

# Final Submittal

(Blue Paper)

**CRYSTAL RIVER OCTOBER 2005 EXAM**

**05000302/2005301**

**SEPTEMBER 12 - 16, 2005**  
**SEPTEMBER 19, 2005 (WRITTEN)**

1. Administrative JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**AdminCO1 (2K5) NRC [NEW] (ADMINISTRATIVE)**

***SRO ONLY***

**DETERMINE OVERTIME AVAILABILITY**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**Task:** SRO – Determine overtime availability.

**Alternate Path:** No

**JPM #:** AdminCO1 (2K5) NRC [NEW]

**K/A Rating/Importance:** G2.1.4 SRO 3.4

**Task Number/Position:**

**Task Standard:** Determine overtime availability per AI-100, Facility Administrative Policies.

**Preferred Evaluation Location:**

Simulator \_\_\_ In-Plant \_\_\_ Admin X

**Preferred Evaluation Method:**

Perform X Simulate \_\_\_

**References:**

AI-100, Rev. 28

**Validation Time:** 15 minutes

**Time Critical:** No

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**Candidate:** \_\_\_\_\_  
Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_ UNSAT \_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name

\_\_\_\_\_/\_\_\_\_\_  
Signature Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Tools/Equipment/Procedures Needed:**

AI-100, Rev. 28

**READ TO THE OPERATOR**

**INITIAL CONDITIONS**

You are the Control Room Supervisor.  
The plant is shutdown following a reactor trip.  
Preparations for startup are in progress.  
This is Thursday, 9-15-05, swing shift.  
The SSO has directed you to call in additional operators to work assisting the on-shift crew during startup.  
The operators will work 12 hours on Friday, 9-16-05, day shift, 0700 to 1900.  
Operations Shift Rotation Schedule attached.

**INITIATING CUES**

Identify the operators, if any, that would violate overtime restrictions if called in to work on Friday, 9-16-05, day shift. Also identify the overtime restriction(s), if any, that would be violated.

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<p><b>STEP 1:</b> Obtain a copy of the correct procedure or perform JPM from memory.</p> <p><b>STANDARD:</b> Candidate obtains a copy of AI-100 or performs the JPM from memory.</p> <p><b>EXAMINER'S NOTE:</b> Provide candidate with a copy of AI-100, Facility Administrative Policies, if requested.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 2:</b> Determine if overtime restriction guidelines would be violated for Operator #1.</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would NOT be violated for Operator #1.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 3:</b> Determine if overtime restriction guidelines would be violated for Operator #2.</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would NOT be violated for Operator #2.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 4:</b> Determine if overtime restriction guidelines would be violated for Operator #3.</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would be violated for Operator #3.</p> <p style="text-align: center;"><b>&gt; 24 hours in any 48 hour period</b></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required by NRC Generic Letter 82-12)</p> <p>SAT ____</p> <p>UNSAT ____</p>

<p><b>STEP 5:</b> Determine if overtime restriction guidelines would be violated for Operator #4</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would NOT be violated for Operator #4.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 6:</b> Determine if overtime restriction guidelines would be violated for Operator #5.</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would be violated for Operator #5.</p> <p style="text-align: center;"><i>&gt; 72 hours in any 7-day period</i></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required by NRC Generic Letter 82-12)</p> <p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 7:</b> Determine if overtime restriction guidelines would be violated for Operator #6.</p> <p><b>STANDARD:</b> Candidate determines that overtime restriction guidelines would NOT be violated for Operator #6.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>END OF TASK</b></p>	

## CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS

You are the Control Room Supervisor.  
The plant is shutdown following a reactor trip.  
Preparations for startup are in progress.  
This is Thursday, 9-15-05, swing shift.  
The SSO has directed you to call in additional operators to work assisting the on-shift crew during startup.  
The operators will work 12 hours on Friday, 9-16-05, day shift, 0700 to 1900.  
Operations Shift Rotation Schedule attached.

### INITIATING CUES

Identify the operators, if any, that would violate overtime restrictions if called in to work on Friday, 9-16-05, day shift. Also identify the overtime restriction(s), if any, that would be violated.

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### CR3 Operations Shift Rotation Schedule

Operator	Monday 9-5-05	Tuesday 9-6-05	Wednesday 9-7-05	Thursday 9-8-05	Friday 9-9-05	Saturday 9-10-05	Sunday 9-11-05
	Note	Note	Note	Note	Note	Note	Note
#1		07-19	07-15	07-15	07-19	Off	Off
#2		07-15	07-15	07-15	07-19	07-19	Off
#3		15-03	Off	Off	23-07	23-07	23-07
#4		15-03	Off	Off	23-07	23-11	23-11
#5		23-11	23-07	23-11	Off	07-15	07-19
#6		23-11	23-07	23-07	Off	Off	07-19

NOTES:

- 1) Outage Prep Meeting -- Jim's Office -- 1500-1800
- 2) Passport Training -- MTF -- 0700-1100

Operator	Monday 9-12-05	Tuesday 9-13-05	Wednesday 9-14-05	Thursday 9-15-05	Friday 9-16-05	Saturday 9-17-05	Sunday 9-18-05
	Note	Note	Note	Note	Note	Note	Note
#1		Requal	Requal	Requal	Off	Off	Off
#2		Requal	Requal	Requal	Off	Off	Off
#3		23-07	23-07	19-07	Off	Off	VAC
#4		19-07	23-07	23-07	Off	Off	07-15
#5		07-19	07-19	07-19	VAC	Off	Off
#6		07-19	07-19	07-19	VAC	Off	Off

NOTES:

- 1) Mandatory AI-704 Review -- Rusty 3A -- 0700-1100
- 2) Plant Support -- 0700-1900 -- Requal Cancelled





I  
Information  
Use

PROGRESS ENERGY  
CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL

AI-100  
FACILITY ADMINISTRATIVE POLICIES

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3. These guidelines shall NOT be exceeded without PRIOR approval per step 4.11.2.
4. All plant personnel shall be aware of these limits and shall inform their first line Supervisor prior to exceeding these limits. Compliance with these overtime guidelines is the responsibility of each individual. Supervisory personnel provide oversight of compliance to these guidelines.
5. The following job categories are interpreted to fall under Generic Letter 82-12: Plant staff who perform safety related functions including All licensed Operators, SPO's, PPO's, Test Engineers, Reactor Engineers, Mechanical, Electrical, NTST Technicians, Facility Services, Rad Waste, Chemistry and Health Physics Technicians, Cal Lab, Quality Control Inspectors, HVAC, Maintenance Support Specialist and their first line Supervisors .
6. CR-3 has taken a more conservative approach and expanded the applicability of the NRC overtime guidelines per Generic Letter 82-12 to include all active licensed operators in addition to all plant personnel from first line supervisor and below. [CAPR 151657]
7. All time spent performing plant related activities (excluding turnover time) shall be included when calculating work hours. This includes training, work related meetings, administrative work, etc. [CAPR 151657].

**NOTE**

Shift turnover time is normally  $\leq$  1 hour, but may exceed 1 hour based on unusual plant conditions.

8. The following guidelines shall be followed: [CAPR 151657]
  - An individual shall NOT be permitted to work more than 16 hours straight, excluding turnover time.
  - An individual shall NOT be permitted to work more than 16 hours in any 24-hour period, NOR more than 24 hours in any 48-hour period, NOR more than 72 hours in any 7-day period, excluding turnover time.
  - A break of at least 8 hours should be allowed between work periods, including shift turnover time.
  - The use of overtime shall be considered on an individual basis and NOT for the entire staff on a shift.

#### 4.12.2 Deviations from Overtime Guidelines

1. The affected staff member's Superintendent or first line Supervisor is responsible for recommending that an individual be authorized to exceed these overtime guidelines.
2. For those jobs that fall under the guidelines of Generic Letter 82-12, it is the Superintendent or first line Supervisor's responsibility to insure that authorization by the Plant General Manager, his designee or higher levels of management, is received prior to exceeding these overtime guidelines. For those jobs that do NOT fall under the guidelines of Generic Letter 82-12, authorization may be granted by the applicable section manager, section manager's designee, or higher levels of management. [CAPR 151657]

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**AdminCO2 (2K5) NRC [NEW] (ADMINISTRATIVE)**

**CALCULATE SDM WITH A MISALIGNED CONTROL ROD**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**Task:** Determine Shutdown Margin.

**Alternate Path:** NO

**JPM #:** AdminCO2 (2K5) NRC [NEW]

**K/A Rating/Importance:** G2.1.7 RO 3.7 SRO 4.4  
G2.1.12 SRO 4.0

**Task Number/Position:**

**Task Standard:** Determine SDM using SP-421, Reactivity Balance Calculations.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator \_\_\_\_\_ Plant \_\_\_\_\_ Admin X

Perform X Simulate \_\_\_\_\_

**References:**

OP-103C, Rev. 25  
SP-421, Rev. 55  
TS 3.1.4

**Validation Time:** 15 minutes

**Time Critical:** No

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**Candidate:** \_\_\_\_\_  
Printed Name

**Time Started:** \_\_\_\_\_

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## SIMULATOR OPERATOR SETUP INSTRUCTIONS

1. None

## SIMULATOR OPERATOR INSTRUCTIONS

1. None

**Tools/Equipment/Procedures Needed:**

Consumable copies of SP-421 and OP-103C.  
TS 3.1.4

**!!!!!!SEPARATE CANDIDATE CUE SHEETS FOR SRO and RO!!!!!!**

**READ TO THE OPERATOR**

**INITIAL CONDITIONS:**

You are the Balance of Plant Operator.  
The plant is stable at 60% power.  
Control rod 6-6 has dropped to the 60% withdrawn position and is determined to be untrippable.  
The actions of AP-545, Plant Runback, have been completed up to Step 3.42.  
RCS boron is 1109 ppmB.  
210 EFPD.  
Xenon value from current Saxon is -2.48%  $\Delta$  k/k.  
Boron-10 atom percent is 19.8.  
RCS temperature is 579° F.  
Group 8 is at 32% withdrawn.

**INITIATING CUES:**

The Control Room Supervisor has directed you to verify if adequate SDM exists using SP-421, Reactivity Balance Calculations. Enter SDM below and document additional actions, if any, you would perform.

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**SROs only: After calculating SDM determine if any TS actions are required. Document your answer below.**

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<p><b>STEP 1:</b> Locate procedures.</p> <p><b>STANDARD:</b> Candidate obtains a copy of SP-421 and OP-103C.</p> <p><b>EXAMINER'S NOTE:</b> Provide candidate with a copy of SP-421. When the candidate asks for OP-103C provide it to him/her at that time.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 2:</b> Determine correct enclosure to use.</p> <p><b>STANDARD:</b> Candidate determines that Enclosure 1B, One Hour Misaligned Rod SDM Calculation, is the enclosure to be used.</p> <p><b>EXAMINER'S NOTE:</b> If candidate determines that Enclosure 1, SDM – Normal Conditions, is to be used, allow the candidate to complete the JPM since both enclosures will result at the same endpoint. Make a note of this and during the final exam review point out to the candidate that Enclosure 1B was created just for this type of plant condition.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 3:</b> Step 1</p> <p>Enter core burnup.</p> <p><b>STANDARD:</b> Candidate accurately transfers data from Cue Sheet to enclosure.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>



<b>STEP 4:</b>	Step 2	<b>Critical Step *</b> (accurate curve selection and calculation required to determine adequate SDM)
	Boron Reactivity	
	1. Enter RCS boron concentration (Cue Sheet)	
	2. Enter B-10 atom percent (Cue Sheet)	
	3. Calculate B-10 adjusted value	SAT_____
	4. Enter RCS temperature (Cue Sheet)	UNSAT_____
	5.* Use Curve 19 to determine boron concentration required for shutdown margin.	
	6.* Use Curve 3 to determine differential boron worth.	
	7.* Perform calculation to determine boron reactivity.	
<b>STANDARD:</b>	Candidate accurately transfers data from Cue Sheet, determines correct curves to use and accurately calculates the value for boron reactivity.	
	Value should be within limits listed on attached key.	
<b>COMMENTS:</b>		
<b>STEP 5:</b>	Step 3	SAT_____
	Determine Control Rod Group 8 Reactivity.	UNSAT_____
<b>STANDARD:</b>	Candidate determines that Group 8 reactivity is 0% $\Delta$ k/k.	
<b>COMMENTS:</b>		

<p><b>STEP 6:</b> Step 4</p> <p>Determine Xenon reactivity.</p> <p><b>STANDARD:</b> Candidate accurately transfers data from Cue Sheet to enclosure.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 7:</b> Step 5</p> <p>Shutdown Margin</p> <ol style="list-style-type: none"> <li>1. Determine SDM.</li> <li>2. If SDM is determined to be less negative than -1.0% <math>\Delta k/k</math> then SDM is unacceptable. Immediately notify the CRS and refer to TS 3.1.4.</li> <li>3. If SDM is determined to be more negative than -1.0% <math>\Delta k/k</math> then SDM is acceptable. Notify the CRS and continue to step 6.</li> </ol> <p><b>STANDARD:</b> Candidate determines that SDM is unacceptable and immediately notifies the CRS.</p> <p>Value should be within limits listed on attached key.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (accurate calculation and immediate notification of the CRS is required to comply with TS)</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>RO</u> - END OF TASK</b></p>	

<p><b>STEP 8: SRO Only</b></p> <p>Refer to TS 3.1.4, Control Rod Group Alignment Limits, and determine required actions.</p> <p><b>STANDARD:</b> Candidate determines that the following actions are required (Condition D):</p> <ol style="list-style-type: none"> <li>1. Initiate boration to restore SDM within 1 hour.</li> <li>2. Be in Mode 3 within 6 hours.</li> </ol> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (TS required actions)</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>SRO</u> - END OF TASK</b></p>	

ONE HOUR MISALIGNED ROD SHUTDOWN MARGIN CALCULATION

1. Core Burnup

Core Burnup = EFPD (from SAXON)

= 210 EFPD

**NOTE**

For the remaining steps (2-4) the following NOTES apply:

- (1) It is permissible to round to the nearest whole EFPD.
- (2) It is permissible to round to the nearest whole %wd.
- (3) For RCS > 532 degrees F, 532 degrees F data may be used.
- (4) Two decimal place accuracy is required in calculations.

2. Boron Reactivity

a. Measured RCS Boron Concentration 1109 ppmB

**NOTE**

The reference Boron-10 (B-10) atom percent (a/o) is 19.8 for all calculations used in deriving the reactivity curves in OP-103C. If the B-10 a/o is unknown, use the reference value of 19.8

b. B-10 atom percent of RCS Boron 19.8 a/o

c. B-10 adjusted Boron Concentration is  
Step 2(a) \* Step 2(b) / 19.8 = 1109 ppmB

d. RCS temperature 579 °F

e. Using RCS temperature from 2(d) and core burnup from Step 1, determine the Boron concentration required for shutdown from appropriate Curve 18 or Curve 19 of OP-103C.

1662 (LIMIT 1659 to 1665) ppmB

f. Differential boron worth from Curve 3 of OP-103C, Reactivity Worth Curves.

0.7508 %Δk/k/100 ppm

g. Reactivity During Modes 1,2,3,4, and 5

Reactivity = [(e-c) x f/100] - 1.0

= [( 1662 - 1109 ) x 0.75 ÷ 100] - 1.0 = +/- + 3.15 %Δk/k

(LIMIT 3.125 to 3.17)

ONE HOUR MISALIGNED ROD SHUTDOWN MARGIN CALCULATION (Cont'd)

3. Control Rod Group 8 Reactivity

- a. IF Group 8 is 28% wd to 32% wd, use 0.00%Δk/k.
- b. IF Group 8 is 0% wd, use +0.10%Δk/k
- c. IF Group 8 is at any other location,  
AND EFPD is < 653,  
THEN use +0.25%Δk/k
- d. IF EFPD is ≥ 653, use 0.0%Δk/k.

+ 0 % Δ k/k

**NOTE**

(5) For the one hour misaligned rod calculation ONLY, the value for xenon calculated prior to the misaligned rod for this hour may still be used provided that:

- the existing SAXON printout accurately reflects the core conditions prior to the misaligned rod, and
- the maximum post-misaligned rod power level is less than, or equal to, the power level used on the existing SAXON printout for calculating this hour's xenon.

(6) Using a xenon value of 0.0% delta k/k is conservative and may be used at any time.

4. Xenon Reactivity

- a. Obtain Xenon reactivity from Saxon code (submit printout).

OR

- b. IF the Saxon code is unavailable,  
THEN use 0.0% Δ k/k or contact Reactor Engineering for a value (0.0% Δ k/k is conservative and therefore preferred).

- 2.48 - % Δ k/k

5. Shutdown Margin

- a. Determine the shutdown margin by adding Items 2, 3 and 4 above, and round to the nearest tenth  
+/- + 0.7 (LIMIT 0.6 TO 0.7) % Δ k/k
- b. 1. IF the shutdown margin determined in Step 5a is less negative than -1.0% k/k (i.e., zero, positive or between 0.0 and -1.0),  
THEN the shutdown margin is unacceptable. **IMMEDIATELY** inform the Control Room Supervisor and refer to ITS 3.1.4.
- 2. IF the shutdown margin determined in Step 5a is more negative than -1.0% k/k,  
THEN the shutdown margin is acceptable. Notify the Control Room Supervisor and continue to step 6.

\_\_\_\_\_/\_\_\_\_\_  
Calculated By/Date

\_\_\_\_\_/\_\_\_\_\_  
Verified By/Date

If 0.0 % Δk/k was used for Xenon then so value would be +32 % Δk/A add 10/10/04  
Based on Post Exam comment and notes

# ***SRO***

## ***CANDIDATE CUE SHEET***

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### **INITIAL CONDITIONS:**

You are the Balance of Plant Operator.

The plant is stable at 60% power.

Control rod 6-6 has dropped to the 60% withdrawn position and is determined to be untrippable.

The actions of AP-545, Plant Runback, have been completed up to Step 3.42.

RCS boron is 1109 ppmB.

210 EFPD

Xenon value from current Saxon is -2.48%  $\Delta$  k/k.

Boron-10 atom percent is 19.8.

RCS temperature is 579° F.

Group 8 is at 32% withdrawn.

### **INITIATING CUES:**

The Control Room Supervisor has directed you to verify if adequate SDM exists using SP-421, Reactivity Balance Calculations. Enter SDM below and document additional actions, if any, you would perform.

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**SROs only: After calculating SDM determine if any TS actions are required. Document your answer below.**

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# ***RO***

## ***CANDIDATE CUE SHEET***

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### **INITIAL CONDITIONS:**

You are the Balance of Plant Operator.

The plant is stable at 60% power.

Control rod 6-6 has dropped to the 60% withdrawn position and is determined to be untrippable.

The actions of AP-545, Plant Runback, have been completed up to Step 3.42.

RCS boron is 1109 ppmB.

210 EFPD

Xenon value from current Saxon is  $-2.48\% \Delta k/k$ .

Boron-10 atom percent is 19.8.

RCS temperature is 579° F.

Group 8 is at 32% withdrawn.

### **INITIATING CUES:**

The Control Room Supervisor has directed you to verify if adequate SDM exists using SP-421, Reactivity Balance Calculations. Enter SDM below and document additional actions, if any, you would perform.

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**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**AdminEC1 (2K5) NRC [NEW] (ADMINISTRATIVE)**

**PERFORM A QPTR CALCULATION**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05





**SIMULATOR OPERATOR SETUP INSTRUCTIONS**

1. None

**SIMULATOR OPERATOR INSTRUCTIONS**

1. None

**Tools/Equipment/Procedures Needed:**

Consumable copies of SP-303.  
TS 3.2.4  
COLR

**!!!!!!SEPARATE CANDIDATE CUE SHEETS FOR SRO and RO!!!!!!**

**READ TO THE OPERATOR**

**INITIAL CONDITIONS:**

You are the Balance of Plant Operator.  
The plant has been stable at this power level for the previous 3 hours.  
The Symmetrical Incore Detector System is inoperable.  
Current NI values from the control console are:  
NI-5 = 63%  
NI-6 = 65%  
NI-7 = 63%  
NI-8 = 65%  
 $\Delta T_c = 0.2^\circ F$   
Rod Index is 245%

**INITIATING CUES:**

The Control Room Supervisor has directed you to calculate current out-of-core QPT using SP-303, Tilt Monitoring with an Unavailable Symmetric Incore System. Enter AOT (adjusted out-of-core tilt) values below and document additional actions, if any, you would perform.

SP-303, Enclosure 1, Table 1 is attached.

NI-5 AOT = \_\_\_\_\_ NI-6 AOT = \_\_\_\_\_ NI-7 AOT = \_\_\_\_\_ NI-8 AOT = \_\_\_\_\_

**SROs only: After calculating AOT determine if any TS actions are required. Document your answer below.**

<p><b>STEP 1:</b> Record time, current NI power levels, <math>\Delta T_c</math> and Rod Index in Table 3.</p> <p><b>STANDARD:</b> Candidate accurately transfers data from Cue Sheet to Table 3.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 2:</b> Obtain the appropriate normalization constants (N) for each quadrant from Section 4.1 and record in Table 3.</p> <p><b>STANDARD:</b> Candidate accurately transfers data from Table 1 (provided) to Table 3.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 3a:</b> Calculate the current average NI power.</p> <p><b>STANDARD:</b> Candidate accurately calculates average NI power. Calculation result is 64%.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 3b:</b> Calculate current out-of-core tilt (OCD) in each quadrant.</p> <p><b>STANDARD:</b> Candidate accurately calculates OCD tilt for each quadrant. Values should be <math>\pm 0.1\%</math> of value listed on attached key.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><b>STEP 4:</b> Record the current OCD tilt for each quadrant in Table 3.</p> <p><b>STANDARD:</b> Candidate accurately transfers data to Table 3.</p> <p><b>COMMENTS:</b></p>	<p>SAT_____</p> <p>UNSAT_____</p>

<p><u>STEP 5:</u> Calculate adjusted out-of-core tilt (AOT) for each quadrant.</p> <p><u>STANDARD:</u> Candidate accurately calculates AOT for each quadrant. Values should be <math>\pm 0.1\%</math> of value listed on attached key.</p> <p><u>COMMENTS:</u></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><u>STEP 6:</u> Record AOT values for each quadrant in Table 3.</p> <p><u>STANDARD:</u> Candidate accurately transfers data to Table 3.</p> <p><u>COMMENTS:</u></p>	<p>SAT_____</p> <p>UNSAT_____</p>
<p><u>STEP 7:</u> Compare the current AOT for each quadrant to the Power Range Channels QPT limits in the COLR.</p> <p><u>STANDARD:</u> Candidate determines that Quadrant ZW AOT is above the Steady-State Limit and below the Transient Limit. Candidate notifies CRS.</p> <p><u>COMMENTS:</u></p>	<p><b>Critical Step</b> (accurate comparison to the COLR and notification of the CRS is required to comply with TS)</p> <p>SAT_____</p> <p>UNSAT_____</p>
<p><b><u>RO</u> - END OF TASK</b></p>	

<p><b>STEP 8: SRO Only</b></p> <p>Refer to TS 3.2.4, Quadrant Power Tilt, and determine required actions.</p> <p><b>STANDARD:</b> Candidate determines that the following actions are required:</p> <ol style="list-style-type: none"> <li>1. Perform SR 3.2.5.1 once every 2 hours, OR</li> <li>2. Reduce thermal power <math>\geq 2\%</math> RTP from the allowable thermal power for each 1% of QPT greater than the steady state limit within 2 hours, AND</li> <li>3. Reduce overpower trip setpoint and the flux/delta flux/flow trip setpoint to <math>\geq 2\%</math> RTP from the allowable thermal power for each 1% of QPT greater than the steady state limit within 10 hours, and  AND</li> <li>4. Restore QPT to less than or equal to the steady state limit within 24 hours.</li> </ol> <p><b>CRITICAL STEP:</b> <i>SRO determines that 1 and 4 must be completed OR determines that 2, 3 and 4 must be completed.</i></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (TS required actions)</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>SRO</u> - END OF TASK</b></p>	

TABLE 3 Current Out-of-Core QPT Calculations												Date _____				
Time	1		2		4		6		1		2		4		6	
Step	NI Pwr	N	OCD	AOT	NI Pwr	N	OCD	AOT	NI Pwr	N	OCD	AOT	NI Pwr	N	OCD	AOT
Quadrant / NI																
WX / NI-5	63	+0.10	-1.56	-1.46												
YZ / NI-6	65	-1.57	-1.56	-0.01												
XY / NI-7	63	+0.10	-1.56	-1.46												
ZW / NI-8	65	+1.37	+1.56	<u>+2.93</u>												
$\Delta T_c$	0.2° F															
Reg Rod Index	245 %wd															
Performed by:	Initial															
Verified by:	Initial															

Where:

NI Pwr = Out-of-Core Nuclear Inst Power (%)      N = Normalization Factor (%)  
 OCD = Out-of-Core Detector Tilt (%)      AOT = Adjusted Out-of-Core Detector Tilt (%)

# SRO

## CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS:

You are the Balance of Plant Operator.

The plant has been stable at this power level for the previous 3 hours.

The Symmetrical Incore Detector System is inoperable.

Current NI values from the control console are:

NI-5 = 63%

NI-6 = 65%

NI-7 = 63%

NI-8 = 65%

$\Delta T_c = 0.2^\circ \text{ F}$

Rod Index is 245%

### INITIATING CUES:

The Control Room Supervisor has directed you to calculate current out-of-core QPT using SP-303, Tilt Monitoring with an Unavailable Symmetric Incore System. Enter AOT (adjusted out-of-core tilt) values below and document additional actions, if any, you would perform.

SP-303, Enclosure 1, Table 1 is attached.

NI-5 AOT = \_\_\_\_\_ NI-6 AOT = \_\_\_\_\_ NI-7 AOT = \_\_\_\_\_ NI-8 AOT = \_\_\_\_\_

**SROs only: After calculating AOT determine if any TS actions are required. Document your answer below.**

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Calculation of Normalization Constants

TABLE 1 Normalization Constants				
Quadrant/NI	Step 2	Step 2	Step 4	Step 6 (IT - OCD)
	NI Power	Incore Tilt (IT)	Out-of-Core Tilt (OCD)	Normalization Constant (N)
WX / NI-5	55	+0.10	0	+0.10
YZ / NI-6	56	+0.25	+1.82	-1.57
XY / NI-7	55	+0.10	0	+0.10
ZW / NI-8	54	-0.45	-1.82	+1.37

Step 7:  
Normalization calculations from: Control Console / Yesterday  
Source / Date  
 $\Delta T_c$  at the time of the source data: 0 ° F  
Regulating Rod index at the time of the source data: 240 %wd

Enclosure 1:  
Performed by: AK / Yesterday / 0100  
Initial / Date / Time  
Verified by: GO / Yesterday / 0130  
Initial / Date / Time

# RO

## CANDIDATE CUE SHEET

*(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)*

### INITIAL CONDITIONS:

You are the Balance of Plant Operator.

The plant has been stable at this power level for the previous 3 hours.

The Symmetrical Incore Detector System is inoperable.

Current NI values from the control console are:

NI-5 = 63%

NI-6 = 65%

NI-7 = 63%

NI-8 = 65%

$\Delta T_c = 0.2^\circ \text{ F}$

Rod Index is 245%

### INITIATING CUES:

The Control Room Supervisor has directed you to calculate current out-of-core QPT using SP-303, Tilt Monitoring with an Unavailable Symmetric Incore System. Enter AOT (adjusted out-of-core tilt) values below and document additional actions, if any, you would perform.

SP-303, Enclosure 1, Table 1 is attached.

NI-5 AOT = \_\_\_\_\_ NI-6 AOT = \_\_\_\_\_ NI-7 AOT = \_\_\_\_\_ NI-8 AOT = \_\_\_\_\_

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**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**AdminRC1 (2K5) NRC [NEW] (ADMINISTRATIVE)**

**CALCULATE THE MAXIMUM PERMISSIBLE STAY  
TIME WITHIN EMERGENCY DOSE LIMITS**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**Task:** RO/SRO – Calculate the maximum permissible stay time within Emergency Dose Limits.

**Alternate Path:** No

**JPM #:** AdminRC1 (2K5) NRC [NEW]

**K/A Rating/Importance:** G2.3.4 RO 2.5 SRO 3.4

**Task Number/Position:**

**Task Standard:** Calculate the maximum permissible stay time within Emergency Dose Limits  
(± 5 minutes)

**Preferred Evaluation Location:**

Simulator \_\_\_ In-Plant \_\_\_ Admin X

**Preferred Evaluation Method:**

Perform X Simulate \_\_\_

**References:**

EM-202, Rev. 75

**Validation Time:** 5 minutes

**Time Critical:** No

**Candidate:** \_\_\_\_\_  
Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_ UNSAT \_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature / \_\_\_\_\_  
Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SIMULATOR OPERATOR SETUP INSTRUCTIONS**

1. None

**SIMULATOR OPERATOR INSTRUCTIONS**

1. None

**Tools/Equipment/Procedures Needed:**

EM-202, Rev. 75

**READ TO THE OPERATOR**

**INITIAL CONDITIONS**

You are the Balance of Plant operator.

An emergency event is in progress.

Emergency Dose Limits (EDL) are in effect.

The PPO has received 1.62 Rem TEDE this year.

The use of High Pressure Aux Spray will increase the pressure reduction rate but is not required to protect valuable plant equipment.

