Final Submittal

FINAL ADMIN JPMS

CRYSTAL RIVER FEBRUARY 2008 EXAM ADMIN RETAKE

05000302/2008-301

FEBRUARY 14, 2008

FINAL

CRYSTAL RIVER UNIT 3

.

JPM COVER SHEET

JPM #RC1 NRC 2008 (ADMIN)

SRO Only

DETERMINE EXTERNAL REPORTING REQUIREMENTS

| PREPARED/REVIEWED | Date: <u>1/31/08</u> | |
|-------------------|--|----------------------|
| VALIDATED BY: | Wunderly, Vansicklen, Morris | Date: <u>1/31/08</u> |
| APPROVAL BY: | Mark Vansicklen (Nuclear Training Supervisor) | Date: <u>1/31/08</u> |
| CONCURRED BY: | Blair Wunderly (Operations Representative) | Date: <u>1/31/08</u> |

Validation is not required for minor enhancements, procedure revisions that do not affect the JPM or individual step changes that do not affect the flow of the JPM.

Operations concurrence is required for new JPMs and changes that affect the flow, critical steps or time critical steps of the JPM. Operations concurrence is not required for changes that are required due to a procedure revision.

| JPM #: RC1 NRC 2008 Remedial | |
|--|---------------------------------------|
| Task: Determine External Reporting Requirements | |
| Alternate Path: YES NO | |
| PRA Top Critical Action: YES XO | |
| Safety Function: NA | |
| K/A Rating/Importance: G 2.3.1 SRO 3.0 | |
| Task Number: 1190101035 SRO | |
| Position: SRO ONLY RO/SRO | NLO/RO/SRO |
| Task Standard: Determine External Reporting Requ | irements per CP-151. |
| Preferred Evaluation Location: | Preferred Evaluation Method |
| | |
| <u>References:</u> | |
| CP-151, Rev. 19 HPP-218, Rev. 5 10CFR | |
| Validation Time: 15 minutes | Time Critical: 🗌 YES 🔀 NO |
| Candidate: Printed Name | <u>Time Started:</u> |
| Performance Rating: SAT UNSAT | Performance Time: |
| Examiner: Printed Name Comment: | Signature Date |
| | · · · · · · · · · · · · · · · · · · · |

• 1

SIMULATOR OPERATOR SETUP INSTRUCTIONS:

1. NA

.

,

SIMULATOR OPERATOR INSTRUCTIONS:

1. NA

TOOLS / EQUIPMENT / PROCEDURES NEEDED:

Copies of CP-151, Rev. 19 Copies of HPP-218, Rev, 5 Copies of 10CFR20 (Rev. 2006 verified identical to 2007 version) Both 10CFR books

READ TO THE CANDIDATE

INITIAL CONDITIONS:

,

.

You are the Superintendent, Shift Operations.

The plant is at 100% rated thermal power.

- A Health Physics Supervisor has called the Control Room reporting a source is missing.
- The missing source has a concentration of 240,000 μCi of Cs-136.

INITIATING CUE:

You are requested to determine if any external reporting requirements to outside regulatory agencies apply. If so document your findings below. (Include to whom any report(s) due and imposed time limits.)

Start Time:_____

| <u>STEP 1</u> : | N/A |
|--|-----|
| Obtain a copy of CP-151 | |
| STANDARD: | |
| Candidate obtains a copy of CP-151. | |
| EXAMINER NOTE: | |
| Provide candidate with a copy of CP-151. | |
| COMMENTS: | |
| | |

s •

| <u>STEP 2</u> : | Critical Step |
|--|---|
| Using supplied reference material, candidate determines reportability. | Basis: Fed. |
| STANDARD: | Regulation requires notification. |
| Using CP-151, Enclosure 2, Section V.B. (Loss of radioactive material (10CFR20.1001-20.2401) and 10CFR20 App. C, determines that immediate notification shall be made to the NRC Operations Center. (CS) | SAT |
| A with a fall way are art must be addressited within 20 days of the work of | UNSAT |
| A written follow-up report must be submitted within 30 days of the verbal notification. This report will be submitted by non-Operations personnel (Licensing department). | |
| EXAMINER NOTE: | |
| When requested, provide candidate with a copy of 10CFR. Operator will need to ascertain the value in App. C of Part 20 for Cs-136 to determine if notification is required. See Attached reference for Examiner. | |
| Immediate and immediately imply as soon as practicable after discovery of the associated item (normally within 1 hour of occurrence). | |
| EXAMINER NOTE: | |
| 10CFR73.71 is only applicable to a loss of any shipment of SNM or spent fuel and is not relevant to the completion of this JPM. | |
| EXAMINER NOTE: | |
| The only CRITICAL portion of this JPM is to determine that an immediate report to the NRC is required. | |
| COMMENTS: | |
| | |
| TERMINATION CRITERIA: | |
| Immediate notification to NRC determined. | |
| END OF TASK | |

Stop Time:_____

۰**،**

ANSWER KEY **EXAMINER'S CFR REFERENCE**

PART 20 APPENDIX "C" Cs-136 limit requiring labeling is 10 µCi's (Page 413 of CFR, Rev. 2006)

1000 x 10 µCi's = 10,000 µCi's (Amount lost was 240,000 µCi's)

Sec. 10CFR20.2201 Reports of theft or loss of licensed material.

- (a) <u>Telephone reports</u>.
 - (1) Each licensee shall report by telephone as follows:
 - (i) Immediately after its occurrence becomes known to the licensee, any lost, stolen, or missing licensed material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in appendix C to part 20 under such circumstances that it appears to the licensee that an exposure could result to persons in unrestricted areas; or
 - (ii) Within 30 days after the occurrence of any lost, stolen, or missing licensed material becomes known to the licensee, all licensed material in a quantity greater than 10 times the quantity specified in appendix C to part 20 that is still missing at this time.
 - (2) Reports must be made as follows:
 - (i) Licensees having an installed Emergency Notification System shall make the reports to the NRC Operations Center in accordance with Sec. 50.72 of this chapter, and
 - (ii) All other licensees shall make reports by telephone to the NRC Operations Center (301-816-5100).

(b) Written reports.

(1) Each licensee required to make a report under paragraph (a) of this section shall, within 30 days after making the telephone report, make a written report setting forth the following information:

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

You are the Superintendent, Shift Operations.

The plant is at 100% rated thermal power.

- A Health Physics Supervisor has called the Control Room reporting a source is missing.
- The missing source has a concentration of 240,000 μCi of Cs-136.

INITIATING CUE:

You are requested to determine if any external reporting requirements to outside regulatory agencies apply. If so document your findings below. (Include to whom any report(s) due and imposed time limits.)

CRYSTAL RIVER UNIT 3 JPM COVER SHEET

s i

. .

JPM #EC1 NRC 2008 (ADMIN)

RO and **SRO**

PERFORM RCS WATER INVENTORY BALANCE PER SP-317

| PREPARED/REVIEWED | BY:Alan Kennedy | Date: _ | 02/04/08 |
|-------------------|-------------------------------|---------|----------|
| | | | |
| VALIDATED BY: | Virgin, Bracewell, Morris | _ Date: | 02/04/08 |
| | | | |
| APPROVAL BY: | Mark Vansicklen | _ Date: | 02/04/08 |
| | (Nuclear Training Supervisor) | | |
| CONCURRED BY: | Blair Wunderly | Date: | 02/04/08 |
| | (Operations Representative) | | |

Validation is not required for minor enhancements, procedure revisions that do not affect the JPM or individual step changes that do not affect the flow of the JPM.

Operations concurrence is required for new JPMs and changes that affect the flow, critical steps or time critical steps of the JPM. Operations concurrence is not required for changes that are required due to a procedure revision.

