NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

SIMULATOR LESSON PLAN

02-REQ-009-TRA 2.43 Revision 0

TITLE: EOP-C4 TRAINING

	SIGNATURE	DATE
PREPARED BY		7/12/91
VALIDATED BY		7/12/91
SUPERVISOR OPS TRAINING		7/12/91
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	FOR J B HELLER	7/12/91

Summary of Pages

(Effective Date: 7/12/91)

Number of Pages: 23

Date	Pages
July 1991	1 - 23

27

4/29/03

A. TRAINING DESCRIPTION

1. Title of Lesson Plan. EOP-C4 Training
2. Estimated Duration of Lesson: 1.5 hrs
3. Prerequisites:
   a. Instructor:
      Qualified in accordance with NTP-16.
   b. Trainees:
      Meet eligibility requirements per 10CFR55.
4. References:
   a. N2-EOP Bases Document
   b. N2-EOP - RPV Control
   c. N2-EOP-C2 Emergency Depressurization
   d. N2-EOP-C4 RPV Flooding
   e. N2-EOP-6 Attachments

B. REQUIREMENTS

1. NTP-11, Licensed Operator Requalification Training

C. PRE-EXERCISE BRIEF

Conduct in accordance with NTI-4.3.1 using Attachment 1 as a guide.

D. SIMULATOR SET-UP

1. Initialize to IC-20
2. Change the simulator conditions as follows:
   a. Hang the "Above the 100% Rod Line" sign
3. Presets
   a. Preset Malfunctions
      1) 1, RD17, 90
   b. Preset I/O
      None
   c. Preset Remotes
      None

E. POSITION ASSIGNMENTS

Ensure proper rotation of trainees is performed to meet the requirements of the training session.

F. SCENARIO SUMMARY

The purpose of this training session is to review EOP-C4, RPV Flooding. The scenario begins with the crew operating at full power. Once the crew assumes the shift they will experience a full power ATWS followed shortly by a large break LOCA. The crew will carry out actions per EOP-C4, due to the loss of level indication, to establish greater than 135 psig in the RPV. Once the crew is able to get all the control rods in the scenario will be terminated when they have established RPV pressure 61 psig above suppression chamber pressure.

G. LEARNING OBJECTIVES

LO-1.0 Demonstrate effective communications in accordance with the Operations Department Instruction on verbal communications.

LO-2.0 Demonstrate for those exercises that require use of the Emergency Plan, an understanding of the roles and responsibilities of the SSS, ASSS/STA and the CSO/NAOE in accordance with Operation Department Instruction.

LO-3.0 SRO's shall demonstrate an understanding of command and control, EOP place keeping techniques and effective use of Control Room personnel during emergency conditions.

LO-4.0 Operators shall demonstrate "Self Verification" work practices in accordance with Operations Department Instructions.

LO-5.0 Given a reactor plant that has experienced a full power ATWS and LOCA the crew will perform actions to raise RPV pressure to greater than 135 psig.

Tasks:

RO: Perform the actions for a large break LOCA, inside the primary containment. (2009150501)

SRO: Direct the actions required per EOP-C4, RPV Flooding. (3449560603)

LO-6.0 Given a shutdown reactor with no level indication the operating crew will establish RPV pressure as close as practicable to 61 psig above suppression chamber pressure.

Tasks:

RO: Perform the actions for a large break LOCA, inside the primary containment. (2009150501)

SRO: Directing the actions required per EOP-C4, RPV Flooding. (3449560603)

LO-7.0 Given EOP-C4 the operating crew will be able to discuss the bases for each step in accordance with the N2-EOP Bases Document.

Tasks:

RO: Perform the actions for a large break LOCA, inside the primary containment. (2009150501)

SRO: Directing the actions required per EOP-C4, RPV Flooding. (3449560603)

H. LESSONS LEARNED

None

I. TURNOVER INFORMATION

1. Give the following information for initial conditions:

Core Life: BOI

Description: Plant is operating at full power above the 100% rod line

Rod Sequence Information: Step 84

Plant Conditions: 100% Power

2. Tech. Spec. limitations in effect:

None

3. Significant problems/abnormalities:

None

4. Evaluations/maintenance for the on-coming shift:

None

J. SCENARIO

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
1. Provide turnover information to SSS.	SSS provides crew turnover		
2. When SSS completes the turnover commence the scenario.	Crew assumes the shift		
3. Enter malfunction 2, RP01 Rx Scram	<u>Crew</u> Reports failure to scram <u>SSS/ASSS</u> a. Enters EOP RPV control b. Directs mode switch to shutdown. c. Directs water level maintained 159.3 to 202.3 inch. d. Directs pressure maintained below 1037 psig. e. Direct RRCS initiated <u>CSO/E</u> a. Place mode switch to shutdown. b. Maintains water level as directed. c. Maintains pressure as directed d. Initiates RRCS		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
	SSS/ASSS a. Direct recirc flow runback to minimum.		
	CSO/E a. Reduces recirc flow to minimum		
	SSS/ASSS a. Direct recirc pumps tripped		
	CSO/E a. Trip recirc pumps		
	SSS/ASSS a. Direct control rod insertion IAW EOP-6 Attachment 14		
	CSO/E a. Insert rods IAW EOP-6 Attachment 14		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
4. As requested: To defeat RPS enter 3, RP02 To defeat ARI enter 4, RP014 To defeat RSCS enter 5, RW02	SSS/ASSS a. Exit EOP-RPV control section RL b. Enter EOP-C5 c. Direct ADS inhibit switches to ON CSO/E a. Place ADS inhibit to ON		
5. When ADS has been inhibited enter malfunction 6, RR20 DBA LOCA - RPV pressure lowers rapidly - Containment pressure rises rapidly - MSIV's close	CREW a. Report indications of LOCA SSS/ASSS a. Enters FOP-PC control Exercises sections DWT, SPL, PCP, PCH and SPT. b. Decide that RPV level cannot be determined, RPV flooding is required. c. Exit RP enter C2 and order 7ADS valves opened.		LO-5.0

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
	CSO/E		
6. When directed by floor instructor enter malfunction 7,RR19 then clear malfunction 6.	a. Open 7ADS valves		
	SSS/ASSS		
	a. Enters EOP-C4 RPV flooding.		
	b. Directs operators to terminate and prevent all injection except boron and CRD.		
	CSO/E		
	a. Terminate and prevent		
	1. RHR		
	2. Feed/condensate		
	3. HPCS		
	4. RCIC		
	5. LPCS		
	SSS/ASSS		
SSS waits until RPV pressure is below 135 psig.	a. Determine RPV pressure is below minimum alternate flooding pressure.		
	b. Verify MSIV's closed		
	c. Verify/direct main steam line drains closed		

EXPECTED STUDENT RESPONSE

SAT/UNSAT/NA

COMMENTS

8. When scram is reset clear malfunction 1.

If directed to override feedwater high level trip
pg. FW4 .Toggle 33

d. Verify/direct RCIC steam line isolation valves closed.
e. Directs injection using feed/condensate to achieve 135 psig.
f. Direct actions for DW sprays and suppression chamber sprays.