The following tasks are to be performed to align High Pressure Aux Spray:

#	TASK	TIME REQUIRED	DOSE RATE
1	Open MUV-273	12 minutes	5.31 R/hr
2	Open DHV-95	4 minutes	19.75 R/hr
3	Throttle DHV-126		3.65 R/hr

**Note: Assume no dose is received while traveling between tasks.**

**INITIATING CUES**

The PPO has completed tasks 1 and 2 in the time required. How long does he have to complete Task #3 without exceeding his Emergency Dose Limit?

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**Note: Candidate may perform these steps in a different order.**

**Note: Candidate should understand the following:**

1. **EDL is 5 Rem for this event (may use EM-202 as a reference).**
2. **Current exposure for the year is not counted toward the EDL.**

<p><b>STEP 1:</b> Determine dose received while performing Task #1.</p> <p><b>STANDARD:</b> Candidate determines dose received while performing Task #1.  <math>5.31 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 12 \text{ min} = 1.06 \text{ R}</math></p> <p><b>EXAMINER'S NOTE:</b> <b>If JPM is not performed in the simulator then provide candidate with a copy of EM-202, Duties of the Emergency Coordinator.</b></p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 2:</b> Determine dose received while performing Task #2.</p> <p><b>STANDARD:</b> Candidate determines dose received while performing Task #2.  <math>19.75 \text{ R/hr} \times 1\text{hr}/60 \text{ min} \times 4 \text{ min} = 1.32 \text{ R}</math></p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 3:</b> Determine dose remaining for EDL.</p> <p><b>STANDARD:</b> Candidate determines dose remaining for EDL.  <math>5.0 \text{ R} - 1.06 \text{ R} - 1.32 \text{ R} = 2.62 \text{ R}</math></p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>



<b>STEP 4:</b>	Determine the time available for the PPO to complete Task #3 without exceeding the EDL.	<b>Critical Step</b> (required to calculate maximum stay time)
<b>STANDARD:</b>	Candidate determines ( <b>± 5 minutes</b> ) the time available for the PPO to complete Task #3 without exceeding the EDL.	SAT _____
	$\frac{\text{Available Dose}}{\text{Dose Rate}} = \frac{2.62 \text{ R}}{3.65 \text{ R/hr}} = .718 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} = 43.1 \text{ min}$	UNSAT _____
<b>COMMENTS:</b>		
<b>END OF TASK</b>		

## CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS

You are the Balance of Plant operator.

An emergency event is in progress.

Emergency Dose Limits (EDL) are in effect.

The PPO has received 2.26 Rem TEDE this year.

The use of High Pressure Aux Spray will increase the pressure reduction rate but is not required to protect valuable plant equipment.

The following tasks are to be performed to align High Pressure Aux Spray:

#	TASK	TIME REQUIRED	DOSE RATE
1	Open MUV-273	12 minutes	5.31 R/hr
2	Open DHV-95	4 minutes	19.75 R/hr
3	Throttle DHV-126		3.65 R/hr

**Note:** Assume no dose is received while traveling between tasks.

### INITIATING CUES

The PPO has completed tasks 1 and 2 in the time required. How long does he have to complete Task #3 without exceeding his Emergency Dose Limit?

---

## CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS

You are the Balance of Plant operator.

An emergency event is in progress.

Emergency Dose Limits (EDL) are in effect.

The PPO has received 1.62 Rem TEDE this year.

The use of High Pressure Aux Spray will increase the pressure reduction rate but is not required to protect valuable plant equipment.

The following tasks are to be performed to align High Pressure Aux Spray:

#	TASK	TIME REQUIRED	DOSE RATE
1	Open MUV-273	12 minutes	5.31 R/hr
2	Open DHV-95	4 minutes	19.75 R/hr
3	Throttle DHV-126		3.65 R/hr

**Note: Assume no dose is received while traveling between tasks.**

### INITIATING CUES

The PPO has completed tasks 1 and 2 in the time required. How long does he have to complete Task #3 without exceeding his Emergency Dose Limit?

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PROGRESS ENERGY  
CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL

EMERGENCY PLAN IMPLEMENTING PROCEDURE

**EM-202**

***DUTIES OF THE EMERGENCY COORDINATOR***

### Guidelines for PE Emergency Worker Exposure

CONDITION	DOSE LIMIT (REM TEDE)	GUIDANCE
1. Emergency conditions <u>NOT</u> requiring actions to prevent serious injury or protect valuable property.	5	Emergency worker exposure should <u>NOT</u> exceed 5 REM TEDE.
2. Emergency conditions requiring actions to prevent serious injury or protect valuable property.	10	Exposure greater than 5 REM TEDE should receive approval of the Emergency Coordinator. Appropriate controls for emergency workers include time limitations and respirators.
3. Emergency conditions requiring lifesaving actions or actions to protect large populations.	25	Exposure greater than 5 REM TEDE should receive approval of the Emergency Coordinator. Appropriate controls for emergency workers include time limitations, respirators, and thyroid blocking.
4. Emergency conditions requiring lifesaving actions or actions to protect large populations.	> 25	Exposure greater than 5 REM TEDE receive approval of the Emergency Coordinator. Exposure at this level should be to volunteers who are healthy, above the age of 45, have an understanding of the health risks involved, and, preferably, be those whose normal duties have trained them for such missions. Appropriate controls for emergency workers include time limitations, respirators, and thyroid blocking.

**NOTE:** Reference for this table is Table 2.2 in the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA 400-R/92-001).

CRYSTAL RIVER UNIT 3

JPM COVER SHEET

AdminEP1 (2K5) NRC [Bank #306] (ADMINISTRATIVE)

RO ONLY

**COMPLETE AN OFF-SITE DOSE ASSESSMENT**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**Task:** Complete an Off-Site Dose Assessment during Radiological Emergencies  
(Control Room Method).

**Alternate Path:** N/A

**JPM #:** AdminEP1 (2K5) NRC [Bank #306]

**K/A Rating/Importance:** Generic 2.4.39 (3.3 / 3.1)

**Task Number:** 1150402007

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Complete an Off-Site Dose Assessment during Radiological  
Emergencies (Control Room Method), EM-204A

**Preferred Evaluation Location:**

**Preferred Evaluation Method:**

Simulator \_\_\_ In-Plant \_\_\_ Admin X

Perform X Simulate \_\_\_

**References:**

EM-204A, Rev. 24

**Validation Time:** 15 minutes

**Time Critical:** NO

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**Candidate:** \_\_\_\_\_

Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_ / \_\_\_\_\_

Printed Name

Signature

Date

**Comment:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. NA

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. NA



ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

Consumable copies of EM-204A  
Calculator

**READ TO THE OPERATOR**

**Initial Conditions:**

You are the Reactor Operator.  
A Radiological Emergency is in progress.  
RM-A2 low-range gas channel reads 6000 cpm.  
Wind Speed (33') is 5.2 meters/second (15 min. avg)  
Chart Recorder Primary Tower delta T is -1.50 (15 min. avg)  
Wind Direction (33') is 268 degrees  
Release duration is unknown

**Initiating Cues:**

**You are directed to perform EM-204A.**

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

<p><b>STEP 1:</b> Provide candidate with a copy of EM-204A and a calculator.</p> <p><b>STANDARD:</b> N/A</p> <p><b>COMMENTS:</b></p>	
<p><b>STEP 2:</b> Candidate completes EM-204A, Enclosure 1.</p> <p><b>STANDARD:</b> Candidate will complete EM-204A and return material to you.</p> <p><b>EXAMINER NOTE:</b></p> <p>See attached Answer Key. Candidate answers should match the key in order to be correct. For step 4.4.1 a range of +/- .005 may be allowed for rounding purposes only.</p> <p>Candidate must obtain all three of the affected sectors to be successful.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b> (information used for the protection of the public)</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>END OF TASK</b></p>	

**ADMINISTRATIVE JOB PERFORMANCE MEASURE**

**ANSWER KEY**

STEP #	RAD AND MET MONITOR DATA			FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM
4.1.2	RM-A2 LOW RANGE GAS CHANNEL	<b>6000</b>	CPM	
or 4.1.3	RM-A2 MID-RANGE GAS CHANNEL		mR/HR	
4.2.1	SIGMA-THETA		DEGREES (1)	
or 4.2.2	DELTA T	<b>-1.5</b>	DEGREES F (2)	
4.2.3	WIND FROM (33')	<b>268</b>	DEGREES (2)	8A
4.2.4	WIND SPEED (33')	<b>5.2</b>	M/SEC (2)	
4.2.4.1	WIND SPEED MPH=M/SEC X 2.24	<b>11.648</b>	MPH	13A
4.2.5	STABILITY CLASS	<b>A</b>		13B
	(1) Meter displays a rolling 15 minute average, so the current instantaneous value should be used.  (2) 15 minute average from chart recorder on meteorological panel			

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

## ANSWER KEY

STEP#	SITE BOUNDARY DOSE INFORMATION			FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM
4.3.1 or 4.3.2	DDE mR/HR	THYROID mR/HR	TEDE mR/HR	
	<b>1.2 E-01</b>	<b>3.2 E-01</b>	<b>1.6 E-01</b>	
4.4.1	DOSE RATE CORRECTED FOR WIND SPEED = (mR/HR ÷ M/SEC) (From 4.2.4)			14E, 14F
	DDE mR/HR	THYROID mR/HR	TEDE mR/HR	
	<b>.023</b>	<b>.062</b>	<b>.031</b>	
	Enter on State Form		Enter on State Form	
4.5.1	PROJECTED RELEASE DURATION _____ 1 _____ HOURS. (If duration can't be estimated, assume 1 hour.)			
4.5.2	DOSE = (CORRECTED DOSE RATE X DURATION HOURS)			
	DDE mR	THYROID mR	TEDE mR	
	<b>.023</b>	<b>.062</b>	<b>.031</b>	
4.6.1	NOBLE GAS CI/SEC	IODINE CI/SEC		14A, 14B
	<b>2.1E-2</b>	<b>2.1E-4</b>		
4.6.2	AFFECTED SECTORS <u>  D  </u> , <u>  E  </u> , <u>  F  </u> , _____ (three minimum)			8B
4.7.1	_____ Performed by _____ Date/Time _____			
4.7.2	_____ Emergency Coordinator _____ Date/Time _____			

REVISION DATE 7/30/03 SEC  
 RMA2NG 2.13E+07 -24.18

# ANSWER KEY

TABLE 1  
 RM-A2 LOW-RANGE MONITOR  
 SITE BOUNDARY (0.83-MILE)  
 DOSE RATE (MR/HR)

ENCLOSURE 2  
 (Page 1 of 2)

LOWRANGE CPM	NG uCi/cc	NG C/SEC	I C/SEC	STABILITY CLASS A,B,C			STABILITY CLASS D,E			STABILITY CLASS F,G		
				DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR
100	5.8E-06	4.3E-04	4.3E-06	2.6E-03	6.7E-03	3.2E-03	1.2E-02	3.1E-02	1.5E-02	4.3E-02	1.1E-01	5.4E-02
200	1.1E-05	7.7E-04	7.7E-06	4.6E-03	1.2E-02	5.8E-03	2.2E-02	5.6E-02	2.7E-02	7.8E-02	2.0E-01	9.8E-02
400	2.0E-05	1.5E-03	1.5E-05	8.8E-03	2.3E-02	1.1E-02	4.1E-02	1.1E-01	5.1E-02	1.5E-01	3.8E-01	1.8E-01
600	2.9E-05	2.2E-03	2.2E-05	1.3E-02	3.4E-02	1.6E-02	6.0E-02	1.6E-01	7.5E-02	2.2E-01	5.7E-01	2.7E-01
800	3.9E-05	2.8E-03	2.8E-05	1.7E-02	4.4E-02	2.1E-02	8.0E-02	2.1E-01	1.0E-01	2.9E-01	7.5E-01	3.6E-01
1000	4.8E-05	3.5E-03	3.5E-05	2.1E-02	5.5E-02	2.7E-02	9.9E-02	2.6E-01	1.2E-01	3.6E-01	9.3E-01	4.5E-01
2000	9.5E-05	7.0E-03	7.0E-05	4.2E-02	1.1E-01	5.2E-02	2.0E-01	5.1E-01	2.4E-01	7.1E-01	1.8E+00	8.8E-01
4000	1.9E-04	1.4E-02	1.4E-04	8.3E-02	2.2E-01	1.0E-01	3.9E-01	1.0E+00	4.9E-01	1.4E+00	3.6E+00	1.8E+00
6000	2.8E-04	2.1E-02	2.1E-04	1.2E-01	3.2E-01	1.6E-01	5.8E-01	1.5E+00	7.3E-01	2.1E+00	5.5E+00	2.6E+00
8000	3.8E-04	2.8E-02	2.8E-04	1.7E-01	4.3E-01	2.1E-01	7.8E-01	2.0E+00	9.7E-01	2.8E+00	7.3E+00	3.5E+00
1E+04	4.7E-04	3.5E-02	3.5E-04	2.1E-01	5.4E-01	2.6E-01	9.7E-01	2.5E+00	1.2E+00	3.5E+00	9.1E+00	4.4E+00
2E+04	9.4E-04	6.9E-02	6.9E-04	4.1E-01	1.1E+00	5.2E-01	1.9E+00	5.0E+00	2.4E+00	7.0E+00	1.8E+01	8.7E+00
4E+04	1.9E-03	1.4E-01	1.4E-03	8.3E-01	2.2E+00	1.0E+00	3.9E+00	1.0E+01	4.8E+00	1.4E+01	3.6E+01	1.7E+01
6E+04	2.8E-03	2.1E-01	2.1E-03	1.2E+00	3.2E+00	1.6E+00	5.8E+00	1.5E+01	7.3E+00	2.1E+01	5.4E+01	2.6E+01
8E+04	3.8E-03	2.8E-01	2.8E-03	1.7E+00	4.3E+00	2.1E+00	7.7E+00	2.0E+01	9.7E+00	2.8E+01	7.3E+01	3.5E+01
1E+05	4.7E-03	3.5E-01	3.5E-03	2.1E+00	5.4E+00	2.6E+00	9.7E+00	2.5E+01	1.2E+01	3.5E+01	9.1E+01	4.4E+01
2E+05	9.4E-03	6.9E-01	6.9E-03	4.1E+00	1.1E+01	5.2E+00	1.9E+01	5.0E+01	2.4E+01	7.0E+01	1.8E+02	8.7E+01
4E+05	1.9E-02	1.4E+00	1.4E-02	8.3E+00	2.2E+01	1.0E+01	3.9E+01	1.0E+02	4.8E+01	1.4E+02	3.6E+02	1.7E+02
6E+05	2.8E-02	2.1E+00	2.1E-02	1.2E+01	3.2E+01	1.6E+01	5.8E+01	1.5E+02	7.3E+01	2.1E+02	5.4E+02	2.6E+02
8E+05	3.8E-02	2.8E+00	2.8E-02	1.7E+01	4.3E+01	2.1E+01	7.7E+01	2.0E+02	9.7E+01	2.8E+02	7.3E+02	3.5E+02
1E+06	4.7E-02	3.5E+00	3.5E-02	2.1E+01	5.4E+01	2.6E+01	9.7E+01	2.5E+02	1.2E+02	3.5E+02	9.1E+02	4.4E+02

## ANSWER KEY

### DETERMINATION OF AFFECTED SECTORS

WIND DIRECTION (°FROM)	AFFECTED SECTORS
349-11	H J K
12-33	J K L
34-56	K L M
57-78	L M N
79-101	M N P
102-123	N P Q
124-146	P Q R
147-168	Q R A
169-191	R A B
192-213	A B C
214-236	B C D
237-258	C D E
<b>259-281</b>	<b>D E F</b>
282-303	E F G
304-326	F G H
327-348	G H J

SIGMA-THETA (Degrees) (Primary method)	DELTA T (Degrees F) (Secondary method)	STABILITY CLASS
$\geq 22.5$	$\leq -1.46$	<b>A (most dispersed plume)</b>
$< 22.5$ to 17.5	-1.45 to -1.31	B
$< 17.5$ to 12.5	-1.30 to -1.16	C
$< 12.5$ to 7.5	-1.15 to -0.39	D
$< 7.5$ to 3.8	-0.38 to 1.15	E
$< 3.8$ to 2.1	1.16 to 3.07	F
$< 2.1$	$\geq 3.08$	G (most concentrated plume)

## CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### Initial Conditions:

You are the Reactor Operator.

A Radiological Emergency is in progress.

RM-A2 low-range gas channel reads 6000 cpm.

Wind Speed (33') is 5.2 meters/second (15 min. avg)

Chart Recorder Primary Tower delta T is  $-1.50$  (15 min. avg)

Wind Direction (33') is 268 degrees

Release duration is unknown

### Initiating Cues:

You are directed to perform EM-204A.

CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL

EMERGENCY PLAN IMPLEMENTING PROCEDURE

**EM-204A**

**OFF-SITE DOSE ASSESSMENT DURING  
RADIOLOGICAL EMERGENCIES  
(CONTROL ROOM METHOD)**



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## 1.0 PURPOSE

This procedure provides a timely method for Control Room personnel to estimate the radiation exposure at the Site Boundary (0.83 miles) during a radiological emergency. The procedure was developed for use during the first hour of a monitored, filtered release through the Auxiliary Building Vent. [NOCS 00389, 01029, 01062, 01128, 01582, 01589, 01592, 09815, 13140]

## 2.0 REFERENCES

### 2.1 Developmental References

- 2.1.1 Radiological Emergency Response Plan (RERP), Progress Energy Crystal River Unit 3.
- 2.1.2 Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA-400-R-92-001, Environmental Protection Agency (October, 1991).
- 2.1.3 Nuclear Regulatory Commission – Response Technical Manual RTM-96, Vol. 1 Rev. 4.
- 2.1.4 Radiation Monitor Sensitivity Curve Log, Crystal River 3.
- 2.1.5 Engineering Evaluation EEF-00-009, Rev. 1 – Radiological Monitor Response Factors

## 3.0 PERSONNEL INDOCTRINATION

### 3.1 Definitions

- 3.1.1 **Affected Sectors** - As a minimum, the downwind sector(s) and the adjacent sectors, as indicated Enclosure 3.
- 3.1.2 **Committed Dose Equivalent (CDE)** - Dose to an organ due to the intake of radioactive materials. For initial emergency dose assessment, only dose to the thyroid is considered when calculating CDE (CDE dose = Thyroid dose).
- 3.1.3 **Deep Dose Equivalent (DDE)** - External whole body dose.
- 3.1.4 **Delta T** – The temperature differential between the 175' level and 33' level of the primary meteorological tower.
- 3.1.5 **Sigma-Theta** - The standard deviation of a set of wind range measurements. The Sigma-Theta meter automatically calculates and displays the standard deviation of wind range for the previous 15 minutes.
- 3.1.6 **Thyroid (THY) Dose** - Dose to the thyroid due to intake of radioactive iodine. For initial emergency dose assessment, only dose to the thyroid is considered when calculating Committed Dose Equivalent (see Step 3.1.2).
- 3.1.7 **Total Dose (TEDE)** - The Total Effective Dose Equivalent is the sum of external Dose (DDE) and the equivalent amount of whole body dose due to the individual organ uptakes.
- 3.1.8 **Wind Direction** - Direction the wind is coming from, where north = 0°, east = 90°, south = 180°, and west = 270°.

## 3.2 Responsibilities

- 3.2.1 The Emergency Coordinator (EC) is responsible during all emergencies for the implementation of procedures. The EC is required to initially evaluate the situation by EM-202, Duties of the Emergency Coordinator. Responsibility for performing this procedure will be assigned by the EC.

## 3.3 Limits and Precautions

- 3.3.1 Stability classes have been grouped into three categories: (A,B,C), (D,E), (F,G). The most stable dispersion factor is applied to all the classes in each category. Table dose rates will be more conservative for classes A, B, D, and F (i.e., actual dose rates will be lower).
- 3.3.2 NO credit is taken for radioactive decay. Table dose rates become more conservative as time progresses (i.e., actual dose rates will be lower).
- 3.3.3 For monitor readings that lie between two table values, the higher table value should be used.

## 4.0 INSTRUCTIONS

- 4.0.1 **RECORD** all input parameters and dose estimates on the data sheet in Enclosure 1. The right margin of the data sheet lists the section number of the Florida Nuclear Plant Emergency Notification Form for data which also must be recorded there.

### 4.1 Radiological Data

- 4.1.1 IF RM-A2 low-range gas channel is NOT in service,  
OR does NOT contain representative sample flow,  
THEN
- EXIT this procedure
  - INFORM the State Warning Point that dose information will be provided in follow-up notifications.
- 4.1.2 IF RM-A2 low-range gas channel is on-scale,  
THEN READ the counts per minute and **RECORD** on the data sheet.
- 4.1.3 IF RM-A2 low-range gas channel is off-scale high,  
THEN:
- REQUEST that the control board operator switch the RM-A2 mid/high range controller to auto.
  - WHEN the mid-range monitor has stabilized,  
THEN READ the mR/hr.
  - RECORD on the data sheet.

## 4.2 Meteorological Data

### NOTE

The preferred source of meteorological data is the 33' Primary Tower (MMP-3). Alternate sources are the 175' Primary Tower and the 33' Alternate Tower (MMP-1).

If the wind direction, or wind speed recorders are NOT in service, the appropriate meter may be observed for a brief period (possibly 30 seconds) to obtain an estimate.

4.2.1 READ the Sigma-Theta meter (MM-7-SI) on the alternate tower panel (or computer point W208) and RECORD on the data sheet. The Sigma-Theta meter reading is based on the past 15 minutes of data. Therefore, the instantaneous reading can be used.

4.2.2 IF Sigma-Theta is NOT available,  
THEN ESTIMATE the previous 15 minute average primary tower Delta T from the recorder (MM-21-TR) and RECORD on the data sheet.

### NOTE

If the wind direction instrumentation is NOT available, visual indicators such as clouds, stacks, cooling towers, etc. may be used to determine wind direction.

4.2.3 ESTIMATE the previous 15 minute average wind direction (direction wind is coming from) from the 33' recorder (MM-19-TR) and RECORD on the data sheet.

### NOTE

If the wind speed instrumentation is NOT available, the default wind speeds are 2 meters per second for a day release or 1 meter per second for a night release. (Meters per second x 2.24=mph.)

4.2.4 ESTIMATE the previous 15 minute average wind speed from the 33' recorder (MM-19-TR) and RECORD on the data sheet.

4.2.4.1 MULTIPLY the meters per second from Step 4.2.4 by 2.24 to calculate miles per hour (mph) and RECORD on the data sheet.

**NOTE**

If stability class CANNOT be determined, the default is the D & E group.

4.2.5 Determine the stability class from the table below.

<b>SIGMA-THETA (Degrees) (Primary method)</b>	<b>DELTA T (Degrees F) (Secondary method)</b>	<b>STABILITY CLASS</b>
≥ 22.5	≤ -1.46	A (most dispersed plume)
< 22.5 to 17.5	-1.45 to -1.31	B
< 17.5 to 12.5	-1.30 to -1.16	C
< 12.5 to 7.5	-1.15 to -0.39	D
< 7.5 to 3.8	-0.38 to 1.15	E
< 3.8 to 2.1	1.16 to 3.07	F
< 2.1	≥3.08	G (most concentrated plume)

**4.3 Dose Rate Tables**

**NOTE**

For monitor readings that lie between two table values, the higher table value should be used.

4.3.1 IF RM-A2 low-range gas channel was on-scale, THEN FIND the following dose rates on Enclosure 2, Table 1, corresponding to the count rate in cpm and the stability class (from Step 4.2.5) and RECORD on the data sheet.

- DDE mR/hr
- Thyroid mR/hr
- Total (TEDE) mR/hr

4.3.2 IF RM-A2 low-range gas channel was off-scale and the mid-range monitor mR/hr was recorded, THEN FIND the following dose rates on Enclosure 2, Table 2, corresponding to the monitor count rate in mR/hr and the stability class (from Step 4.2.5) and RECORD on the data sheet.

- DDE mR/hr
- Thyroid mR/hr
- Total (TEDE) mR/hr

**4.4 Wind Correction Calculation**

4.4.1 CORRECT the DDE dose rate, Thyroid dose rate and Total (TEDE) dose rate for wind speed by dividing by the meters per second from Step 4.2.4. Do NOT use mph. RECORD on data sheet.

#### 4.5 Dose Calculation

##### NOTE

If the release duration CANNOT be estimated or determined, the default is 1 hour.

4.5.1 ESTIMATE the release/exposure duration and RECORD on the data sheet.

##### CAUTION

**EM-202 Enclosure 1 indicates a Site Area Emergency if dose assessment results indicate site boundary dose >100 mR TEDE or >500 mR Thyroid CDE for the actual or projected duration of the release.**

**EM-202 Enclosure 1 indicates a General Emergency if dose assessment results indicate a site boundary dose of >1000 mR TEDE or >5000 mR Thyroid CDE for actual or projected duration of the release.**

4.5.2 DETERMINE the DDE dose, Thyroid dose and Total (TEDE) dose by multiplying the wind-corrected dose rate for each by the release/exposure duration. RECORD on the data sheet.

#### 4.6 Additional Florida Nuclear Plant Emergency Notification Form Information

4.6.1 On the same table used to determine dose rates, FIND the Noble Gas Ci/sec and Iodine Ci/sec corresponding to the monitor count rate (from Steps 4.3.1, 4.3.2). RECORD on the data sheet.

4.6.2 DETERMINE the affected sectors on Enclosure 3 corresponding to wind direction from 4.2.3 and RECORD on the data sheet.

#### 4.7 Documentation

4.7.1 RECORD person's name performing the procedure, and the date and time initial assessment was made.

4.7.2 SUBMIT this procedure to the Emergency Coordinator for review and signature.

4.7.3 TRANSMIT all documentation and calculations created by this procedure to Records Management after appropriate reviews.