JPM #: EC1 NRC 2008 Remedial [Mod Bank #283]

۲

1

<u>**Task</u>:** RO - Perform a Reactor Coolant System inventory balance SRO - Perform safety and technical reviews of plant procedures</u>

| Alternate Path: | S 🛛 NO |) | | |
|----------------------------------|--------------------------|----------------|-----------------------|-------------------|
| PRA Top Critical Action: | YES | NO NO | | |
| Safety Function: NA | | | | |
| K/A Rating/Importance: | G2.2.12 | RO 3.0 SRC |) 3.4 | |
| Task Number/Position: | 0020202004 1190101029 | RO SRO | | |
| Position: SRO ONLY | ∕ ⊠RO | /SRO | NLO/RO/SRO | |
| Task Standard: Perform a Ro | eactor Coolan | t System inven | tory balance per SP- | 317. |
| Preferred Evaluation Location | <u>on:</u> | | Preferred Evaluat | <u>ion Method</u> |
| SIM PLANT A | DMIN | | PERFORM | SIMULATE |
| References: | | | | |
| SP-317, Rev 69 | | | | |
| Validation Time : 30 – RO | 33 mir | 1 - SRO | <u>Time Critical:</u> | YES 🖾 NO |
| <u>Candidate:</u> | Printed Name | | <u>Time Start</u> | ed: |
| 1 | | | <u>Time Finis</u> | hed: |
| Performance Rating: | SAT | | <u>Performan</u> | ce Time: |
| Examiner: | | | | |
| Printed Name | | Signat | ure | Date |
| Comment: | | | | |

Tools/Equipment/Procedures Needed:

1. SP-317

4

1

- 2. SRO Only Technical Specifications
- 3. Calculator

READ TO THE OPERATOR

Initial Conditions

You are the Reactor Operator

The current time is 0400 on this date. The plant has been at steady state conditions (100%) for the past 24 hours. Relevant plant data is supplied with this JPM. Plant computer is operable. RM-A12 is inoperable. Manual calculation is required. The CRS has authorized a test interval of 4 hours.

Initiating Cues

Using the data supplied, complete an RC System Water Inventory Balance for the period from 0000 to 0400. Where appropriate, assume that independent reviews have been completed.

Completion of the following satisfies the requirement to inform the Control Room Supervisor of your results.

| Primary-to-Secondary Leakage | gpm |
|------------------------------|-----|
| Identified Leakage | gpm |
| Unidentified Leakage | gpm |
| Controlled Bleed Off | gpm |

SROs only:

Upon completion of the above, evaluate your results and list actions required per Technical Specifications, if any. Include applicable time requirements.

No ITS actions required, or

Per TS _____ (TS number) the actions below must be completed within _____ hours.

| <u>STEP 1</u> : | (step 4.1.1.1) | |
|--|--|--------------|
| Procedure Note: Dumpster readings are not required if RCV-150 is open and RCDT level indication is being used. | | SAT UNSAT |
| | Record the following data on Enclosure 1: Record the instruments selected as sources Start time RCDT Level and Start time Pressurizer Level Tave MUT Level RCS Pressure | |
| STANDARD: | | |
| Data is record | ed on Enclosure 1. | |
| <u>COMMENTS</u> | <u>.</u> | |
| <u>STEP 2</u> : | (step 4.1.1.2) | |
| Determine and | d record individual RCP CBO flow. | UNSAT |
| STANDARD: | | |
| Data is record | ed on Enclosure 1. | |
| <u>COMMENTS</u> | <u>:</u> | |
| <u>STEP 3</u> : | (step 4.1.1.3) | C A T |
| Obtain and rec | cord RCP standpipe flushwater flow rate. | SAI |
| STANDARD: | | |
| Data is record | ed on Enclosure 1. | |
| COMMENTS | <u>.</u> | |
| | | |

1

| <u>STEP 4</u> : (step $4.1.1.4$) | |
|--|---------|
| Record component identified leakage. | |
| STANDARD: | UNSAI |
| Data is recorded on Enclosure 1 | |
| | |
| <u>COMMENTS:</u> | |
| $(TED 5, \dots, (star 4, 1, 1, 5))$ | |
| <u>STEP 5</u> : (step 4.1.1.5) | SAT |
| Obtain Primary to Secondary leakage data and record on Enclosure 1. | LINISAT |
| STANDARD: | |
| Data is recorded on Enclosure 1. Since RM-A12 is inoperable (per cue) chemistry value is used. Conversion from gpd to gpm is required. | |
| COMMENTS: | |
| | |
| <u>STEP 6</u> : (step 4.1.2.1) | SAT |
| Record the following data on Enclosure 1: | SA1 |
| • Stop time | UNSAT |
| RCDT level and stop time RCP Seal leakage if applicable | |
| Pressurizer Level | |
| • Tave | |
| MUT Level RCS Pressure | |
| STANDARD: | |
| Data is recorded on Enclosure 1 | |
| | |
| <u>COMMENTS:</u> | |
| | |

1

1

| <u>STEP 7</u> : (step 4.1.3.1) | SAT |
|--|-------------------------------------|
| Calculate the test run time. | |
| STANDARD: | UNSAT |
| Per the cue the run time is 4 hours (240 minutes) | |
| COMMENTS: | |
| | |
| <u>STEP 8</u> : (step 4.1.3.2) | Critical Step |
| Complete Section B of Enclosure 1. | Basis: |
| STANDARD: | calculations |
| Value must be within $\pm 10\%$ of value listed on attached key. | ensure correct |
| COMMENTS: | Tech Spec actions identified. |
| | SAT |
| | UNSAT |
| <u>STEP 9</u> : (step 4.1.3.3) | δάτ |
| Calculate total seal leakage, if applicable. | |
| STANDARD: | UNSAT |
| Not applicable. RCV-150 open. | |
| COMMENTS: | |
| | |

;

,

| $\underline{\text{STEP 10}}: \qquad (\text{steps 4.1.3.4 thru 4.1.3.7})$ | Critical Step |
|--|-----------------------------|
| Complete Section D of Enclosure 1. | Basis: |
| STANDARD: | Accurate calculations |
| $\frac{1}{1}$ | required to |
| Step D.1 where no error band is allowed. | ensure correct Tech Spec |
| COMMENTS | actions |
| | identified. |
| | SAT |
| | UNSAT |
| <u>STEP 11</u> : (step 4.1.3.8) | Critical Step |
| Total the identified component leakages in Section E of Enclosure 1. | Basis: |
| STANDARD | Accurate calculations |
| | required to |
| Values must be within $\pm 10\%$ of values listed on attached key. | ensure correct Tech Spec |
| COMMENTS: | actions identified |
| | lucintineu. |
| | SAT |
| | UNSAT |
| <u>STEP 12</u> : (step 4.1.3.9) | Critical Step |
| Calculate "RCP Seal Leakage Collection Point" leakage in Section F of Enclosure 1. | Basis: |
| STANDARD: | Accurate calculations |
| Values must be within + 100/ of values listed on attacked loss | required to |
| values must be within $\pm 10\%$ of values listed on attached key. | Tech Spec |
| COMMENTS: | actions identified. |
| | SAT |
| | |
| | UNSAT |

,

,

| <u>STEP 13</u> : (step 4.1.3.10) | Critical Step |
|--|--|
| Calculate "RCS Leakages" in Section G of Enclosure 1. | Basis: Accurate calculations |
| Values must be within $\pm 10\%$ of values listed on attached key. | required to ensure correct Tech Spec |
| <u>COMMENTS:</u> | actions identified. |
| | SAT |
| | UNSAT |
| <u>STEP 14</u> : (step 4.1.3.11) | SAT |
| Record current μ and σ values. | UNSAT |
| STANDARD: | |
| Candidate records data from attached data sheet. | |
| COMMENTS: | |
| | |
| <u>STEP 15</u> : (step 4.1.3.12) | SAT |
| Calculate Unidentified Leakage Limit and record in Step 4.1.3.14 | UNSAT |
| STANDARD: | |
| Candidate calculates limit and records. | |
| COMMENTS: | |
| | |
| <u>STEP 16</u> : (step 4.1.3.13) | SAT |
| Perform an independent review of all calculations on Enclosure 1. | UNSAT |
| STANDARD: | |
| N/A. Per the cue all independent reviews are considered complete. | |
| COMMENTS: | |
| | |