CSO/E

a. Verifies/closes MSIV's, MSL drains and RCIC.
b. Commence injection to the RPV to achieve 135 psig or greater using feed/condensate.
c. Trips drywell unit coolers
d. Sprays the drywell and suppression chamber as directed.

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
	SSS/ASSS a. Directs injection of other listed sources to achieve 135 psig.		
9. When crew has established 135 psigs enter IO's per Simulator operator aid to clear the high SDV scram signal. Remove Io's when scram inserted.	CSO/E a. Injects with sources as directed to achieve 135 psig. b. Reports to SDV scram clear and inserts second scram. c. Reports all rods in		
	SSS/ASSS a. Order SLC secured and exits RQ b. Proceeds to the shutdown leg of RPV flooding c. Directs RPV pressure maintained 61 psig above suppression chamber pressure.		LO-6.0

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
10. When containment sprays are in progress and RPV pressure is 61 psig above supp. chamber pressure terminate the scenario?	CSO/E a. Secures SLC b. Controls injection to maintain RPV pressure 61 psig above suppression chamber pressure.		
11. Using the EOP Bases Document and the Simulator conditions review EOP-C4 Bases.			LO-7.0
Q: What is the purpose of RPV flooding?	A: To specify actions to inject water into the RPV and increase RPV water level until either the main steam lines flood, or if the reactor is not shutdown, to assure adequate core cooling by a combination of submergency and steam cooling.		
Q: Why do we want to exit C4 as soon as we can determine RPV level?	A: The flooding evolution may place severe hydraulic loads on the piping downstream of the SRV's.		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS

12. Discuss how "RPV water level can be determined"

    The statement "RPV water level can be determined" is meant to allow the SSS to utilize any method(s) of level determination available to him. This may be a direct or indirect method utilized alone or in conjunction with other methods. Conservatively, the SSS could wait until "RPV water level instrumentation is available", however, other methods could be, but are not limited to, flow through the SRVs, temperature stratification in the vessel, or use of neutron monitoring instrumentation. Recognize however that neutron monitoring instrumentation methods will not be useful for determining level as far as action levels in C4. If SRVs are being used to determine level, this mechanism will be lost when flooding is secured, thus it is appropriate to stay in C4.

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: If we have a choice between maintaining adequate core cooling or containment integrity we choose containment integrity. Why?	A: In order to protect the general public.		
13. Discuss how we determine if the reactor will remain shutdown during the flooding evolution using the bases document.			
Q: Why do we terminate and prevent injection prior to floodup during an ATWS?	A: When RPV flooding is required and less than the number of SRVs dedicated to ADS are open, then emergency RPV depressurization is also required. A rapid depressurization of the RPV can result in the rapid injection of large amounts of relatively cold, unborated water from low pressure injection systems as RPV pressure reaches and falls below the shutoff head of the pumps in these systems.		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
	The actions taken in this step to terminate and prevent injection into the RPV allow RPV depressurization to proceed safely under failure-to-scram conditions. Injection from boron injection systems and CRD is not terminated because operation of these systems may be required to establish and maintain the reactor in a shutdown condition.		
14 Review the crews actions for terminate and prevent.	The statement to "Terminate and prevent injection" means to take the most direct action which will stop and preclude injection flow into the RPV.		

Actions may include, as appropriate, closing the injection flow valve, tripping the pump, and deenergizing the electrical power supplying system components.

Q: Define Minimum Alternate RPV Flooding Pressure and discuss how adequate core cooling is maintained?

A: The Minimum Alternate RPV Flooding Pressure (Figure C4-2, refer to Section C) is defined to be the lowest RPV pressure at which steam flow through open SRVs is sufficient to preclude the clad temperature of the hottest fuel rod from exceeding 1500°F, even if the reactor core is not completely covered or the reactor is at power.

As long as RPV pressure remains above the Minimum ALTERNATE RPV Flooding Pressure, the core is adequately cooled by a combination of submergency and steam cooling, irrespective of whether any water is being injected into the RPV or the reactor is at power. Once RPV pressure is below the Minimum ALTERNATE RPV Flooding Pressure, further actions are directed to assure that the core remains adequately cooled.

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: Why do we isolate steam lines connected to the RPV if 4 SRV's are open?	A: Steam lines connected to the RPV are isolated prior to initiating actions to flood the RPV to preclude damage which may occur due to excessive thermal stress (cold water coming in contact with the hot RPV metal), excessive loading of lines of hangers not designed to accommodate the weight of water, and flooding of stem driven equipment (RCIC turbine, main turbine, etc.). Steam line isolation is performed, however, only if the status of SRVs assures that the RPV will remain depressurized during the flooding evolution.		

If less than the Minimum Number of SRVs Required for Emergency Depressurization (4) can be opened, steam line isolation is not appropriate because, as stated previously, the open steam lines provide the means of venting the RPV as the floodup progresses. Execution of the actions directed by this step is contingent upon the number of SRVs which can be opened.

Q: Why is the RCIC System isolated?

A: The RCIC System is isolated in order to preserve its ability to provide RPV injection should it later be needed under conditions when all motor driven pumps are incapable of adequately flooding the RPV.

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: Why do we isolate the main condenser when it could be used as a heat sink?	A: If RPV depressurization is performed and significant reactor power is still being generated, boron injection will be required shortly as the energy from RPV blowdown rapidly heats the suppression pool. Therefore, action to isolate steam lines is directed to limit boron depletion from the RPV during the ensuing floodup. Ultimately, failure to close the MSIVs risks damage to downstream equipment which may be needed during subsequent restorative actions.		
Q: Why are we cautioned to inject slowly when commencing the floodup?	A: To preclude the possibility of large power excursions caused by the rapid injection of cold, unborated water.		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: Why do we want to maintain the Minimum Alternate RPV Flooding Pressure?	A: Because that will assure that either the RPV will flood to the main steam lines, or, if the reactor returns to criticality, the core will be adequately cooled by a combination of submergence and steam cooling.		
Q: Why are we allowed to only use feed/condensate and CRD at this point?	A: Since the inject outside the shroud the cold unborated water will mix with the warm borated water prior to reading the core.		