DATA SHEET

STEP #	RAD AND MET MONITOR DATA			FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM
4.1.2	RM-A2 LOW RANGE GAS CHANNEL		CPM	
or 4.1.3	RM-A2 MID-RANGE GAS CHANNEL		mR/HR	
4.2.1	SIGMA-THETA		DEGREES (1)	
or 4.2.2	DELTA T		DEGREES F (2)	
4.2.3	WIND FROM (33')		DEGREES (2)	8A
4.2.4	WIND SPEED (33')		M/SEC (2)	
4.2.4.1	WIND SPEED MPH=M/SEC X 2.24		MPH	13A
4.2.5	STABILITY CLASS			13B
<p>(1) Meter displays a rolling 15 minute average, so the current instantaneous value should be used.</p> <p>(2) 15 minute average from chart recorder on meteorological panel</p>				

**DATA SHEET**

STEP#	SITE BOUNDARY DOSE INFORMATION			FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM
4.3.1 or 4.3.2	DDE mR/HR	THYROID mR/HR	TEDE mR/HR	
4.4.1	DOSE RATE CORRECTED FOR WIND SPEED = (mR/HR ÷ M/SEC) (From 4.2.4)			14E, 14F
	DDE mR/HR	THYROID mR/HR	TEDE mR/HR	
		Enter on State Form	Enter on State Form	
4.5.1	PROJECTED RELEASE DURATION _____ HOURS. (If duration can't be estimated, assume 1 hour.)			
4.5.2	DOSE = (CORRECTED DOSE RATE X DURATION HOURS)			
	DDE mR	THYROID mR	TEDE mR	
4.6.1	NOBLE GAS CI/SEC	IODINE CI/SEC		14A, 14B
4.6.2	AFFECTED SECTORS _____, _____, _____, _____ (three minimum)			8B
4.7.1	_____ Performed by _____ Date/Time _____			
4.7.2	_____ Emergency Coordinator _____ Date/Time _____			



TABLE 1  
RM-A2 LOW-RANGE MONITOR

ENCLOSURE 2  
(Page 1 of 2)

SITE BOUNDARY (0.83-MILE)  
DOSE RATE (MR/HR)

LOWRANGE CPM	NG uCi/cc	NG CI/SEC	I CI/SEC	STABILITY CLASS A,B,C			STABILITY CLASS D,E			STABILITY CLASS F,G		
				DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR
100	5.8E-06	4.3E-04	4.3E-06	2.6E-03	6.7E-03	3.2E-03	1.2E-02	3.1E-02	1.5E-02	4.3E-02	1.1E-01	5.4E-02
200	1.1E-05	7.7E-04	7.7E-06	4.6E-03	1.2E-02	5.8E-03	2.2E-02	5.6E-02	2.7E-02	7.8E-02	2.0E-01	9.8E-02
400	2.0E-05	1.5E-03	1.5E-05	8.8E-03	2.3E-02	1.1E-02	4.1E-02	1.1E-01	5.1E-02	1.5E-01	3.8E-01	1.8E-01
600	2.9E-05	2.2E-03	2.2E-05	1.3E-02	3.4E-02	1.6E-02	6.0E-02	1.6E-01	7.5E-02	2.2E-01	5.7E-01	2.7E-01
800	3.9E-05	2.8E-03	2.8E-05	1.7E-02	4.4E-02	2.1E-02	8.0E-02	2.1E-01	1.0E-01	2.9E-01	7.5E-01	3.6E-01
1000	4.8E-05	3.5E-03	3.5E-05	2.1E-02	5.5E-02	2.7E-02	9.9E-02	2.6E-01	1.2E-01	3.6E-01	9.3E-01	4.5E-01
2000	9.5E-05	7.0E-03	7.0E-05	4.2E-02	1.1E-01	5.2E-02	2.0E-01	5.1E-01	2.4E-01	7.1E-01	1.8E+00	8.8E-01
4000	1.9E-04	1.4E-02	1.4E-04	8.3E-02	2.2E-01	1.0E-01	3.9E-01	1.0E+00	4.9E-01	1.4E+00	3.6E+00	1.8E+00
6000	2.8E-04	2.1E-02	2.1E-04	1.2E-01	3.2E-01	1.6E-01	5.8E-01	1.5E+00	7.3E-01	2.1E+00	5.5E+00	2.6E+00
8000	3.8E-04	2.8E-02	2.8E-04	1.7E-01	4.3E-01	2.1E-01	7.8E-01	2.0E+00	9.7E-01	2.8E+00	7.3E+00	3.5E+00
1E+04	4.7E-04	3.5E-02	3.5E-04	2.1E-01	5.4E-01	2.6E-01	9.7E-01	2.5E+00	1.2E+00	3.5E+00	9.1E+00	4.4E+00
2E+04	9.4E-04	6.9E-02	6.9E-04	4.1E-01	1.1E+00	5.2E-01	1.9E+00	5.0E+00	2.4E+00	7.0E+00	1.8E+01	8.7E+00
4E+04	1.9E-03	1.4E-01	1.4E-03	8.3E-01	2.2E+00	1.0E+00	3.9E+00	1.0E+01	4.8E+00	1.4E+01	3.6E+01	1.7E+01
6E+04	2.8E-03	2.1E-01	2.1E-03	1.2E+00	3.2E+00	1.6E+00	5.8E+00	1.5E+01	7.3E+00	2.1E+01	5.4E+01	2.6E+01
8E+04	3.8E-03	2.8E-01	2.8E-03	1.7E+00	4.3E+00	2.1E+00	7.7E+00	2.0E+01	9.7E+00	2.8E+01	7.3E+01	3.5E+01
1E+05	4.7E-03	3.5E-01	3.5E-03	2.1E+00	5.4E+00	2.6E+00	9.7E+00	2.5E+01	1.2E+01	3.5E+01	9.1E+01	4.4E+01
2E+05	9.4E-03	6.9E-01	6.9E-03	4.1E+00	1.1E+01	5.2E+00	1.9E+01	5.0E+01	2.4E+01	7.0E+01	1.8E+02	8.7E+01
4E+05	1.9E-02	1.4E+00	1.4E-02	8.3E+00	2.2E+01	1.0E+01	3.9E+01	1.0E+02	4.8E+01	1.4E+02	3.6E+02	1.7E+02
6E+05	2.8E-02	2.1E+00	2.1E-02	1.2E+01	3.2E+01	1.6E+01	5.8E+01	1.5E+02	7.3E+01	2.1E+02	5.4E+02	2.6E+02
8E+05	3.8E-02	2.8E+00	2.8E-02	1.7E+01	4.3E+01	2.1E+01	7.7E+01	2.0E+02	9.7E+01	2.8E+02	7.3E+02	3.5E+02
1E+06	4.7E-02	3.5E+00	3.5E-02	2.1E+01	5.4E+01	2.6E+01	9.7E+01	2.5E+02	1.2E+02	3.5E+02	9.1E+02	4.4E+02

BASED ON RM-A2 GAS CALIBRATION ON 5/20/03  
DOSE RATES ARE DETERMINED FOR 1 METER/SEC WIND SPEED  
BASED ON A VENT FLOW OF 156000 CFM  
BASED ON LOCAN T=O MIX  
BASED ON I/NG RATIO OF 0.01 - RCS CONC EQUAL X0.2 PARTITIONING X 0.05 FILTERS

TABLE 2  
RM-A2 MID-RANGE MONITOR  
SITE BOUNDARY (0.83-MILE)  
DOSE RATE (MR/HR)

MIDRANGE mR/hr	NG uCi/cc	NG Ci/SEC	I Ci/SEC	STABILITY CLASS A,B,C			STABILITY CLASS D,E			STABILITY CLASS F,G		
				DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR	DDE mR/HR	THY mR/HR	TEDE mR/HR
0.01	3.0E-04	2.2E-02	2.2E-04	1.3E-01	3.4E-01	1.7E-01	6.2E-01	1.6E+00	7.7E-01	2.2E+00	5.8E+00	2.8E+00
0.02	6.0E-04	4.4E-02	4.4E-04	2.7E-01	6.9E-01	3.3E-01	1.2E+00	3.2E+00	1.5E+00	4.5E+00	1.2E+01	5.6E+00
0.04	1.2E-03	8.8E-02	8.8E-04	5.3E-01	1.4E+00	6.6E-01	2.5E+00	6.4E+00	3.1E+00	8.9E+00	2.3E+01	1.1E+01
0.06	1.8E-03	1.3E-01	1.3E-03	8.0E-01	2.1E+00	9.9E-01	3.7E+00	9.6E+00	4.6E+00	1.3E+01	3.5E+01	1.7E+01
0.08	2.4E-03	1.8E-01	1.8E-03	1.1E+00	2.8E+00	1.3E+00	4.9E+00	1.3E+01	6.2E+00	1.8E+01	4.6E+01	2.2E+01
0.1	3.0E-03	2.2E-01	2.2E-03	1.3E+00	3.4E+00	1.7E+00	6.2E+00	1.6E+01	7.7E+00	2.2E+01	5.8E+01	2.8E+01
0.2	6.0E-03	4.4E-01	4.4E-03	2.7E+00	6.9E+00	3.3E+00	1.2E+01	3.2E+01	1.5E+01	4.5E+01	1.2E+02	5.6E+01
0.4	1.2E-02	8.8E-01	8.8E-03	5.3E+00	1.4E+01	6.6E+00	2.5E+01	6.4E+01	3.1E+01	8.9E+01	2.3E+02	1.1E+02
0.6	1.8E-02	1.3E+00	1.3E-02	8.0E+00	2.1E+01	9.9E+00	3.7E+01	9.6E+01	4.6E+01	1.3E+02	3.5E+02	1.7E+02
0.8	2.4E-02	1.8E+00	1.8E-02	1.1E+01	2.8E+01	1.3E+01	4.9E+01	1.3E+02	6.2E+01	1.8E+02	4.6E+02	2.2E+02
1	3.0E-02	2.2E+00	2.2E-02	1.3E+01	3.4E+01	1.7E+01	6.2E+01	1.6E+02	7.7E+01	2.2E+02	5.8E+02	2.8E+02
2	6.0E-02	4.4E+00	4.4E-02	2.7E+01	6.9E+01	3.3E+01	1.2E+02	3.2E+02	1.5E+02	4.5E+02	1.2E+03	5.6E+02
4	1.2E-01	8.8E+00	8.8E-02	5.3E+01	1.4E+02	6.6E+01	2.5E+02	6.4E+02	3.1E+02	8.9E+02	2.3E+03	1.1E+03
6	1.8E-01	1.3E+01	1.3E-01	8.0E+01	2.1E+02	9.9E+01	3.7E+02	9.6E+02	4.6E+02	1.3E+03	3.5E+03	1.7E+03
8	2.4E-01	1.8E+01	1.8E-01	1.1E+02	2.8E+02	1.3E+02	4.9E+02	1.3E+03	6.2E+02	1.8E+03	4.6E+03	2.2E+03
10	3.0E-01	2.2E+01	2.2E-01	1.3E+02	3.4E+02	1.7E+02	6.2E+02	1.6E+03	7.7E+02	2.2E+03	5.8E+03	2.8E+03
20	6.0E-01	4.4E+01	4.4E-01	2.7E+02	6.9E+02	3.3E+02	1.2E+03	3.2E+03	1.5E+03	4.5E+03	1.2E+04	5.6E+03
40	1.2E+00	8.8E+01	8.8E-01	5.3E+02	1.4E+03	6.6E+02	2.5E+03	6.4E+03	3.1E+03	8.9E+03	2.3E+04	1.1E+04
60	1.8E+00	1.3E+02	1.3E+00	8.0E+02	2.1E+03	9.9E+02	3.7E+03	9.6E+03	4.6E+03	1.3E+04	3.5E+04	1.7E+04
80	2.4E+00	1.8E+02	1.8E+00	1.1E+03	2.8E+03	1.3E+03	4.9E+03	1.3E+04	6.2E+03	1.8E+04	4.6E+04	2.2E+04
100	3.0E+00	2.2E+02	2.2E+00	1.3E+03	3.4E+03	1.7E+03	6.2E+03	1.6E+04	7.7E+03	2.2E+04	5.8E+04	2.8E+04
200	6.0E+00	4.4E+02	4.4E+00	2.7E+03	6.9E+03	3.3E+03	1.2E+04	3.2E+04	1.5E+04	4.5E+04	1.2E+05	5.6E+04
400	1.2E+01	8.8E+02	8.8E+00	5.3E+03	1.4E+04	6.6E+03	2.5E+04	6.4E+04	3.1E+04	8.9E+04	2.3E+05	1.1E+05
600	1.8E+01	1.3E+03	1.3E+01	8.0E+03	2.1E+04	9.9E+03	3.7E+04	9.6E+04	4.6E+04	1.3E+05	3.5E+05	1.7E+05
1000	3.0E+01	2.2E+03	2.2E+01	1.3E+04	3.4E+04	1.7E+04	6.2E+04	1.6E+05	7.7E+04	2.2E+05	5.8E+05	2.8E+05

BASED ON:

- 0.03 mid-range conversion factor from EEF-00-009, Rev.1
- WINDSPEED 1 M/SEC
- VENT FLOW 156000 CFM
- BASED ON LOCAN T=0 MIX
- BASED ON I/NG RATIO OF 0.01 - RCS CONC EQUAL X0.2 PARTITIONING X 0.05 FILTERS

**DETERMINATION OF AFFECTED SECTORS**

WIND DIRECTION (°FROM)	AFFECTED SECTORS
349-11	H J K
12-33	J K L
34-56	K L M
57-78	L M N
79-101	M N P
102-123	N P Q
124-146	P Q R
147-168	Q R A
169-191	R A B
192-213	A B C
214-236	B C D
237-258	C D E
259-281	D E F
282-303	E F G
304-326	F G H
327-348	G H J

**Revision 24 Summary; September, 2003**

Throughout	Emphasized negative words.
Cover	Replaced FPC logo with PE logo. "Deleted Florida Power Corporation." Changed procedure type to "Reference."
1.0	Deleted redundant phrase "The purpose of."
2.1.1	Deleted Florida Power Corporation and replaced with Progress Energy in the RERP title.
2.1.4	Deleted Florida Power Corporation in the Radiation Monitor Sensitivity Curve Log title.
3.1.1	Deleted erroneous reference to the affected sectors table being the last page of each enclosure. It is now Enclosure 3.
3.1.4, 3.1.6	Deleted "FPC."
3.3.3	Added Limit and Precaution that for monitor readings between two table values, that the higher value should be used.
4.2	Added MMP-1 and MMP-3 met tower designators to note as clarifiers.
4.2.1	Added Sigma Theta meter number as a clarifier. Per request of an Operations Training Instructor, added that Sigma Theta can also be obtained from computer point W208. This will allow use of Sigma Theta in the Simulator where the Alternate Tower is not modeled. Added to record on the data sheet.
4.2.2	Stated to read Delta T from the recorder instead of the indicator and estimate the previous 15 minute average. Added the Delta T recorder number as a clarifier.
4.2.3	Added the wind direction recorder number as a clarifier.
4.2.4	Added the wind speed recorder number as a clarifier.
4.3.1	Added note reflecting new Limit and Precaution 3.3.3
4.4.1	Added to not use mph for the wind speed correction to dose rate.
Encl 1	Clarified in the step 4.4.1 equation to use wind speed from step 4.2.4. Updated State Notification Form reference numbers. Added full title of State Notification Form to both pages of data sheet.
Encl 2	Updated Table 1 for 5/20/03 RM-A2 gas calibration. Verified TEDE and THY dose factor from RADDOSE-IV runs and adjusted THY factor in Table 1 and Table 2 from 2.7 to 2.6.

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**AdminEP2 (2K5) NRC (ADMINISTRATIVE)**

**SRO ONLY**

**DETERMINE EMERGENCY ACTION LEVEL AND  
PROTECTIVE ACTION RECOMMENDATIONS**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt/Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05



ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. N/A

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. N/A

**TOOLS/EQUIPMENT/PROCEDURES NEEDED:**

1. EM-202, Rev. 75
2. EOP-7, Rev. 12

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

**READ TO THE OPERATOR**

**INITIAL CONDITIONS:**

You are the Superintendent, Shift Operations.  
See attached data sheet.

**INITIATING CUE:**

Determine the highest Emergency Action Level for the time line provided. Also determine the Protective Action Recommendations required, if any. Document your answers below.

DO NOT use EC discretion.

Attach page of Enclosure 1 used to determine your classification.

THIS JPM IS TIME CRITICAL

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ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

<u>STEP 1:</u>	Obtain a copy of the correct procedure.																						
<u>STANDARD:</u>	Candidate obtains a copy of EM-202 and EOP-7.	SAT _____																					
<u>EXAMINER'S NOTE:</u>	<b>Provide candidate with a copy of EM-202 and EOP-7 when requested.</b>	UNSAT _____																					
<u>COMMENTS:</u>																							
<u>STEP 2:</u>	Candidate determines classification for the data provided.	<b>Critical Step</b>																					
<u>STANDARD:</u>	Candidate determines the classification using the Fission Product Barrier Matrix:	<b>Basis: Protection of the Public.</b>																					
	<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">FUEL CLAD LOSS FACTOR</td> <td style="width: 10%; text-align: right;">+4</td> <td style="width: 20%;"></td> </tr> <tr> <td colspan="3" style="padding-left: 20px;">(RM-G29 or 30 &gt;100 R/hr for 15 minutes or longer)</td> </tr> <tr> <td>RCS LOSS FACTOR</td> <td style="text-align: right;">+4</td> <td></td> </tr> <tr> <td colspan="3" style="padding-left: 20px;">(RM-G29 or 30 &gt;10 R/hr for 15 minutes or longer)</td> </tr> <tr> <td>CONTAINMENT LOSS</td> <td style="text-align: right;">+2</td> <td></td> </tr> <tr> <td colspan="3" style="padding-left: 20px;">(Rapid unexplained RB pressure decrease following initial increase)</td> </tr> <tr> <td>TOTAL</td> <td style="text-align: right;">+10</td> <td></td> </tr> </table>	FUEL CLAD LOSS FACTOR	+4		(RM-G29 or 30 >100 R/hr for 15 minutes or longer)			RCS LOSS FACTOR	+4		(RM-G29 or 30 >10 R/hr for 15 minutes or longer)			CONTAINMENT LOSS	+2		(Rapid unexplained RB pressure decrease following initial increase)			TOTAL	+10		SAT _____
FUEL CLAD LOSS FACTOR	+4																						
(RM-G29 or 30 >100 R/hr for 15 minutes or longer)																							
RCS LOSS FACTOR	+4																						
(RM-G29 or 30 >10 R/hr for 15 minutes or longer)																							
CONTAINMENT LOSS	+2																						
(Rapid unexplained RB pressure decrease following initial increase)																							
TOTAL	+10																						
		UNSAT _____																					
	<b>GENERAL EMERGENCY</b>																						
<u>COMMENTS:</u>																							

ATTACHMENT 8  
ADMINISTRATIVE JOB PERFORMANCE MEASURE

<p><b>STEP 3:</b> Candidate determines the Protective Action Recommendations.</p> <p><b>STANDARD:</b></p> <p>Candidate refers to Enclosure 7 of EM-202.</p> <p>Using RM-G29/30 readings the candidate will determine the need to evacuate Zone 1 and shelter Zones 2 &amp; 3.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Protection of the Public.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>TERMINATION CUE:</b></p> <p>Emergency Action Level and Protective Action Recommendations determined.</p>	
<p><b>END OF TASK</b></p>	

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS:**

You are the Superintendent, Shift Operations.  
See attached data sheet.

**INITIATING CUE:**

Determine the highest Emergency Action Level for the time line provided. Also determine the Protective Action Recommendations required, if any. Document your answers below.

DO NOT use EC discretion.

Attach page of Enclosure 1 used to determine your classification.

THIS JPM IS TIME CRITICAL

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At 1330 today the plant was as 100% power. The plant experiences a transient and at time 1400 the following conditions exist. Initial notifications have been made.

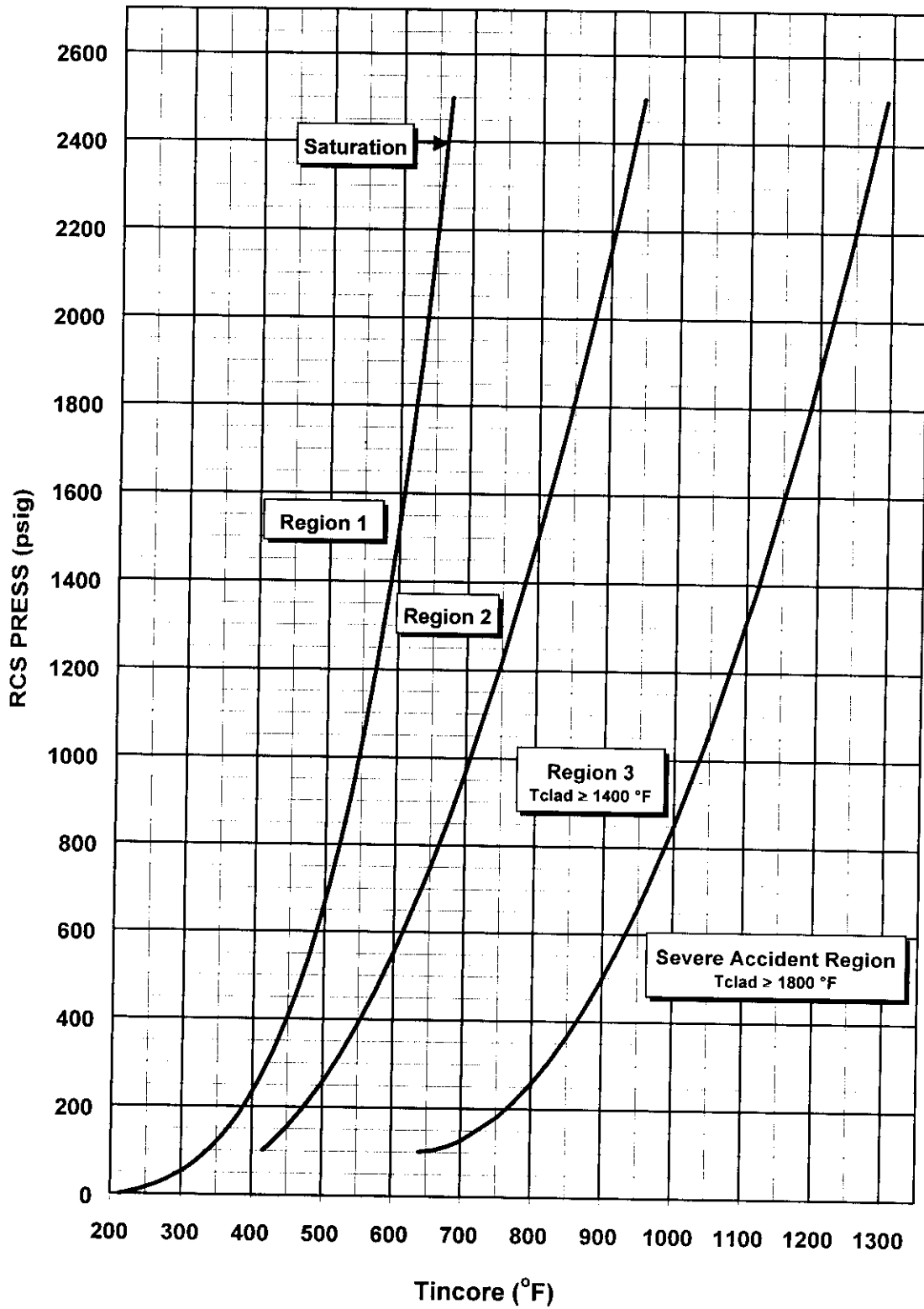
TIME	1345
RCS PRESSURE	110 PSIG
PRESSURIZER LEVEL	0"
INCORES	340° F
RX BLDG SPRAY FLOW	0 GPM/TRAIN
RX BLDG PRESSURE	28 PSIG
RMG - 29 & 30	102 R/HR

TIME	1400
RCS PRESSURE	110 PSIG
PRESSURIZER LEVEL	0"
INCORES	390° F
RX BLDG SPRAY FLOW	0 GPM/TRAIN
RX BLDG PRESSURE	4 PSIG
RMG - 29 & 30	150 R/HR

Based on the above information identify the appropriate EAL.

**FOR THIS EXERCISE DO NOT USE ANY EC DISCRETION!**

#### 4.0 FIGURE 1 INADEQUATE CORE COOLING REGIONS



**GUIDELINES FOR PROTECTIVE ACTION RECOMMENDATIONS FOR NON-ESSENTIAL ENERGY COMPLEX PERSONNEL AND GENERAL POPULATION**

PLANT CONDITIONS / OFFSITE DOSE ESTIMATES	RECOMMENDED ACTIONS
<p>1. <b>CONDITION:</b> GENERAL EMERGENCY DECLARED. <b>NO APPARENT CORE DAMAGE.</b></p> <p><b>CORE DAMAGE INDICATIONS:</b> a. RCS pressure vs temperature in Region 1 or 2 (Refer to EOP-07); or b. RM-G29/30 reading &lt; 100 R/hr; or c. PASS results.</p>	<p>Evacuate Zone 1 (See Notes 1 and 2)</p> <p>If a release is in progress, check Item 11.C "Consider Issuance of KI" on the Florida Nuclear Plant Emergency Notification Form "YES."</p>
<p>2. <b>CONDITION:</b> GENERAL EMERGENCY DECLARED. CLAD DAMAGE/GAS GAP RELEASE (<b>NO CORE MELT</b>).</p> <p><b>CORE DAMAGE INDICATIONS:</b> a. RCS pressure vs temperature in Region 3 (Refer to EOP-07); or b. Core uncovered for 15-30 minutes; or c. RM-G29/30 reading of 100-75,000 R/hr (RB spray off) OR 100-25,000 R/hr (RB spray on); or d. PASS results.</p> <p><b>OR:</b></p> <p>* Dose at the 0.83 mile Site Boundary is projected to be: a) TEDE: ≥ 1.0 Rem b) Thyroid CDE: ≥ 5.0 Rem</p>	<p>Evacuate Zone 1 (See Note 2)</p> <p>Shelter Zones 2 &amp; 3 (See Note 1)</p> <p>If a release is in progress, check Item 11.C "Consider Issuance of KI" on the Florida Nuclear Plant Emergency Notification Form "YES."</p>
<p>3. <b>CONDITION:</b> GENERAL EMERGENCY DECLARED. CORE MELT OCCURRING OR LIKELY.</p> <p><b>CORE DAMAGE INDICATIONS:</b> a. RCS pressure vs temperature in the Severe Accident Region (Refer to EOP-07); or b. Core uncovered for &gt; 30 minutes; or c. RM-G29/30 reading &gt; 75,000 R/hr (RB spray off) or &gt; 25,000 R/hr (RB spray on).</p> <p><b>WITH:</b></p> <p><b>NO</b> projected containment failure and <b>NO</b> release underway.</p> <p><b>OR</b></p>	<p>Evacuate Zone 1 (See Note 2)</p> <p>Shelter Zones 2 &amp; 3 (See Note 1)</p>
<p>Projected containment failure and/or release underway.</p>	<p>Evacuate Zones 1 and 2 and 3 (See Notes 2 and 3)</p> <p>If a release is in progress, check Item 11.C "Consider Issuance of KI" on the Florida Nuclear Plant Emergency Notification Form "YES."</p>

\* PARs within the first hour of an event should be based on PLANT CONDITIONS ONLY until the Dose Assessment Team is operational.

NOTE 1: Relocate/evacuate population affected by ground contamination after plume passage or at any time projected dose from actual release is ≥ 1.0 REM TEDE or ≥ 5.0 REM Thyroid CDE.

NOTE 2: Evacuation time estimates are 2 hours for a Zone 1 evacuation and 4 hours for Zones 2 & 3 evacuation. (These times do NOT include notification or preparation time for evacuees.)

NOTE 3: IF projected dose from an actual release is >1.0 REM TEDE or 5.0 REM Thyroid beyond 10 miles, THEN RECOMMEND evacuation to State and Local government by distance in miles, OR by subdivision and geographic boundaries.

**ZONE DESCRIPTIONS**

Zone 1: 0-5 miles 360 degrees and out to 10 miles in Gulf

Zone 2: 5-10 miles in Citrus County

Zone 3: 5-10 miles in Levy County

**EMERGENCY CLASSIFICATION TABLE**  
**FISSION PRODUCT BARRIER MATRIX**  
Applicable Modes: 1 - 4 Complete For All Barriers

<p><b>5.1 LOSS OF FUEL CLAD</b> If any item is checked, barrier is lost. Enter 4 for FUEL CLAD in classification table below.</p>	<p>1. CORE CONDITIONS IN REGION 3 OR SEVERE ACCIDENT REGION OF ICC CURVES</p>	<p>1. RCS LEAK OR OTSG TUBE LEAK RESULTING IN LOSS OF ADEQUATE SUBCOOLING MARGIN</p>	<p><b>7.1 LOSS OF CONTAINMENT</b> If any item is checked, barrier is lost. Enter 2 for CONTAINMENT in classification table below.</p>
<p>2. RCS ACTIVITY &gt;300 µCi/gm I-131 DOSE EQUIVALENT</p>	<p>2. RM-G29 OR 30 &gt; 10 R/hr FOR 15 MINUTES OR LONGER</p>	<p>2. CONTAINMENT PRESSURE OR SUMP LEVEL RESPONSE NOT CONSISTENT WITH LOCA CONDITIONS</p>	<p>1. RAPID UNEXPLAINED RB PRESSURE DECREASE FOLLOWING INITIAL INCREASE</p>
<p>3. RM-G29 OR 30 &gt; 100 R/hr FOR 15 MINUTES OR LONGER</p>	<p>3. EC DEEMS RCS BARRIER IS LOST</p>	<p>3. AN OTSG HAS &gt; 10 GPM TUBE RUPTURE WITH PROLONGED STEAMING TO THE ATMOSPHERE FROM THE AFFECTED OTSG OR AN UNISOLABLE STEAM LEAK OUTSIDE RB FROM THE AFFECTED OTSG</p>	<p>2. CONTAINMENT PRESSURE OR SUMP LEVEL RESPONSE NOT CONSISTENT WITH LOCA CONDITIONS</p>
<p>4. EC DEEMS FUEL CLAD BARRIER IS LOST</p>		<p>4. CONTAINMENT ISOLATION IS INCOMPLETE AND RELEASE PATH TO THE ENVIRONMENT EXISTS</p>	<p>3. AN OTSG HAS &gt; 10 GPM TUBE RUPTURE WITH PROLONGED STEAMING TO THE ATMOSPHERE FROM THE AFFECTED OTSG OR AN UNISOLABLE STEAM LEAK OUTSIDE RB FROM THE AFFECTED OTSG</p>
<p><b>5.2 POTENTIAL LOSS OF FUEL CLAD</b> If any item is checked, barrier is potentially lost. Enter 3 for FUEL CLAD in classification table below.</p>	<p>1. RCS CONDITIONS WARRANT ENTRY INTO EOP-07</p>	<p>1. RCS LEAK OR OTSG TUBE LEAK REQUIRING ONE OR MORE INJECTION VALVES</p>	<p>4. CONTAINMENT ISOLATION IS INCOMPLETE AND RELEASE PATH TO THE ENVIRONMENT EXISTS</p>
<p>2. CORE EXIT THERMOCOUPLES &gt;700°F</p>	<p>2. CORE EXIT THERMOCOUPLES &gt;700°F</p>	<p>2. RCS LEAK OR OTSG TUBE LEAK RESULTS IN ES ACTUATION ON LOW RCS PRESSURE</p>	<p>5. EC DEEMS CONTAINMENT BARRIER IS LOST</p>
<p>3. EC DEEMS FUEL CLAD BARRIER IN JEOPARDY</p>	<p>3. EC DEEMS FUEL CLAD BARRIER IN JEOPARDY</p>	<p>3. RCS PRESSURE/TEMPERATURE RELATIONSHIP VIOLATES NDT LIMITS</p>	<p>6. EC DEEMS CONTAINMENT BARRIER IN JEOPARDY</p>
	<p>4. HPI/PORV OR HPI/SAFETY VALVE COOLING IS IN PROGRESS</p>	<p>4. HPI/PORV OR HPI/SAFETY VALVE COOLING IS IN PROGRESS</p>	<p>7.2 POTENTIAL LOSS OF CONTAINMENT If any item is checked, barrier is potentially lost. Enter 1.5 for CONTAINMENT in classification table below.</p>
	<p>5. EC DEEMS RCS BARRIER IN JEOPARDY</p>	<p>5. EC DEEMS RCS BARRIER IN JEOPARDY</p>	<p>1. RB PRESSURE &gt;54 psig</p>
			<p>2. RB HYDROGEN CONCENTRATION &gt;4%</p>
			<p>3. RB PRESSURE &gt;30 psig WITH NO BUILDING SPRAY AVAILABLE</p>
			<p>4. RMG-29 OR 30 READINGS &gt;25,000 R/hr</p>
			<p>5. CORE CONDITIONS IN SEVERE ACCIDENT REGION OF ICC CURVES FOR &gt;15 MINUTES</p>
			<p>6. EC DEEMS CONTAINMENT BARRIER IN JEOPARDY</p>

**CLASSIFICATION TABLE**

ENTER LOSS OR POTENTIAL LOSS OR ZERO FOR EACH BARRIER THEN TOTAL AND DETERMINE CLASS BELOW	
FUEL CLAD _____	+ RCS _____ + CONTAINMENT _____ = _____

<b>IF TOTAL IS:</b>	<b>RECOMMENDED EVENT CLASSIFICATION IS:</b>
> 0 BUT < 2	UNUSUAL EVENT
> 2 BUT < 4	ALERT
> 4 BUT < 8.5	SITE AREA EMERGENCY
> 8.5	GENERAL EMERGENCY

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**Plantl (2K5) NRC [Bank #403] (PLANT)**

**ALTERNATE PATH**

**SAFETY FUNCTION 1**

**MANUAL REACTOR TRIP PER AP-990**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05



IN-PLANT JOB PERFORMANCE MEASURE

**Task:** Manually trip the reactor during AP-990.

**Alternate Path:** Yes

**JPM #:** PlantI (2K5) NRC [Bank #403]

**K/A Rating/Importance:** E02EA1.1 RO 4.0 SRO 3.6

**Task Number/Position:** 1010402004

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Manually trip the reactor during AP-990.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator \_\_\_ Plant X Admin \_\_\_

Perform \_\_\_ Simulate X

**References:**

AP-990 Rev. 22

**Validation Time:** 15 Minutes

**Time Critical:** No

**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## IN-PLANT JOB PERFORMANCE MEASURE

### SIMULATOR OPERATOR SETUP INSTRUCTIONS:

1. NA

### SIMULATOR OPERATOR INSTRUCTIONS:

1. NA

### TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1. Copy of AP-990 signed off up to Step 3.17.
2. Consumable copies of AP-990, Steps 3.16 & 3.17

## IN-PLANT JOB PERFORMANCE MEASURE

### READ TO THE OPERATOR

#### INITIAL CONDITIONS:

You are the Reactor Operator.  
The Control Room has been evacuated.  
AP-990 has been completed through Step 3.16

#### INITIATING CUE:

The Control Room Supervisor directs you to perform AP-990, Step 3.17.