ï

.

| <u>STEP 17</u> : (step $4.1.3.14$) | C A T |
|---|--|
| Verify Acceptance Criteria are met. | |
| STANDARD: | |
| Candidate transfers data from Enclosure 1 to cue sheet. | |
| COMMENTS: | |
| | |
| <u>STEP 18</u> : (step 4.1.3.15 and 4.1.3.16) | SAT |
| If Acceptance Criteria is NOT met, then refer to Section 5.2, Contingencies and INFORM the Control Room Supervisor of the completion and the results of this procedure. | UNSAT |
| STANDARD: | |
| Candidate determines that Acceptance Criteria is NOT met and notifies CRS that ITS 3.4.12 actions apply. | |
| COMMENTS: | |
| | |
| TERMINATION CRITERIA: | |
| Correct leak rate determined. | |
| RO - END OF TASK | |
| | |
| STEP 19: (SRO only) | Critical Step |
| STANDARD: | Basis: Correct |
| SRO candidates should review ITS and determine the required actions and time frames for the calculated results. | required actions must be identified to |
| TS 3.4.12, Condition A – Reduce leakage to within limits in 4 hours. | complete task. |
| | SAT |
| | UNSAT |

TERMINATION CRITERIA:

Correct ITS actions determined.

SRO - END OF TASK

ANSWER KEY

RCS LEAKAGE CALCULATION

min

A. <u>TIME</u>:

- 1) Start date/time / 0000
- 2) Stop date/time / 0400

3) Run time (time difference between A1 and A2)

B. <u>RC DRAIN TANK</u>:

| B.1 | Measurement Sc | Measurement Source (Note 1) | | | | | | |
|------|-------------------------|--|-------------------|---------|-------|------------|--|--|
| B.2 | DVM instrumen | DVM instrument number (otherwise N/A) | | | | | | |
| | DVM calibration | | NA | | | | | |
| | | 1 st period 2 nd period 3 rd period Total | | | | | | |
| B.3 | Start time | 0000 | | | | Clock time | | |
| B.4 | Stop time | 0400 | | | | Clock time | | |
| B.5 | Run time | 240 | | | 240 | Minutes | | |
| B.6 | Stop level | 88.270 | | | | Inches | | |
| B.7 | Start level | 86.268 | | | | Inches | | |
| B.8 | Δ Level | 2.002 | | | 2.002 | Inches | | |
| B.9 | Δ Inventory (Tot | tal Δ Level x 33 | 66.066 | Gallons | | | | |
| B.10 | RCDT rate of ch | ange (Δ Invent | ory / total run t | ime) | 0.275 | gpm | | |

Note 1: USE computer point X368 for leak rates < 4 hrs duration. The DVM may be used if X368 is unavailable.

C. <u>RCP SEALS</u>:

1) CONTROLLED BLEED OFF

- a) Controlled bleed off (gpm)
- b) Total of all pumps (gpm)

2) DUMPSTER FLOWS

- a) Dumpster reading at stop time
- b) Dumpster reading at start time
- c) Dumpster difference (clicks) (C2a minus C2b)
- d) Dumpster conversion (gals/click)
- e) Dumpster flow-rate (C2c x C2d/A3) gpm
- f) Standpipe flush water flowrate (gpm)
- g) RCP seal leakage (C2e minus C2f) gpm
- h) Total RCP seal leakage gpm (SUM C2g values for all 4 RCPs)

| RCP-1A X922 | RCP-1B X923 | RCP-1C X924 | RCP-1D X925 | | | | |
|----------------|----------------|----------------|----------------|--|--|--|--|
| 1.440 | 1.365 | 1.540 | 1.660 | | | | |
| 6.005 | | | | | | | |

240

| RC-134-FZ | RC-135-FZ | RC-136-FZ | RC-137-FZ | | | |
|-----------|-----------|-----------|-----------|--|--|--|
| NR | NR | NR NR | | | | |
| NR | NR | NR | NR | | | |
| NR | NR | NR | NR | | | |
| 0.25 | 0.25 | 0.25 | 0.25 | | | |
| NR | NR | NR | NR | | | |
| 0.05 | 0.05 | 0.05 | 0.05 | | | |
| NR | NR | NR | NR | | | |
| NR | | | | | | |

ANSWER KEY

RCS LEAKAGE CALCULATION

D. <u>**RCS INVENTORY CHANGES:**</u> (If <u>NO</u> change is observed, N/A respective correction factor.)

1) RCS PRESSURE (Computer pt. R762F must be converted from psia to psig)

| a) | Measurement source | R762F |
|----|--|------------|
| b) | Pressure at start time (Round to whole number) | _2146 psig |
| c) | Pressure at stop time (Round to whole number) | _2146 psig |
| d) | Average pressure | _2146psig |

2) PRESSURIZER (USE computer point R874 or RECL-66 for leak rates < 4 hrs in duration)

| a) | Measurement source | R874 / RECL-66 |
|----|--|--------------------------------------|
| b) | Level at start time | <u>222.703</u> in. |
| c) | Level at stop time | ≈ <u>220.710</u> in. |
| d) | Level change (D2b minus D2c) | = <u>1.993</u> in. |
| e) | Correction factor (Round D1d to closest value) | x <u>12.21</u> gal/in. (Enclosure 3) |
| f) | Inventory change (D2d x D2e) | = 24.335 gal. |

 T_{avg} (USE computer point R731 or RECL-16 for leak rates < 4 hrs in duration When Tave < 520° use RECL-18 or RECL-239)

| a) | Measurement source | | <u>R731 / RE</u> | CL-16 | |
|----|--|---|------------------|---------|---------------|
| b) | Temperature at start time | | 579.102 | _°F | |
| c) | Temperature at stop time | ≈ | 579.107 | °F | |
| d) | Temperature change (D3b minus D3c) | = | -0.005 | _°F | |
| e) | Average temperature $([D3b + D3c] \div 2)$ | = | 579.10 | _°F | |
| f) | Correction factor (Based on D3e) | х | 96.51 | _gal/°F | (Enclosure 2) |
| g) | Inventory change (D3d x D3f) | = | -0.483 | _gal. | |

4) MAKE-UP TANK (USE computer point X359 for leak rates < 4 hrs in duration)

| a) Measurement source | X359 |
|---------------------------------|-----------------------------|
| b) Level at start time | <u>88.102</u> in. |
| c) Level at stop time | \approx <u>70.110</u> in. |
| d) Level change (D4b minus D4c) | = <u>17.992</u> in. |
| e) Correction factor | x <u>30.85</u> gal/in. |
| f) Inventory change (D4d x D4e) | = <u>555.053</u> gal. |

5) WATER ADDITIONS OR REMOVALS (Do <u>NOT</u> add or remove inventory for leak rates < 4 hrs in duration)

a) Additions total

| - | F | + | + | + | = | gal. |
|------|--|---|---|---|---|-------|
| | And the second sec | | | | | J |
| | | | | | | |
| | | | | | | |
| | | | | | | |

b) Removals total

_____+ ____+ ____+ _____= ____gal.

6) TOTAL INVENTORY RATE-OF-CHANGE

(D2f minus D3g plus D4f plus D5a minus D5b) / A3

(24.335 - 0.483 + 555.053 + 0 - 0) / 240 = 2.416 gpm

RCS LEAKAGE CALCULATION

E. COMPONENT IDENTIFIED LEAKAGE:

NOTE

To obtain leakage in "gpm", MULTIPY the number of drops per minute by 1.67 x 10^{-5} (0.0000167).

