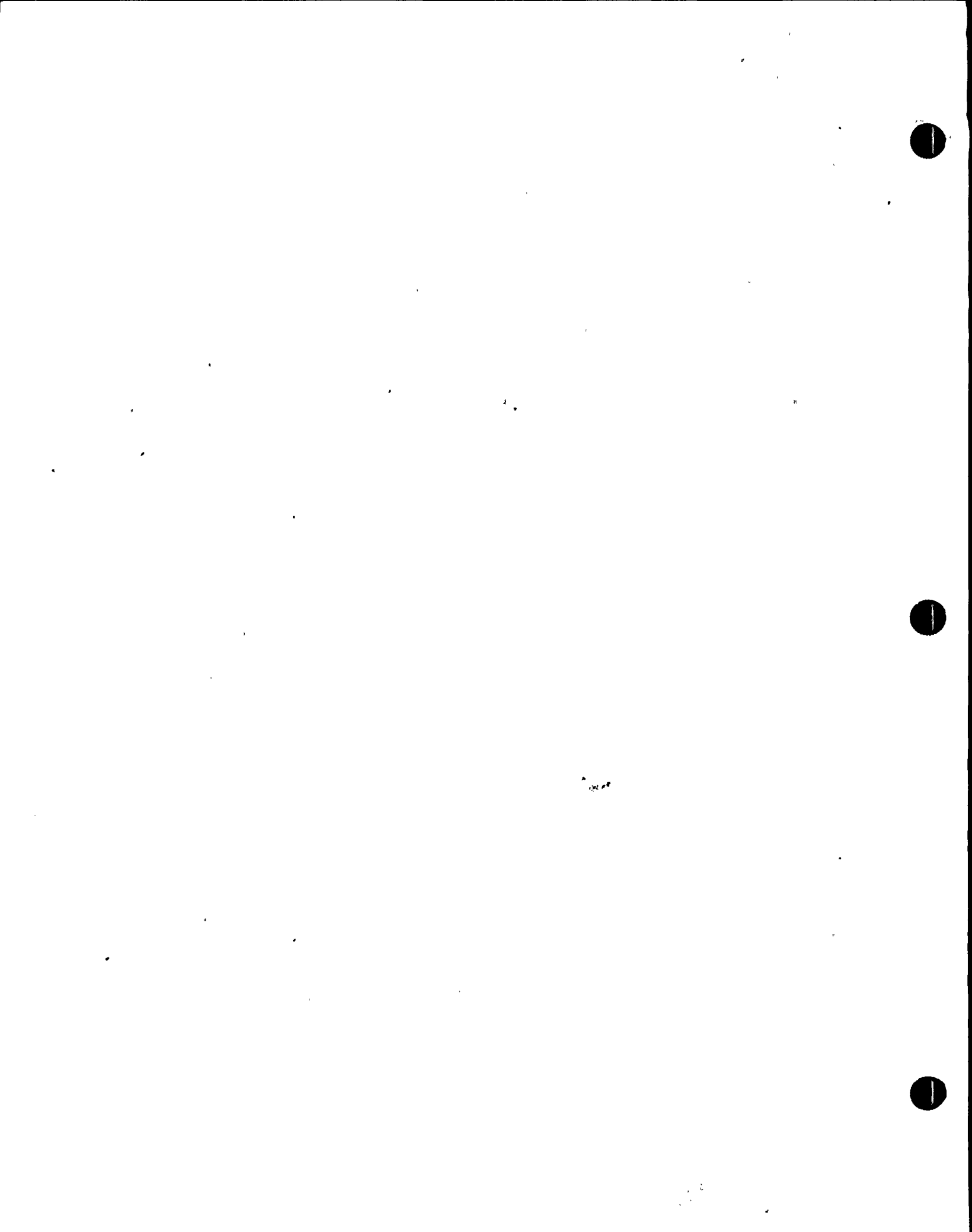
Approved By: *[Signature]* 10/12/90  
Superintendent of Operations Date

**MASTER  
CONTROLLED  
DOCUMENT**

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*4/29/96*

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## SCENARIO SUMMARY

### LARGE BREAK OUTSIDE CONTAINMENT WITH FUEL FAILURE (ATWS)

The plant is operating at rated power when the scenario begins. The shift is required to perform a quarterly surveillance on the RCIC System.