IN-PLANT JOB PERFORMANCE MEASURE

**EXAMINER'S NOTE: FOR STEPS DENOTED AS "CRITICAL STEP", WHICH HAVE MULTIPLE ACTIONS, THE INDIVIDUAL REQUIRED ACTION WILL BE DENOTED "CS". IF NO INDIVIDUAL ACTIONS ARE DENOTED AS SUCH THEN ALL ACTIONS WITHIN THE STEP ARE DEEMED "CRITICAL".**

<b><u>STEP 1:</u></b> Obtain AP-990.	SAT _____
<b><u>STANDARD:</u></b> Candidate obtains a copy of AP-990.	UNSAT _____
<b><u>EXAMINER'S NOTE:</u></b> Examiner will provide candidate with AP-990 signed off through Step 3.16.	
<b><u>COMMENTS:</u></b>	

IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 2:</b></p>	<p>(step 3.17) Verify NI-14-NI2 is on scale. If NI-14-NI2 is <u>NOT</u> on scale, <u>THEN</u> ensure Rx is shutdown.</p>	<p><b>Critical Step</b></p>
	<p>1. Notify PPO to ensure CRD Bkrs are tripped (124 ft CC CRD Room):</p>	<p><b>Basis: Reactivity Control</b></p>
	<p>"CRD BREAKER A" (CS)  "CRD BREAKER B" (CS)  "CRD BREAKER CB3" (CS)  "CRD BREAKER CB1" (CS)  "CRD BREAKER CB4" (CS)  "CRD BREAKER CB2" (CS)</p>	<p>SAT _____</p>
	<p>2. Notify PPO to verify all CRD "0%" lights for groups 1 through 7 are lit on "POSITION REFERENCE PANEL".</p>	<p>UNSAT _____</p>
	<p>3. If NI-14-NI2 is not on scale, then notify TSC to consider emergency boration.</p>	
<p><b>STANDARD:</b></p>	<p>Candidate observes NI-14-NI2 on RSP.</p>	
	<p>Candidate locates six CRD Breakers and indicates that he/she would depress trip pushbuttons.</p>	
	<p>Candidate locates Position Reference Panel and observes lights for Group 1 through 7.</p>	
	<p>Candidate again checks NI-14-NI2</p>	
<p><b>EXAMINER'S CUE:</b></p>	<p><b>When candidate observes NI-14-NI2 indicate to him/her that NI-14-NI2 is "as seen" (Off-scale high for 100% power). Inform the candidate that he/she is to complete the remaining portion of this step.</b></p>	
	<p><b>When candidate indicates that he would depress the trip pushbutton for each breaker inform him/her that they hear a loud clunk and the open flag is visible.</b></p>	
	<p><b>When candidate looks at the Position Reference Panel indicate to him/her that the "0%" lights for Group 1 through 7 are on.</b></p>	
	<p><b>When candidate checks NI-14-NI2 indicate a reading that is on scale (RX shutdown) and decreasing.</b></p>	

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# IN-PLANT JOB PERFORMANCE MEASURE

<u>COMMENTS:</u>	
<u>TERMINATION CUE:</u> <b>CRD breakers OPEN, CRD groups 1 through 7 fully inserted and NI-14-NI2 on scale and decreasing.</b>	
<b>END OF TASK</b>	

# IN-PLANT JOB PERFORMANCE MEASURE

## CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### **INITIAL CONDITIONS:**

You are the Reactor Operator.  
The Control Room has been evacuated.  
AP-990 has been completed through Step 3.16

### **INITIATING CUE:**

The Control Room Supervisor directs you to perform AP-990, Step 3.17.



SOCR	REV 22	AP-990
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## SHUTDOWN FROM OUTSIDE THE CONTROL ROOM

### 1.0 ENTRY CONDITIONS

IF a fire exists in any of the following areas:

- Control Room
- Cable spreading room
- Control Complex HVAC

which affects Control Room habitability,

OR results in loss of plant control,

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

#### NOTE

There are no immediate actions for this procedure.

Approved by MSO \_\_\_\_\_ Dave Porter for Blair Wunderly Date 6/20/05  
(SIGNATURE ON FILE)

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.16 ___ IF DPDP-4B FUSE #1 light is lit (ES-A-B fuse status panel) <u>THEN</u> ensure PORV is isolated.	1 ___ Ensure PORV is selected to "CLOSE".  2 ___ Ensure RCV-11 is closed.
3.17 ___ Verify NI-14-NI2 is on scale.	
___ IF NI-14-NI2 is <u>NOT</u> on scale, <u>THEN</u> ensure Rx is shutdown.	1 Notify PPO to ensure CRD Bkrs are tripped (124 ft CC CRD Room):  ___ "CRD BREAKER A"  ___ "CRD BREAKER B"  ___ "CRD BREAKER CB3"  ___ "CRD BREAKER CB1"  ___ "CRD BREAKER CB4"  ___ "CRD BREAKER CB2"  2 ___ Notify PPO to verify all CRD "0%" lights for groups 1 through 7 are lit on "POSITION REFERENCE PANEL" (124 ft CC CRD Room).  3 ___ IF NI-14-NI2 is <u>NOT</u> on scale, <u>THEN</u> notify TSC to consider emergency boration.

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**PlantJ (2K5) NRC [Bank #058] (PLANT)**

**SAFETY FUNCTION 4 (SECONDARY)**

**RESET EFP-2 TRIP VALVE (ASV-50)**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

**In-Plant Job Performance Measure**

**Task:** Reset Trip Valve ASV-50 for EFP-2.

**Alternate Path:** NO

**JPM #:** PlantJ (2K5) NRC [Bank #058]

**K/A Rating/Importance:** 061A2.04 RO 3.4 SRO 3.8

**Task Number:** 0190404001

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Following an overspeed trip of ASV-50, reset ASV-50 IAW OP-450.

**Preferred Evaluation Location:**

**Preferred Evaluation Method:**

Simulator \_\_\_ In-Plant X Admin \_\_\_

Perform \_\_\_ Simulate X

**References:**

OP-450 Rev. 46

**Validation Time:** 15 min.

**Time Critical:** NO

**Candidate:** \_\_\_\_\_  
Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_ UNSAT \_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_ / \_\_\_\_\_  
Printed Name Signature Date

Comment:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## In-Plant Job Performance Measure

### SIMULATOR OPERATOR SETUP INSTRUCTIONS:

1. NA

### SIMULATOR OPERATOR INSTRUCTIONS:

1. NA

### TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1. Consumable copies of OP-450, Rev. 46, Section 4.1

## In-Plant Job Performance Measure

### READ TO THE OPERATOR

#### Initial Conditions:

You are the Auxiliary Building Operator.

ASV-50 (EFP-2's trip valve) has tripped.

#### Initiating Cues:

The Control Room Supervisor directs you to RESET EFP-2 in accordance with OP-450, step 4.1.7.

**In-Plant Job Performance Measure**

**EXAMINER'S NOTE: THIS JPM REQUIRES AN RCA ENTRY. ENSURE ALL RWP REQUIREMENTS ARE ADHERED TOO.**

<p><b>STEP 1:</b> IF EFP-2 shaft begins to roll while relatching ASV-50, THEN TRIP ASV-50 AND INVESTIGATE cause</p> <p><b>EXAMINER'S CUE:</b> If the examinee asks about EFP-2 shaft status, inform him/her that the shaft is as observed.</p> <p><b>STANDARD:</b> Candidate will monitor shaft status during the following steps.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 2:</b> ENSURE CLOSED ASV-204 and ASV-5</p> <p><b>STANDARD:</b> Candidate may call the control room and request status of ASV-5 and ASV-204. Candidate may check local valve control station indicating lights. (Closed "Green" lights lit)</p> <p><b>EXAMINER'S CUE:</b> If required, report as control room operator that ASV-5 and ASV-204 are closed.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 3:</b> ENSURE local drain traps appear to operate normally.</p> <p><b>STANDARD:</b> Candidate checks for excessive steam flow and/or water flowing to drains.</p> <p><b>EXAMINER'S CUE:</b> Inform candidate conditions are as observed.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

### In-Plant Job Performance Measure

<p><b>STEP 4:</b> TURN handwheel clockwise (CW) to raise latch collar</p> <p><b>STANDARD:</b> Candidate indicates that he would put on his gloves prior to touching hand wheel.</p> <p>Locate ASV-50.</p> <p>Simulate rotating handwheel in clockwise direction.</p> <p>Observe latch collar rising.</p> <p>Observe latch collar up fully</p> <p><b>EXAMINER'S CUE:</b> <b>Point to the latch collar and report it is rising <u>if the hand wheel is being turned in the correct direction.</u> Then report Latch up fully.</b></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis: To re-latch ASV-50, latch collar has to be up fully.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP5:</b> ENSURE tappet and tappet nut are fully depressed</p> <p><b>STANDARD:</b> Candidate checks tappet and tappet nut full depressed on the bearing housing.</p> <p><b>EXAMINER'S CUE:</b> <b>Report tappet and tappet nut are as observed.</b></p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 6:</b> ENGAGE latch lever</p> <p><b>STANDARD:</b> Locate Trip handle reset lever and simulates moving handle in direction necessary to engage trip hook.</p> <p><b>EXAMINER'S CUE:</b> <b>Point to the latch and inform the examinee it moves in place.</b></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis: Trip hook has to be engaged in order to open valve.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>



### In-Plant Job Performance Measure

<p><b><u>STEP 7:</u></b> Slowly TURN hand wheel counter-clockwise (CCW) until full OPEN</p> <p><b><u>STANDARD:</u></b> Candidate simulates turning the hand wheel slowly counter-clockwise.</p> <p style="padding-left: 40px;">Observe valve stem rising to full up position.</p> <p><b><u>EXAMINER'S CUE:</u></b> <b>Point to the valve stem and report it is rising if <u>the hand wheel is being turned in the correct direction.</u> Then report valve stem up fully.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step Basis:</b>  <b>Necessary to open the valve.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 8:</u></b> VERIFY alarm CLEARS</p> <p><b><u>STANDARD:</u></b> Candidate simulates call to control room to ask about EFP-2 trip alarm status.</p> <p><b><u>EXAMINER'S CUE:</u></b> <b>When control room is called, report that alarm is clear. (assuming all critical steps were completed correctly)</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>END OF TASK</b></p>	

## In-Plant Job Performance Measure

### CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

#### **Initial Conditions:**

You are the Auxiliary Building Operator.

ASV-50 (EFP-2's trip valve) has tripped.

#### **Initiating Cues:**

The Control Room Supervisor directs you to RESET EFP-2 in accordance with OP-450, step 4.1.7.

PROGRESS ENERGY  
CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL

**OP-450**  
**EMERGENCY FEEDWATER SYSTEM**

**4.1 Startup of Emergency Feedwater System (Continuous)**

ACTION

DETAILS

**NOTE**

Portions of these instructions are duplicated on a plaque in the field.

4.1.7 ENSURE ASV-50 is RESET

- IF EFP-2 shaft begins to roll while relatching ASV-50, THEN PERFORM the following:
  - TRIP ASV-50
  - INVESTIGATE cause
  - 1.  ENSURE CLOSED ASV-204 and ASV-5
  - 2.  ENSURE local drain traps appear to operate normally
  - 3.  TURN handwheel clockwise (CW) to raise latch collar
  - 4.  ENSURE tappet and tappet nut are fully depressed
  - 5.  ENGAGE latch lever
  - 6.  Slowly TURN handwheel counter-clockwise (CCW) until full OPEN
  - 7.  VERIFY alarm CLEARS

\_\_\_\_\_  
Initial/Date

4.1.8 ENSURE an Independent Verification of manipulated valves is performed

- PERFORM an Independent Verification of Enclosure 3, EFW System Fill and Vent

Independent Verification \_\_\_\_\_  
Initial/Date

4.1.9 IF restoration of EFP-2 Governor is required,  
OR initial setup of EFP-2 Governor is required,  
THEN GO TO Section 4.4.1, EFP-2 Governor Setting

\_\_\_\_\_  
Initial/Date

4.1.10 PERFORM Breaker Alignment for EFP-3

- PERFORM Enclosure 4, EFP-3 Building Breaker Alignment

\_\_\_\_\_  
Initial/Date

**CRYSTAL RIVER UNIT 3**

**JPM COVER SHEET**

**PlantK (2K5) NRC [Bank #395] (PLANT)**

**SAFETY FUNCTION 8**

**APPENDIX R CHILLER LINEUP**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Gerhardt/Moffatt

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

IN-PLANT JOB PERFORMANCE MEASURE

**Task:** Respond to a loss of SW cooling by placing the Appendix R Chiller in service per AP-330.

**Alternate Path:** No

**JPM #:** PlantK (2K5) NRC [Bank #395]

**K/A Rating/Importance:** 008A2.01 RO 3.3 SRO 3.6

**Task Number:** 0080402012

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Place the Appendix R Chiller in service following a loss of SW using AP-330, Enclosure 7.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator \_\_\_ Plant X Admin \_\_\_

Perform \_\_\_ Simulate X

**References:**

AP-330, Enclosure 7, Rev. 18

**Validation Time:** 15 Minutes

**Time Critical:** No

**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

IN-PLANT JOB PERFORMANCE MEASURE

**SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. NA

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. NA

**TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. Consumable copies of AP-330, Enclosure 7

## IN-PLANT JOB PERFORMANCE MEASURE

### READ TO THE OPERATOR

#### INITIAL CONDITIONS:

The plant has experienced a loss of SW and is in AP-330.  
The Appendix R Chiller is supplying the Unit 4160V and Unit 480V Switchgear rooms.

#### INITIATING CUES:

You are the Primary Plant Operator.  
The Control Room Supervisor has directed you to complete Enclosure 7 of AP-330, APPENDIX R CHILLER LINEUP.



IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 1:</b> Obtain AP-330 Enclosure 7</p> <p><b>STANDARD:</b> Candidate should obtain the TB copy of AP-330.</p> <p><b>EXAMINER'S CUE:</b> <b>Once the candidate has identified where he/she would get the procedure give them a copy of AP-330, Enclosure 7.</b></p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 2:</b> (step 7.1)</p> <p>If Appendix R Chiller (CHHE-2) is providing Unit 4160V/480V SWGR Room cooling, then remove chiller from service.</p> <p>Notify SPO to perform the following in order (145 ft TB Control Panel AH-42 by CC entrance):</p> <p style="padding-left: 40px;">Select CHP-2 "Chilled Water Pump" to "OFF".</p> <p style="padding-left: 40px;">When "CHHE-2 Air Cooled Chiller Status" indicates off, then select CHHE-2 "Air Cooled Chiller" to "OFF".</p> <p><b>STANDARD:</b> Candidate locates TB Control Panel and selects CHP-2 to off.</p> <p>Candidate observes CHHE-2 Air Cooled Chiller Status indicates off, he/she then selects CHHE to off.</p> <p><b>EXAMINER'S CUE:</b> <b>SPO is not available. The PPO must perform all steps.</b></p> <p style="padding-left: 40px;"><b>Inform the candidate that CHP-2 indicates off.</b></p> <p style="padding-left: 40px;"><b>Inform the candidate that CHHE-2 Air Cooled Chiller Status indicates off, then when CHHE-2 is selected to off inform the candidate that CHHE-2 indicates off.</b></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b></p> <p><b>Chiller lineup must be secured prior to change in alignment.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 3:</b> (step 7.2)</p> <p>Ensure Appendix R chiller is aligned to dedicated shutdown loads.</p> <p>Notify SPO to close the following valves (145 ft TB southeast stairwell):</p> <p style="padding-left: 40px;">CHV-210 "TB SWGR ROOM COOLER APPENDIX R CH INLET ISO"</p> <p style="padding-left: 40px;">CHV-211 "TB SWGR ROOM COOLER APPENDIX R CH OUTLET ISO"</p> <p>Notify SPO to open the following valves (119 ft TB by RH control panel):</p> <p style="padding-left: 40px;">CHV-131 "APPENDIX R CH RETURN HEADER ISO"</p> <p style="padding-left: 40px;">CHV-132 "APPENDIX R CH SUPPLY HEADER ISO"</p> <p>Notify Maintenance to maintain drip pans.</p> <p><b>STANDARD:</b> Candidate locates CHV-210 and CHV-211 and places each valve in the closed position</p> <p>Candidate locates CHV-131 and CHV-132 and places each valve in the open position.</p> <p>Candidate makes notification to maintain drip pans.</p> <p><b>EXAMINER'S CUE:</b> Notify candidate that each valve (CHV-210 &amp; 211) handle reaches the hard stop in the perpendicular direction.</p> <p>Notify the candidate that each valve (CHV-131 &amp; 132) handle reaches the hard stop in the parallel direction.</p> <p>Inform the candidate that maintenance has been notified to maintain the drip pans.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b>  <b>Basis:</b>  <b>Provides proper flowpath to dedicated loads.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 4:</b> (step 7.3)</p> <p>Ensure Appendix R chill water aligned to AHF-54B</p> <p>Notify PPO to close the following valves in order (C EFIC Room):</p> <p>CHV-89 "EFIC Room Cooler Normal Duty CH Inlet Iso"</p> <p>CHV-102 "EFIC Room Cooler Normal Duty CH Outlet Iso"</p> <p>Notify PPO to place "EFIC Room HVAC Chilled Water Valves CHV-97 &amp; CHV-101" selector switch to "DED" (B EFIC Room).</p> <p>Ensure CHV-97 is open.</p> <p>Ensure CHV-101 is closed.</p> <p><b>STANDARD:</b> Candidate locates CHV-89 and places in the closed position, he/she then locates CHV-102 and places it in the closed position.</p> <p>Candidate locates the selector switch for CHV-97 &amp; 101 and places it in the "DED" position and then ensures that CHV 97 is open and CHV-101 is closed.</p> <p><b>EXAMINER'S CUE:</b> Notify candidate that each valve (CHV-89 &amp; 102) reaches the hard stop in the closed direction.</p> <p>Notify the candidate the switch for CHV-97 and 101 is in the "DED" position.</p> <p>Notify the candidate that CHV 97 indicates open and CHV-101 indicates closed.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b> <b>Basis: Same as step 7.2</b></p> <p>SAT_____</p> <p>UNSAT_____</p>
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IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 5:</b> (step 7.4)</p> <p>Place Appendix R dedicated chiller in service.</p> <p>Notify SPO to perform the following in order (145 ft TB Control Panel AH-42 by CC entrance):</p> <p style="padding-left: 40px;">Select CHP-2 "Chilled Water Pump" to "ON".</p> <p style="padding-left: 40px;">Select CHHE-2 "Air Cooled Chiller" to "ON".</p> <p><b>STANDARD:</b> Candidate locates Panel AH-42 and selects CHP-2 to On.</p> <p style="padding-left: 40px;">Candidate selects CHHE-2 to On.</p> <p><b>EXAMINER'S CUE:</b> Inform candidate that CHP-2 red light lit.</p> <p style="padding-left: 40px;">Inform candidate that CHHE-2 red light lit.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b> <b>Basis:</b> <b>Restores unit to provide cooling.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 6:</b> (step 7.5)</p> <p>Ensure Appendix R fans are running.</p> <p>Notify SPO to select the following switches to "ON" (145 ft TB Control Panel AH-42 by CC entrance):</p> <p>"FAN COIL UNIT AHHE 51 480 V ES SWGR RM A"</p> <p>"FAN COIL UNIT AHHE 50 480 V ES SWGR RM A"</p> <p>"FAN COIL UNIT AHHE 53 480 V ES SWGR RM B"</p> <p>"FAN COIL UNIT AHHE 52 480 V ES SWGR RM B"</p> <p>"FAN COIL UNIT AHHE 48 4160 V ES SWGR RM A"</p> <p>"FAN COIL UNIT AHHE 46 BATT. CHRG. RM A"</p> <p>"FAN COIL UNIT AHHE 49 4160 V ES SWGR RM B"</p> <p>"FAN COIL UNIT AHHE 47 BATT. CHRG. RM B"</p> <p>"FAN COIL UNIT AHHE 54 INVERTER RM A"</p> <p>"FAN COIL UNIT AHHE 55 INVERTER RM A"</p> <p>"FAN COIL UNIT AHHE 56 INVERTER RM B"</p> <p>"FAN COIL UNIT AHHE 57 INVERTER RM B"</p> <p>"FAN COIL UNIT AHHE 45 REMOTE SHUTDOWN RM"</p> <p><b>STANDARD:</b> Candidate locates each control switch and places it in the on position.</p> <p><b>EXAMINER'S CUE:</b> As candidate selects each switch to the on position inform him/her that the switch is selected to "ON".</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b>  <b>Basis:</b>  <b>Provides individual cooling to vital areas.</b></p> <p>SAT_____</p> <p>UNSAT_____</p>
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IN-PLANT JOB PERFORMANCE MEASURE

<p><b>STEP 7:</b> (step 7.6) Start AHF-54B.</p> <p><b>STANDARD:</b> Notifies RO in control room to start AHF-54B.</p> <p><b>EXAMINER'S CUE:</b> Inform the candidate as the control room RO that AHF-54B indicates on.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step:</b> <b>Basis: Same as step 7.5</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 8:</b> (step 7.7) Exit this enclosure.</p> <p><b>STANDARD:</b> Candidate states that he/she has completed the enclosure.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>TERMINATION CUE:</b> AP-330 Enclosure 7 complete</p>	
<p style="text-align: center;"><b>END OF TASK</b></p>	

## CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS:

The plant has experienced a loss of SW and is in AP-330.  
The Appendix R Chiller is supplying the Unit 4160V and Unit 480V Switchgear rooms.

### INITIATING CUES:

You are the Primary Plant Operator.  
The Control Room Supervisor has directed you to complete Enclosure 7 of AP-330, APPENDIX R CHILLER LINEUP.

LSW	REV 18	AP-330
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## LOSS OF NUCLEAR SERVICE COOLING

### 1.0 ENTRY CONDITIONS

IF any of the following conditions exist:

- SW cooled component TEMPS high and rising
- SW flow lost and can NOT be restored
- SW Raw Water flow lost and can NOT be restored
- SW surge tank level < 7 ft

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

#### NOTE

**There are no immediate actions for this procedure.**

Approved by MSO _____ J. Huegel _____ Date 12/18/03 _____ (SIGNATURE ON FILE)		
AP-330	PAGE 1 of 89	LSW



#### 4.0 ENCLOSURE 7 APPENDIX R CHILLER LINEUP

##### ACTIONS

##### DETAILS

7.1 \_\_\_ IF Appendix R Chiller (CHHE-2) is providing Unit 4160V/480V SWGR Room cooling, THEN remove chiller from service.

- Notify SPO to perform the following in order (145 ft TB Control Panel AH-42 by CC entrance):

\_\_\_ Select CHP-2 "Chilled Water Pump" to "OFF".

\_\_\_ WHEN "CHHE-2 AIR COOLED CHILLER STATUS" indicates off, THEN select CHHE-2 "Air Cooled Chiller" to "OFF".

7.2 \_\_\_ Ensure Appendix R chiller is aligned to dedicated shutdown loads.

- 1 Notify SPO to close the following valves (145 ft TB southeast stairwell):

\_\_\_ CHV-210  
"TB SWGR ROOM COOLER  
APPENDIX R CH INLET ISO"

\_\_\_ CHV-211  
"TB SWGR ROOM COOLER  
APPENDIX R CH OUTLET ISO"

- 2 Notify SPO to open the following valves (119 ft TB by RH control panel):

\_\_\_ CHV-131 "APPENDIX R CH  
RETURN HEADER ISO"

\_\_\_ CHV-132 "APPENDIX R CH  
SUPPLY HEADER ISO"

- 3 \_\_\_ Notify Maintenance to maintain drip pans.

#### 4.0 ENCLOSURE 7 APPENDIX R CHILLER LINEUP (CONT'D)

##### ACTIONS

##### DETAILS

7.3 \_\_\_ Ensure Appendix R chill water aligned to AHF-54B

1 Notify PPO to close the following valves in order (C EFIC Room):

\_\_\_ CHV-89 "EFIC ROOM COOLER NORMAL DUTY CH INLET ISO"

\_\_\_ CHV-102 "EFIC ROOM COOLER NORMAL DUTY CH OUTLET ISO"

2 \_\_\_ Notify PPO to place "EFIC ROOM HVAC CHILLED WATER VALVES CHV-97 & CHV-101" selector switch to "DED" (B EFIC Room).

3 \_\_\_ Ensure CHV-97 is open.

4 \_\_\_ Ensure CHV-101 is closed.

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7.4 \_\_\_ Place Appendix R dedicated chiller in service.

• Notify SPO to perform the following in order (145 ft TB Control Panel AH-42 by CC entrance):

\_\_\_ Select CHP-2 "Chilled Water Pump" to "ON".

\_\_\_ Select CHHE-2 "Air Cooled Chiller" to "ON".

#### 4.0 ENCLOSURE 7 APPENDIX R CHILLER LINEUP (CONT'D)

### ACTIONS

### DETAILS

7.5 \_\_\_ Ensure Appendix R fans are running.

- Notify SPO to select the following switches to "ON" (145 ft TB Control Panel AH-42 by CC entrance):

\_\_\_ "FAN COIL UNIT AHHE 51  
480 V ES SWGR RM A"

\_\_\_ "FAN COIL UNIT AHHE 50  
480 V ES SWGR RM A"

\_\_\_ "FAN COIL UNIT AHHE 53  
480 V ES SWGR RM B"

\_\_\_ "FAN COIL UNIT AHHE 52  
480 V ES SWGR RM B"

\_\_\_ "FAN COIL UNIT AHHE 48  
4160 V ES SWGR RM A"

\_\_\_ "FAN COIL UNIT AHHE 46  
BATT. CHRG. RM A"

\_\_\_ "FAN COIL UNIT AHHE 49  
4160 V ES SWGR RM B"

\_\_\_ "FAN COIL UNIT AHHE 47  
BATT. CHRG. RM B"

\_\_\_ "FAN COIL UNIT AHHE 54  
INVERTER RM A"

\_\_\_ "FAN COIL UNIT AHHE 55  
INVERTER RM A"

\_\_\_ "FAN COIL UNIT AHHE 56  
INVERTER RM B"

\_\_\_ "FAN COIL UNIT AHHE 57  
INVERTER RM B"

\_\_\_ "FAN COIL UNIT AHHE 45  
REMOTE SHUTDOWN RM"

**4.0 ENCLOSURE 7 APPENDIX R CHILLER LINEUP (CONT'D)**

**ACTIONS**

**DETAILS**

7.6 \_\_\_ Start AHF-54B

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7.7 \_\_\_ **EXIT** this enclosure.

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimA (2K5) NRC [Bank #294] (SIMULATOR)**

**SAFETY FUNCTION 1**

**TRANSFER A SINGLE CONTROL ROD TO THE AUXILIARY  
POWER SUPPLY**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Andy Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

**ATTACHMENT 7  
SIMULATOR JOB PERFORMANCE MEASURE**

**Task:** Transfer a single control rod to the Auxiliary Power Supply.

**Alternate Path:** NO

**JPM #:** SimA (2K5) NRC [Bank #294]

**K/A Rating/Importance:** 001A4.03 RO 4.0 SRO 3.7

**Task Number/Position:** 0010102010 RO

**Task Standard:** Transfer a single control rod to the Auxiliary Power Supply by using OP-502, Control Rod Drive System, Section 4.16, Transferring a Group or Rod to the Auxiliary Power Supply.