NOTE

Do <u>NOT</u> round the individual component leakages.

| Component | Leakage Rate | | | |
|------------------------------|--------------------|------|-----|------|
| | | gpm | | |
| DHV-4 | 0.00025 | gpm | | |
| MUV-27 | 0.0000835 | gpm | | |
| | | gpm | | |
| | | gpm | | |
| Total component leakage rate | | | 0.0 | _gpm |
| CP SEAL LEAKAGE COLLECTIO | N POINT: [NOCS 040 | 486] | | |

| RB Sump (RCV-150 CLOSED) (otherwise N/A) (RCDT rate of change plus Total RCP seal leakage) (B10 plus C2h) | NA | _gpm |
|--|------|------|
| 2) RC Drain Tank (RCV-150 OPEN) (otherwise N/A) (RCDT rate of change minus Total of RCP standpipe flush water flow-rates) (B10 minus C2f) (B10 minus C2f) | | |
| (C2t = RCP-1A + RCP-1B + RCP-1C + RCP-1D) or Total RCP seal leakage C2h if RCDT level is <u>NOT</u> available | .075 | _gpm |

F. RCP

| ANSWER KEY | RCS LEAKAG | E CALCULATION | ENCLO (Pa | <u>OSURE 1</u> ge 4 of 4) | |
|--|---|-------------------------------------|--------------|------------------------------|------|
| G. RCS LEAKAGES [| [NOCS 000597] | | | | |
| 1) Primary-to-Second (Round to hundred) | dary Leakage dths) | | | 0.07 | _gpm |
| Identified Leakage (Round to hundred any analog instrum | e (E plus F plus G1) dths if <u>only</u> using comput nents) | er points /round to ter | ths if using | <u>0.15</u> | _gpm |
| Unidentified Leak (Round to hundred any analog instrum | age (D6 minus [E plus F dths if <u>only</u> using comput nents) | plus G1]) er points/round to ten | ths if using | <u>2.27</u> | _gpm |
| 4) Controlled Bleed Off (C1b) (Round to hundredths if using computer points/round to tenths if using Enclosure 4, Calculated CBO Flow) | | | | | _gpm |
| Performed By (Start) | | Time: | Date: | | |
| Performed By (Stop) | | Time: | Date: | | |
| Independently Reviewed | 1 By | Time: | Date: | | |

e

~

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Initial Conditions

÷

You are the Reactor Operator

The current time is 0400 on this date. The plant has been at steady state conditions (100%) for the past 24 hours. Relevant plant data is supplied with this JPM. Plant computer is operable. RM-A12 is inoperable. Manual calculation is required. The CRS has authorized a test interval of 4 hours.

Initiating Cues

Using the data supplied, complete an RC System Water Inventory Balance for the period from 0000 to 0400. Where appropriate, assume that independent reviews have been completed.

Completion of the following satisfies the requirement to inform the Control Room Supervisor of your results.

| Primary-to-Secondary Leakage | gpm |
|------------------------------|-----|
| Identified Leakage | gpm |
| Unidentified Leakage | gpm |
| Controlled Bleed Off | gpm |

SROs only:

Upon completion of the above, evaluate your results and list actions required per Technical Specifications, if any. Include applicable time requirements.

No ITS actions required, or

Per TS ______ (TS number) the actions below must be completed within ______ hours.

RCS LEAKAGE DATA SHEET

| | RCDT | PRESSURIZER LEVEL | | MUT |
|------|-----------|-------------------|----------------|-----------|
| TIME | X368 | RC-001-LIR1 | R874 / RECL-66 | X359 |
| 0000 | 86.268 in | 220 in | 222.703 in | 88.102 in |
| 0030 | 86.311 in | 220 in | 222.555 in | 86.303 in |
| 0100 | 86.625 in | 220 in | 221.345 in | 83.522 in |
| 0130 | 87.112 in | 220 in | 220.657 in | 82.445 in |
| 0200 | 87.333 in | 220 in | 221.412 in | 80.189 in |
| 0230 | 87.645 in | 220 in | 222.355 in | 77.726 in |
| 0300 | 87.811 in | 217.5 in | 220.186 in | 75.925 in |
| 0330 | 88.012 in | 217.5 in | 220.512 in | 73.411 in |
| 0400 | 88.270 in | 217.5 in | 220.710 in | 70.110 in |

| RCP | SEALS | CONTROLLED | BLEED OFF |
|-----|-------|------------|------------------|

| TIME | RCP-1A X922 | RCP-1B X923 | RCP-1C X924 | RCP-1D X925 |
|------|-------------|-------------|-------------|-------------|
| 0000 | 1.440 gpm | 1.365 gpm | 1.540 gpm | 1.660 gpm |
| 0030 | 1.481 gpm | 1.334gpm | 1.583 gpm | 1.632 gpm |
| 0100 | 1.432 gpm | 1.399 gpm | 1.544 gpm | 1.677 gpm |
| 0130 | 1.493 gpm | 1.411 gpm | 1.498 gpm | 1.716 gpm |
| 0200 | 1.425 gpm | 1.393 gpm | 1.573 gpm | 1.641 gpm |
| 0230 | 1.437 gpm | 1.344 gpm | 1.544 gpm | 1.685 gpm |
| 0300 | 1.484 gpm | 1.366 gpm | 1.591 gpm | 1.643 gpm |
| 0330 | 1475 gpm | 1.344 gpm | 1.568 gpm | 1.634 gpm |
| 0400 | 1.473 gpm | 1.329 gpm | 1.553 gpm | 1.622 gpm |

| | RCS PARAMETERS COMPONENT LEAKAGE | | | | | ENT LEAKAGE |
|------------------------|----------------------------------|--------------|--------------|---|------------------------------|------------------|
| | T _{avg} | RCS PR | RCS PRESSURE | | DHV-4 15 drops/min | |
| TIME | R731 / | RC-003A-PIR1 | R762F | | MUV 27 | 5 drong/min |
| | RECL-16 | (psig) | (psia) | | IVI U V -27 | 5 010ps/11111 |
| 0000 | 579.102°F | 2150 | 2160.735 | 5 | <u>OTSG</u> | LEAKAGE |
| 0030 | 579.322°F | 2145 | 2155.584 | 4 | 100.8 gpd | (from chemistry) |
| 0100 | 579.415°F | 2145 | 2156.152 | 2 | RCDT INFORMATION | |
| 0130 | 579.222°F | 2150 | 2157.235 | 5 | | |
| 0200 | 579.265°F | 2155 | 2165.698 | 3 | PRESSURE 2 psig & steady | |
| 0230 | 579.125°F | 2160 | 2170.259 |) | RCV-150 | open |
| 0300 | 579.298°F | 2155 | 2165.364 | 1 | Vented to waste gas header | |
| 0330 | 579.312°F | 2150 | 2159.264 | 1 | No leakage thru RCV-8, 9, 10 | |
| 0400 | 579.107°F | 2150 | 2160.715 | 5 | | |
| ADDITIONAL INFORMATION | | | | | | |

1. There were no additions, removals, or samples drawn from the RCS during this period.

2. MUT addition made 45 minutes prior to start of SP.

3. RCDT pumped down 45 minutes prior to start of SP.

4. Standpipe flush water = 0.05 gpm/pump

5. Current μ value is 0.12 gpm.

6. Current σ value is 0.03 gpm

7. Chemistry notified of SP-317 performance starting at 0000.

CRYSTAL RIVER UNIT 3 JPM COVER SHEET

*

1

JPM #CO1 NRC 2008 (ADMIN)

RO

CALCULATE SDM WITH A DROPPED CONTROL ROD

| PREPARED/REVIEWED B | Y: <u>Alan Kennedy</u> | Date: | 01-31-08 |
|---------------------|-------------------------------|-------|----------|
| | | | |
| VALIDATED BY: | Bracewell, Virgin, Morris | Date: | 01/31/08 |
| | | | |
| APPROVAL BY: | Mark Vansicklen | Date: | 01/31/08 |
| | (Nuclear Training Supervisor) | | |
| CONCURRED BY: | Blair Wunderly | Date: | 01/31/08 |
| | (Operations Representative) | | |

Validation is not required for minor enhancements, procedure revisions that do not affect the JPM or individual step changes that do not affect the flow of the JPM.