The C narrow range level transmitter fails upscale activating the feed pump and turbine trip logic on the C channel.

During the RCIC Surveillance, the CST suction valve fails to close. The failure leads to the system being declared inoperable.

A steam line break occurs outside the primary containment causing a Group I isolation signal. The MSIVs remain open and the reactor does not scram. A manual isolation closes all but the C MSL MSIVs and scram occurs when the EPAs are cycled.

Indication of fuel failure with one MSL unisolated complicates the recovery. The scenario ends with the plant being cooled down and the Emergency Plan notifications being made.



## SCENARIO OBJECTIVES

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

Perform the Actions Required for an Anticipated Trip without Scram (ATWS)

Task Number 2000200501 K/A Rating 4.40

Requal TIF 4.41 Class, Simulator

Perform the Actions Required for a Steam Line Rupture

Task Number 2000400501 K/A Rating 4.10

Requal TIF 4.28 Class, Simulator

Scram the Reactor Manually and take Immediate Actions

Task Number 2010130101 K/A Rating 4.10

Requal TIF 3.67 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

(\*) Individual Simulator Critical Task

(\*\*) Crew Simulator Critical Task



## NMP 2 CONTROL ROOM REFERENCES

### PROCEDURES:

- N2-OP-1, Main Steam System
- N2-OP-3, Condensate and Feedwater System
- N2-OP-29, Reactor Recirculation System
- N2-OP-34, Nuclear Boiler, Automatic Depressurization and Safety Relief Valves
- N2-OP-35, Reactor Core Isolation Cooling
- N2-OP-60, Drywell Cooling
- N2-OP-83, Primary Containment Isolation System
- N2-OP-97, Reactor Protection System
- N2-OP-101A, Plant Startup
- N2-OP-101C, Plant Shutdown
- N2-EOP-RPV, Reactor Pressure Vessel Control
- EPP-20, Emergency Notifications
- EAP-2, Classification of Emergency Conditions
- N2-OSP-IC2, Q002 RCIC Pump and Valve Operability Test and System Integrity Test

### TECHNICAL SPECIFICATIONS:

- LCO 3.3.9, Table 3.3.9-2
- LCO 3.7.4
- Tech Spec Interpretation #44





TIME

EVENT

INSTRUCTOR ACTIVITY

PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

Special Instructions:

Markup as out-of-service:

2RDS-P1B (B CRD Hydraulic Pump)

Simulator Operation:

Initialize: IC-20

Preset Malfunctions:

MF;1,RP03

RPS failure to scram

MF;2,MS05G

"C" MSL Fails to isolate

MF;3,MS05C

MF;4,MS13

MSIV Failure to isolate

MF;5RP14

RRCS ARI Failure

Preset Remote Functions:

None

Preset I/O Overrides

2,E51A-DS28-B,,OFF

Amber light for 2ICS\*MOV129

3,E51A-S10-C,,OFF

Green light 2ICS\*MOV129

4,E51A-S10-D,,ON

Red light for 2ICS\*MOV129

10,AN601301-25,,OFF

TCS Low Press



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EVALUATOR COMMENTS

Distribute and discuss turnover sheets

Initial Conditions:

100% BOL, maintaining power in OP-101A, RHM GP 147

Out-Of-Service Equipment:

RDS Pump 1B for seal work  
12 - 14 more hours before restoring

Surveillances scheduled:

N2-OSP-ICS-Q002  
"RCIC Pump and Valve Operability Test and System Integrity Test"

Allow not more than five minutes for panel walkdown.

Walkdown the panels

T = 0

Begin the Scenario

Assume the shift; continue power operation and perform assigned surveillance test.



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
T = +2	1	Set Malfunction: MF:6,FW28C	Vessel Narrow Range Level Transmitter fails upscale	<u>CSO/E</u> 1. Identify "C" Narrow Range Upscale 2. Verify all other NR level indicators show normal band 3. Report condition to SSS	4a 4a 6a
			Feed Pump Trip Logic "C" channel light illuminates.	<u>SSS</u> 1. Review Technical Specifications for actions required with NR transmitter failure. (Tech Spec Table 3.3.9-2)	
				<u>CSO/E</u> 1. Contact I & C to have them investigate problem with C NR level transmitter 2. Inform SSS of contact with I & C.	6b 6b
		Role Play: As I & C when contacted about C NR level transmitter, inform Operator that "you will investigate problem and get back to them"			



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EVALUATOR COMMENTS

2

During performance of surveillance procedure, Step 7.2.4 cannot be verified (CST Suction MOV-129 will not close with Suppression Pool suction open).