**Preferred Evaluation Location:**

**Preferred Evaluation Method:**

Simulator  In-Plant  Admin

Perform  X  Simulate

**References:**

OP-502, Rev. 49

**Validation Time:** 10 min.

**Time Critical:** NO

=====

**Candidate:** \_\_\_\_\_  
Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT  UNSAT

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature / \_\_\_\_\_  
Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SIMULATOR SETUP INSTRUCTIONS:**

1. None

**SIMULATOR OPERATOR INSTRUCTIONS:**

1. Any power IC

**Tools/Equipment/Procedures Needed:**

Consumable copies of OP-502, Section 4.16

**READ TO THE OPERATOR**

**Initial Conditions:**

You are the Reactor Operator.  
The plant is stable at full power.  
Control Rod troubleshooting is in progress.

**Initiating Cues:**

You are requested to transfer Rod 5-4 to the Auxiliary Power Supply. Following transfer of the rod leave the reactor diamond and demand stations in manual for further manipulations.



<p><b>STEP 1:</b> Obtain a copy of the appropriate procedure.</p> <p><b>STANDARD:</b> Candidate obtains a copy of OP-502.</p> <p><b>EXAMINER'S NOTE:</b> Once candidate determines correct section of procedure provide a copy of Section 4.16.</p> <p><b>EXAMINER'S CUE:</b> For purposes of this JPM assume the SRO concurs with each rod manipulation.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 2:</b> (Step 4.16.1)</p> <p><b>PROCEDURE CAUTION:</b> Tave control will go to Feedwater regulation if Feedwater is in AUTO.</p> <p>Place Reactor Diamond in MANUAL.</p> <p>DEPRESS "MANUAL"  VERIFIED "MANUAL" light ON, "AUTO" light OFF</p> <p><b>STANDARD:</b> Candidate depresses the Diamond Panel MANUAL pushbutton and observes the MANUAL light ON and the AUTO light OFF.</p> <p><b>EXAMINER'S NOTE:</b> Candidate may elect to take both FW Loop Demand Stations to "Manual". This is satisfactory, but not required.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b>  (required to accomplish rod transfer)</p> <p>SAT ____</p> <p>UNSAT ____</p>

<p><b>STEP 3:</b> (Step 4.16.2)</p> <p>Place Reactor Demand control station in Hand.</p> <p>DEPRESS HAND  VERIFY "REACTOR DEMAND" in Mini Track ("AUTO" and "HAND" lights on)</p> <p><b>STANDARD:</b> Candidate depresses the HAND pushbutton on the Reactor Demand (Bailey) HAND/AUTO station and observes that both the HAND and AUTO lights are ON.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 4:</b> (Step 4.16.3)</p> <p>Select "GROUP SELECT" Switch to desired group.</p> <p><b>STANDARD:</b> Candidate positions the "GROUP SELECT" Switch to Group 5.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b>  (required for transfer of the correct rod)</p> <p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 5:</b> (Step 4.16.4)</p> <p>Select ALL or desired rod.</p> <p>Use "SINGLE SELECT" Switch.</p> <p><b>STANDARD:</b> Candidate positions the "SINGLE SELECT" Switch to 4.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b>  (required for transfer of the correct rod)</p> <p>SAT ____</p> <p>UNSAT ____</p>

<p><b>STEP 6:</b> (Step 4.16.5)</p> <p>Select "SEQ OR"</p> <p>Verify "SEQ OR" light ON "SEQ" light ON</p> <p><b>STANDARD:</b> Operator depresses the "SEQ/SEQ OR" pushbutton and verifies both lights ON.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT _____</p> <p>UNSAT ____</p>
<p><b>STEP 7:</b> (Step 4.16.6)</p> <p>Select "AUXIL"</p> <p>Verify "AUXIL" light ON, "GROUP" light OFF Verify "TRANS RESET" light OFF Verify "CONTROL ON" white light for selected group is ON</p> <p><b>STANDARD:</b> Candidate depresses the "AUXIL/GROUP" pushbutton and verifies "AUXIL" light ON and "GROUP" light OFF. Also verifies "TRANS RESET" light OFF and "CONTROL ON" light for GP 5 ON.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT _____</p> <p>UNSAT ____</p>
<p><b>STEP 8:</b> (Step 4.16.7)</p> <p>Place "SPEED SELECTOR" switch in "JOG"</p> <p>Verify "SY" light comes ON</p> <p><b>STANDARD:</b> Candidate rotates "RUN/JOG" switch to "JOG" and verifies "SY" light ON.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT _____</p> <p>UNSAT ____</p>

<p><b>STEP 9:</b> (Step 4.16.8)</p> <p>Select "CLAMP"</p> <p>Verify "CLAMP" light ON Verify "CLAMP REL" light OFF</p> <p><b>STANDARD:</b> Candidate depresses "CLAMP/CLAMP REL" pushbutton and verifies "CLAMP" light ON and "CLAMP REL" light OFF.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 10:</b> (Step 4.16.9)</p> <p><b>PROCEDURE CAUTION: If Amber control ON lights for more than one group are ON, STOP, and notify SSO.</b></p> <p>Depress "MAN TRANS"</p> <p>Verify "TR CF" light ON Verify Amber "CONTROL ON" light(s) for only selected Group or rod come ON</p> <p><b>STANDARD:</b> Candidate depresses "MAN TRANS" pushbutton and verifies "TR CF" light ON. The candidate will also verify the Amber "CONTROL ON" light for rod 5-4 is ON.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 11:</b> (Step 4.16.10)</p> <p>Select "CLAMP REL"</p> <p>Verify "CLAMP REL" light ON Verify "CLAMP" light OFF</p> <p><b>STANDARD:</b> Candidate depresses "CLAMP/CLAMP REL" pushbutton and verifies "CLAMP REL" light ON and "CLAMP" light OFF.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b> (required to accomplish rod transfer)</p> <p>SAT ____</p> <p>UNSAT ____</p>

<p><b>STEP 12:</b> (Step 4.16.11)</p> <p>Select "GROUP"</p> <p>Verify "GROUP" light ON  Verify "AUXIL" light OFF  Verify "SY" light OFF</p> <p><b>STANDARD:</b> Candidate depresses "GROUP/AUXIL" pushbutton and verifies "GROUP" light ON and "AUXIL" light OFF. Candidate will also verify the "SY" light OFF.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 13:</b> (Step 4.16.12)</p> <p>If latching Safety Rods in accordance with section 4.2, return to Section 4.2.3 after completion of this step.</p> <p><b>STANDARD:</b> N/A</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>STEP 14:</b> (Step 4.16.13)</p> <p>Place "SPEED SELECTOR" switch in "RUN"</p> <p>Verify white "CONTROL ON" light for selected group is ON  Verify Amber "CONTROL ON" light(s) for selected group/rod is ON</p> <p><b>STANDARD:</b> Candidate rotates "RUN/JOG" switch to "RUN", observes the white (Diamond panel) "CONTROL ON" light for group 5 is ON and the Amber (PI panel) "CONTROL ON" light for rod 5-4 is ON.</p> <p><b>COMMENTS:</b></p>	<p>SAT ____</p> <p>UNSAT ____</p>

<p><u>STEP 15:</u> (Step 4.16.14)</p> <p>Restore "SINGLE SELECT" Switch.</p> <p>Place "SINGLE SELECT" Switch to OFF</p> <p><u>STANDARD:</u> Candidate rotates "SINGLE SELECT" Switch to OFF.</p> <p><u>COMMENTS:</u></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><u>STEP 16:</u> (Step 4.16.15)</p> <p>Restore "GROUP SELECT" Switch</p> <p>Place "GROUP SELECT" Switch to OFF</p> <p><u>STANDARD:</u> Candidate rotates GROUP SELECT switch to OFF.</p> <p><u>COMMENTS:</u></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><u>STEP 16:</u> (Step 4.16.16)</p> <p><b>PROCEDURE NOTE:</b> When in "SEQ" the Control ON lamp and Amber Control ON lamps are on for rods on the Aux Power Supply and controlling rod group (usually group 7)</p> <p>Select "SEQ"</p> <p>Verify "SEQ" light ON</p> <p>Verify "SEQ OR" light OFF</p> <p><u>STANDARD:</u> Candidate depresses "SEQ/SEQ OR" pushbutton and verifies "SEQ" light ON and "SEQ OR" light OFF.</p> <p><b><u>EXAMINER'S CUE:</u> You have transferred rod 5-4 to the Auxiliary Power Supply. This JPM is complete.</b></p> <p><u>COMMENTS:</u></p>	<p>SAT ____</p> <p>UNSAT ____</p>
<p><b>END OF TASK</b></p>	

## ***CANDIDATE CUE SHEET***

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

### **Initial Conditions:**

You are the Reactor Operator.  
The plant is stable at full power.  
Control Rod troubleshooting is in progress.

### **Initiating Cues:**

You are requested to transfer Rod 5-4 to the Auxiliary Power Supply. Following transfer of the rod leave the reactor diamond and demand stations in manual for further manipulations.

**PROGRESS ENERGY  
CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL**

**OP-502  
CONTROL ROD DRIVE SYSTEM**



**4.16 Transferring A Group Or Rod On To The Auxiliary Power Supply (Reference)**  
 [NOCS 040591]

ACTION

DETAILS

**CAUTION**

Tave control will go to Feedwater regulation if Feedwater is in AUTO

**NOTE**

When Group 8 is on the Auxiliary Power Supply and the Reactor Diamond is in MANUAL with Sequence OR Sequence Override selected, Group 7 rods will not move when the insert/withdraw switch is manipulated.

4.16.1 PLACE Reactor Diamond in MANUAL

1.  DEPRESS MANUAL
2.  VERIFY Manual light ON, Auto. light is OFF

\_\_\_\_\_  
Initial/Date

4.16.2 PLACE Reactor Demand control station in HAND

1.  DEPRESS HAND
2.  VERIFY Reactor Demand in Mini Track, "AUTO." and "HAND" light ON

\_\_\_\_\_  
Initial/Date

4.16.3 SELECT "GROUP SELECT" Switch to desired group

<input type="checkbox"/> Group 1	<input type="checkbox"/> Group 5
<input type="checkbox"/> Group 2	<input type="checkbox"/> Group 6
<input type="checkbox"/> Group 3	<input type="checkbox"/> Group 7
<input type="checkbox"/> Group 4	<input type="checkbox"/> Group 8

\_\_\_\_\_  
Initial/Date

4.16.4 SELECT All or desired rod

- Use "SINGLE SELECT" Switch

\_\_\_\_\_  
Initial/Date

4.16.5 SELECT "SEQ OR."

- VERIFY "SEQ OR." light ON
- "SEQ" light ON

\_\_\_\_\_  
Initial/Date

**4.16 Transferring A Group Or Rod On To The Auxiliary Power Supply (Reference)**  
 [NOCS 040591]

ACTION	DETAILS
4.16.6 SELECT "AUXIL."	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "AUXIL." light ON, "GROUP" light OFF</li> <li>• <input type="checkbox"/> VERIFY "TRANS RESET" light OFF</li> <li>• <input type="checkbox"/> VERIFY "CONTROL ON" white light for group selected in Step 4.16.3 is ON</li> </ul>
<u>          </u> Initial/Date	
4.16.7 PLACE "SPEED SELECTOR" switch in "JOG"	<ul style="list-style-type: none"> <li>• VERIFY "SY" light comes ON</li> </ul>
<u>          </u> Initial/Date	
4.16.8 SELECT "CLAMP"	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "CLAMP" light ON</li> <li>• <input type="checkbox"/> VERIFY "CLAMP REL." light OFF</li> </ul>
<u>          </u> Initial/Date	
<p><b>CAUTION</b></p> <p>If Amber control on lights for more than one group is on, STOP, and notify SSO.</p>	
4.16.9 DEPRESS "MAN TRANS"	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "TR CF." light ON</li> <li>• <input type="checkbox"/> VERIFY Amber "CONTROL ON" light(s) for only selected Group or rod come ON</li> </ul>
<u>          </u> Initial/Date	
4.16.10 SELECT "CLAMP REL."	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "CLAMP REL." light ON</li> <li>• <input type="checkbox"/> VERIFY "CLAMP" light OFF</li> </ul>
<u>          </u> Initial/Date	

**4.16 Transferring A Group Or Rod On To The Auxiliary Power Supply (Reference)**  
 [NOCS 040591]

ACTION	DETAILS
4.16.11 SELECT "GROUP"	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "GROUP" light ON</li> <li>• <input type="checkbox"/> VERIFY "AUXIL" light OFF</li> <li>• <input type="checkbox"/> VERIFY "SY" light OFF</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
4.16.12 If latching Safety Rods in accordance with Section 4.2, RETURN TO Section 4.2.3 after completion of this step	<ul style="list-style-type: none"> <li>• REFER to Section 4.2</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
4.16.13 PLACE "SPEED SELECTOR" switch in "RUN"	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY white "CONTROL ON" light for selected group is ON</li> <li>• <input type="checkbox"/> VERIFY Amber "CONTROL ON" light(s) for selected Group/rod is ON</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
4.16.14 RESTORE "SINGLE SELECT" Switch	<ul style="list-style-type: none"> <li>• PLACE "SINGLE SELECT" Switch to OFF</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
4.16.15 RESTORE "GROUP SELECT" Switch	<ul style="list-style-type: none"> <li>• PLACE "GROUP SELECT" Switch to OFF</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
<p><b>NOTE</b></p> <p>When in "SEQ" the Control ON lamp and Amber Control ON lamps are on for rods on the Aux Power Supply and controlling rod group (Usually group 7).</p>	
4.16.16 SELECT "SEQ" [NOCS 001778]	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> VERIFY "SEQ" light ON</li> <li>• <input type="checkbox"/> VERIFY "SEQ OR." light OFF</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>
4.16.17 RETURN Reactor Control stations to Auto. as required	<ul style="list-style-type: none"> <li>• REFER to OP-504, Integrated Control System</li> </ul> <p style="text-align: right;">/_____ Initial/Date</p>

**END OF SECTION**

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimB (2K5) NRC [Bank #389] (SIMULATOR)**

**SAFETY FUNCTION 3**

**ALTERNATE PATH**

**RESPOND TO AN OTSG TUBE RUPTURE AT POWER**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 8-29-05

VALIDATED BY: Ron Tyrie

Date: 8-29-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 8-31-05

ATTACHMENT 7  
SIMULATOR JOB PERFORMANCE MEASURE

**Task:** Perform the actions specified during a steam generator tube rupture.  
(Restore Pressurizer level during an OTSG Tube Rupture per EOP-6 step 3.1)

**Alternate Path:** Yes

**JPM #:** SimB (2K5) NRC [Bank #389]

**K/A Rating/Importance:** 004A4.06 RO 3.6 SRO 3.1

**Task Number:** 1150502005

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** EOP-6 and AI-505

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator  Plant \_\_\_ Admin \_\_\_

Perform  Simulate \_\_\_

**References:** EOP-06, Rev. 17  
AI-505, Rev. 15

**Validation Time:** 10 Minutes

**Time Critical:** No

**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_

### **SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. Initialize previous stored IC# 65 (FATHER)  
Or
- 1 Initialize the simulator to a 90% IC and:
  - A. Set Letdown flow to 70 gpm.
  - B. Fail MUV-49 open.
  - C. Fail MUP-1C to trip after RWP-3B start.
  - D. Set the "A" OTSG high tube leak to 0.7 = 285 gpm.
  - E. Unfreeze and allow PZR level to lower to approx 200" (198-200")
  - F. Clear unrelated distracting alarms and freeze the simulator.

### **SIMULATOR OPERATOR INSTRUCTIONS:**

1. Unfreeze the simulator when directed by examiner.

### **TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. Copy of EOP-06
2. Consumable copies of page 3 / 4 to replace marked up copies.

**READ TO THE OPERATOR**

**INITIAL CONDITIONS:**

You are the Reactor Operator.  
The plant is in Mode 1.  
An OTSG Tube Rupture is in progress

**INITIATING CUE:**

The Control Room Supervisor has directed you to perform EOP-06, Step 3.1

<p><b><u>STEP 1:</u></b></p> <p>The guidance of the EOP would normally be read by the CRS. For the purpose of this JPM a copy of EOP-06 will be given to the operator.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate reviews the guidance of EOP-06 step 3.1</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>Examiner will provide operator with a copy of EOP-06.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 2:</u></b> (step 3.1 Action Category)</p> <p>Candidate determines the need to restore PZR level</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate will review the action guidance of step 3.1, monitor reactor power and Pressurizer level and Pressurizer level trend.</p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>Simulator set up will establish conditions of an OTSG tube rupture greater than makeup capabilities with letdown in service at 70 gpm. This condition will continue until PZR level is at or slightly below 200". This should be the status of the plant when the candidate enters the control room. Based on these conditions; Rx power &gt; 20% and PZR level &lt; 200 in, the candidate should recognize the need to restore PZR level per detailed actions.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step</b></p> <p><b>Basis: Must be able to recognize that PZR level is lowering.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>



**Critical Step**

**Basis:**  
**Maximize**  
**RCS**  
**Inventory to**  
**allow**  
**controlled**  
**Shutdown.**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

**STEP 3:** (step 3.1, detail 1)

Close MUV-49

**STANDARD:**

1. Operator selects closed on MUV-49 and recognizes the valve fails to close.
2. Operator uses an alternate method to isolate Letdown Flow.
  - a. Locate and select closed on MUV-567 control switch.

OR

  - b. Locate and select closed on MUV-50 control switch and rotate the control knob for MUV-51 in the counter-clockwise direction to close MUV-51.

**EXAMINER'S NOTE:**

MUV-49 is failed open as part of the setup for the JPM. Operator should recognize the intent of closing MUV-49 is to isolate Letdown flow and use an alternate method to accomplish this step. The two methods listed above are the most probable operator actions. This action is justified IAW AI-505 4.1.4 step 1 b.

IF the student elects to call the PPO to close MUV-49 locally, wait approximately 1 minute and report that this cannot be accomplished.

Other methods to isolate letdown may be used by the student and will be acceptable as long as they can be accomplished in a timely manner and do not create unacceptable operational or radiological concerns (i.e. isolating in a manner that lifts the letdown system relief valve would not be acceptable). In any case the operator must restore PZR level.

**EXAMINER'S CUE:**

If SRO direction is requested when MUV-49 failure is identified, then direct the candidate to "Isolate letdown using an alternative method".

**COMMENTS:**

<p><b>STEP 4:</b> (step 3.1, detail 2)</p> <p>Open MUV-24</p> <p><b>STANDARD:</b></p> <p>Candidate locates control switch for MUV-24 and holds the switch in the clockwise (open) direction until the green light is extinguished and the red light is on.</p> <p><b>EXAMINER'S CUE:</b></p> <p>Opening MUV-24 is important to maximizing the time allowed for plant shutdown without PZR level lowering to a point requiring a reactor trip. However, if the candidate does not perform this step and goes directly to the next detail, he can still be successful in restoration of PZR level.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 5:</b> (step 3.1, detail 3)</p> <p>Ensure BWST to MUP valves are open:</p> <p style="padding-left: 40px;"> <input type="checkbox"/> MUV-73  <input type="checkbox"/> MUV-58 </p> <p><b>STANDARD:</b></p> <p>Operator locates the control switch for MUV-73 and rotates it in the open (Clockwise) direction observing the green closed light go out and the red open light come on.  Candidate locates the control switch for MUV-58 and verifies it is open.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b>  <b>Ensures proper MUP suction.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

**STEP 6:** (step 3.1, detail 4)

4 \_\_\_ IF PZR level does NOT recover, THEN take additional actions to restore PZR level:

\_\_\_ Start second MUP and required cooling pumps.

[Rule 5, EDG Control]

Open additional HPI valves:

\_\_\_ MUV-23

\_\_\_ MUV-25

\_\_\_ MUV-26

**STANDARD:**

Candidate monitors PZR level. Based on PZR level trend the examinee should perform this step. If level is recovering based on actions taken at detail 1 then this step may be marked N/A.

If PZR level continues to lower, then the following standard applies:

Candidate locates the control switches for DCP-1B, RWP-3B and MUP-1C and rotates each switch to the "start" position, observing the red "run" light being illuminated for each pump. All three pumps must be started for successful completion of step. MUP-1C will trip after it is started.

Candidate locates the control switches for MUV-23, 25 and 26 and holds the individual valve control switch in the "open" direction to establish additional flow to the RCS. Candidate monitors PZR level trend and attempts to establish sufficient flow to cause an upward PZR level trend.

**EXAMINER'S CUE:**

If the Operator has established sufficient makeup to cause PZR level to rise the JPM may be stopped.

**COMMENTS:**

**Critical Step**

**Basis: PZR level continues to decrease without additional flow.**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

<p><b><u>STEP 7:</u></b> (step 3.1 Detail 5)</p> <p>If PZR level does <u>NOT</u> recover, <u>THEN</u> close MUP recirc to MUT valves:  <input type="checkbox"/> MUV-53  <input type="checkbox"/> MUV-257</p> <p><b><u>STANDARD:</u></b></p> <p>Operator closes MUV-53 and MUV-257. Operator should observe PZR level starting to increase.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>When the Candidate has established sufficient makeup to cause PZR level to rise the JPM can be stopped.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> Required to cause PZR level to increase.</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>TERMINATION CUE:</u></b></p> <p>Sufficient Make-up flow exists to cause PZR level to rise.</p>	

## CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### INITIAL CONDITIONS:

You are the Reactor Operator.  
The plant is in Mode 1.  
An OTSG Tube Rupture is in progress

### INITIATING CUE:

The Control Room Supervisor has directed you to perform EOP-06, Step 3.1

SGTR	REV 17(A)	EOP-06
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## STEAM GENERATOR TUBE RUPTURE

### 1.0 ENTRY CONDITIONS

IF > 1 gpm OTSG tube leakage exists,

AND DHR is NOT in operation,

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

#### NOTE

There are no immediate actions for this procedure.

Approved by David M. Porter for B. Wunderly Date 05/30/2005  
 (SIGNATURE ON FILE)

EOP-06

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SGTR

### 3.0 FOLLOW-UP ACTIONS

#### ACTIONS

#### DETAILS

3.1 \_\_\_ IF at any time, any of the following exist:

\_\_\_ Rx power > 20%,  
AND PZR level  
< 200 in

\_\_\_ Rx tripped,  
AND PZR level  
< 50 in

THEN restore PZR level.

1 \_\_\_ Close MUV-49

2 \_\_\_ Open MUV-24

3 Ensure BWST to MUP valves are open:

\_\_\_ MUV-73

\_\_\_ MUV-58

4 \_\_\_ IF PZR level does NOT recover,  
THEN take additional actions to restore PZR level:

\_\_\_ Start second MUP and required cooling pumps.

[Rule 5, EDG Control]

Open additional HPI valves:

\_\_\_ MUV-23

\_\_\_ MUV-25

\_\_\_ MUV-26

5 \_\_\_ IF PZR level does NOT recover,  
THEN close MUP recirc to MUT valves:

\_\_\_ MUV-53

\_\_\_ MUV-257

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimC (2K5) NRC [NEW] (SIMULATOR)**

**SAFETY FUNCTION 2**

**ALTERNATE PATH**

**RESPOND TO A STUCK OPEN SPRAY VALVE**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 8-29-05

VALIDATED BY: Ron Tyrie

Date: 8-29-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 8-31-05



ATTACHMENT 7  
SIMULATOR JOB PERFORMANCE MEASURE

**Task:** Perform the actions specified for a stuck open spray valve.

**Alternate Path:** Yes

**JPM #:** SimC (2K5) NRC [NEW]

**K/A Rating/Importance:** 002A4.01 RO 4.2 SRO 4.4

**Task Number:**

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Using OP-305 or AP-520 perform the actions specified for a stuck open PZR spray valve.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator  X  Plant \_\_\_\_\_ Admin \_\_\_\_\_

Perform  X  Simulate \_\_\_\_\_

**References:** OP-305, Rev 34  
AP-520, Rev. 7

**Validation Time:** 20 min

**Time Critical:** No

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**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_

### **SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. Initialize previous stored IC# **66 (GRANDFATHER)** and allow simulator to run until a steady RCS pressure decrease is evident on SPDS.
2. Freeze the simulator and notify the examiner.

OR

1. Establish steady state 4% power conditions
2. Insert the following failures
  - a. RCV-13 fail to position      TVHV0131 = 0.3      COND ON A3\_A2\_DS53\_1
  - b. RCV-14 run open              TFHV0143 = True      COND ON A3\_A2\_DS56\_1
3. Freeze the simulator and notify the examiner.

### **SIMULATOR OPERATOR INSTRUCTIONS:**

1. Unfreeze the simulator when directed by examiner.

### **TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. **Copy of OP-305 with steps 4.9.1 and 4.9.2 signed off.**

## **READ TO THE OPERATOR**

### **INITIAL CONDITIONS:**

You are the Reactor Operator.  
The plant is in Mode 2.

### **INITIATING CUE:**

The Control Room Supervisor has directed you to perform a boron equalization per Section 4.9 of OP-305, Operation of the Pressurizer. Steps 4.9.1 and 4.9.2 have already been completed.

<p><b><u>STEP 1:</u></b></p> <p>Candidate will be given a copy of OP-305 with Steps 4.9.1 and 4.9.2 signed off.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate reviews the status of the plant and Steps 4.9.3 and 4.9.4.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b>Examiner will provide operator with a copy of OP-305.</b></p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>Notify simulator operator when candidate is ready to perform the JPM.</p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 2:</u></b> (Step 4.9.3)</p> <p>Establish Pressurizer Spray</p> <ol style="list-style-type: none"> <li>1. Select PZR Heater Banks "D" &amp; "E" to "ON"</li> <li>2. Select RCV-14 to "MANUAL"</li> <li>3. Throttle OPEN RCV-14 to maintain normal RCS pressure, AND maintain PZR Heater demand between 50 &amp; 90%</li> </ol> <p><b><u>STANDARD:</u></b></p> <ol style="list-style-type: none"> <li>1. Candidate selects PZR Heater Banks "D" and "E" to "ON"</li> <li>2. Candidate selects RCV-14 to Manual</li> <li>3. Candidate throttles OPEN RCV-14. When candidate throttles RCV-14 it will experience a failure and run full open. The candidate will attempt to close RCV-14. Valve will not close. Candidate will attempt to close RCV-13 (Spray Block valve). RCV-13 will not close.</li> </ol> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b>If SRO direction is requested direct the candidate to stop the pressure reduction using the appropriate procedure.</b></p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>At this point the candidate will take one of two routes. Section 4.5 of this procedure, OP-305, provides guidance to shutdown RCP-1B. Candidate may also elect to enter AP-520. Either method will result in securing RCP-1B.</p>	<p>SAT _____</p> <p>UNSAT _____</p>

<p><b><u>STEP 3:</u></b> (Step 4.5.1 of OP-305)</p> <p>IF at any time during performance of this section RCV-13 will not close when called to do so, then minimize Pressurizer Spray</p> <p>1. Shutdown RCP-1B and refer to AP-545, Plant Runback</p> <p><b><u>STANDARD:</u></b></p> <p>1. Candidate secures RCP-1B and verifies RCS pressure begins to recover.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>If SRO direction is requested direct the candidate to follow the procedural guidance.</p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>If RCP-1B is shutdown at this point then RCS pressure will begin to recover. When the candidate states this fact then this JPM may be <b>terminated</b>.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step</b></p> <p><b>(required action to minimize spray flow)</b></p> <p>SAT_____</p> <p>UNSAT_____</p>
<p><b><u>STEP 4:</u></b></p> <p>The guidance of the AP would normally be read by the CRS. For the purpose of this JPM the candidate will use the simulator copy and perform the actions without SRO guidance.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate enters AP-520.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>Notify the candidate that Steps 3.1 through 3.3 will be performed by the other operator.</p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT_____</p> <p>UNSAT_____</p>

**STEP 5:** (step 3.5 of AP-520)

Verify proper operation of PZR heaters.

- PZR Heater Control
- PZR Htr Banks
- RC-203-JI
- RC-204-JI

**STANDARD:**

1. Candidate will verify RC-3-PIC in AUTO with a heater demand
2. Candidate will ensure power to PZR heater banks
3. Candidate will check power output on RC-203 and 204-JI

**EXAMINER'S NOTE:**

**COMMENTS:**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

**STEP 3:** (step 3.6 of AP-520)

IF RCS PRESS continues to lower, THEN isolate possible sources of RCS PRESS reduction.

Close the following valves:

- DHV-91
- RCV-53
- RCV-11
- PORV
- RCV-13
- RCV-14

**STANDARD:**

1. Candidate selects closed on all the indicated valves and verifies GREEN light ON.
2. Candidate recognizes that RCV-13 probably did not close completely.

**EXAMINER'S NOTE:**

RCV-13 will stop movement mid-stroke. With no GREEN light and RCS pressure still decreasing the candidate will determine that RCV-13 is still open partially and continue on in the procedure.

**EXAMINER'S CUE:**

If SRO direction is requested when RCV-13 failure is identified, then direct the candidate to continue on in the procedure.

**COMMENTS:**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

<p><b><u>STEP 4:</u></b> (step 3.7 of AP-520)</p> <p>IF RCS PRESS continues to lower, AND RCV-13 is NOT closed, THEN stop RCP-1B.</p> <p>*When RX power is &lt;72%, THEN stop RCP-1B</p> <p>Concurrently Perform AP-545, Plant Runback</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate determines that RCS pressure is still lowering, notifies the CRS and stops RCP-1B. Candidate will continue to monitor plant parameters. Candidate also notifies the CRS to concurrently perform AP-545.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>If SRO direction is requested when securing RCP-1B, then direct the candidate to perform the actions of the AP.</p> <p>State that the other Reactor Operator will perform the actions of AP-545.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step*</b></p> <p><b>(required action to minimize spray flow)</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 5:</u></b> (step 3.8 of AP-520)</p> <p>IF RCS PRESS continues to lower, THEN trip the RX and Concurrently Perform EOP-2, Vital System Status Verification.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate determines that RCS pressure is recovering.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>Terminate the JPM when the candidate states that RCS pressure is recovering.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>END OF TASK</b></p>	



## CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### **INITIAL CONDITIONS:**

You are the Reactor Operator.  
The plant is in Mode 2.