Operations concurrence is required for new JPMs and changes that affect the flow, critical steps or time critical steps of the JPM. Operations concurrence is not required for changes that are required due to a procedure revision.

| <u>JPM #:</u> CO1 NRC 2 | 008 Remedial | | | |
|---|----------------------|-----------------|---------------------------------------|-------------------------|
| Task: Perform a SD | M calculation. | | | |
| Alternate Path: | | 0 | | |
| <u>PRA Top Critical A</u> | ction: YES | NO NO | | |
| Safety Function: | NA | | | |
| K/A Rating/Importa | ance: G2.1.7 RO | 3.7 SRO 4 | .4 | |
| <u>Task Number:</u> | 1150202005 - RO | 1190201006 - | SRO | |
| Position: | SRO ONLY | RO/SRO | NLO/R | O/SRO |
| Task Standard: Det | termine SDM with a d | ropped rod usin | g SP-421, Reactivit | y Balance Calculations. |
| Preferred Evaluatio | n Location: | | Preferred Evalua | tion Method |
| SIM PLAN | NT 🛛 ADMIN | | PERFORM | SIMULATE |
| References: | | | | |
| ITS 3.1.4, SP-421, Re OP-103C, Rev. 30 | ev. 58 | | | |
| Validation Time: 20 |) minutes | | Time Critical: |] YES 🖂 NO |
| Candidate: | Printed Name | | _ <u>Time Start</u> | |
| Performance Rating | <u>::</u> 🗌 SAT 🗌 UI | NSAT | <u>Time Finis</u> <u>Performan</u> | hed: |
| Examiner: | Printed Name | | Signature | Date |
| <u></u> | | | | |

ş 5

SIMULATOR OPERATOR SETUP INSTRUCTIONS

1. None

а () (

SIMULATOR OPERATOR INSTRUCTIONS

1. None

TOOLS/EQUIPMENT/PROCEDURES NEEDED

1. Consumable copies of:

SP-421, Rev 58 OP-103C, Rev 30

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 fully into the core.
The actions of AP-545, Plant Runback, have been completed up to Step 3.42, verification of adequate SDM.
RCS boron is 950 ppmB.
210 EFPD.
Boron-10 atom percent is 19.8.
RCS temperature is 579° F.
Group 8 is at 100% withdrawn.
Xenon value from current Saxon is -2.15% Δ k/k.

INITIATING CUES:

The Control Room Supervisor has directed you to verify if adequate SDM exists using the Xenon value from the current Saxon. Perform SP-421, Reactivity Balance Calculations. Enter SDM value below and indicate whether or not SDM is acceptable.

SDM value:

SDM is acceptable

SDM is **NOT** acceptable

TIME START:_____

| <u>STEP 1</u> : | |
|---|-------|
| Locate procedures. | SAT |
| STANDARD: | UNSAT |
| Candidate obtains a copy of SP-421 and OP-103C. | |
| EXAMINER NOTE: | |
| Provide candidate with a copy of SP-421 and OP-103C. | |
| COMMENTS: | |
| | |
| <u>STEP 2</u> : | SAT |
| Determine correct enclosure to use. | |
| STANDARD: | UNSA1 |
| Candidate determines that Enclosure 1B, One Hour Misaligned Rod SDM Calculation, is the enclosure to be used per Step 3.2.3 and 4.1.1. | |
| EXAMINER NOTE: | |
| 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. | |
| COMMENTS: | |
| | |
| STEP 3: Step 1 (SP-421, Enclosure 1B) | SAT |
| Enter core burnup. | |
| STANDARD: | UNSAI |
| Candidate accurately transfers data from Cue Sheet to enclosure. | |
| COMMENTS: | |
| | |

,

. .

٠

| <u>STEP 4</u> : | Step 2 (SP-421, Enclosure 1B) | Critical Step |
|---------------------------------|--|--|
| Boron Reactiv | vity | Basis: |
| 1. | Enter RCS boron concentration (Cue Sheet) | Accurate curve selection and calculation |
| 2. | Enter B-10 atom percent (Cue Sheet) | required to |
| 3. | Calculate B-10 adjusted value | correct SDM. |
| 4. | Enter RCS temperature (Cue Sheet) | SAT |
| 5. | Use Curve 18 to determine boron concentration required for shutdown margin. (CS) <i>Required band is 1250 to 1270 ppmB. Based on curve readability. One-half division on either side of curve intersection.</i> | UNSAT |
| 6. | Use Curve 3 to determine differential boron worth. (CS) Required band is 0.74 to 0.78 % delta k/k/100 ppm. Based on curve readability. One-half division on either side of curve intersection. | |
| 7. | Perform calculation to determine boron reactivity. (CS) Required band is 1.22 to 1.50 % delta k/k. Based on values from #5 and #6 above. | |
| <u>STANDARD</u> | | |
| Candidate acc and accurately | curately transfers data from Cue Sheet, determines correct curves to use y calculates the value for boron reactivity. | |
| EXAMINER | NOTE: | |
| Curve 18 mus is only used if | t be used since the control rod has fully inserted into the core. Curve 19 f control rod is misaligned and determined to be untrippable. | |
| <u>COMMENTS</u> | <u>}:</u> | |
| | | |

ĩ

.

| <u>STEP 5</u> : | Step 3 (SP-421, Enclosure 1B) | |
|------------------|--|--|
| Control Rod | Group 8 Reactivity | SAT |
| | | UNSAT |
| STANDARD | | |
| NA | | |
| COMMENTS | <u>S:</u> | |
| STEP 6. | Step A (SP- $A21$ Enclosure 1B) | |
| $\frac{51L1}{0}$ | Step 4 (SI -421, Eliciosule TB) | SAT |
| Determine Xe | enon reactivity. | UNSAT |
| <u>STANDARD</u> | <u>''</u> | |
| Candidate acc | curately transfers data from Cue Sheet to enclosure. | |
| COMMENTS | | |
| | | |
| <u>STEP 7</u> : | Step 5 (SP-421, Enclosure 1B) | Critical Step |
| Shutdown Ma | argin | Basis: |
| 1. | Determine SDM. (CS) Required band is -0.7 to -0.9 % delta k/k. Based on allowable band arrived at for procedure step 2.g and rounding to the nearest tenth as required by procedure step 5.a. | calculation and immediate notification of the CRS/SSO is required to |
| 2. | If SDM is determined to be less negative than -1.0% Δ k/k then SDM is unacceptable. Immediately notify the CRS and refer to TS 3.1.4. (CS) | comply with TS. |
| 3. | If SDM is determined to be more negative than $-1.0\% \Delta k/k$ then SDM is acceptable. Notify the CRS and continue to step 6. | SAT |
| STANDARD | <u>.</u> | UNSAT |
| Candidate det | | |
| | termines that SDM is unacceptable and immediately notifies the CRS. | |
| <u>COMMENTS</u> | termines that SDM is unacceptable and immediately notifies the CRS. | |

.

.

TERMINATION CRITERIA:

.

Candidate determines that SDM is unacceptable and immediately notifies the CRS/SSO.