15. Review the alternate injection systems listed for RPV flooding and discuss why they are not preferred.

16. Discuss why containment flooding would be required if SRV's could not be opened or if the minimum alternate flood pressure were not reached.

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: Why do we want to maintain RPV pressure as low as practicable?	A: Minimize injection flow requirements SRV tail pipe loading, primary containment heatup and boron dilution.		
17. Should the reactor be shutdown with boron with RPV water level raised to the main steam lines, boron dilution will follow and the reactor may return to criticality. The subsequent increase in reactor power will require a reduction injection to maintain RPV pressure near the Minimum Alternate RPV Flooding Pressure (Figure C4-2, refer to Section C). This action will result in a reduction in RPV water level to below the main steam lines, limiting the boron dilution.			
Note: Move to K			

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
Q: Why do we need atleast 4 SRV's open during vessel flooding?	A: To ensure the RPV will remain depressurized.		
Q: Why are we directed to isolate steam lines if atleast 4 SRV's are open or HPCS/Feedwater are available.	A: Steam driven equipment need to be protected during floodup.		
Q: Why do we leave the steamlines open if we do not meet the conditions in the last question?	A: Provides a means of venting the RPV as the floodup is in progress.		
Q: Why do we need to maintain 61 psig above suppression chamber pressure.	A: It is the lowest differential pressure between the RPV and suppression chamber at which steam flow through 4 SRV's is sufficient to remove decay heat.		
Q: What is the decay heat rate based on.	A: Ten minutes after shutdown from full power.		

INSTRUCTOR INFORMATION/ INSTRUCTOR ACTIVITIES	EXPECTED STUDENT RESPONSE	SAT/UNSAT/NA	COMMENTS
18. Review why containment flooding is required if 4 SRV's are not open if 61 psig is not achieved.			
19. Using the bases document review the remain steps of EOP-C4.			
20. Review the learning objectives.			

K. POST EXERCISE ASSESSMENT

1. The instructor may review the Scenario Summary, Learning Objectives and the Lessons Learned with the crew.

   The Lessons Learned should be reviewed even if no errors were committed.

2. The crew may perform a self assessment.

   Have the crew assess their performance in relation to the Lessons Learned and the Learning Objectives for this exercise.

   The individual who was the SSS during the scenario should lead the assessment.

3. Instructors Assessment

   The instructors may provide an assessment of the crew's performance (as necessary) during the execution of the crew's self-assessment. The bases of this assessment shall be the Lesson Plan Notes, Team Work Rating Scale and the topics covered in the Lesson Plan. The comments from the Scenario Checklist should be detailed and focus on individual performance. The comments from the Team Work Rating Scale should be global and should be focused on the team as a whole.

The below are examples that may be used during the assessment:

a. Control Room formality
b. Actions taken and differences from expected actions.
c. Procedural use and compliance.
d. Attentiveness to control panels and indications.
e. Teamwork and communications.
f. Meeting the Learning Objectives.
g. Logkeeping
h. Understanding plant/system response.
i. Diagnosis of events/conditions
j. Recognize progress and good performance.
k. Compliance/use of Technical Specifications.
l. Supervisory control.
m. Emergency plan implementation.
n. Notifications and administrative requirements.
o. Self verification techniques
p. Conservative approach to reactor safety
(NCTS 5) q. Realism

Summarize any performance weaknesses or trainees misconceptions and provide guidance or training to correct these weaknesses. Any questions asked during the scenario should be reviewed with the entire crew.

4. Questions raised during the assessments, or at any time during the training session, that cannot be immediately answered should be researched and answered before the end of the day, if possible. If the answer is found after the training cycle is completed, bring the questions and the answer to the program coordinator for disposition.

5. Questions concerning interpretations of procedural steps, technical specifications or station policy will be answered by contacting the responsible station management person and relaying the answer to the crew. For further clarification, it may be necessary to complete the appropriate plant/simulator documentation.

6. Video taping may be used to enhance the crew's strengths and weakness.

(NCTS 3)

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-NLO-006-342-2-01 Revision 2

TITLE: EMERGENCY OPERATING PROCEDURES

	SIGNATURE	DATE
PREPARER	[signature]	1-7-91
TRAINING AREA SUPERVISOR	[signature]	1-7-91
TRAINING SUPPORT SUPERVISOR	[signature]	1-7-91
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	[signature]	1/7/91

Summary of Pages

(Effective Date: 1-7-91)

Number of Pages: 34

Date	Pages
November 1990	1,2,5,7,8,14-16, 18-21,23-27
January 1991	3,4,6,9-13,17,22, 28-34

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____

DATA ENTRY: _____

RECORDS: _____

ATTACHMENT 3
LESSON PLAN TEMPORARY/PUBLICATION/ADDENDUM CHANGE FORM

The attached change was made to:

Lesson plan title: EMERGENCY OPERATING PROCEDURES

Lesson plan number: 02-NCO-006-342-2.01

Name of instructor initiating change: _____

Reason for the change: Added SOER 86-1 to Sect I.G as a reference ~~to the station~~ pg 1

Type of change:

1. Temporary change ____
2. Publication change ____
3. Addendum change ✓

Disposition:

✓ 1. Incorporate this change during the next scheduled revision.

____ 2. Begin revising the lesson plan immediately. Supervisor initiate the process.

____ 3. To be used one time only.

Approvals:

Instructor: [signature] /Date 8-21-91

Training Area Supervisor (or designee): [signature] /Date 8/21/91

I. TRAINING DESCRIPTION

A. Title of Lesson: Emergency Operating Procedures

B. Lesson Description: Provide instruction on Emergency Operating Procedures. Emphasis is placed on knowledge and activities associated with Auxiliary Operator duties in the plant.