### **INITIATING CUE:**

The Control Room Supervisor has directed you to perform a boron equalization per Section 4.9 of OP-305, Operation of the Pressurizer. Steps 4.9.1 and 4.9.2 have already been completed.

PROGRESS ENERGY  
CRYSTAL RIVER UNIT 3  
PLANT OPERATING MANUAL

**OP-305**  
**OPERATION OF THE PRESSURIZER**

**4.9 Establishing Pressurizer Spray for Boron Equalization (Reference)**

ACTION	DETAILS
4.9.1 HAVE Chemistry sample Pressurizer water space and RCS before spraying	_____ Initial/Date
4.9.2 CONSIDER reactivity effects prior to spraying Pressurizer	<ul style="list-style-type: none"><li>• There will be an approximate .0262 ppmb change in RCS boron for <u>every ppm</u> difference between the RCS and the PZR</li><li>• Refer to OP-304 and/or OP-103C as necessary</li></ul> _____ Initial/Date
4.9.3 ESTABLISH Pressurizer Spray	<ol style="list-style-type: none"><li>1. ___ SELECT PZR Heater Banks "D" &amp; "E" to "ON"</li><li>2. ___ SELECT RCV-14 to "MANUAL"</li><li>3. ___ THROTTLE OPEN RCV-14 to maintain normal RCS pressure, <u>AND</u> MAINTAIN PZR Heater demand between 50 &amp; 90%</li></ol> _____ Initial/Date
4.9.4 <u>WHEN</u> Boron equalization is complete, <u>OR</u> <u>WHEN</u> Automatic Pressurizer Spray is required, <u>THEN STOP</u> Pressurizer Spray	<ol style="list-style-type: none"><li>1. ___ CLOSE RCV-14</li><li>2. ___ SELECT RCV-14 to "AUTO"</li><li>3. ___ SELECT PZR Heater Banks "D" &amp; "E" to "AUTO"</li></ol> _____ Initial/Date

**END OF SECTION**

**4.5 Operation Of Pressurizer Spray With RCV-14 Stuck Open (Continuous)**

ACTIONS

DETAILS

**NOTE**

This procedure section utilizes **RCV-13** for pressurizer spray control instead of RCV-14. Procedures referencing RCV-14 for spray control can be noted that RCV-13 was used.

4.5.1 IF at any time during performance of this section, RCV-13 will **NOT** close when called to do so, THEN MINIMIZE Pressurizer spray

- PERFORM the following sequence until RCS pressure is stable:
  1. \_\_\_ SHUTDOWN RCP-1B, AND REFER to AP-545, Plant Runback
  2. \_\_\_ MANUALLY CLOSE RCV-13 if valve is accessible
  3. \_\_\_ BYPASS closing torque switch per Enclosure 1 and CLOSE RCV-13
  4. \_\_\_ TRIP Reactor AND REFER to EOP-02, Vital System Status Verification
  5. \_\_\_ SHUTDOWN RCPs one at a time until pressure has stabilized

\_\_\_\_\_  
Initial/Date

**NOTE**

Each opening from a closed RCV-13 is considered a cycle on the Pressurizer spray line.

4.5.2 LOG Pressurizer spray line temperature and Pressurizer temperature prior to each opening of RCV-13

- \_\_\_ REFER to Enclosure 2
- \_\_\_ USE computer points A-324 "RC Pressurizer Spray Line Temp" and R-203 "Pressurizer Temp"

\_\_\_\_\_  
Initial/Date

#### 4.5 Operation Of Pressurizer Spray With RCV-14 Stuck Open (Continuous)

ACTIONS	DETAILS
4.5.3 JOG OPEN RCV-13 and MONITOR RCS pressure for response	<ul style="list-style-type: none"><li>• At ES MCC 3AB Unit 5A:<ol style="list-style-type: none"><li>1. ___ ENSURE two Electricians are prepared to assist in performance of Enclosure 1</li><li>2. ___ ESTABLISH continuous communication between Control Room and personnel at ES MCC 3AB Unit 5A</li><li>3. ___ DEPRESS "OPEN" then DEPRESS "STOP"</li><li>4. ___ REPEAT Detail 3 until desired RCS pressure is established or as directed by the CRS</li><li>5. ___ IF RCV-13 fails to close when desired for any reason, <u>THEN IMMEDIATELY GO TO</u> Step 4.5.1</li></ol></li></ul>
4.5.4 <u>WHEN</u> Pressurizer spray is no longer desired, <u>THEN SECURE</u> Pressurizer spray	<ol style="list-style-type: none"><li>1. ___ CLOSE RCV-13</li><li>2. ___ SECURE PZR heaters as needed</li><li>3. ___ TRANSMIT a copy of Enclosure 2 to Engineering to perform post cooldown stress analysis</li></ol>

\_\_\_\_\_  
Initial/Date

\_\_\_\_\_  
Initial/Date

END OF SECTION

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## LOSS OF RCS COOLANT OR PRESSURE

### 1.0 ENTRY CONDITIONS

IF any of the following occur:

- A significant rise in RCS leakage
- An uncontrolled RCS PRESS reduction

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

#### NOTE

**There are no immediate actions for this procedure.**

Approved by <u>David M. Porter for B. Wunderly</u> Date <u>05/30/2005</u> (SIGNATURE ON FILE)		
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### 3.0 FOLLOW-UP ACTIONS

#### ACTIONS

#### DETAILS

3.1 \_\_\_ Notify personnel of entry into AP-520

- \_\_\_ PA announcement
  - \_\_\_ STA
  - \_\_\_ Plant operators
  - \_\_\_ SSO (evaluate plant condition for potential entry into Emergency Plan)
- 

3.2 \_\_\_ IF RB is occupied,  
THEN evacuate RB.

- 1 \_\_\_ Depress "RB EVACUATION" push button.
- 2 \_\_\_ Notify personnel over PA.
- 3 \_\_\_ Repeat PA announcement.

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.3 \_\_\_ Verify OTSG tube leakage has not increased.

- \_\_\_ Notify Chemistry to sample OTSGs.
- Observe radiation monitors and recorder traces for the following:

\_\_\_ RM-A12 (Condenser Exh)

\_\_\_ RM-G26-RI (B1 MS line)

\_\_\_ RM-G27-RI (A2 MS line)

\_\_\_ RM-G25-RI (A1 MSV-25)

\_\_\_ RM-G28-RI (B2 MSV-26)

\_\_\_ IF OTSG tube leak > 1 gpm exists, AND DHR is NOT in operation, THEN GO TO EOP-06, Steam Generator Tube Rupture, beginning with Step 3.1

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3.4 \_\_\_ IF a significant rise in RCS leakage exists, THEN GO TO Step 3.12 in this procedure.

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### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

#### STATUS

RCS PRESS lowering.

- 3.5  Verify proper operation of PZR heaters.
- "PZR HEATER CONTROL"
  - PZR Htr Banks
  - RC-203-JI
  - RC-204-JI
- IF PZR Htrs are NOT operating properly, THEN notify Maintenance to initiate repair efforts.

- 
- 3.6  IF RCS PRESS continues to lower, THEN isolate possible sources of RCS PRESS reduction.
- Close the following valves:
    - DHV-91
    - RCV-53
    - RCV-11
    - PORV
    - RCV-13
    - RCV-14

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.7 ___ <u>IF</u> RCS PRESS continues to lower, <u>AND</u> RCV-13 is <u>NOT</u> closed, <u>THEN</u> stop RCP-1B	1 ___ <u>IF</u> Rx power is $> 72\%$ , <u>THEN</u> <b>CONCURRENTLY PERFORM</b> AP-510, Rapid Power Reduction, beginning with Step 3.1  2 ___ <u>WHEN</u> Rx power is $\leq 72\%$ , <u>THEN</u> stop RCP-1B  3 ___ <b>CONCURRENTLY PERFORM</b> AP-545, Plant Runback, beginning with Step 3.1
3.8 ___ <u>IF</u> RCS PRESS continues to lower, <u>THEN</u> trip the Rx and <b>CONCURRENTLY PERFORM</b> EOP-2, Vital System Status Verification, beginning with Step 2.1	

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**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimD (2K5) NRC [Modified Bank #003] (SIMULATOR)**

**SAFETY FUNCTION 4 (Primary)**

**ALTERNATE PATH**

**RESPOND TO AN ES A/B ACTUATION**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 8-28-05

VALIDATED BY: Ron Tyrie

Date: 8-28-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 8-31-05

**Simulator Job Performance Measure**

**Task:** Respond to an ES A/B actuation

**Alternate Path:** Yes

**JPM #:** SimD (2K5) NRC [Bank #003]

**K/A Rating/Importance:** 025AA1.10 RO 3.1 SRO 2.9

**Task Number:** 0130502002 / 0050502002

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** During emergency operation, ensure proper ES component response IAW EOP-03, Step 3.9.

**Preferred Evaluation Location:**

**Preferred Evaluation Method:**

Simulator  In-Plant \_\_\_\_\_

Perform  Simulate \_\_\_\_\_

**References:**

EOP-03, Rev.12

**Validation Time:** 6 min.

**Time Critical:** NO

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**Candidate:** \_\_\_\_\_

Printed Name

**Time Start:** \_\_\_\_\_

**Time Finish:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

**Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_

Printed Name

Signature

Date

**Comment:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Simulator Job Performance Measure

### SIMULATOR OPERATOR SETUP INSTRUCTIONS:

1. RESTORE IC# 67 (GRANDFATHER)
2. Unfreeze and then freeze the simulator to allow lockouts to trip.
  - a. Acknowledge SCM alarms.
3. RESTORE IC# 67
  - a. Acknowledge ALL alarms.

### **OR**

1. Initialize the simulator to a 100% power IC.
2. Fail DHV-34 "Closed" (TFBUV34C = T).
3. Fail DHV-35 "Closed" (TFBUV35C = T).
4. Place condition on DHV-34 to remove failure when DHV-34 control switch taken to open (TFBUV34C = F / Condition = A1\_A2\_S11\_3).
5. Fail BSP-1B 5 minutes after DHV-35 switch to open (TFBS2802 = TRUE, Cond on A1\_A2\_S13\_3)
6. Fail DHP-1B 5 minutes after DHV-35 switch to open (TFBUMSZB = TRUE, Cond on A1\_A2\_S13\_3)
7. Insert a 0.03 LOCA at the discharge of RCP-1A (TVHH0401 = 0.03).
8. Perform EOP-13, Rule 1.
9. Run until RCS pressure is approx. 900 psig.
10. Acknowledge all annunciator alarms and loss of ASCM alarms.
11. Silence all nuisance alarms not associated with the JPM using the "ALA" shortcut in expert mode.
12. Freeze the simulator.
13. Store IC \_\_\_\_\_

### SIMULATOR OPERATOR INSTRUCTIONS:

1. Acknowledge alarms not associated with the JPM as the other operator.

### TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1. Ensure simulator copy of EOP-03 is checked off up to step 3.9.

## Simulator Job Performance Measure

### READ TO THE OPERATOR

#### Initial Conditions:

You are the Reactor Operator.

While in Mode 1 a LOCA occurred causing a loss of adequate sub-cooling margin.

EOP-02 Immediate Actions were performed.

EOP-13, Rule 1 actions were performed.

EOP-03 follow-up actions 3.1 through 3.8 have been performed.

#### Initiating Cues:

The CRS is in EOP-03 at Step 3.9 and has directed you to ensure that ES equipment is properly aligned.

## Simulator Job Performance Measure

<p><b><u>STEP 1:</u></b> Obtain copy of the appropriate procedure.</p> <p><b><u>STANDARD:</u></b> Candidate obtains a copy of EOP-03, Step 3.9</p> <p><b><u>EXAMINER'S NOTE:</u></b> Candidate may verify EOP-13 Rule 1 actions and EOP-03 actions up to 3.9.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2A:</u></b> IF at any time, ES systems have, OR should have actuated, THEN ensure ES equipment is properly aligned.</p> <p>Ensure applicable ES actuations: "A" HPI</p> <p><b><u>STANDARD:</u></b> Candidate verifies HPI actuation ES status lights are green for "A" Train of HPI (excluding MUP-1A and AHF-1C slow speed).</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2B:</u></b> IF at any time, ES systems have, OR should have actuated, THEN ensure ES equipment is properly aligned.</p> <p>Ensure applicable ES actuations: "B" HPI</p> <p><b><u>STANDARD:</u></b> Candidate verifies HPI actuation ES status lights are green for "B" Train of HPI (excluding MUP-1B, AHF-1B slow speed and AHF-1C slow speed)</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

Simulator Job Performance Measure

<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2C:</u></b> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</p> <p>Ensure applicable ES actuations: "A" LPI</p> <p><b><u>STANDARD:</u></b> Candidate verifies LPI actuation ES status lights are green for "A" Train of LPI.</p> <p>Candidate finds that the LPI actuation status light for DHV-34 is Amber.</p> <p>*Candidate locates control switch for DHV-34 and selects "Open".</p> <p>Candidate verifies DHV-34 ES status light goes "Green"</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>If candidate notifies the CRS prior to taking action for DHV-34, the examiner should only state "Ensure ES equipment is properly aligned".</p> <p><b><u>EXAMINER'S NOTE:</u></b></p> <p>Both LPI pumps are currently running without a suction source. Additionally, once DHV-34 &amp; 35 are opened the candidate should recognize that no flow will occur due to the high RCS pressure.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step*</b></p> <p><b>Basis: LPI &amp; BS suction flowpath.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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## Simulator Job Performance Measure

<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2D:</u></b> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</p> <p>Ensure applicable ES actuations: "B" LPI</p> <p><b><u>STANDARD:</u></b> Candidate verifies LPI actuation ES status lights are green for "B" Train of LPI.</p> <p>Candidate finds that the LPI actuation status light for DHV-35 is Amber.</p> <p>*Candidate locates control switch for DHV-35 and selects "Open".</p> <p>*Candidate recognizes that DHV-35 did not open.</p> <p>Candidate notifies CRS of failure and affect on DHP-1B and BSP-1B.</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>If candidate notifies the CRS prior to taking action for DHV-35, the examiner should only state "Ensure ES equipment is properly aligned".</p> <p>If candidate notifies the CRS about the DHV-35 failure reply that another operator will work on getting DHV-35 open.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step*</b></p> <p><b>Basis: Same as step 2C.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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**Simulator Job Performance Measure**

<p><b><u>EXAMINER'S NOTE:</u> All parts of Step 2 can be performed in any sequence.</b></p> <p><b><u>STEP 2E:</u> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</b></p> <p>Ensure applicable ES actuations: <b>“A” RBIC</b></p> <p><b><u>STANDARD:</u> Candidate verifies RBIC actuation ES status lights are green for “A” Train of RBIC.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>EXAMINER'S NOTE:</u> All parts of Step 2 can be performed in any sequence.</b></p> <p><b><u>STEP 2F:</u> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</b></p> <p>Ensure applicable ES actuations: <b>“AB” RBIC</b></p> <p><b><u>STANDARD:</u> Candidate verifies RBI&amp;C actuation ES status lights are green for “AB” Train of RBIC (excluding SWV-79, 80, 81, 82, 83, 84, 85, &amp; 86).</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>EXAMINER'S NOTE:</u> All parts of Step 2 can be performed in any sequence.</b></p> <p><b><u>STEP 2G:</u> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</b></p> <p>Ensure applicable ES actuations: <b>“B” RBIC</b></p> <p><b><u>STANDARD:</u> Candidate verifies RBIC actuation ES status lights are green for “B” Train of RBIC.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

## Simulator Job Performance Measure

<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2H:</u></b> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</p> <p style="padding-left: 40px;">Ensure applicable ES actuations: <b>"A" RB Spray</b></p> <p><b><u>STANDARD:</u></b> Candidate verifies RB Spray actuation ES status lights are green for "A" Train of RB Spray.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>EXAMINER'S NOTE:</u></b> All parts of Step 2 can be performed in any sequence.</p> <p><b><u>STEP 2I:</u></b> IF at any time, ES systems have, <u>OR</u> should have actuated, <u>THEN</u> ensure ES equipment is properly aligned.</p> <p style="padding-left: 40px;">Ensure applicable ES actuations: <b>"B" RB Spray</b></p> <p><b><u>STANDARD:</u></b> Candidate verifies RB Spray actuation ES status lights are green for "B" Train of RB Spray.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 3:</u></b> Notify CRS of actions taken and status of ES systems.</p> <p><b><u>STANDARD:</u></b> Candidate notifies CRS that DHV-34 &amp; 35 did not automatically position on the ES actuation and that control switch operation of DHV-34 was successful, but DHV-35 will not open. Candidate notifies CRS of this failure and its affect on DHP-1B and BSP-1B.</p> <p><b><u>EXAMINER'S CUE:</u></b> Acknowledge response as the CRS.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>END OF TASK</b></p>	

## Simulator Job Performance Measure

### OPERATOR CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

#### **INITIAL CONDITIONS:**

You are the Reactor Operator.

While in Mode 1 a LOCA occurred causing a loss of adequate sub-cooling margin.

EOP-02 Immediate Actions were performed.

EOP-13, Rule 1 actions were performed.

EOP-03 follow-up actions 3.1 through 3.8 have been performed.

#### **INITIATING CUES:**

The CRS is in EOP-03 at Step 3.9 and has directed you to ensure that ES equipment is properly aligned.

ISM	REV 12	EOP-03
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## INADEQUATE SUBCOOLING MARGIN

### 1.0 ENTRY CONDITIONS

IF in one of the following modes:

- Mode 3
- Mode 4

AND adequate subcooling margin does NOT exist,

THEN use this procedure.

Approved by MSO <u>David M. Porter for Blair Wunderly</u> Date <u>04/27/2005</u> (SIGNATURE ON FILE)		
EOP-03	PAGE 1 of 81	ISM

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.9 \_\_\_ IF at any time, ES systems have,  
OR should have actuated,  
THEN ensure ES equipment is properly aligned.

1 Ensure applicable ES actuations:

\_\_\_ HPI (1625 psig RCS PRESS)

\_\_\_ LPI (500 psig RCS PRESS)

\_\_\_ RBIC (4 psig RB PRESS)

\_\_\_ RB Spray (30 psig RB PRESS)

2 Bypass or reset ES actuation:

\_\_\_ Auto

\_\_\_ Manual

3 \_\_\_ Control ES systems as required.

[Rule 2, HPI Control]

[Rule 5, EDG Control]

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimE (2K5) NRC [Bank #035] (SIMULATOR)**

**SAFETY FUNCTION 4 (Secondary)**

**PERFORM ACTIONS FOR A STUCK OPEN  
MSSV**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Andy Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

SIMULATOR JOB PERFORMANCE MEASURE

**Task:** Perform the required actions if a MSSV fails to reset following a Reactor/Turbine trip.

**Alternate Path:** No

**JPM #:** SimE (2K5) NRC [Bank #035]

**K/A Rating/Importance:** 039A2.04 RO 3.4 SRO 3.7

**Task Number:** 0390502002

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Perform the required actions if an MSSV fails to reset following a Reactor/Turbine trip.

**Preferred Evaluation Location:** Simulator X Plant \_\_\_\_\_ Admin \_\_\_\_\_  
**Preferred Evaluation Method:** Perform X Simulate \_\_\_\_\_

**References:**  
EOP-02, Step 3.11 Rev. 9

**Validation Time:** 6 Minutes **Time Critical:** No

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**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_  
Printed Name

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## SIMULATOR JOB PERFORMANCE MEASURE

### SIMULATOR OPERATOR SETUP INSTRUCTIONS:

1. "Restore" the simulator to IC# 68 (GRANDFATHER) developed for this JPM.
2. Run IC until header pressure is 1000 psig.

OR

1. If creating IC perform the following in order:
  - Fail MSV-48 (TVSVSR4B) to position .04 conditional on Rx power < 10% (rrswtp le 10)
  - Trip Rx
  - Set pressurizer level setpoint to 100".
  - Perform EOP-14 Enclosure 1 (Expert mode, Enc1)
  - Set Conditional to Delete the MSV-48 failure (TVSVSR4B = -1) when header pressure is < 950#. (A4\_A2\_A7\_3 le 950)
  - Allow plant to stabilize until all MSSVs are closed, except MSV-48.
  - Defeat nuisance alarms.
  - Run IC until header pressure is 1000 psig.
  - Store IC.

### SIMULATOR OPERATOR INSTRUCTIONS:

1. NA

### TOOLS / EQUIPMENT / PROCEDURES NEEDED:

1. Radio (may be simulated)
2. Consumable copies of EOP-02, Step 3.11

# SIMULATOR JOB PERFORMANCE MEASURE

## READ TO THE OPERATOR

### INITIAL CONDITIONS:

You are the Reactor Operator.  
A Reactor Trip has occurred.  
EOP-02 Immediate Actions have been completed.  
EOP-02, Steps 3.1 thru 3.10, have been completed.

### INITIATING CUE:

The Control Room Supervisor directs you to perform EOP-02, Step 3.11.

SIMULATOR JOB PERFORMANCE MEASURE

<u>STEP 1:</u>	Candidate obtains copy of EOP-02.	SAT _____
<u>STANDARD:</u>	Candidate locates EOP-02.	UNSAT _____
<u>COMMENTS:</u>		

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 2:</b> (step 3.11)</p> <p>Verify MSSVs are closed.</p> <p><u>IF</u> MSSVs are <u>NOT</u> closed, <u>THEN</u> attempt to reseal MSSVs.</p> <p><u>IF</u> OTSG PRESS is &gt; desired setpoint, <u>THEN</u> control OTSG PRESS using TBVs (preferred) or ADVs.</p> <p><u>IF</u> OTSG PRESS is ≤ desired setpoint, <u>AND</u> any MSSV is open, <u>THEN</u> momentarily lower associated OTSG PRESS to ≥ 900 psig.</p> <p><u>IF</u> any MSSV is <u>NOT</u> reset, <u>THEN</u> notify Maintenance to start repair efforts.</p> <p><b>STANDARD:</b> Observes MSSV lifting on MSSV monitor.</p> <p><i>This step may be accomplished by either of the following:</i></p> <p><b>FIRST METHOD:</b></p> <p>Locate the hand/Auto station for TBVs on affected OTSG.</p> <p style="text-align: center;">"B" OTSG MSV-11 &amp; MSV-14</p> <p>Depress the Manual pushbutton to select manual.</p> <p>Depress the Open pushbutton to lower OTSG pressure to desired set point.</p> <p>When OTSG is at desired pressure observe OTSG pressure and TV monitor to ensure valve is seated.</p> <p>Depress the Close pushbutton to close MSV-11 and 14.</p> <p>Depress the Auto pushbutton to return MSV-11 and 14 to Auto control.</p> <p>Observe OTSG pressure and TV monitor to ensure valve remains seated.</p> <p>Notify the Control Room Supervisor of the condition of MSV-48.</p>	<p><b>Critical Step:</b></p> <p><b>Basis:</b> Recognizes abnormal condition that will result in overcooling.</p> <p>SAT _____</p> <p>UNSAT _____</p>
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SIMULATOR JOB PERFORMANCE MEASURE

(STEP-2) (continued)

SECOND METHOD:

Locate the Hand/Auto station for the UNAFFECTED OTSG.

"A" OTSG MSV-9 & MSV-10

Depress the Manual pushbutton for MSV-9 & 10.

Locate the Turbine Header Pressure set point control knob.

Rotate the set point knob to desired set point.

(A setting of  $\approx 30$  will be  $\approx 900$  psig, including 125# bias)

When OTSG is at desired pressure observe OTSG pressure and TV monitor to ensure valve is seated.

Returns setpoint to normal ( $\approx 47$ ) and TBVs to Auto.

Observe OTSG pressure and TV monitor to ensure valve remains seated.

Notify the Control Room Supervisor of the condition of MSV-48.

**EXAMINER'S NOTE:**

**If questioned by the candidate as to how much to lower OTSG pressure or candidate does not lower pressure sufficient to reseat the MSSV tell them as the CRS to limit the decrease to 900 psig**

**Simulator is setup to close MSV-48 when OTSG pressure is lowered to  $\approx 945$  psig.**

**COMMENTS:**

SIMULATOR JOB PERFORMANCE MEASURE

<p><b><u>TERMINATION CUE:</u></b></p> <p><b><u>EXAMINER'S NOTE:</u></b></p>	<p><b>MSV-48 is closed and TBVs are returned to normal post trip lineup.</b></p> <p><b>The intent of the task is for the operator to take control of the TBVs (preferred) and lower the OTSG pressure to successfully reseal the MSSV. If action other than method 1 or 2 is taken which successfully reseals the MSSV without placing the plant at risk then the task should be considered satisfactory. An example of placing the plant at risk would be lowering OTSG pressure to the point that a MSLI occurs. However, if while reducing pressure to lower pressure in the affected OTSG the operator lowers pressure in the non-affected OTSG this should be a comment on his/her evaluation. Additionally, steaming to atmosphere is not the preferred method to lower the OTSG pressure. Thus, if the candidate uses the ADVs to lower pressure this should be a comment on the evaluation.</b></p>	
<p><b>END OF TASK</b></p>		

SIMULATOR JOB PERFORMANCE MEASURE

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

**INITIAL CONDITIONS:**

You are the Reactor Operator.  
A Reactor Trip has occurred.  
EOP-02 Immediate Actions have been completed.  
EOP-02, Steps 3.1 thru 3.10, have been completed.

**INITIATING CUE:**

The Control Room Supervisor directs you to perform EOP-02, Step 3.11.

VSSV	REV 09	EOP-02
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## VITAL SYSTEM STATUS VERIFICATION

### 1.0 ENTRY CONDITIONS

IF in Modes 1 through 4,

AND NOT on Decay Heat,

AND either of the following:

- Rx trip has occurred
- Rx trip should have occurred

THEN use this procedure.

Approved by MSO David M. Porter for Blair Wunderly Date 04/27/2005  
(SIGNATURE ON FILE)

EOP-02	PAGE 1 of 47	VSSV
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### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.10 \_\_\_ IF PZR Htrs are required,  
THEN ensure PZR Htrs are  
controlling in Auto or  
Manual.

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3.11 \_\_\_ Verify MSSVs are closed.

\_\_\_ IF MSSVs are NOT closed,  
THEN attempt to reseal  
MSSVs.

1 \_\_\_ IF OTSG PRESS is > desired  
setpoint,  
THEN control OTSG PRESS using  
TBVs (preferred) or ADVs.

2 \_\_\_ IF OTSG PRESS is  $\leq$  desired  
setpoint,  
AND any MSSV is open,  
THEN momentarily lower  
associated OTSG PRESS  
to  $\geq$  900 psig.

3 \_\_\_ IF any MSSV is NOT reset,  
THEN notify Maintenance to  
start repair efforts.

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimF (2K5) NRC [Bank #048] (SIMULATOR)**

**SAFETY FUNCTION 6**

**SYNCHRONIZE OFF-SITE POWER AND  
UNLOAD/SHUTDOWN EDG-1A**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Andy Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

SIMULATOR JOB PERFORMANCE MEASURE

**Task:** Synchronize in off-site power and unload/shutdown EGDG-1A.

**Alternate Path:** No

**JPM #:** SimF (2K5) NRC [Bank #048]

**K/A Rating/Importance:** 064A4.09 RO 3.2 SRO 3.3

**Task Number:** 0640402005 / 0640402006

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Synchronize in off-site power and unload/shutdown EGDG-1A using AP-770.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator X Plant \_\_\_\_\_ Admin \_\_\_\_\_

Perform X Simulate \_\_\_\_\_

**References:**

AP-770 Rev. 33, Enclosure 6

**Validation Time:** 20 Minutes

**Time Critical:** No

**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## SIMULATOR JOB PERFORMANCE MEASURE

### **SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. "Restore" the simulator to IC# 69 (GRANDFATHER) developed for this JPM.
2. If creating IC perform the following:
  - Insert LOOP
  - Delete LOOP after plant trips.
  - Perform AP-770 up to step 3.53 (restoring a bus).
  - Close breakers 4900 and 4902.
  - Store IC.

### **SIMULATOR OPERATOR INSTRUCTIONS:**

1. Be prepared to complete portions of step 6.1 of Enclosure 6 in AP-770 as PPO (adjusting speed droop from 0 to 60 in increments of 10 and selecting unit-parallel switch to parallel).

Page "EDG"  
Speed Droop (TAGDADRP)  
Unit / Parallel Switch (TCG5AUPS)

2. Be prepared to complete portions of step 6.4 of Enclosure 6 AP-770 as PPO (adjusting speed droop from 60 to 0 in increments of 10 and selecting unit-parallel switch to unit).

### **TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. Radio (may be simulated)
2. Copy of AP-770
3. Consumable copies of AP-770, Enclosure 6

# SIMULATOR JOB PERFORMANCE MEASURE

## READ TO THE OPERATOR

### INITIAL CONDITIONS:

You are the Reactor Operator.

The plant is stable in Mode 3 following a loss of off-site power.

Both diesels are running and tied to their respective ES bus.

AP-770 is complete up to off-site power availability (Step 3.53)

### INITIATING CUES:

Off-site power is now available.