END OF TASK

TIME STOP:

ENCLOSURE 1B

(Page 1 of 3)

ONE HOUR MISALIGNED ROD SHUTDOWN MARGIN CALCULATION

NOTE

1. Core Burnup

Core Burnup = EFPD (from SAXON)

EFPD 210 =

For the remaining steps (2-4) the following NOTES apply: It is permissible to round to the nearest whole EFPD. (1)(2) It is permissible to round to the nearest whole %wd. For RCS > 532 degrees F, 532 degrees F data may be used. (3)Two decimal place accuracy is required in calculations. (4)2. **Boron Reactivity** Measured RCS Boron Concentration 950 ppmB a. 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-10 atom percent of RCS Boron 19.8 a/o b. B-10 adjusted Boron Concentration is с. Step 2(a)Step 2(b), / 19.8 =950 ppmB 579 F. d. RCS temperature Using RCS temperature from 2(d) and core burnup from Step 1, determine the Boron e. concentration required for shutdown from appropriate Curve 18 or Curve 19 of OP-103C. **1259** (LIMIT 1250 to 1270)_ppmB f. Differential boron worth from Curve 3 of OP-103C, Reactivity Worth Curves.

0.7593 *(LIMIT 0.74 to 0.78)* %Ωk/k/100 ppm

Reactivity During Modes 1,2,3,4, and 5 g. Reactivity = $[(e-c) \times f/100] - 1.0$ $= [(1259 - 950) \times 0.7593 \rightarrow 100] - 1.0 = +/- + 1.35 \% \Omega k/k$ (LIMIT 1.22 to 1.50)

ENCLOSURE 1B

(Page 2 of 3)

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

3. <u>Control Rod Group 8 Reactivity</u>

ų.

Shutdown margin curves assume Group 8 at 100%wd, including the first 4 EFPD. Therefore, any APSR insertion would provide conservative margin in the shutdown margin. Since APSRs are not to be routinely inserted, no credit will be taken for APSR position in shutdown margin calculations.

| 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 |
| (6) Using a xenon value of 0.0% delta k/k is conservative and may be used at any time |
| Xenon Reactivity |
| a. Obtain Xenon reactivity from Saxon code (submit printout). |
| b. IF the Saxon code is unavailable, <u>THEN</u> use 0.0% Δ k/k or contact Reactor Engineering for a value (0.0% Δ k/k is conservative and therefore preferred). <u>- 2.15</u> % Δ k/k |
| Shutdown Margin |
| a. Determine the shutdown margin by adding Items 2, 3 and 4 above, and round to the nearest |
| tenth +/ 0.8 (<i>LIMIT -0.7 TO -0.9</i>) % Δ k/k |
| b. 1. <u>IF</u> 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), <u>THEN</u> the shutdown margin is unacceptable. IMMEDIATELY inform the Control Room Supervisor and refer to ITS 3.1.4 |
| 2. <u>IF</u> 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. / Verified By/Date |

4.

5.

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 fully into the core. The actions of AP-545, Plant Runback, have been completed up to Step 3.42, verification of adequate SDM. RCS boron is 950 ppmB. 210 EFPD Boron-10 atom percent is 19.8. RCS temperature is 579° F. Group 8 is at 100% withdrawn. Xenon value from current Saxon is -2.15% Δ k/k.

INITIATING CUES:

The Control Room Supervisor has directed you to verify if adequate SDM exists using the Xenon value from the current Saxon. Perform SP-421, Reactivity Balance Calculations. Enter SDM value below and indicate whether or not SDM is acceptable.

SDM value:

SDM is acceptable

SDM is **NOT** acceptable
CRYSTAL RIVER UNIT 3

7

.

JPM COVER SHEET

JPM #EP1 NRC 2008 (ADMIN)

SRO

COMPLETE AN OFF-SITE DOSE ASSESSMENT AND CLASSIFY EMERGENCY ACTION LEVEL

| PREPARED/REVIEWI | ED BY: Alan Kennedy | Date: | 01/31/08 |
|------------------|-------------------------------|-------|----------|
| | | | |
| VALIDATED BY: | Virgin, Bracewell, Morris | Date: | 01/31/08 |
| | | | |
| APPROVAL BY: | Mark Vansicklen | Date: | 01/31/08 |
| | (Nuclear Training Supervisor) | | |
| CONCURRED BY: | Blair Wunderly | Date: | 01/31/08 |
| | (Operations Representative) | | |

Validation is not required for minor enhancements, procedure revisions that do not affect the JPM or individual step changes that do not affect the flow of the JPM.

Operations concurrence is required for new JPMs and changes that affect the flow, critical steps or time critical steps of the JPM. Operations concurrence is not required for changes that are required due to a procedure revision.

JPM #: EP1 NRC 2008 Remedial

,

.

Task: Complete an off-site dose assessment during radiological emergencies.

| Alternate Path: YES XO | |
|--|---|
| PRA Top Critical Action: YES XO | |
| Safety Function: NA | |
| K/A Rating/Importance: G 2.4.39 RO 3.3 G 2.4.41 RO 2.3 | SRO 3.1 SRO 4.1 |
| <u>Task Number:</u> 1150402007 RO | |
| Position: SRO ONLY RO/SRO | NLO/RO/SRO |
| <u>Task Standard:</u> Complete an off-site dose assessment du Emergency Action Level. | ring radiological emergencies and determine |
| Preferred Evaluation Location: | Preferred Evaluation Method |
| SIM PLANT ADMIN | PERFORM SIMULATE |
| References: | |
| EM-204A, Rev 24 EM-202, Rev 84 | |
| Validation Time: 20 minutes – SRO | <u>Time Critical:</u> YES NO |
| Candidate: | Time Started: |
| Printed Name | Time Finished: |
| Performance Rating: SAT UNSAT | Performance Time: |
| Examiner: Printed Name | Signature Date |
| <u>Comment</u> : | |

SIMULATOR SETUP INSTRUCTIONS

NA

r

SIMULATOR OPERATOR INSTRUCTIONS

NA

TOOLS/EQUIPMENT/PROCEDURES NEEDED

- 1. EM-204A, Rev 24
- 2. EM-202, Rev 84
- 3. Calculator
- 4. Ruler

CUE SHEET #1

READ TO THE OPERATOR

Initial Conditions:

You are the Senior Reactor Operator.

A Radiological Emergency is in progress. Sigma-Theta (MM-7-SI) indicates 12 degrees. All data from the Primary Met Tower (MMP-3) has been lost. RM-A2 mid-range monitor has indicated 40 mr/hr for the last 15 minutes. Wind Speed (33') is 10 meters/second (15 min. avg). Wind Direction (33') is 285 degrees (15 min. avg). Release duration is unknown.

Initiating Cues:

You are directed to perform EM-204A.

Return procedure to examiner upon completion.

CUE SHEET #2

READ TO THE OPERATOR

Initiating Cues:

Using the data contained on the previous cue sheet and the completed EM-204A determine the Emergency Action Level classification, if any.

Do not use EC judgement.

THIS PORTION OF THE JPM IS TIME CRITICAL.

TIME START _____

| STED 1. | |
|---|--|
| | |
| Provide candidate with a copy of EM-204A, calculator and ruler. | |
| STANDARD: | |
| N/A | |
| COMMENTS: | |
| | |
| STEP 2: | Critical Step: |
| Candidate completes EM-204A, Enclosure 1. | BASIS: |
| STANDARD: | used to |
| Candidate will complete EM-204A. | determine site boundary dose for EAL |
| EXAMINER NOTE: | classification. |
| See attached Answer Key. | SAT |
| Critical Steps are denoted on the Answer Key by (CS). | |
| Steps without (CS) are not deemed critical but any errors should be addressed with the candidate following completion of the exam. | |
| COMMENTS: | |
| | |

.

| STEP 3: | Critical Step: |
|---|--------------------------------|
| Provide candidate with CUE SHEET #2 and a copy of EM-202. | BASIS: |
| Candidate determines EAL classification following completion of EM-204A, Enclosure 1. | classification required for |
| STANDARD: | protection of plant and |
| Candidate determines that a Site Area Emergency is applicable based on EAL 1.3, Stability Class D or E with RM-A2 Mid-Range monitor indicating > 20 mr/hr for 15 minutes or longer OR Site Boundary dose >100 mR TEDE or | personnel. |
| >500 mR thyroid CDE. | SAT |
| COMMENTS: | UNSAT |
| | |
| TERMINATION CRITERIA: | |
| EM-204A completed and EAL classification determined. | |
| END OF TASK | |

TIME STOP

· .