C. Estimate of Duration of the Lesson: 8 hours

D. Method of Evaluation, Grade Format, and Standard of Evaluation: Written exam, passing grade of 80% or greater.

E. Method and Setting of Instruction:
EOP lecture and facilitated discussion shall be conducted in the classroom.

F. Prerequisites:

1. Instructor:
   a. Certified in accordance with NTP-16.
2. Trainee:
   a. In accordance with NTP-12.

G. References:

1. Emergency Procedure Guidelines, Revision 4 (NEDO 31331)
2. Emergency Procedure Guidelines, Appendix A
3. Emergency Procedure Guidelines, Appendix B (OEI Document 8390-4B0
4. NMP-2 FSAR Section 13.5.2.1.2, Emergency Operating Procedures
5. P&ID's; 1E, 1F, 30A, 30B, 30C, 31A, 31B, 31D, 31E, 31F, 32A, 33A, 33B, 36A, 37D, 37E, 37F, 61A, 61B, 105A, 105B
6. N2-EOP-RPV; RPV Control
7. N2-EOP-PC, Primary Containment Control
8. N2-EOP-SC; Secondary Containment Control
9. N2-EOP-RR; Radioactivity Release Control
10. N2-EOP-MSL; MSIV Leakage Control
11. N2-EOP-6;
12. N2-EOP-C1; Alternate Level Control
13. N2-EOP-C2; Emergency RPV Depressurization
14. N2-EOP-C3; Steam Cooling
15. N2-EOP-C4; RPV Flooding
16. N2-EOP-C5; Level/Power Control
17. N2-EOP-C6; Primary Containment Flooding

II. REQUIREMENTS

A. Requirements for Class:

1. INPO NLO Guidelines
2. NTP-12

B. Specific Content:

1. TMR dated 8/27/89 from J. Helker

III. TRAINING MATERIALS

A. Instructor Materials:

1. Whiteboard and Markers
2. Overhead projector
3. Transparencies
4. EOP Flowcharts
5. NLOT EOP Overview Instructor Guide
6. P&ID's
7. TR

B. Trainee Materials:

1. Objectives
2. EOP Flowcharts
3. EOP-6
4. EOP Student Guide
5. P&ID's; 1E, 1F, 30A, 30B, 30C, 31A, 31B, 31D, 31E, 31F, 32A, 33A, 33B, 36A, 37D, 37E, 37F, 61A, 61B 105A, 105B
6. Course Evaluation Forms

IV. EXAM AND MASTER ANSWER KEYS

Exams and answer keys will be on permanent file in the Records Room.

V. LEARNING OBJECTIVES

A. Terminal Objectives:

Upon satisfactory completion of this lesson, the trainee will be able to perform NLO duties required to:

TO-1.0	Make ECCS Injection Systems throttleable	(2009010504)	|2
TO-2.0	Crosstie Residual Heat Removal and Firewater Systems	(2009020504)	|
TO-3.0	Utilize ECCS Keepful Pumps for RPV Injection	(2009030504)	|2
TO-4.0	Utilize Condensate Transfer for RPV Injection and/or Primary Containment Flooding.	(2009040504)	|
TO-5.0	Utilize SLS Test Tank for RPV Injection	(2009050504)	|2
TO-6.0	Depressurize the RPV using the Condenser	(2009060504)	|
TO-7.0	Defeat Reactor Water Cleanup System Isolation Interlocks	(2009070504)	|
TO-8.0	Insert Control Rods using Alternate Methods	(2009080504)	|2
TO-9.0	Inject Boron with the Standby Liquid Control System Hydro Pump	(2009090504)	|
TO-10.0	Operate Steam Jet Air Ejectors with Auxiliary Boiler Steam	(2009100504)	|2
TO-11.0	Backfill Main Steamline Isolation Valves	(2009110504)	|2
TO-12.0	Vent or depressurize the RPV	(2009120504)	|
TO-13.0	Inject Boron using the Reactor Water Cleanup System	(2009130504)	|
TO-14.0	Vent the Containment	(2009140504)	|2
TO-15.0	Purge the Containment by Defeating Interlocks	(2009150504)	|
TO-16.0	Defeat the HVR LOCA Isolation Signals	(2009160504)	|2
TO-17.0	Determine Containment Level (above el. 224 ft.)	(2009170504)	| |

B. Enabling Objectives

Upon completion of training the Trainee will have gained the knowledge to:

EO-1.0 Describe the type of logic used to develop the Emergency Operating Procedures for Nine Mile Point Unit 2.

EO-2.0 Describe the three mechanisms of adequate core cooling.

EO-3.0 Describe the purpose of each Emergency Operating Procedure.

EO-4.0 Describe the purpose of various shaped blocks used in the Emergency Operating Procedures.

EO-5.0 Describe the methods used to identify steps in a flowchart referenced from a different flowchart.

EO-6.0 Describe electrical safety precautions associated with lifting leads and installing jumpers.

EO-7.0 Describe environmental concerns associated with performing in plant actions during implementation of the Emergency Operating Procedures.

EO-8.0 Using EOP-6, determine and use the correct attachment to identify the actions and/or locate information related to NLO duties required during implementation of the Emergency Operating Procedures.

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
I. OVERVIEW OF EMERGENCY OPERATING PROCEDURES		
A. Introduction		
1. Self		
2. Course Content	Review major topics to be covered and	
a. Course provides information concerning:	method of instruction to be used.	
1) History and development of Emergency Operating Procedures.		
2) An overview of the six Emergency Operating Procedures and six Contingency Procedures.	Pass TR out to trainees. Ensure trainees have copies of EOP flow charts and objectives. Review objectives with the trainees.	
3) NLO actions required by EOP's	Discuss method of evaluation with the trainees.	
3. Objectives	Discuss purpose of Course Evaluation	
B. History	Forms with trainees.	
1. Investigation was conducted after the Three Mile Island (TMI) accident.		
2. Deficiencies noted:		
a. Operator required additional training in controlling the reactor during "abnormal" conditions.		
3. At TMI, Abnormal/Emergency Procedures were entered:	In this context, includes abnormal <u>and</u> emergency conditions.	
a. After event was identified.	This is known as "event" based logic.	

4. This type of logic was disastrous at TMI because:
   a. Several failures occurred in plant.
   b. Operators could not accurately diagnose "event(s)".
   c. Wrong procedures were used.
5. After TMI, BWR Owners Group (BWROG) saw need to change:
   a. EOP logic
   b. Training received by operators.
6. BWROG formed an Emergency Procedure Committee to address issues identified during analysis of TMI.
7. Emergency Procedure Committee developed a set of generic Emergency Procedure Guidelines (EPGs) to:
   a. Assist plants in developing site specific Emergency Operating Procedures (EOPs).
   b. Change logic used in EOPs to "symptom" based logic.

Draw on Board:

After TMI: BWROG

Emergency Procedures Committee

Emergency Procedure Guidelines (Symptom Based Logic)

Site Specific EOP's

Conditions of plant cause entry into EOP not when event is classified.

Examples: LOCA = event
High Drywell Pressure=symptom

EO-1.0

c. Provide standards for plants experiencing abnormal, or emergency conditions.

8. Emergency Procedure Guideline development was based on providing guidelines to prevent or reduce the release of radioactive material to the public and environment from the reactor. This can be delineated with three main tasks:

a. Protection of the Containment Building Integrity including:
   1. Fuel cladding boundaries
   2. Reactor pressure vessel boundaries
   3. Primary containment boundaries
   4. Secondary containment boundaries

b. Control of Reactivity

c. Maintenance of the Heat Sink (the suppression pool).