3. Commence Surveillance Procedure N2-OSP-ICS-Q002

3a

4. Report the ICS surveillance failure to SSS.

2a,6a

SSS

Review Technical Specifications for action required for CST suction valve failure

3a

1. Review Tech Spec 3.7.4 Reactor Core Isolation Cooling System and TS Interpretation #44
2. Declare RCIC inoperable





TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR-COMMENTS
T = +15		Set Malfunction: MF;7,RX01,20,03,+18:00 MF,8,MS02,,,+19:00		3. Verify HPCS operable	
T = +18	3	Malfunction 6 takes effect	Fuel damage of increasing severity which causes increased coolant activity		
T = +19	4	Malfunction 7 takes effect	Main Steam line rupture outside containment		
			Level swells to above level 8 on high steam flow	<u>TEAM</u> Respond to steamline rupture indicated by high temperature MSL tunnel	2a,4a,b,6b
			1. Turbine trips		
			2. Feed pumps trip	(**) 1. Report that MSIV flow is high and valves did not isolate Task # <u>2000400501</u> K/A Rating <u>4.10</u>	Sat/Unsat
				(**)2. Report that the reactor has not scrammed Task # <u>2000200501</u> K/A Rating <u>4.40</u>	Sat/Unsat



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OPERATOR ACTIONS

EVALUATOR-COMMENTS

High MSL Radiation annunciator

603133

3. Report turbine trip
4. Report feed pump trip

SSS

(\*)Enter EOP-RPV control

3a

Sat/Unsat

Task # 3449390603K/A Rating 4.70Task # 3449400603K/A Rating 4.70Task # 3449410603K/A Rating 4.70

1. Direct attempts to manually  
scram the reactor
2. Direct power reduction per  
EOP-RQ
3. Direct isolation of MSIVs  
manually

CSO/E

1. Attempt a manual reactor  
scram

5a,b

2. Verify RRCS functioned to  
trip the recirc pumps

4a



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OPERATOR ACTIONS

EVALUATOR COMMENTS

A, B, and D steam lines isolate (C line remains unisolated)

(\* 3. Manually isolate MSIVs  
Task # 2000400501  
K/A Rating 4.10

5a,b Sat/Unsat

Control Rods insert and shut-down the reactor

(\* 4. Trip EPAs for scram pilot solenoids  
Task # 2010130101

5a,b Sat/Unsat

Vessel level shrinks due to MSIV closure, level drops below level 2

K/A Rating 4.10  
5. Verify control rod insertion shutting down reactor

6. Report "C" Main Steam Line is unisolated, other steam lines isolated

SSS

1. Direct vessel level control and restoration to between 159.3 and 202.3"

2a,b,6a

2. Direct actions to isolate "C" main steamline locally if possible

2a,b,6a

3. Direct action to control pressure using SRVs and/or RCIC

2a,b,6a

ROLE PLAY:

As NAOE when asked to locally isolate outboard MSIV for "C" MSL, state that you will investigate conditions in the tunnel



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OPERATOR ACTIONS

EVALUATOR-COMMENTS

High High MSL Rad monitors  
AN603107 and 603407

ASSS/STA

1. Notify Radiation Protection that there has been a steamline rupture with a failure to isolate. Ask them to evaluate off-site release and turbine building conditions.

1a,b,6a,b,

CSO/E

1. Restore level to between 159.3 and 202.3 using feed and condensate 5a,b
2. Control pressure using SRVs
3. When level is restored above level 2, restore drywell cooling 5a,b
4. Place suppression pool cooling in service 5a,b

ROLE PLAY:

As NAOE report that you cannot enter the tunnel due to high temperature and high radiation.