.

ANSWER KEY

| STEP # | RAD AND MET M | FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM | | |
|-------------|---|---|------------------|-----|
| 4.1.2 | RM-A2 LOW RANGE GAS CHANNEL | | СРМ | |
| or 4.1.3 | RM-A2 MID-RANGE GAS CHANNEL | 40 | mR/HR | |
| 4.2.1 | SIGMA-THETA | 12 | DEGREES (1) | |
| or 4.2.2 | DELTA T | | DEGREES F (2) | |
| 4.2.3 | WIND FROM (33') | 285 | DEGREES (2) | 8A |
| 4.2.4 | WIND SPEED (33') | 10 | M/SEC (2) | |
| 4.2.4.1 | WIND SPEED MPH=M/SEC X 2.24 | 22.4 | MPH | 13A |
| 4.2.5 | STABILITY CLASS | D (CS) | | 13B |
| | (1) Meter displays a rolling 15 minute a instantaneous value should be used (2) 15 minute average from chart recor | | | |

.

ANSWER KEY

| STEP# | SITE BC | FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM | | |
|----------------------|-------------------------------------|---|---------------------|----------|
| | DDE mR/HR | THYROID mR/HR | TEDE mR/HR | |
| 4.3.1 or 4.3.2 | 2.5 E 03 | 6.4 E 03 | 3.1 E 03 | |
| 4.4.1 | DOSE RATE CORRE | | | |
| | DDE mR/HR | THYROID mR/HR | TEDE mR/HR | |
| | 2.5 E 02 | 6.4 E 02 | 3.1 E 02 | 14E, 14F |
| | | Enter on State Form | Enter on State Form | |
| 4.5.1 | PROJECTED RELEAS (If duration | | | |
| 4.5.2 | DOSE = (CORRE | | | |
| | DDE mR | THYROID mR | TEDE mR | 4 |
| | 2.5 E 02 (CS) | 6.4 E 02 (CS) | 3.1 E 02 (CS) | |
| | NOBLE GAS CI/SEC | IODINE CI/SEC | | · |
| 4.6.1 | 8.8 E 01 | 8.8 E-01 | | 14A, 14B |
| 4.6.2 | AFFECTED SECTORS (three minimum) | E,F | ,G, | 8B |
| 4.7.1 | | | | |
| | Performed by | Date/Time | | |
| 4.7.2 | | Date/Time | | |
| | | Date/Time | | |

.

>

ANSWER KEY

ENCLOSURE 2 (Page 2 of 2)

-

TABLE 2 RM-A2 MID-RANGE MONITOR

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

| | | | | : | A,B,C | CLASS | | STABILITY D,E | (CLASS | | STABILTY F,G | Y CLASS |
|-------------------|--------------|------------------|------------------|--------------|------------------|---------------|--------------|------------------|---------------|------------------|------------------|---------------|
| MIDKANGE mK/hr | NG uCi/cc | NG CI/SEC | I CI/SEC | DDF WK/HK | ТНҮ mк/нк | IEDE mK/HK | DDE mK/HK | I НҮ mK/HK | IEDE mK/HK | DDE MK/HK | IНY mK/HK | IEDE mK/HK |
| 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 | (./E-U1 | 2.2E+00 | 5.8E+00 | 2.8E+00 |
| 0.02 | 6.0E-04 | 4.4E-02 | 4.4 E- 04 | 2.7E-01 | б.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 | 1.4ヒ+00 | 6.6E-01 | 2.5E+00 | 6.4E+00 | 3.1E+00 | 8.9⊨+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 |
| U.U8 | 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 | 1.8ヒ+01 | 4.6E+01 | 2.2E+01 |
| U.1 | 3.0E-03 | 2.2E-01 | 2.2E-03 | 1.3E+00 | 3.4E+00 | 1.76+00 | 6.2E+00 | 1.6E+01 | (./E+00 | 2.2E+01 | 5.8E+01 | 2.8E+01 |
| 0.2 | 6.0E-03 | 4.4 E- 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 | 8.8Է-01 | 8.8E-03 | 5.3E+00 | 1.4ヒ+01 | 6.6E+00 | 2.5E+01 | 6.4E+01 | 3.1E+01 | 8.9E+01 | 2.3E+02 | 1.1E+02 |
| U.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 |
| ۵.۷ | 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 | 3.4⊨+01 | 1./E+U1 | 6.2E+01 | 1.6E+02 | (./E+U1 | 2.2E+02 | 5.8E+02 | 2.8E+02 |
| 2 | 6.0E-02 | 4.4 ± +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 | 8.8⊢+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 |
| б | 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./E+02 | 6.2E+02 | 1.6E+03 | 1.1E+02 | 2.2E+03 | 5.8E+03 | 2.8E+03 |
| 20 | 6.0E-01 | 4.4 ± +01 | 4.4Է-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 | 8.8⊨+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 | 1.3 ⊢ +04 | 3.5E+04 | 1./E+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 | 4.6 ⊢ +04 | 2.2E+04 |
| 100 | 3.0E+00 | 2.2E+02 | 2.2E+00 | 1.3E+03 | 3.4⊨+03 | 1./E+03 | 6.2E+03 | 1.6E+04 | 1.1E+03 | 2.2E+04 | 5.8⊨+04 | 2.8E+04 |
| 200 | 6.0E+00 | 4.4E+02 | 4.4ヒ+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 | 1.4 ± +04 | 6.6F+03 | 2.5E+04 | ნ.4 Է+ 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./E+05 |
| 1000 | 3.0E+01 | 2.2E+03 | 2.2E+01 | 1.3E+04 | 3.4ヒ+04 | 1./E+04 | 6.2E+04 | 1.6E+05 | 1.1 ±+04 | 2.2E+05 | 5.8E+05 | 2.8E+05 |

2/14/2008 UN: U.U3 mid-range conversion factor from EEF-UU-UU9, Rev.1 WINDSPEED 1 M/SEC

JPM #EP1 NRC 2008 Remedial - Rev. 1



(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Initiating Cues:

.

a.

Using the data contained on the previous cue sheet and the completed EM-204A determine the Emergency Action Level classification, if any.

Do not use EC judgement.

THIS PORTION OF THE JPM IS TIME CRITICAL.

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Initial Conditions:

٩

6

You are the Senior Reactor Operator.

A Radiological Emergency is in progress. Sigma-Theta (MM-7-SI) indicates 12 degrees. All data from the Primary Met Tower (MMP-3) has been lost. RM-A2 mid-range monitor has indicated 40 mr/hr for the last 15 minutes. Wind Speed (33') is 10 meters/second (15 min. avg). Wind Direction (33') is 285 degrees (15 min. avg). Release duration is unknown.

Initiating Cues:

You are directed to perform EM-204A.

Return procedure to examiner upon completion.