Ask Trainees: Does a High Drywell Pressure always indicate a LOCA?
Answer: No, a loss of Drywell Cooling could also cause a High Drywell pressure.

C. Terms

Several terms are used in the EPGs and EOPs which may not have clear definitions, or the same definition, for all personnel.

A few of these terms will be covered now.

1. Adequate Core Cooling - heat removal from the reactor sufficient to maintain peak cladding temperature (PCT) at or below 1800°F/1500°F.
   a. 1500° for steam cooling with injection (the threshold temp for fuel rod perforation.)
   b. 1800° for steam cooling without injection (the threshold temperature for significant metal - water reaction.)

Show Transparency #1

Discuss significance of 2200°F PCT. (Zirc-Water reaction is exothermic- above 2200°F, becomes self sustaining.)

Show Transparency #2

EO-2.0

2. Three mechanisms of adequate core cooling exits. In order of preference, they are:
   a. Core Submergence - Each bundles is completely submerged.
   b. Steam Cooling with injection: Steam updraft through the uncovered portion of the reactor core is sufficient to prevent the temperature of the hottest fuel rod from exceeding 1500°F.
   c. Steam cooling without injection: Steam updraft through the uncovered portion of the reactor core is sufficient to prevent the temperature of the hottest fuel rod from exceeding 1800°F.

EO-2.0

3. Cannot be Determined - the current valve or status of an identified parameter cannot be ascertained using all available indications (direct and indirect, singly or in combination).

Show Transparency #3
Example: Use SRMs to determine water level in RPV.

4. Confirm - use available indications (status lights, direct and indirect presentations of the values of plant parameters, etc.) and/or physical observation to establish that the specified action has occurred or conditions are as stated. This does not include an implied requirement to take any corrective action if the identified conditions do not exist.

Show Transparency #4

Stress this point.

D. EOP's

There are six (6) Emergency Operating Procedures which have been developed for use at Nine Mile Point - Unit 2. They are:

1. Reactor Pressure Vessel (RPV) Control -
   a. designed to:
      1) Maintain adequate core cooling
      2) Shutdown the reactor
      3) Cooldown the reactor to cold shutdown conditions

Show Transparency #5
Ask trainees to list the three (3) parameters, assist as necessary.
Uncover items on transparency when listed.

EO-3.0

2

b. entered on:
   1) RPV water level (<159.3")
   2) RPV pressure (>1037 #)
   3) Drywell pressure (>1.68 #)
   4) Reactor power is greater than 4% or unknown and scram is required

2. Primary Containment Control -

   a. Designed to protect safety related equipment in the Primary Containment and to maintain Primary Containment integrity.

   b. entered on:
      1) Suppression pool temperature (>90°)
      2) Drywell temperature (>150°)
      3) Suppression pool water level (>201')
      4) Suppression pool water level (<199.5')
      5) Primary Containment Hydrogen concentration (>1.8%)
      6) Drywell pressure (>1.68 #)

Show Transparency #6A

Ask trainees to list the six (6) parameters, assist as necessary.

Uncover items on transparency when listed.

Show TP #6B (entry conditions)

EO-3.0

|2

|2

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
3. Secondary Containment Control -	Show Transparency #7A	|2
a. Designed to:	Ask trainees to list the three (3) parameters.	EO-3.0
1) Protect equipment in the secondary containment.	Uncover items on transparency when listed.	
2) Limit the radioactivity release to the secondary containment.	Assist as necessary.	
3) Maintain secondary containment integrity or limit radioactivity release from the secondary containment.		
b. Entered on:		
1) Differential pressure ($\geq$ 0 in of H_2O).	Show TP #7B (entry conditions)	|2
2) Area temperature (> isolation setpoint)		
3) Area radiation level (unexpectedly high)		
4) HVR exhaust radiation level (above an isolation setpoint)		
5) Floor drain sump water level (high-high)		
4. Radioactivity Release Control -	Show Transparency #8	
a. Designed to limit the release of radioactivity into areas outside the primary and secondary containments.	Ask trainees to list the one (1) parameter, assist as necessary. Uncover item on transparency when listed.	EO-3.0

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
b. Entered when:	Show TP #8B (entry conditions)	|2
1) Stack GEMS exceeds the alarm setpoint (P882)	Release rate is above Emergency Plan Alert level.	
2) Vent GEMS exceeds the alarm setpoint (P882)		
3) DRMS liquid effluent monitor exceeds the alert setpoint (yellow)		
5. MSIV Leakage Control -	- Show Transparency #9	
	- This condition is considered an "event" vice a "symptom".	
a. Designed to control:	- The only exception to "symptom" base EOP logic.	
1) Off-site radioactivity release rate	- Ask trainees to list the one (1) parameter, assist as necessary.	EO-3.0
	- Uncover item on transparency when listed.	
b. Entered when:		
1) A condition exists which requires an MSIV isolation, and	Show TP #9B (entry conditions)	|2
2) Main steam line radiation level is high-high, and		
3) Any of the following exists:		
a) Turbine HVAC exhaust radiation level high (above the Alert level - yellow) or cannot be determined.		

b) Off-gas pretreatment radiation level high (above the Alert level - yellow) or cannot be determined.

c) Stack or vent GEMS exceed the alarm setpoint.

6. EOP-6 — Show TP #10 — |2

a. Purpose: to provide a consolidated procedure for those off normal actions required by EOP's. — (purpose) — |

b. Entry when:

1) Directed by the EOP's during emergency conditions.

E. Contingency Plans

1. In order to provide guidance for more severly degraded conditions, six (6) contingency plans were developed. — EO-3.0

2. These contingency plans supplement the EOPs and are entered when directed by an EOP.

3. The contingency plans are: — Show each Contingency Plan flowchart.

a. Alternate Level Control C-1

b. Emergency RPV Depressurization C-2 — Show TP #11 (list of c plans) — |2

c. Steam Cooling C-3

d. RPV Flooding C-4

e. Level/Power Control C-5

f. Primary Containment Flooding C-6

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
F. Emergency Operating Procedure Usage	- Use Instructor copy of EOP-RPV.	EO-4.0
1. Entry Conditions	- Have trainees refer to handout copy of N2-EOP-RPV.	
a. always located at top of EOP	- Direct trainees to top of EOP-RPV.	
b. always enclosed in a heavy lined rectangle with rounded corners		
c. Any one (1) condition, or "symptom" being met requires entry into that EOP.	- Ask trainees how many symptoms are required to enter EOP.	
2. Decision Block	- Having one (1) symptom could (cause entry into more than one (1) EOP (ie - Drywell Pressure).	
a. always a diamond shaped block	- Point out block to trainees.	
b. Always asks a question and provides two paths.	- Point out "yes" and "no" paths.	
3. Action Block		
a. always a rectangular block	- Point out Action Blocks to trainees.	EO-4.0
b. always states an action to be taken prior to proceeding on in the EOP	- Read one or two of the action blocks.	
4. Junction Point		
a. A heavy solid dot which means to perform all associated actions simultaneously.	- Point out junction point to trainees.	