The Control Room Supervisor has directed you to perform AP-770, Enclosure 6, "A" EDG SHUTDOWN.

SIMULATOR JOB PERFORMANCE MEASURE

<p><b><u>STEP 1:</u></b> Obtain a copy of appropriate procedure.</p> <p><b><u>STANDARD:</u></b> Candidate obtains a copy of AP-770, starting with Step 6.1 of Enclosure 6.</p> <p><b><u>EXAMINER'S NOTE:</u></b> When the candidate locates the correct procedure provide him with a copy of AP-770, Enclosure 6.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 2:</u></b> (step 6.1)</p> <p>Prepare "A" EDG to synchronize with off-site power source.</p> <p>Ensure plant conditions are stable.</p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 2A:</u></b> (step 6.1) Continued</p> <p>Ensure HPI is bypassed or reset.</p> <p>*Depress 4160V ESA UV RESET push button.</p> <p>Notify PPO to obtain key 94 from Control Room.</p> <p>*While maintaining frequency, notify PPO to select A EDG SPEED DROOP to 60 in increments of 10</p> <p>*Select EDG A EXC VOLT ADJ select to CONT RM</p> <p>Notify PPO to select A EDG Unit-Parallel switch to PAR</p> <p>Adjust EDG A EXC VOLT ADJUST to maintain A EDG voltage 4150 to 4250 volts.</p> <p>Ensure at least 1 of the following breakers is closed:</p> <p style="margin-left: 40px;">1691</p> <p style="margin-left: 40px;">1692</p> <p style="margin-left: 40px;">4900</p> <p style="margin-left: 40px;">4902</p>	<p><b>Critical Step*</b></p> <p><b>Basis:</b> Generator electrical alignment to share load.</p> <p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

STANDARD:

Candidate verifies plant stable; initial conditions indicated the plant is stable.

Candidate verifies on both "A" and "B" ES status panels that the channel function enable green lights are ON and the bypass reset green lights are ON.

Candidate depresses pushbutton for 4160 V UV RESET and verifies that both reset/normal lights are ON.

PPO notified to complete details 4 and 5 of Step 6.1 of Enclosure 6 in AP-770; candidate may raise "A" EDG speed to maintain frequency.

Candidate rotates EDG "A" EXC VOLT ADJ SELECT switch to CONT RM. (Q-2-5 alarms).

PPO notified to complete detail 7 of Step 6.1 of Enclosure 6 in AP-770.

Candidate rotates EDG "A" EXC VOLT ADJUST knob to keep the voltage between 4150 and 4250 volts.

Candidate verifies that at least one of the following breakers is closed: 1691, 1692, 4900 or 4902

EXAMINER'S/ BOOTH OPERATOR CUE:

**When notified as the PPO to adjust Speed Droop then adjust Speed Droop as directed and report back to the candidate as the PPO.**

**When notified as the PPO to select Unit Parallel switch to PAR then select Unit Parallel switch to PAR as directed and report back to the candidate as the PPO.**

COMMENTS:

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 3:</b> (step 6.2)</p> <p>Synchronize "A" EDG with off-site power source.</p> <p>*Select synchroscope for breaker to be paralleled to ON (3211).</p> <p>*Adjust EDG "A" EXC VOLT ADJUST to match incoming and running voltages.</p> <p>*Adjust EDG "A" SPEED to establish synchroscope moving slow in the fast direction.</p> <p>*Close oncoming breaker at approximately 11 o'clock.</p> <p>Select synchroscope to OFF.</p>	<p><b>Critical Step*</b></p> <p><b>Basis: Meet requirements to parallel two electrical sources.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STANDARD:</b></p> <p>Candidate rotates synchroscope for breaker 3211 to ON and verifies sync lights ON.</p> <p>Candidate rotates EDG "A" EXC VOLT ADJUST knob (as needed) so that the incoming voltage and running voltage are approximately the same.</p> <p>Candidate rotates EDG "A" SPEED control handle until the needle on the synchroscope is rotating slowly in the fast direction.</p> <p>Candidate rotates breaker 3211 to close when the synchroscope is at approximately the 11 o'clock position.</p> <p>Candidate rotates the synchroscope control handle for breaker 3211 to OFF and verifies sync lights off.</p>	
<p><b>COMMENTS:</b></p>	



SIMULATOR JOB PERFORMANCE MEASURE

<p><b><u>STEP 4:</u></b> (step 6.3)</p> <p>Reduce "A" EDG load.</p> <p>Maintain -1.5 to +1.5 MVAR by adjusting EDG "A" EXC VOLT ADJUST.</p> <p>If "A" EDG load is &gt; 1200 KW, then adjust EDG "A" SPEED to reducer load to approximately 1200 KW.</p> <p>When load has been reduced to approximately 1200 KW for 3 to 5 min, then adjust EDG "A" SPEED to reduce load to approximately 200 KW.</p> <p>Establish approximately +0.1 MVAR by adjusting EDG "A" EXC VOLT ADJUST.</p> <p>*Open breaker 3209.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate rotates EDG "A" EXC VOLT ADJUST knob to maintain MVARs between -1.5 and +1.5 if needed.</p> <p>Candidate verifies load is &lt; 1200 KW.</p> <p>When load has been approximately 1200 KW for 3 to 5 minutes candidate rotates EDG "A" SPEED knob and reduces load to approximately 200 KW.</p> <p>Candidate establishes <math>\approx</math> +0.1 MVAR using the EDG A EXC VOLT ADJUST.</p> <p>Candidate rotates breaker 3209 control handle to open and verifies green light ON and red light OFF.</p> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step*</b></p> <p><b>Basis: Prepare EDG for ES Standby</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 5:</b> (step 6.4)</p> <p>Stop "A" EDG.</p> <p>*Notify PPO to adjust "A" EDG SPEED DROOP to 0.</p> <p>*Notify PPO to select "A" EDG Unit-Parallel switch to UNIT</p> <p>Maintain 59.8 to 60.2 HZ by adjusting EDG "A" SPEED.</p> <p>Select EDG "A" VOLT ADJUST MODE SELECT to MAN</p> <p>Maintain EDG voltage at 3933 to 4400V by adjusting EDG "A" MANUAL VOLTAGE ADJUST.</p> <p>*Select EDG "A" VOLT ADJUST MODE SELECT to AUTO.</p> <p>*Select EDG "A" EXC VOLT ADJ SELECT to DG RM.</p> <p>*Depress "A" EDG STOP pushbutton.</p> <p><b>STANDARD:</b></p> <p>Candidate notifies PPO to complete details 1 and 2 of step 6.4 of Enclosure 6 in AP-770.</p> <p>Candidates rotates EDG "A" SPEED knob as required to maintain 59.8 to 60.2 HZ.</p> <p>Candidate rotates EDG "A" VOLT ADJUST MODE SELECT to MAN.</p> <p>Candidate rotates EDG "A" MANUAL VOLTAGE ADJUST to maintain EDG voltage between 3933 and 4400V.</p> <p>Candidate rotates EDG "A" VOLT ADJUST MODE SELECT to AUTO.</p> <p>Candidate rotates EDG "A" EXC VOLT ADJ SELECT to DG RM. (Q-5-2 clears)</p> <p>Candidate depresses the "A" EDG STOP push button and verifies EDG stops by voltage decrease to 0 and run/ready light extinguishes.</p>	<p><b>Critical Step*</b></p> <p><b>Basis:</b></p> <p><b>Restoration of "A" EGDG to ES standby.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
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SIMULATOR JOB PERFORMANCE MEASURE

<p><b><u>EXAMINER'S CUE:</u></b></p> <p>When notified as the PPO to adjust Speed Droop then adjust Speed Droop as directed and report back to the candidate as the PPO.</p> <p>When notified as the PPO to select Unit Parallel switch to UNIT then select Unit Parallel switch to UNIT as directed and report back to the candidate as the PPO.</p> <p><b><u>COMMENTS:</u></b></p>	
<p><b><u>STEP 6:</u></b> (step 6.5)</p> <p>Exit this Enclosure</p> <p><b><u>STANDARD:</u></b> NA</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>TERMINATION CUE:</u></b> Enclosure 6 is completed.</p>	
<p align="center"><b>END OF TASK</b></p>	

SIMULATOR JOB PERFORMANCE MEASURE

**CANDIDATE CUE SHEET**

**(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)**

**INITIAL CONDITIONS:**

You are the Reactor Operator.

The plant is stable in Mode 3 following a loss of off-site power.

Both diesels are running and tied to their respective ES bus.

AP-770 is complete up to off-site power availability (Step 3.53)

**INITIATING CUES:**

Off-site power is now available.

The Control Room Supervisor has directed you to perform AP-770, Enclosure 6, "A" EDG SHUTDOWN.

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**EMERGENCY DIESEL GENERATOR ACTUATION**

**1.0 ENTRY CONDITIONS**

IF any ES 4160V Bus UV occurs,

THEN use this procedure.

**2.0 IMMEDIATE ACTIONS**

<p><b><u>NOTE</u></b></p> <p><b>There are no immediate actions for this procedure.</b></p>
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Approved by MSO <u>D. M. Porter for B. Wunderly</u>		Date <u>07/29/05</u>
(SIGNATURE ON FILE)		
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## 4.0 ENCLOSURE 6 A EDG SHUTDOWN

### ACTIONS

### DETAILS

6.1 \_\_\_ Prepare A EDG to synchronize with offsite power source.

1 \_\_\_ Ensure plant conditions are stable.

2 \_\_\_ Ensure HPI is bypassed or reset.

3 \_\_\_ Depress "4160V ESA UV RESET" push button.

4 \_\_\_ Notify PPO to obtain key 94 from Control Room.

5 \_\_\_ While maintaining frequency, notify PPO to select A EDG "SPEED DROOP" to "60" in increments of 10 (119 ft AB A EDG Engine Room).

6 \_\_\_ Select "EDG A EXC VOLT ADJ SELECT" to "CONT RM".

7 \_\_\_ Notify PPO to select "A EDG Unit-Parallel Switch" to "PAR" (119 ft AB A EDG Control Room).

8 \_\_\_ Adjust "EDG A EXC VOLT ADJUST" to maintain A EDG voltage 4150 to 4250 volts.

9 Ensure at least 1 of the following breakers is closed:

\_\_\_ 1691

\_\_\_ 1692

\_\_\_ 4900

\_\_\_ 4902

#### 4.0 ENCLOSURE 6 A EDG SHUTDOWN (CONT'D)

##### ACTIONS

##### DETAILS

6.2 \_\_\_ Synchronize A EDG with  
offsite power source.

- 1 \_\_\_ Select synchroscope for Bkr to be paralleled to "ON".
  - 2 \_\_\_ Adjust "EDG A EXC VOLT ADJUST" to match incoming and running voltages.
  - 3 \_\_\_ Adjust "EDG A SPEED" to establish synchroscope moving slow in the "FAST" direction.
  - 4 \_\_\_ Close oncoming Bkr at  $\approx$  11 o'clock.
  - 5 \_\_\_ Select synchroscope to "OFF".
- 

6.3 \_\_\_ Reduce A EDG load.

- 1 \_\_\_ Maintain -1.5 to +1.5 MVAR by adjusting "EDG A EXC VOLT ADJUST".
- 2 \_\_\_ IF A EDG load is  $>$  1200 KW, THEN adjust "EDG A SPEED" to reduce load to  $\approx$  1200 KW.
- 3 \_\_\_ WHEN load has been reduced to  $\leq$  1200 KW for 3 to 5 min, THEN adjust "EDG A SPEED" to reduce load to  $\approx$  200 KW.
- 4 \_\_\_ Establish  $\approx$  +0.1 MVAR by adjusting "EDG A EXC VOLT ADJUST".
- 5 \_\_\_ Open Bkr 3209

#### 4.0 ENCLOSURE 6 A EDG SHUTDOWN (CONT'D)

##### ACTIONS

##### DETAILS

6.4 \_\_\_ Stop A EDG.

- 1 \_\_\_ Notify PPO to adjust A EDG "SPEED DROOP" to "0" (119 ft AB A EDG Engine Room).
- 2 \_\_\_ Notify PPO to select "A EDG Unit-Parallel Switch" to "UNIT" (119 ft AB A EDG Control Room).
- 3 \_\_\_ Maintain 59.8 to 60.2 Hz by adjusting "EDG A SPEED".
- 4 \_\_\_ Select "EDG A VOLT ADJUST MODE SELECT" to "MAN".
- 5 \_\_\_ Maintain EDG voltage at 3933 to 4400V by adjusting "EDG A MANUAL VOLTAGE ADJUST".
- 6 \_\_\_ Select "EDG A VOLT ADJUST MODE SELECT" to "AUTO".
- 7 \_\_\_ Select "EDG A EXC VOLT ADJ SELECT" to "DG RM".
- 8 \_\_\_ Depress A EDG "STOP" push button.

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6.5 \_\_\_ EXIT this enclosure.

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**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimG (2K5) NRC [Bank #184] (SIMULATOR)**

**SAFETY FUNCTION 7**

**RESTORE RPS CHANNEL POWER**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Andy Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05



## SIMULATOR JOB PERFORMANCE MEASURE

### **SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. "Restore" the simulator to IC# 70 (GRANDFATHER) developed for this JPM.
2. If creating IC perform the following:
  - Open "A" RPS System "AC" power breaker
  - Open "A" RPS System "DC"
  - Open "A" RPS PS-1 +15 V breaker
  - Open "A" RPS PS-2 -15 V breaker
  - Open both fan breakers
  - Ensure RCS pressure SASS toggle switch selected to "B" RPS
  - ACK SASS Transfer on SASS modules
  - Store IC.

### **SIMULATOR OPERATOR INSTRUCTIONS:**

1. Close "A" CRD Breaker when requested.

### **TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. Consumable copies of OP-507, Section 4.7

# SIMULATOR JOB PERFORMANCE MEASURE

## READ TO THE OPERATOR

### INITIAL CONDITIONS:

You are the Reactor Operator.

The "A" RPS channel was de-energized using the breaker on the vital bus to allow repair of its power supply.

The repairs have been completed.

VBDP-3, breaker 17, has been closed.

### INITIATING CUE:

The Control Room Supervisor directs you to restore power to RPS Channel "A".

SIMULATOR JOB PERFORMANCE MEASURE

<u>STEP 1:</u>	Identify and locate the required procedure	SAT _____
<u>STANDARD:</u>	The candidate should identify that the required procedure is OP-507 Section 4.7.	UNSAT _____
<u>EXAMINER'S NOTE:</u>	<b>When the candidate identifies and locates the correct procedure and section supply him/her with a copy of OP-507, Section 4.7.</b>	
<u>COMMENTS:</u>		
<u>STEP 2:</u>	Procedure Note: Ensure no SASS modules selected to channel being restored.	SAT _____
<u>STANDARD:</u>	Candidate verifies that no SASS modules are selected to the "A" RPS channel.	UNSAT _____
<u>EXAMINER'S NOTE:</u>	<b>Only RCS pressure is used by SASS. This switch has already been transferred to the "B" RPS channel.</b>	
<u>COMMENTS:</u>		

SIMULATOR JOB PERFORMANCE MEASURE

**STEP 3:** (step 4.7.1)

Ensure affected RPS Channel Power Supply breakers are OFF

SAT \_\_\_\_\_

Ensure the following power supply breakers are selected to OFF position

UNSAT \_\_\_\_\_

"SYSTEM AC POWER"

"SYSTEM DC POWER"

"PS-(channel)1" + 15V Power Supply

"PS-(channel)2" - 15V Power Supply

Fan breakers

**STANDARD:**

Candidate locates the above breakers and verifies they are in the OFF position.

**COMMENTS:**

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 4:</b> (step 4.7.2)</p> <p>Ensure power feeder breaker for the affected channel is closed.</p> <p>Ensure Feeder Breaker is CLOSED</p> <p>Channel "A" - VBDP-3 Bkr. #17</p> <p>Verify "Power Available" lamp on "System AC Power" breaker is lit.</p> <p><b>STANDARD:</b> Per cue VBDP-3, breaker 17 is closed.</p> <p>Candidate checks that "Power Available" lamp on "System AC Power" breaker is lit.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 5:</b> (step 4.7.3)</p> <p>Close affected RPS Channel "System AC Power" breaker.</p> <p>Verify "Power On" lamp ON "System AC Power" breaker is lit.</p> <p><b>STANDARD:</b> Candidate places the breaker in the ON position and then verifies the power on lamp is lit.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Power alignment to the RPS cabinet.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 6:</b> (step 4.7.4)</p> <p>Ensure RPS cabinet fans are operating.</p> <p>Turn on both Fan breakers.</p> <p>Ensure fan lamps are lit.</p> <p><b>STANDARD:</b> Candidate places breakers for both fans in the ON position and verifies that the fan lamps are lit.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 7:</b> (step 4.7.5)</p> <p>CLOSE affected RPS Channel ±15v power supply breakers.</p> <p>CLOSE the following power supply breakers:</p> <p style="padding-left: 40px;">"PS-(channel) 1" + 15V Power Supply</p> <p style="padding-left: 40px;">"PS-(channel) 2" - 15V Power Supply</p> <p><b>STANDARD:</b> Candidate locates breakers and places in the ON position.</p> <p><b>EXAMINER'S NOTE:</b> A possibility exist that the examinee may think that the power supply should be energized at this point. (This will not occur until the next step). If the examinee believes a fault has occurred and request CRS/Maintenance assistance then end the JPM at this point.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> Simultaneous alignment of both power supplies.</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 8:</b> Procedure Note: The following step will restore power to the affected RPS Channel.</p> <p><b>STANDARD:</b> Candidate reads note.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>



SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 9:</b> (step 4.7.6)</p> <p>REPOWER affected RPS Channel</p> <p>CLOSE "System DC Power" Breaker</p> <p><b>STANDARD:</b> Candidate locates breaker and places in the ON position. Candidate responds to any associated alarms.</p> <p><b>EXAMINER'S NOTE:</b></p> <p>At this time the following Annunciator alarms clear:</p> <p>RCS flow loop A, RCS flow loop B, RCS total flow, subassembly + and - 15V pwr fault alarm, RCS pressure, and mismatch (SASS)</p> <p>If &gt; 45% power:</p> <p>Annunciator for turbine trip bypass clear. Turbine AMSAC Low Flux bypass clear.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> Power alignment to the RPS cabinet.</p> <p>SAT _____</p> <p>UNSAT _____</p>
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SIMULATOR JOB PERFORMANCE MEASURE

**STEP 10:** (step 4.7.7)

RESET affected RPS component power supplies:

DEPRESS RESET toggle switch for the following power supplies:

Channel A

NI-1 Detector Power Supply (will not energize >10%)

\*NI-5 Detector Power Supply

\*Contact Monitor P.S.

**STANDARD:**

Candidate locates detector reset power supply toggle, presses and releases toggle switch. Candidate should observe power restored to NI-5 and contact monitor and all 4 contact monitor lights go dim.

**EXAMINER'S NOTE:**

The source range will not energize if with reactor power > 10 %.

Sub-Assembly "A" detector pwr supply fault clear. DC voltage increases, light on the module illuminates and an annunciator alarm for the turbine trip bypass clears if > 45% pwr.

On contact monitor voltage increases to approximately 125V. All 4 contact monitor lights go "DIM".

**COMMENTS:**

**Critical Step\***

**Basis: Reset of pwr supplies prior to resetting RTM.**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

SIMULATOR JOB PERFORMANCE MEASURE

**STEP 11:** (step 4.7.8)

If RPS A is being powered, then ensure RESET all tripped bistables listed in details:

DEPRESS OUTPUT STATE RESET toggle switch

VERIFY OUTPUT STATE lamp is dim

DEPRESS OUTPUT MEMORY RESET toggle switch

VERIFY OUTPUT MEMORY lamp is dim

**Details:**

**SUR ROD WITHDRAWAL INHIBIT**

\*PWR/PUMP BISTABLE (will not reset with less than 3 RCPs running based on Contact Monitor)

\*PWR/IMBAL/FLOW

\*HIGH FLUX NI-5

FLUX >10% FP NI-5 (will not reset if greater than 10% FP)

MFP TRIP BYPASS (will not reset if less than 20% FP)

TURBINE TRIP BYPASS (will not reset if less than 45% FP)

SHUTDOWN BYPASS (will not reset if greater than 1820 psig)

\*HIGH PRESS TRIP

\*LOW RC PRESS (will not reset if less than 1900 psig)

\*PRESS/TEMP

\*HIGH RC TEMP

**STANDARD:**

Candidate performs the 4 steps above for each bistable listed.

**COMMENTS:**

**Critical Step\***

**Basis:**  
Align bistables to operational lineup.

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 12:</b> (steps 4.7.9, 4.7.10, and 4.7.11) These steps apply to RPS channels B, C and D and are not effected by this JPM.</p> <p><b>STANDARD:</b> NA</p> <p><b>EXAMINER'S NOTE:</b> Candidate should note that these 3 steps are NA.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 13:</b> (step 4.7.12)</p> <p>RESET RB High Pressure Contact Buffer</p> <p>Depress Reset toggle switch on Reactor Building High Press reset module</p> <p><b>STANDARD:</b> The candidate should observe that the 2 input state lamps go from bright to off.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Bistable reset required to reset RPS.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 14:</b> NOTE: The Turbine Trip Contact Buffer will not reset if the turbine is tripped.</p> <p><b>STANDARD:</b> Candidate reads note and notes that the turbine is not tripped.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 15:</b> (step 4.7.13)</p> <p><b>RESET Turbine Trip Contact Buffer.</b></p> <p>Depress test toggle switch on Turbine In Trip State module (lower switch on buffer module)</p> <p><b>STANDARD:</b> Candidate depresses test toggle and observes both red lights on the module change state, bottom from on to off &amp; top from off to on.</p> <p>RPS trouble alarm clear and sub system trip lamp on 880 module goes "DIM"</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Bistable reset required to reset RPS.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 16:</b> (step 4.7.14)</p> <p><b>Reset Reactor Trip module.</b></p> <p>Depress Subsystem Reset toggle on Reactor Trip module.</p> <p>Verify <b>Protective Sub-System</b> amber indicating lamps on the top of each channel cabinet are DIM for the respective channel being reset:</p> <p>"A" RPS Channel "B" RPS Channel "C" RPS Channel "D" RPS Channel</p> <p><b>STANDARD:</b> The candidate depresses the toggle switch and the RPS Channel A trip annunciator alarm clears.</p> <p>The candidate verifies that the <b>PROTECTIVE SUBSYSTEM LAMP</b> (#1 light on the top of each left cabinet) goes dim. It should change from bright to dim when the subsystem reset toggle is pressed down.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Resets channel.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 17:</b> Procedure Notes:</p> <p>Trip Reset will remove the 125# Bias applied to the Turbine Bypass valves, if applicable.</p> <p>Local closure of CRD Breakers will be required unless all Control Rods are fully inserted.</p> <p><b>STANDARD:</b> NA</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 18:</b> (step 4.7.15)</p> <p>Close associated CRD breakers:</p> <p>Depress the Trip Reset P/B Depress the Fault Reset P/B Ensure closed any open CRD breakers</p> <p align="center">A Breaker</p> <p>Verify CRD breaker open and CRD Control Fault annunciator alarms are clear.</p> <p><b>STANDARD:</b> Candidate Depresses the Trip Reset, Fault Reset P/B and notifies the PPO to close the A CRD breaker</p> <p>When "Trip Reset" is depressed there will be no change</p> <p>When "Fault Reset" is depressed the lamp momentarily backlights.</p> <p><b>EXAMINER'S / BOOTH OPERATOR CUE:</b></p> <p align="center"><b>Role Play as the PPO to close the "A" CRD breaker.</b></p> <p align="center"><b>Simulator page is "crd_logic" for the breaker.</b></p> <p align="center"><b>Inform the student when the breaker is closed.</b></p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Restore CRD breaker.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 19:</b> (step 4.7.16)</p> <p>Verify all associated alarms are clear.</p> <p>Local breaker flags indicate CLOSED  Annunciator window J-5-6 clear  Event points 1982, 1983, 1984, 1985 are all clear  CRD Control Fault (J-3-5) event point 1237 clear  Breaker Trip indications in the RPS cabinet are dim (on the top of each cabinet and on the RTM)</p> <p><b>STANDARD:</b> Candidate notifies the PPO to verify that all CRD breakers indicate closed.</p> <p>Candidate verifies that all annunciator alarms are cleared.</p> <p>Candidate verifies that Breaker Trip indications on each RPS cabinet and on the Reactor Trip Module are dim.</p> <p><b>EXAMINER'S CUE:</b> As PPO inform the candidate that all CRD breakers are closed.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 20:</b> (step 4.7.17)</p> <p>If required to energize any EFIC channels, then refer to OP-450</p> <p><b>STANDARD:</b> NA</p> <p><b>EXAMINER'S CUE:</b> Inform the student that all EFIC channels are energized and to complete the remainder of Section 4.7.</p> <p>If asked, the PPO has verified the EFIC cabinets have power.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

SIMULATOR JOB PERFORMANCE MEASURE

<p><b>STEP 21:</b> (step 4.7.18)</p> <p>Reset tripped EFIC.</p> <p>Depress both green flashing "Test/Results/Reset" buttons on EFIC panel.</p> <p>Ensure EFIC Actuation alarm is clear.</p> <p><b>STANDARD:</b> Candidate <b>depresses</b> both green flashing "Test/Results/Reset" buttons on EFIC panel and observes that lamps go from flashing to off and the Emergency Feedwater Actuation Annunciator clears.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step</b></p> <p><b>Basis:</b> <b>Clears half trip on EFIC.</b></p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 22:</b> (step 4.7.19)</p> <p>Reset SASS Transfer and SASS Mismatch Alarms and Modules</p> <p><b>STANDARD:</b> NA</p> <p><b>EXAMINER'S CUE:</b> Inform the student that another Nuclear Operator will complete the required actions for SASS.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>TERMINATION CUE:</b> Power has been restored to RPS Channel A.</p>	
<p><b>END OF TASK</b></p>	



SIMULATOR JOB PERFORMANCE MEASURE

CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

**INITIAL CONDITIONS:**

You are the Reactor Operator.

The "A" RPS channel was de-energized using the breaker on the vital bus to allow repair of its power supply.

The repairs have been completed.

VBDP-3, breaker 17, has been closed.

**INITIATING CUE:**

The Control Room Supervisor directs you to restore power to RPS Channel "A".

**PROGRESS ENERGY**  
**CRYSTAL RIVER UNIT 3**  
**PLANT OPERATING MANUAL**

**OP-507**  
**OPERATION OF THE ES, RPS,**  
**AND ATWAS SYSTEMS**

## 4.7 Restoration of RPS Channel Power (Continuous)

ACTION	DETAILS
<b>NOTE</b>	
Ensure no SASS modules selected to channel being restored.	
4.7.1 ENSURE affected RPS Channel Power Supply breakers are OFF	1. ENSURE the following power supply breakers are selected to OFF position <ul style="list-style-type: none"><li>• <input type="checkbox"/> "SYSTEM AC POWER"</li><li>• <input type="checkbox"/> "SYSTEM DC POWER"</li><li>• <input type="checkbox"/> "PS-(channel)1" + 15V Power Supply</li><li>• <input type="checkbox"/> "PS-(channel)2" - 15V Power Supply</li><li>• <input type="checkbox"/> System Fan Breakers</li></ul>
<u>          </u> Initial/Date	
4.7.2 ENSURE Power feeder breaker for the affected channel is CLOSED	1. ENSURE Feeder Breaker is CLOSED <ul style="list-style-type: none"><li>• <input type="checkbox"/> Channel "A" - VBDP-3 Bkr. #17</li><li>• <input type="checkbox"/> Channel "B" - VBDP-4 Bkr. #17</li><li>• <input type="checkbox"/> Channel "C" - VBDP-5 Bkr. #17</li><li>• <input type="checkbox"/> Channel "D" - VBDP-6 Bkr. #17</li></ul> 2. <input type="checkbox"/> VERIFY "Power Available" lamp on "SYSTEM AC POWER" breaker is LIT
<u>          </u> Initial/Date	
4.7.3 CLOSE affected RPS Channel "SYSTEM AC POWER" breaker	• <input type="checkbox"/> VERIFY "Power On" lamp on "SYSTEM AC POWER" breaker is LIT
<u>          </u> Initial/Date	
4.7.4 ENSURE RPS cabinet fans are OPERATING	1. <input type="checkbox"/> TURN ON both System Fan Breakers 2. <input type="checkbox"/> ENSURE fan lamps are LIT
<u>          </u> Initial/Date	

**4.7 Restoration of RPS Channel Power (Continuous)**

ACTION	DETAILS
4.7.5 CLOSE affected RPS Channel ± 15v power supply breakers	1. CLOSE the following power supply breakers: <ul style="list-style-type: none"> <li>• <input type="checkbox"/> "PS-(channel) 1" + 15V Power Supply</li> <li>• <input type="checkbox"/> "PS-(channel) 2" - 15V Power Supply</li> </ul>
	_____ Initial/Date

**NOTE**

The following step will restore power to the affected RPS Channel.