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PLANT RESPONSE

OPERATOR ACTIONS

EVALUATOR COMMENTS

SSS

1. Direct vessel pressure reduction to maintain 100°F/hr cooldown rate using SRVs

CSO/E

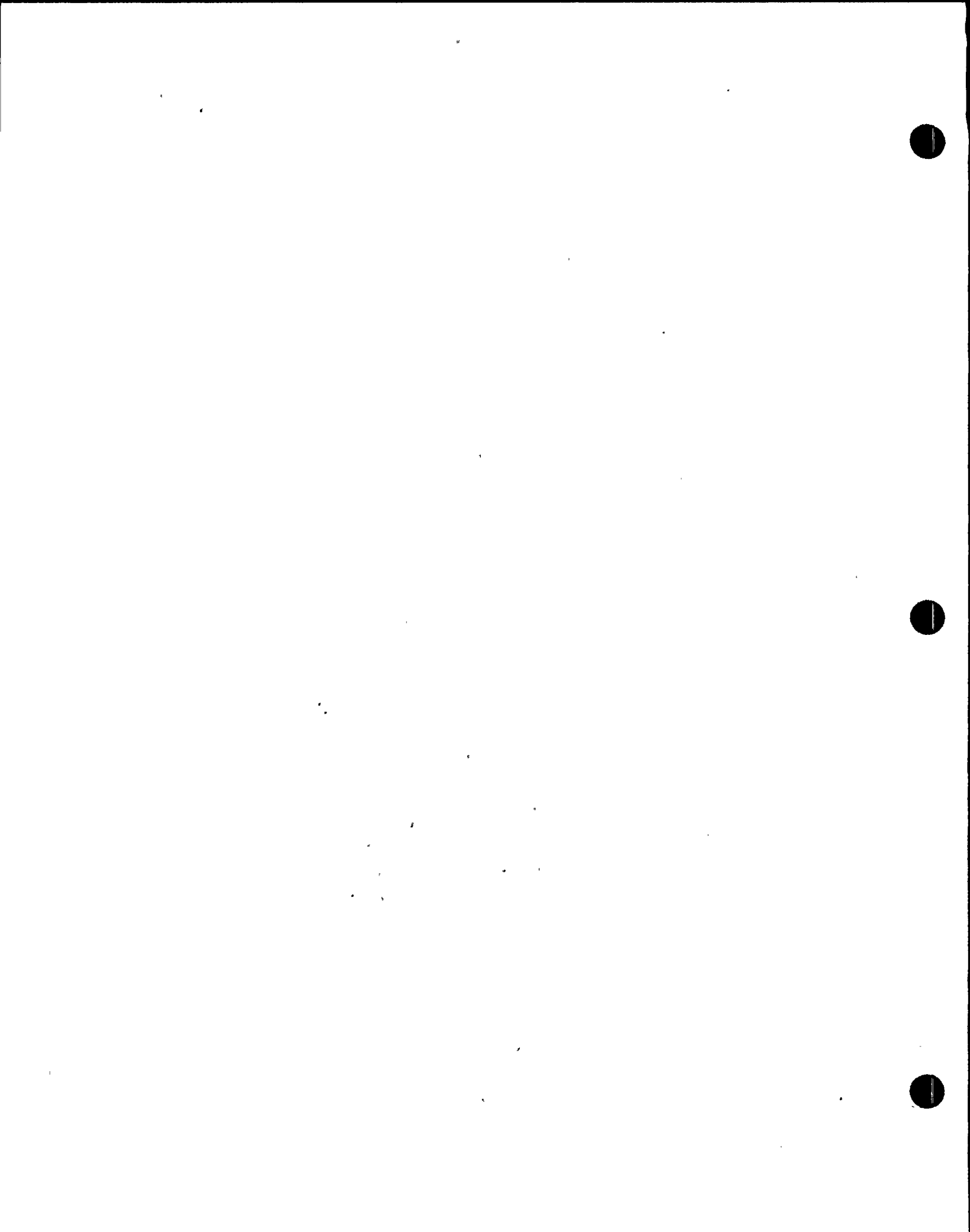
1. Reduce vessel pressure using SRVs 5a,b
2. Monitor cooldown rate 4a

SSS/SEPC

- (\*) 1. Classify the event as a Site Area Emergency (MSL break outside containment with failure to isolate) 2a,b Sat/Unsat  
Task # 3440190303  
K/A Rating 4.70

SSS

1. Activate Emergency Plan for Site Area Emergency 2a,b,c,3b,6b,c



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EVALUATOR-COMMENTS

SEPC/ASSS

1. Call for communicator 6a
2. Make emergency notifications 6b  
per EPP-20 for Site Area  
Emergency

Termination Cue: Vessel level controlled  
between 159.3 and 202.3"  
Vessel being cooled down  
Emergency plan activate for  
Site Area Emergency