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
5. Label/Exit Blocks		
a. thin lined rectangles/squares with rounded corners	- Point out blocks to trainees.	EO-4.0
b. when located at top of EOP is a label for that path		
c. when located at bottom of EOP is an Exit Block for that path		
6. Condition Blocks		
a. Double lined blocks (one heavy and one thin) with rounded corners.	- Point out condition blocks to trainees.	EO-4.0
b. Divided into two (2) or three (3) columns - If, And Then.		
c. When an "If" statement is met, perform the "Then" statement.	- Discuss one or two "If - Then" statements with trainees.	
d. The "And" statement provides additional requirements which need to be met.	- Point out differences with different "And" statements in RP path.	
7. List Blocks		
a. Very thin lined block with square corners.	- Point out list blocks to trainees.	EO-4.0
b. Lists items which are applicable to a proceeding action block.		
c. Also, <u>usually</u> contains notes/cautions associated with items in list.	- There are lists without notes/ cautions (ie - C2).	

8. Wait Blocks		
a. Octagon shaped block	- Point out block to trainees. Look like stop signs so they are easy to recognize.	
b. Provides conditions which must be met before proceeding.		
9. Symbols	- Point out different symbols used.	EO-5.0
a. Various symbols are used to mark steps referenced by other steps.		
b. Small symbol on right side of block is the point where the reference is made.	Find symbols next to Action Block in RQ.	
c. The EOP section on Contingency Plan number is next to the symbol.		
d. The large symbol located on the left side of the block is the point referenced.	Find steps in RP and RL that were referenced.	
10. Letters		
a. Letters inside circles are used to mark steps in the flow chart which are referenced as entry points by other steps.	Point out letters.	EO-5.0
b. References can be made from Contingency Plans.	Point out arrows used and letters next to them.	
c. Letters and numbers inside arrows represent individual Contingency Plans.		

11. Miscellaneous
    a. Tables are provided as necessary with information.
    b. Graphs are also provided as needed.

"Good" and "Bad" areas are clearly marked.

G. Summary of EOP Overview
1. The EOPs allow the operator to respond to the symptoms of a potentially degraded plant condition without having to diagnose the cause of the degradation.
2. EOPs are written in a manner to direct the operator to the correct action regardless of the cause.
3. Allow the operator to perform tasks necessary to control the plant based on more realistic assessments of the situation even if the task will require Technical Specifications to be violated.
4. No Temporary changes are allowed to the Emergency Operating Procedures.

II. EOP-6

A. General
1. Purpose: to provide a consolidated procedure for those off normal actions required by the EOP's.
2. Attachments: EOP-6 consists of twenty-nine separate attachments.

Discuss green and white EOP tape
- only an operator aid: still need to verify valve and/or breaker number is correct. Utilize EOP cards from within panels to verify proper locations.

|2

3. Each "off normal" section is included as a separate attachment.
4. Each attachment contains:
   a. Its purpose/objective and applicability
   b. Direction for completing the objectives
5. Use of tools:
   a. Any step which requires use of tools (keys, screwdriver, wrench, etc.) will have a (T) in the left hand margin.
   b. Any necessary keys/tools not stored in local EOP boxes can be obtained from the EOP drawer in the Control Room.

B. Duties and Responsibilities
1. Actions will be carried out per the EOP's as directed by the SSS.
2. Actions to be taken in the Control Room will be performed by licensed operators.
3. Actions to be taken in the plant, external to the Control Room, will be performed by non-licensed operators as directed by the SSS.

C. Precautions
1. Many of the attachments require lifting of electrical leads and installation of jumpers. Electrical safety standards should be adhered to as delineated in the Niagara Mohawk Accident Prevent Rules.

EO-6.0

(Also referred to as "the green book")

a. Treat all circuits as if they are energized unless proven otherwise.
b. Use a safety man
c. Construct suitable barriers of rigid material.
d. Barriers between 3 and 5 feet above floor.
e. Utilize rubber matting if available
f. Remove all unnecessary metal jewelry
g. Rubber gloves should be worn (on at least one hand.)
h. Safety glasses will be worn
i. Insulate bare portions of hand held tools.

2. Environmental Condition

EO-7.0

a. During implementation of these procedures, environmental conditions may be extreme.
   1) Temperature
   2) Radiation
   3) Water Levels
b. These conditions in many cases will require coordination and support from the OSC (Operation Support Center).

1) An on-site assembly area to which station personnel, other than Control Room and TSC staff report for accountability and special assignment.

2) Located in the Unit 1 Administration Building and includes the lunchroom elevation 277'; elevation 261' Lunchroom, Maintenance and Electrical Shops, Locker Room, Storeroom; Elevation 248' Radiation Protection Office.

3) The OSC supporting functions include providing, equipping, and supervising various teams including in-plant Radiological Survey Teams, Nine Mile Point Fire Department (fire fighting, search and rescue, first aid), Repair and Damage Control Teams, etc.

c. Where access is required in areas of elevated temperatures, protective equipment should be used and precautions taken.

1) Consultation with the safety department or site hygienist is recommended, if possible.
2) Above 135° personnel access may be significantly hampered.

d. When it is anticipated or known that radiation levels are elevated:
1) Radiation protection assistance should be sought.
2) Utilization of emergency exposure guidelines or emergency dosimetry IAW EPP-15 may become necessary.

D. Electrical Lead Removal

1. Identification

a. Any leads which require lifting or relays to be removed as required by EOP's will be clearly labeled as such.

White backed EOP tape with green lettering will be used to conspicuously label components.

b. Utilize self verification, and adhere to previously covered electrical safety standards.
- Stop
- Look
- Touch
- Verify
- Anticipate
- Manipulate

c. Once leads are lifted, wires should be taped to prevent undesired electrical shorts or grounds.

d. Any relays removed should have their mounting hardware reinstalled, or labeled with the removed part and delivered to the SSS. If the part can not be readily removed from its location (as in the Reactor Building), the part should be labeled and placed in a conspicuous location where it will not be damaged.

e. Ensure the SSS is informed following the completion of each step.

f. Any tools utilized in the performance of an EOP step should be returned to their appropriate storage location following completion of that step.