4.7.6 REPOWER affected RPS Channel	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> CLOSE "SYSTEM DC POWER" Breaker</li> </ul>
	_____ Initial/Date

4.7.7 RESET affected RPS component power supplies	1. DEPRESS RESET toggle switch for the following power supplies: <p><u>Channel "A"</u></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> NI-1 Detector Power Supply (will not energize &gt;10%)</li> <li>• <input type="checkbox"/> NI-5 Detector Power Supply</li> <li>• <input type="checkbox"/> Contact Monitor P.S.</li> </ul> <p><u>Channel "B"</u></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> NI-2 Detector Power Supply (will not energize &gt;10%)</li> <li>• <input type="checkbox"/> NI-6 Detector Power Supply</li> <li>• <input type="checkbox"/> Contact Monitor P.S.</li> </ul> <p><u>Channel "C"</u></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> NI-3 Aux Power Supply</li> <li>• <input type="checkbox"/> NI-3 Detector Power Supply</li> <li>• <input type="checkbox"/> NI-7 Detector Power Supply</li> <li>• <input type="checkbox"/> Contact Monitor P.S.</li> </ul> <p><u>Channel "D"</u></p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> NI-4 Aux Power Supply</li> <li>• <input type="checkbox"/> NI-4 Detector Power Supply</li> <li>• <input type="checkbox"/> NI-8 Detector Power Supply</li> <li>• <input type="checkbox"/> Contact Monitor P.S.</li> </ul>
	_____ Initial/Date

4.7 Restoration of RPS Channel Power (Continuous)

	ACTION	DETAILS
4.7.8	<p>IF RPS "A" is being powered,  <u>THEN ENSURE RESET</u> all TRIPPED            bistables listed in DETAILS:</p> <ol style="list-style-type: none"> <li>1. ___ DEPRESS OUTPUT STATE                 RESET toggle switch</li> <li>2. ___ VERIFY OUTPUT STATE lamp                 is DIM</li> <li>3. ___ DEPRESS OUTPUT MEMORY                 RESET toggle switch</li> <li>4. ___ VERIFY OUTPUT MEMORY                 lamp is DIM</li> </ol>	<p><u>NI &amp; P Cabinets #A1 and A2</u></p> <ul style="list-style-type: none"> <li>• ___ SUR ROD WITHDRAWAL INHIBIT</li> <li>• ___ PWR/PUMP BISTABLE (will not reset with                 less than 3 RCPs running based on                 Contact Monitor)</li> <li>• ___ PWR/IMBAL/FLOW</li> <li>• ___ HIGH FLUX NI-5</li> <li>• ___ FLUX &gt;10% FP NI-5 (will not reset if                 greater than 10% FP)</li> <li>• ___ MFP TRIP BYPASS (will not reset if &lt; than                 20% FP)</li> <li>• ___ TURBINE TRIP BYPASS (will not reset if                 less than 45% FP)</li> <li>• ___ SHUTDOWN BYPASS (will not reset if                 greater than 1820 psig)</li> <li>• ___ HIGH PRESS. TRIP</li> <li>• ___ LOW RC PRESS (will not reset if less than                 1900 psig)</li> <li>• ___ PRESS/TEMP</li> <li>• ___ HIGH RC TEMP</li> </ul>
<p>_____/_____            Initial/Date</p>		

4.7.9	<p>IF RPS "B" is being powered,  <u>THEN ENSURE RESET</u> all TRIPPED            bistables listed in DETAILS:</p> <ol style="list-style-type: none"> <li>1. ___ DEPRESS OUTPUT STATE                 RESET toggle switch</li> <li>2. ___ VERIFY OUTPUT STATE lamp                 is DIM</li> <li>3. ___ DEPRESS OUTPUT MEMORY                 RESET toggle switch</li> <li>4. ___ VERIFY OUTPUT MEMORY                 lamp is DIM</li> </ol>	<p><u>NI &amp; P Cabinets #B1 and B2</u></p> <ul style="list-style-type: none"> <li>• ___ SUR ROD WITHDRAWAL INHIBIT</li> <li>• ___ PWR/PUMP BISTABLE (will not reset with                 less than 3 RCPs running based on                 Contact Monitor)</li> <li>• ___ PWR/IMBAL/FLOW TRIP</li> <li>• ___ HIGH FLUX NI-6</li> <li>• ___ FLUX &gt;10% FP NI-6 (will not reset if                 greater than 10% FP)</li> <li>• ___ SHUTDOWN BYPASS (will not reset if                 greater than 1820 psig)</li> <li>• ___ HIGH RC PRESS</li> <li>• ___ LOW RC PRESS (will not reset if less than                 1900 psig)</li> <li>• ___ PRESS/TEMP</li> <li>• ___ HIGH RC TEMP.</li> <li>• ___ MFP TRIP BYPASS (will not reset if less                 than 20% FP)</li> <li>• ___ TURBINE TRIP BYPASS (will not reset if                 less than 45% FP)</li> </ul>
<p>_____/_____            Initial/Date</p>		

## 4.7 Restoration of RPS Channel Power (Continuous)

ACTION	DETAILS
<p>4.7.10 IF RPS "C" is being powered, THEN ENSURE RESET all TRIPPED bistables listed in DETAILS:</p> <ol style="list-style-type: none"> <li>1. ___ DEPRESS OUTPUT STATE RESET toggle switch</li> <li>2. ___ VERIFY OUTPUT STATE lamp is DIM</li> <li>3. ___ DEPRESS OUTPUT MEMORY RESET toggle switch</li> <li>4. ___ VERIFY OUTPUT MEMORY lamp is DIM</li> </ol>	<p><u>NI &amp; P Cabinets #C1 and C2</u></p> <ul style="list-style-type: none"> <li>• ___ SUR BYPASS NI-3 (will not reset if greater than 10% FP)</li> <li>• ___ SUR OUT INHIBIT NI-3</li> <li>• ___ PWR/PUMP BISTABLE (will not reset with less than 3 RCPs running based on Contact Monitor)</li> <li>• ___ PWR/IMBAL/FLOW TRIP</li> <li>• ___ HIGH FLUX TRIP NI-7</li> <li>• ___ FLUX &gt;10% FP NI-7 (will not reset if greater than 10% FP)</li> <li>• ___ SHUTDOWN BYPASS (will not reset if greater than 1820 psig)</li> <li>• ___ HIGH RC PRESS</li> <li>• ___ LOW RC PRESS (will not reset if less than 1900 psig)</li> <li>• ___ PRESS/TEMP</li> <li>• ___ HIGH RC TEMP</li> <li>• ___ MFP TRIP BYPASS (will not reset if less than 20% FP)</li> <li>• ___ TURBINE TRIP BYPASS (will not reset if less than 45% FP)</li> </ul>

\_\_\_\_\_  
Initial/Date

<p>4.7.11 IF RPS "D" is being powered, THEN ENSURE RESET all TRIPPED bistables listed in DETAILS:</p> <ol style="list-style-type: none"> <li>1. ___ DEPRESS OUTPUT STATE RESET toggle switch</li> <li>2. ___ VERIFY OUTPUT STATE lamp is DIM</li> <li>3. ___ DEPRESS OUTPUT MEMORY RESET toggle switch</li> <li>4. ___ VERIFY OUTPUT MEMORY lamp is DIM</li> </ol>	<p><u>NI &amp; P Cabinets #D1 and D2</u></p> <ul style="list-style-type: none"> <li>• ___ SUR BYPASS NI-4 (will not reset if greater than 10% FP)</li> <li>• ___ SUR ROD WITHDRAWAL INHIBIT</li> <li>• ___ PWR/PUMP BISTABLE (will not reset with less than 3 RCPs running based on Contact Monitor)</li> <li>• ___ PWR/IMBAL/FLOW TRIP</li> <li>• ___ HIGH FLUX TRIP NI-8</li> <li>• ___ FLUX &gt;10% FP NI-8 (will not reset if greater than 10% FP)</li> <li>• ___ SHUTDOWN BYPASS (will not reset if greater than 1820 psig)</li> <li>• ___ HIGH RC PRESS</li> <li>• ___ LOW RC PRESS (will not reset if less than 1900 psig)</li> <li>• ___ PRESS/TEMP</li> <li>• ___ HIGH RC TEMP</li> <li>• ___ MFP TRIP BYPASS (will not reset if less than 20% FP)</li> <li>• ___ TURBINE TRIP BYPASS (will not reset if less than 45% FP)</li> </ul>
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\_\_\_\_\_  
Initial/Date



**4.7 Restoration of RPS Channel Power (Continuous)**

ACTION	DETAILS
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**NOTE**

Trip Reset will remove the 125# Bias applied to the Turbine Bypass valves, if applicable.

**NOTE**

Local closure of CRD Breakers will be required unless all Control Rods are fully inserted.

4.7.15	CLOSE associated CRD Breakers	<ol style="list-style-type: none"> <li>1. ___ DEPRESS the TRIP RESET P/B</li> <li>2. ___ DEPRESS the FAULT RESET P/B</li> <li>3. ___ ENSURE CLOSED any open CRD Breakers               <ul style="list-style-type: none"> <li>• ___ A Breaker</li> <li>• ___ B Breaker</li> <li>• ___ CB1 Breaker (C Bkr)</li> <li>• ___ CB2 Breaker (C Bkr)</li> <li>• ___ CB3 Breaker (D Bkr)</li> <li>• ___ CB4 Breaker (D Bkr)</li> </ul> </li> <li>4. ___ VERIFY CRD BREAKER OPEN and CRD CONTROL FAULT annunciator alarms are CLEAR</li> </ol>
		<div style="text-align: center;">/</div> Initial/Date

4.7.16	VERIFY all associated alarms are CLEAR	<ul style="list-style-type: none"> <li>• ___ Local breaker flags indicate CLOSED</li> <li>• ___ Annunciator window J-5-6 CLEAR</li> <li>• ___ Event points 1982, 1983, 1984, 1985 are all CLEAR</li> <li>• ___ CRD Control Fault (J-3-5) event point 1237 CLEAR</li> <li>• ___ Breaker Trip indications in the RPS cabinet are DIM (on the top of each cabinet and on the RTM)</li> </ul>
		<div style="text-align: center;">/</div> Initial/Date



**4.7 Restoration of RPS Channel Power (Continuous)**

ACTION	DETAILS
4.7.17 IF required to energize any EFIC channels, THEN REFER TO OP-450, Emergency Feedwater System	• ___ Cabinet ENERGIZED  _____ Initial/Date
4.7.18 RESET tripped EFIC	1. ___ DEPRESS both green flashing "TEST/RESULTS/RESET" buttons on EFIC panel 2. ___ ENSURE EFIC ACTUATION alarm is CLEAR  _____ Initial/Date
4.7.19 RESET SASS Transfer and SASS Mismatch Alarms and Modules	• ___ REFER TO OP-501, Reactor Non-Nuclear Instrumentation • ___ RESET SASS transfer • ___ RESET SASS mismatch alarms • ___ RESET SASS modules  _____ Initial/Date

END OF SECTION

**CRYSTAL RIVER UNIT 3  
JPM COVER SHEET**

**SimH (2K5) NRC [NEW] (SIMULATOR)**

**SAFETY FUNCTION 9**

**ALTERNATE PATH**

**RESPOND TO A WASTE GAS HEADER LEAK**

PREPARED/REVIEWED BY: Alan Kennedy

Date: 7-18-05

VALIDATED BY: Andy Barnes

Date: 7-18-05

APPROVAL BY: Mark Van Sicklen  
(Nuclear Training Supervisor)

Date: 7-18-05

ATTACHMENT 7  
SIMULATOR JOB PERFORMANCE MEASURE

**Task:** Perform the actions specified for RM-A2 high alarm.

**Alternate Path:** Yes

**JPM #:** SimH (2K5) NRC [NEW]

**K/A Rating/Importance:** 060AA2.05 RO 3.7 SRO 4.2

**Task Number:**

**Position:**  SRO ONLY  RO/SRO  NLO/RO/SRO

**Task Standard:** Using AP-250 perform the actions specified for RM-A2 high alarm.

**Preferred Evaluation Location:**

**Preferred Evaluation Method**

Simulator  X  Plant \_\_\_\_\_ Admin \_\_\_\_\_

Perform  X  Simulate \_\_\_\_\_

**References:** AP-250, Rev. 15

**Validation Time:** 15 min

**Time Critical:** No

**Candidate:** \_\_\_\_\_ **Time Started:** \_\_\_\_\_  
Printed Name

**Time Finished:** \_\_\_\_\_

**Performance Rating:** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ **Performance Time:** \_\_\_\_\_

**Examiner:** \_\_\_\_\_  
Printed Name Signature Date

**Comment:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **SIMULATOR OPERATOR SETUP INSTRUCTIONS:**

1. Initialize 100% IC.
2. Start lesson plan # 20 in NRCEXAM lesson plan directory.
3. Execute Setup Step.
4. Freeze simulator when RM-A2 High Alarm annunciates.
5. Notify lead examiner.

OR

6. Initialize 100% IC.
7. Insert the following labels:
  - a. TAAARL2 = MAX
  - b. TVCMXA02 = 3
  - c. TFAAFOP2 = TRUE
  - d. TFC709BR = TRUE
  - e. TFC709BR = FALSE conditional on A7\_A1\_S49\_2
8. Unfreeze the simulator and allow to run until RM-A2 reaches its High Alarm (about 2 minutes)
9. Freeze the simulator and notify lead examiner.

### **SIMULATOR OPERATOR INSTRUCTIONS:**

1. Unfreeze the simulator when directed by examiner.

### **TOOLS / EQUIPMENT / PROCEDURES NEEDED:**

1. Copy of AP-250
2. Ensure Radiation Monitor Setpoint Log is in simulator.

## **READ TO THE OPERATOR**

### **INITIAL CONDITIONS:**

You are the Reactor Operator.  
The plant is in Mode 1.  
RM-A2 "Atmospheric Radiation High" alarm has just been received.  
AP-250 has been entered.

### **INITIATING CUE:**

The Control Room Supervisor has directed you to perform AP-250 starting at Step 3.1.

**STEP 1:**

The guidance of the AP would normally be read by the CRS. For the purpose of this JPM a copy of AP-250 will be given to the operator.

**STANDARD:**

Candidate reviews the status of the plant and locates a copy of AP-250.

**EXAMINER'S CUE:**

**Examiner will provide operator with a copy of AP-250.**

**EXAMINER'S NOTE:**

**Notify simulator operator when candidate is ready to perform the JPM.**

**COMMENTS:**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

**STEP 2:** (step 3.1)

Ensure Auto actions of affected radiation monitor(s).

See Table 1.

Stopped:	AHF-30	AHF-10
	AHF-11A	AHF-9A
	AHF-11B	*AHF-9B

**STANDARD:**

1. Candidate will verify the listed fans have stopped (GREEN light ON, RED light OFF)
2. Candidate recognizes AHF-9B is still running.
3. \*Candidate selects the control switch to OFF and verifies GREEN light ON and RED light OFF.
4. Candidate reports failure of AHF-9B to automatically trip to the CRS.

**EXAMINER'S CUE:**

**Examiner acknowledges report of AHF-9B failure to automatically trip.**

**COMMENTS:**

**Critical Step\*  
(fan must be secured to reduce spread of contamination)**

SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

<p><b><u>STEP 3:</u></b> (step 3.2)</p> <p>Notify personnel of entry into AP-250.</p> <p><b><u>STANDARD:</u></b></p> <p>N/A</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b>Inform the candidate that the other operator performed these notifications.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 4:</u></b> (step 3.3)</p> <p>Ensure proper radiation monitor operation.</p> <ol style="list-style-type: none"> <li>1. Ensure radiation monitor is energized.</li> <li>2. Ensure "Alarm Reset Operate Check Source" switch is selected to "OPERATE" position.</li> <li>3. *Ensure high alarm setpoint is set per the release permit or Radiation Monitor Setpoint Log.</li> <li>4. IF radiation monitor is off-scale high, THEN ensure "RANGE" switch is selected to "1M" position.</li> <li>5. Observe trends on other radiation monitors, as applicable.</li> </ol> <p><b><u>STANDARD:</u></b></p> <ol style="list-style-type: none"> <li>1. Candidate ensures radiation monitor is energized.</li> <li>2. Candidate ensures 'Alarm Reset Operate Check Source' switch is selected to "OPERATE" position.</li> <li>3. Candidate ensures high alarm setpoint is set per the Release Permit. Current high alarm setpoint is 1.1E5. Candidate will review release permit and check high alarm setpoint.</li> <li>4. Candidate will ensure "RANGE" switch is selected to "1M" position.</li> <li>5. Candidate observes trends on RM-A01-RIR-1 and verifies that additional radiation monitors are increasing.</li> </ol> <p><b><u>COMMENTS:</u></b></p>	<p><b>Critical Step* (required to ensure valid alarm)</b></p> <p>SAT _____</p> <p>UNSAT _____</p>

<p><b><u>STEP 5:</u></b> (step 3.4)</p> <p>Notify Health Physics and Chemistry of radiation monitor actuation.</p> <p><b><u>STANDARD:</u></b></p> <p>N/A</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b>Inform the candidate that the other operator performed these notifications.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 6:</u></b> (step 3.5)</p> <p>IF alarm is NOT valid, THEN perform corrective actions.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate determines that the alarm is valid and continues in procedure.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 7:</u></b> (step 3.6)</p> <p>Evacuate affected areas, as required.</p> <p><b><u>STANDARD:</u></b></p> <p>N/A</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p><b>Inform the candidate that the other operator performed this step and the Auxiliary Building has been evacuated.</b></p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>



<p><b><u>STEP 8:</u></b> (step 3.7)</p> <p>Stop any activities suspected of causing the radiation monitor actuation and restore systems as required.</p> <p><b><u>STANDARD:</u></b></p> <p>N/A</p> <p><b><u>EXAMINER'S CUE:</u></b></p> <p>Inform the candidate that the other operator performed this step and is evaluating plant activities.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 9:</u></b> (step 3.8)</p> <p>Concurrently perform the appropriate enclosures in this procedure.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate continues to Enclosure 2.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b><u>STEP 10:</u></b> (Enclosure 2, step 2.1)</p> <p>Ensure AHF-34A is stopped.</p> <p><b><u>STANDARD:</u></b></p> <p>Candidate observes Events Recorder point 515 indicates this fan is stopped.</p> <p><b><u>COMMENTS:</u></b></p>	<p>SAT _____</p> <p>UNSAT _____</p>

<p><b>STEP 11:</b> (Enclosure 2, step 2.2)</p> <p>Ensure AHU-3 is stopped.</p> <p><b>STANDARD:</b></p> <p>Candidate observes Events Recorder point 1551 indicates this unit is stopped or observes GREEN light ON and RED light OFF on HVAC panel.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 12:</b> (Enclosure 2, step 2.3)</p> <p>IF AB has NOT been evacuated THEN notify PPO to isolate WG system.</p> <p><b>STANDARD:</b></p> <p>Per the earlier examiner's cue the AB has been evacuated. No actions are required.</p> <p><b>COMMENTS:</b></p>	<p>SAT _____</p> <p>UNSAT _____</p>
<p><b>STEP 13:</b> (Enclosure 2, step 2.4)</p> <p>IF at any time, RM-A2 GAS approaches off-scale high, THEN align RM-A2 LMH valve controller.</p> <ol style="list-style-type: none"> <li>*Select "RM-A2 MID/HI Range Controller" to "AUTO"</li> <li>IF TSC is manned, THEN notify Accident Assessment Team of RM-A2 status.</li> </ol> <p><b>STANDARD:</b></p> <ol style="list-style-type: none"> <li>Candidate verifies RM-A2 is approaching off-scale high and selects the "RM-A2 MID/HI Range Controller" to "AUTO".</li> <li>Candidate requests status of the TSC.</li> </ol> <p><b>EXAMINER'S CUE:</b></p> <p>Inform the candidate that the TSC is not manned and terminate the JPM.</p> <p><b>COMMENTS:</b></p>	<p><b>Critical Step*</b> (accurate radiation readings are required)</p> <p>SAT _____</p> <p>UNSAT _____</p>
<p><b>END OF TASK</b></p>	

## CANDIDATE CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

### **INITIAL CONDITIONS:**

You are the Reactor Operator.

The plant is in Mode 1.

RM-A2 "Atmospheric Radiation High" alarm has just been received.

AP-250 has been entered.

### **INITIATING CUE:**

The Control Room Supervisor has directed you to perform AP-250 starting at Step 3.1.

RMA	REV 15	AP-250
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## RADIATION MONITOR ACTUATION

### 1.0 ENTRY CONDITIONS

IF any of the following Atmospheric Radiation High alarms are actuated:

- RM-A1 GAS
- RM-A2 GAS
- RM-A3
- RM-A4
- RM-A5 GAS
- RM-A5 IODINE

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

#### NOTE

There are no immediate actions for this procedure.

Approved by <u>    Dave Jones for J. Huegel    </u> Date <u>    9/16/03    </u> (SIGNATURE ON FILE)		
AP-250	PAGE 1 of 63	RMA

RMA	REV 15	AP-250
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## RADIATION MONITOR ACTUATION

### 1.0 ENTRY CONDITIONS

IF any of the following Atmospheric Radiation High alarms are actuated:

- RM-A1 GAS
- RM-A2 GAS
- RM-A3
- RM-A4
- RM-A5 GAS
- RM-A5 IODINE

THEN use this procedure.

### 2.0 IMMEDIATE ACTIONS

**NOTE**

**There are no immediate actions for this procedure.**

Approved by <u>    Dave Jones for J. Huegel    </u> Date <u>    9/16/03    </u> (SIGNATURE ON FILE)		
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### 3.0 FOLLOW-UP ACTIONS

#### ACTIONS

#### DETAILS

3.1 \_\_\_ Ensure Auto actions of affected radiation monitor(s).

See Table 1

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3.2 \_\_\_ Notify personnel of entry into AP-250

- \_\_\_ PA announcement
- \_\_\_ STA
- \_\_\_ Plant Operators
- \_\_\_ SSO (evaluate plant conditions for potential entry into the Emergency Plan)

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.3 \_\_\_ Ensure proper radiation monitor operation.

1 \_\_\_ Ensure radiation monitor is energized.

2 \_\_\_ Ensure "ALARM RESET OPERATE CHECK SOURCE" switch is selected to "OPERATE" position.

3 Ensure high alarm setpoint is set per the applicable requirements:

\_\_\_ Release Permit

\_\_\_ Radiation Monitor Setpoint Log

4 \_\_\_ IF radiation monitor is off-scale high,  
THEN ensure "RANGE" switch is selected to "1M" position.

5 \_\_\_ Observe trends on other radiation monitors, as applicable.

---

3.4 \_\_\_ Notify Health Physics and Chemistry of radiation monitor actuation.

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.5 \_\_\_ IF alarm is NOT valid,  
THEN perform corrective  
actions.

1 \_\_\_ Depress "HORN SILENCE" push  
button for affected radiation  
monitor.

2 \_\_\_ IF radiation level is below  
high setpoint,  
AND radiation monitor is  
operable,  
THEN GO TO the appropriate  
enclosure in this procedure:

Radiation Monitor	Enclosure
___ RM-A1 GAS	Enclosure 1, RM-A1 Actions, Step 1.8
___ RM-A2 GAS	Enclosure 2, RM-A2 Actions, Step 2.6
___ RM-A3	Enclosure 3, RM-A3 Actions, Step 3.2
___ RM-A4	Enclosure 4, RM-A4 Actions, Step 4.1
___ RM-A5 GAS/ IODINE	Enclosure 5, RM-A5 Actions, Step 5.6

3 \_\_\_ Initiate repair efforts as  
required.

4 \_\_\_ **EXIT** this procedure.



### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.6 \_\_\_ Evacuate affected areas, as required.

1 Determine evacuation requirements of affected area based on the following:

\_\_\_ Radiation levels

\_\_\_ Location

\_\_\_ Work being performed

\_\_\_ Health Physics input

2 \_\_\_ IF evacuation is required, THEN perform the following in order:

\_\_\_ Depress appropriate evacuation alarm push button.

\_\_\_ Notify plant personnel over PA.

\_\_\_ Repeat PA announcement.

---

3.7 \_\_\_ Stop any activities suspected of causing the radiation monitor actuation and restore systems as required.

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

#### ACTIONS

#### DETAILS

3.8 \_\_\_ **CONCURRENTLY PERFORM**  
the appropriate enclosures  
in this procedure.

Radiation Monitor	Enclosure
___ RM-A1 GAS	Enclosure 1, RM-A1 Actions, Step 1.1
___ RM-A2 GAS	Enclosure 2, RM-A2 Actions, Step 2.1
___ RM-A3	Enclosure 3, RM-A3 Actions, Step 3.1
___ RM-A4	Enclosure 4, RM-A4 Actions, Step 4.1
___ RM-A5 GAS/IODINE	Enclosure 5, RM-A5 Actions, Step 5.1

### 3.0 FOLLOW-UP ACTIONS (CONT'D)

	<u>ACTIONS</u>	<u>DETAILS</u>
3.9	<input type="checkbox"/> <u>WHEN</u> all the following are reset:  <input type="checkbox"/> RM-A1 GAS <input type="checkbox"/> RM-A2 GAS <input type="checkbox"/> RM-A3 <input type="checkbox"/> RM-A4 <input type="checkbox"/> RM-A5 GAS <input type="checkbox"/> RM-A5 IODINE  <u>THEN</u> restore ventilation.	1 Ensure 1 CC exhaust fan is running:  <input type="checkbox"/> AHF-20A <input type="checkbox"/> AHF-20B  2 <input type="checkbox"/> Start AHF-30  3 <input type="checkbox"/> Notify Health Physics and Chemistry of AB ventilation restoration.  4 Ensure both AB supply fans are running:  <input type="checkbox"/> AHF-11A <input type="checkbox"/> AHF-11B  5 <input type="checkbox"/> Start AHF-10

---

3.10  **EXIT** this procedure.

## 4.0 ENCLOSURE 2 RM-A2 ACTIONS

### ACTIONS

### DETAILS

2.1 \_\_\_ Ensure AHF-34A is stopped.

- Observe Events Recorder point 515 "HOT MACHINE SHOP WELDING HOOD EXH FAN" in "TRIP".
- 

2.2 \_\_\_ Ensure AHU-3 is stopped.

\_\_\_ IF AHU-3 is NOT stopped, THEN notify SPO to stop AHU-3

- MACHINE SHOP MCC 3-3D "AHU-3 HOT MACHINE SHOP COOLING UNIT FAN" (119 ft Cold Machine Shop mezzanine)

4.0 ENCLOSURE 2 RM-A2 ACTIONS (CONT'D)

ACTIONS

DETAILS

CAUTION

If WGDTs are leaking into AB, hydrogen concentrations may reach explosive levels.

2.3 \_\_\_ IF AB has NOT been evacuated, THEN notify PPO to isolate WG system.

- Ensure WGDT outlet valves are closed (95 ft AB Rad Waste or Remote Panel):

\_\_\_ WDV-436

\_\_\_ WDV-437

\_\_\_ WDV-438

- Ensure WG header to vent valves are closed:

\_\_\_ WDV-489

"SW SURGE TANK VENT TO WG ISO"  
(95 ft AB Sea Water Room above DCT-1B)

\_\_\_ WDV-337

"ECST VENT TO WG ISO"  
(143 ft AB behind WDT-10A)

2.4 \_\_\_ IF at any time, RM-A2 GAS approaches off-scale high, THEN align RM-A2 LMH valve controller.

1 \_\_\_ Select "RM-A2 MID/HI RANGE CONTROLLER" to "AUTO".

2 \_\_\_ IF TSC is manned, THEN notify Accident Assessment Team of RM-A2 status.

#### 4.0 ENCLOSURE 2 RM-A2 ACTIONS (CONT'D)

##### ACTIONS

##### DETAILS

2.5 \_\_\_ IF at any time, all the following exist:

\_\_\_ "RM-A2 MID/HI RANGE CONTROLLER" selected to "AUTO"

\_\_\_ RM-A2 mid range detector indicates < 0.2 mr/hr

THEN select "RM-A2 MID/HI RANGE CONTROLLER" to "MAN".

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2.6 \_\_\_ WHEN radiation monitor can be reset, THEN reset monitor.

1 \_\_\_ Select RM-A2 GAS to "ALARM RESET".

2 \_\_\_ Ensure RM-A2 "HORN SILENCE" is reset.

**4.0 ENCLOSURE 2 RM-A2 ACTIONS (CONT'D)**

ACTIONS

DETAILS

2.7 \_\_\_ Ensure 1 train of AB exhaust fans are running.

A Train	B Train
___ AHF-14A	___ AHF-14B
___ AHF-14C	___ AHF-14D

2.8 \_\_\_ Start 1 penetration cooling fan.

___ AHF-9A
___ AHF-9B

2.9 \_\_\_ IF AHU-3 restart is desired, THEN notify SPO to start AHU-3

- MACHINE SHOP MCC 3-3D  
"AHU-3 HOT MACHINE SHOP COOLING UNIT FAN"  
(119 ft Cold Machine Shop mezzanine)

2.10 \_\_\_ IF AHF-34A restart is desired, THEN start AHF-34A

- Notify PPO to start AHF-34A  
"HOT MACH. SHOP WELD. HOOD EXH. FAN"  
(119 ft AB Hot Machine Shop).

2.11 \_\_\_ **EXIT** this enclosure.

Table 1:  
RM Auto Actions

RM-A2 GAS		
Stopped:	___ AHF-30	___ AHF-10
	___ AHF-11A	___ AHF-9A
	___ AHF-11B	___ AHF-9B
RM-A3		
Stopped:	___ AHF-11A	___ AHF-11B
RM-A4		
Stopped:	___ AHF-10	
RM-A5 GAS/IODINE		
Closed:	___ AHD-12	___ AHD-2E
	___ AHD-12D	___ AHD-1C
	___ AHD-2C	___ AHD-1E
Open:	___ AHD-3	
Stopped:	___ AHF-19A	___ AHF-19B
	___ AHF-17A	___ AHF-17B