E. Procedure

1. RPV water level/high drywell pressure associated ESF Actuations.

- Ask Trainees to list RPV entry condition.
- Ask Trainees to list parameters controlled.

a. Purpose: to provide a tabular list of system initiations and isolations for use in verifying automatic responses to lowering RPV water level or rising drywell pressure.

b. No NLO required actions.

2. Defeating low RPV pressure isolation interlocks
   a. Purpose: to prolong the availability of RCIC as an injection source.
   b. NLO required actions: none

- RCIC is part of Group 10 and will isolate at 75 psia (60 psig).

3. Throttling ECCS Injection
   a. Purpose:
      1) Performed to support EOP-RPV, section RL and C4 and C5.
      2) Used in RPV control to allow throttling injection flow to keep within the safe region of the respective NPSH or Vortex limit figure.
      3) In C4, C5 it is used to control level raising "slowly".
   b. NLO required actions: review Attachment 3 of EOP-6 with trainees.

- Ask Trainees how HPCS, LPCS, LPCI valves normally operate (do they "seal in")?

Use EOP-RPV flowchart to show when this attachment would be used. EO-8.0

4. Throttling RCIC Injection
   a. Purpose: used to support RPV control or C5 when it is required to slowly raise injection flow or maintain level.
   b. NLO required actions: none

Use EOP-RPV flowchart to show when this attachment would be used.

5. RHR Service Water Crosstie
   a. Purpose:
      1) Performed to support EOP-RPV, section RL, EOP-C1, C4, C6

Use EOP-RPV flowchart to show when this attachment would be used.

2) Used to provide an alternate source of injection water into the RPV and Primary Containment.

3) IN RPV, C1 and C4 the intent is to use SWP should the respective LPCI System be otherwise unavailable.

4) In C6, the intent is to use SWP preferably to LPCI.

b. NLO required actions: none

6. RHR Firewater System crosstie

a. Purpose:

1) Used to support EOP-RPV section RL, C1, C4, C6.

Use EOP-RPV to show when this attachment would be used.

2) Intent is to provide an alternate injection source into the RPV and Primary Containment.

3) In RPV, C1, C4 the intent is to use fire water if the respective LPCI System is otherwise unavailable.

4) In C6, the intent is to use FPW preferably to LPCI.

b. NLO required action: review Attachment 6.0 of EOP-6 with trainees.

Use TP of PID 31A (A-1, D-5), 31B (E-2) to show system connection locations.

EO-8.0

7. ECCS keepful pump injection

a. Purpose:

1) To provide an alternate mechanism for injection in the event the ECCS system's main pump is unavailable.

2) Used to support EOP-RPV section RL, C1, C4, C6.

Ask Trainees what flowrate a keepful pump will provide (50 GPM).

Use EOP-RPV to show when this Attachment would be used.

b. NLO required actions: review Attachment 7.0 of EOP-6 with trainees.

Use TP of PID's as listed to show system valves affected. EO-8.0

7.1 HPCS Keepful Pump Injection

7.1.3 PID 33A (G-9)
PID 33B (J-9)

7.2 LPCS/LPCI - A Keepful Pump Injection

7.2.2.a PID 31F (C-4)
7.2.2.c PID 32A (D-8)
7.2.3.a PID 32A (C-6)
7.2.3.c PID 32A (D-8)

7.3 LPCI B/C Keepful Pump Injection

7.3.2.a PID 31G (D-3)
7.3.2.c PID 31G (F-5)
7.3.3.a PID 31G (E-1)
7.3.3.c PID 31G (F-5)

8. Condensate Transfer Injection

   a. Purpose:

      1) To provide an alternate source of RPV injection should the normal injection supply (LPCI, LPCS, HPCS) be unavailable. (With the exception of C6)

      2) Used to support EOP-RPV section RL, EOP-C1, C4, and C6.

      3) In C6, the intent is to use sources external to the containment first, then LPCI, because they have a significantly larger volume of water available.

   b. NLO required actions: review Attachment 8.0 with trainees.

Use EOP-RPV to show when this procedure would be used.

Use TP of PID's as listed to show system valves affected

HPCS	PID 33A (G-2)
LPCS	PID 32A (F-2)
LPCI-A	PID 31A (B-1)
LPCI-B	PID 31B (E-2)
LPCI-C	PID 31B (E-5)

EO-8.0

9. SLS Test Tank Injection

   a. Purpose:

      1) Provide an alternate source of water for RPV level control when SLC is not otherwise being used for Boron Injection.

      2) Used to support EOP-RPV section RL, and C1, C4.

   b. NLO required actions: review Attachment 9.0 with trainees.

Use EOP-RPV to show when this procedure would be used.

Use TP's of PID's as listed to show systems affected

9.1	PID 36A (D-6, D-9)
9.2	PID 36A (E-2)
9.3	PID 36A (F-2)

EO-8.0

10. Depressurizing the RPV using the condenser

a. Purpose:

1) Section 10.1, Defeating IAS and Low RPV Water Level Interlocks is used to allow MSIV or MSL drains to remain open or be reopened in RP or C5 only when Boron Injection is required. (No NLO Actions)

2) Section 10.2 Using MSL Drains is used to support pressure control in RPV. (Review NLO required actions of section 10.2 of EOP-6 with trainees).

Use EOP-RPV to show when the attachment would be used.

Use PID 1F (F-10) to show valves affected.

3) Section 10.3 Opening MSIV's to Utilize Bypass Valves is used to support RP and C5 (review NLO required actions of section 10.3 of EOP-6 with trainees.)

11. Defeating RWCU System Isolation Interlocks

a. Purpose:

1) To provide the ability to operate RWCU when it is required to provide or assist in providing the pressure control function.

Ask Trainees how RWCU could be used to control RPV pressure (used to remove heat from system).

2) Used to support EOP-RPV section RP.

b. NLO required actions: review Attachment 11 of EOP-6 with trainees.

Use EOP-RPV to show when the attachment would be used.

EO-8.0

12. Venting the RPV

    a. Purpose: used to support C-6, Primary Containment Flooding. (Ensures that as the containment is flooded, the RPV will also flood by venting the RPV to the condenser, RCIC, or RHS Hx.)

    b. NLO required actions: review Attachment 12.0 of EOP-6 with trainees.

13. RRCS Manual Initiation (Attachment 13.0)

    a. Purpose: used to support EOP-RPV section RQ when power is >4% and RPS has failed to shutdown the reactor. (No NLO Actions).

14. Alternate Control Rod Insertions

    a. Purpose:

        1) To provide alternate methods to insert control rods during ATWS conditions.

        2) Used to support EOP-RPV section RQ.

    b. NLO required actions: review Attachment 14.0 of EOP-6 with trainees.

Explain ATWS

Use EOP-RPV to show when the attachment would be used.

14.2 De-energize the Scram Solenoids — EO-8.0

14.2.b Show TP's of EOP-6 Figure 14.1, 14.2, 14.3 to show HCU locations and rod sequences.

14.3 Vent the Scram Header

14.3.b Use TP of PID 30C (I-2, J-6) to show valves manipulated.

14.5 Drive Control Rods

14.5.d Use TP of PID 30A (G-7) to show location of 2RDS-V28.

14.6 Vent Control Rod Overpiston Volumes

14.6.d Use TP of PID 30B (F-6) to show location of 2RDS-V1 valves on HCU's.

15. SLS Hydro Pump Injection

a. Purpose:

1) To inject Boron when Boron injection is required and the installed SLS pumps are unavailable.

Ask Trainees how injection of Boron causes the Reactor to shutdown.

2) Used in EOP-RPV section RQ

Use EOP-RPV to show when this attachment would be used.

b. NLO required actions: review Attachment 15.0 of EOP-6 with trainees.

Use TP of PID 36A (F-5, F-9, K-3) to show system valves affected. EO-8.0

16. Use of SJAE with auxiliary boiler steam

a. Purpose:

Ask Trainees why this would be necessary.

1) To "bottle up" or isolate the condenser

2) Used to support EOP-MSIV Leakage Control when main steam is not available.

Use EOP-MSIV leakage control to show when this attachment would be used.

b. NLO required action: review Attachment 16.0 of EOP-6 with trainees. EO-8.0

17. Backfilling MSIV's

a. Purpose:

1) To form a water seal on the MSL's to minimize leakage from the RPV to outside the Primary Containment via the MSIV's.

2) Used to support EOP-MSL.

Use TP's of PID's as listed to show valves affected.

17.2 PID 1F (F-10)
17.4 PID 1F (F-10)
17.9 PID 1F (B-2,4,6,7)
PID 1E (K-4)

Use EOP-MSIV leakage control to show when this attachment would be used.

b. NLO required actions: review Attachment 17.0 of EOP-6 with trainees. EO-8.0

18. Depressurizing the RPV

a. Purpose:

1) To ensure that as the containment is flooded, the vessel will also flood by venting the RPV to the condenser, RCIC, or RHS HX (steam condensing).

2) Used to support C6.

b. NLO required actions: review Attachment 18.0 of EOP-6 with trainees.

Use C6 to show when this attachment would be used.

|2

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
19. RWCU Boron Injection	Use EOP-RPV to show when this attachment would be used.	
a. Purpose:	Use TP of PID's as listed to show valves affected.	
1) Used to inject Boron when Boron injection is required and both the installed SLS pumps and the SLS hydro pump injection method are unavailable.	19.5.2 PID 37F (C-2, C-5) 19.6.1 PID 37D, 37E, (E-3, F-8) 19.6.3 PID 37D, 37E (E-6, F-10, F-6)	
2) Used to support EOP-RPV section RQ.		
b. NLO required actions: review Attachment 19.0 of EOP-6 with trainees.		EO-8.0
20. Defeating L8 FWS Interlocks		
a. Purpose:	Ask Trainees what actions occur at Level 8.	
1) To maximize the availability of FWS when RPV water level is being raised for RPV flooding (C-4). (No NLO Actions).		
21. Containment Venting	Use TP of PID 61B (E-4, E-8, J-4, J-8) to show locations for blank flange installations.	
a. Purpose:		
1) To vent the Primary Containment before suppression chamber pressure reaches the Primary Containment pressure limit.		
2) Used to support EOP-PC section PCP.	Use EOP-PC to show when this attachment would be used.	
b. NLO required actions: review Attachment 21.0 with trainees.		EO-8.0

22. Containment Sprays
    a. Purpose:
        1) To use containment sprays to assist in controlling containment pressure, hydrogen concentration or drywell temperature.
        2) Used to support EOP-PC sections PCP, PCH, DWT. — Use EOP-PC to show when this attachment would be used.
    b. There are no associated NLO actions.
23. Containment Level Determination (above el. 224 ft.) |2
    a. Purpose:
        1) To determine contaminant level above 224'
        2) Used to support EOP-RPV, PC, C1, C4, C5, C6 — Use EOP-RPV and PC to show when this attachment would be used.
    b. NLO required actions: review Attachment 23 of EOP-6 with Trainees. |2
24. DW Unit Cooler Operation W/LOCA Signal
    a. Purpose:
        1) To restore or maintain DW cooling.
        2) Used to support EOP-PC section DWT. — Use of EOP-PC to show when this attachment would be used.
    b. There are no NLO actions

25. Containment Purging
    a. Purpose:
        1) For purging the drywell or suppression chamber with Nitrogen or Air.
        2) Used to support EOP-PC section PCH.
    b. NLO required actions: review Attachment 25 of EOP-6 with trainees.

Use TP of PID's 61A, 105A, 105B as necessary to show system valves affected.

Use of EOP-PC to show when this attachment would be used.

EO-8.0

26. Defeating HVR LOCA isolation signals
    a. Purpose:
        1) To restore RB ventilation with a LOCA signal present.
        2) Used to support EOP-SC
    b. NLO required actions: review Attachment 26 of EOP-6 with trainee.

Use EOP-SC to show when this attachment would be used.

EO-8.0

27. Restoration of H_2/O_2 Analyzers
    a. Purpose:
        1) To restore H_2/O_2 analyzers following system isolation due to a LOCA signal.
        2) Used to support EOP-PC section PCH.
    b. There are no NLO required actions.

28. Determining Reactor Building Temperatures
    a. Purpose:
        1) Used to support EOP-SC Caution one (1) regarding RPV saturation temperature near instrument runs.
    b. There are no NLO required actions.
29. Determining Suppression Chamber Overpressure
    a. Purpose:
        1) Used to support EOP-RPV in determining suppression chamber overpressure for use in ECCS Pump NPSH Limit Curves.
    b. There are no NLO required actions.

2

F. Review
    1. Review the purpose and entry conditions of each EOP.

Q: What are the three mechanisms of adequate core cooling?

A: 1. Core submergence
2. Steam cooling with injection (temp. of hottest fuel rod does not exceed 1500°).
3. Steam cooling without injection (temp. of hottest fuel rod does not exceed 1800°).

    2. Review trainee learning objectives.
    3. Answer any questions.