CRYSTAL RIVER UNIT 3

JPM COVER SHEET

JPM #CO2 NRC 2008 (ADMIN)

SRO Only

PERFORM A REVIEW OF A COMPLETED SURVEILLANCE PROCEDURE, SP-347

| PREPARED/REVIEW | Date: | 01/31/08 | |
|-----------------|--|----------|----------|
| VALIDATED BY: | Bracewell, Virgin, Morris | Date: | 01/31/08 |
| APPROVAL BY: | Mark Vansicklen (Nuclear Training Supervisor) | Date: | 01/31/08 |
| CONCURRED BY: | Blair Wunderly (Operations Representative) | Date: | 01/31/08 |

Validation is not required for minor enhancements, procedure revisions that do not affect the JPM or individual step changes that do not affect the flow of the JPM.

Operations concurrence is required for new JPMs and changes that affect the flow, critical steps or time critical steps of the JPM. Operations concurrence is not required for changes that are required due to a procedure revision.

| JPM #: CO2 NRC 2008 Remedial (Bank #256A) | |
|---|-----|
| Task: Perform a safety and technical review of a plant procedure, SP-34 | 47. |

| Alternate Path: | | NO | |
|----------------------|--------------------------|--------------------|------------------------------------|
| Alternate Fath. | | | |
| PRA Top Critical A | Action: 📋 YES | ⊠ NO | |
| Safety Function: | 2 | | |
| K/A Rating/Importa | ance: G2.1.12 G2.1.23 | SRO 4.0 SRO 4.0 | |
| <u>Task Number:</u> | 1190101029 | | |
| Position: | | RO/SRO | NLO/RO/SRO |
| Task Standard: | Perform a safety | / and technical re | eview of a plant procedure, SP-347 |
| Preferred Evaluation | on Location: | | Preferred Evaluation Method |
| SIM PLAN | NT 🖂 ADMIN | | |
| References: | | | |
| SP-347, Rev. 58 | | | |
| Validation Time: | 30 Minutes | | Time Critical: 🗌 YES 🖾 NO |
| Candidate: | | | Time Started: |
| | Printed Name | | Time Finished: |
| Performance Ratin | ng: 🗌 SAT | | Performance Time: |
| Examiner: | | | |
| Printee | d Name | | Signature Date |
| Comment: | | | |
| | | | |

Tools/Equipment/Procedures Needed:

SP-347, Rev. 58 AI-500 Reference copy Technical Specifications

READ TO THE OPERATOR

INITIAL CONDITIONS

You are the Control Room Supervisor.

A plant shutdown is in progress. SR 3.5.2.5 was completed during the startup from the last refueling outage 18 months ago. SP-347, ECCS and Boration Flow Paths, has just been completed. The Reactor Coolant System is at 840 psig and 450° F. SFP-2 is NOT operating.

INITIATING CUES

Review the attached completed SP-347 for accuracy and compliance.

All components are in the positions verified by the performer. Document any errors found below and determine if any ITS actions are required.

□ No ITS actions are required, or

The following ITS actions are required:

1) LCO Number _____

2) Condition (basis)_____

3) Required Action(s) _____

4) Completion Time(s) _____

TIME START:_____

| STEP 1: | Critical Step (CS) |
|--|------------------------|
| Reviews the completed SP-347. | Basis [,] ITS |
| STANDARD: May identify 3 errors. | required |
| 1. Incorrect Plant Mode determined in step 4.1. Per initial conditions, the plant is in Mode 3, not Mode 4 | positions. |
| The position of CFV-5 in VALVE CHECK LIST I is not in compliance with ITS 3.5.1 (CS) | |
| 3. The position of CFV-6 in VALVE CHECK LIST I is not in compliance with | SAT |
| | UNSAT |
| EXAMINER NOTE: | |
| It is <u>required</u> that the candidate find the errors regarding the closed position of CFV-5 and CFV-6. | |
| The additional error, if not identified by candidate, should be reviewed following exam completion. | |
| COMMENTS: | |
| | |

| <u>STEP 2</u> : | Critical Step |
|---|---------------|
| Identifies non-compliance with ITS 3.5.1. | Basis: |
| STANDARD: | actions |
| Determines correct ITS Actions: | identified. |
| | SAT |
| Condition B (Two CFTs inoperable) Action B.1 – Restore CFT(s) to OPERBLE status Completion Time – 1 hour | UNSAT |
| EXAMINER CUE: | |
| If AI-500 is requested then cue the candidate that another SRO will address the AI-500 notification requirements. | |
| EXAMINER CUE: | |
| If CP-500 is requested (possible CAV-38 and/or CAV-43 position) then cue the candidate that another SRO will address the CP-500 requirements. | |
| COMMENTS: | |
| | |

| <u>STEP 3</u> : | |
|---|-------|
| Restores Operability of the "A" and "B" Core Flood Tanks. | SAT |
| STANDARD: | UNSAT |
| Candidate may direct the opening of CFV-5 and CFV-6 to comply with ITS action. | |
| EXAMINER NOTE: | |
| May include the direction to unlock and close the breakers for the valves, then open the breakers and lock them again after the valves are opened, but this is not required. The only critical portions of this task are to determine which valves are not in compliance with ITS and to enter the correct LCO. | |
| COMMENTS: | |
| | |
| <u>STEP 4</u> : | |
| Directs the completion of the Surveillance Procedure. | SAT |
| STANDARD: | UNSAT |
| Candidate may return the procedure to the operator for correction of the error made in determining the Plant Mode in Step 4.1. | |
| EXAMINER NOTE: | |
| The only critical portions of this task are to determine which valves are not in compliance with ITS and to enter the correct LCO. | |
| COMMENTS: | |
| | |
| TERMINATION CRITERIA: | |
| CFV-5 and CFV-6 identified as mis-positioned and correct ITS LCO determined. | |
| END OF TASK | |

TIME STOP:_____

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

You are the Control Room Supervisor.

A plant shutdown is in progress. SR 3.5.2.5 was completed during the startup from the last refueling outage 18 months ago. SP-347, ECCS and Boration Flow Paths, has just been completed. The Reactor Coolant System is at 840 psig and 450° F. SFP-2 is NOT operating.

INITIATING CUES

Review the attached completed SP-347 for accuracy and compliance.

All components are in the positions verified by the performer. Document any errors found below and determine if any ITS actions are required.

No ITS actions are required, or

The following ITS actions are required:

1) LCO Number _____

2) Condition (basis)_____

3) Required Action(s) _____

4) Completion Time(s) _____



TABLE OF CONTENTS

| <u>SECTION</u> | | PAC | <u> 3E</u> |
|----------------|---|--|--|
| 1.0 | PUR 1.1 1.2 | POSE INTENT EQUIPMENT DATA BASE (EDB) EQUIPMENT | 10 10 10 |
| 2.0 | REF 2.1 | ERENCES DEVELOPMENTAL REFERENCES 2.1.1 Technical Specification References | 10 10 10 |
| 3.0 | PER 3.1 3.2 3.3 3.4 3.5 3.6 | SONNEL INDOCTRINATION. SETPOINTS DESCRIPTION. DEFINITIONS RESPONSIBILITIES LIMITS & PRECAUTIONS ACCEPTANCE CRITERIA. 3.6.1 Modes 1, 2, 3. 3.6.2 Modes 1, 2, 3 and 4. 3.6.3 Mode 4. 3.6.4 Modes 5 & 6. PREREQUISITES | 12 12 12 12 12 13 13 13 14 15 16 |
| 4.0 | INST | RUCTIONS | 17 |
| 5.0 | FOL 5.1 5.2 | LOW-UP ACTIONS RESTORATION INSTRUCTIONS CONTINGENCIES | 20 20 20 |
| ENCLOSU | IRES | | |
| 1 | Valv | e Check List I | 21 |
| 2 | Valv | e Check List II - (BWST Using DHP-1B) | 27 |
| 3 | Valvo | e Check List III - (BWST Using DHP-1A) | 28 |
| 4 | Valvo | e Check List IV - (BAST Using DHP) | 29 |

5

1.0 PURPOSE

1.1 Intent

1.1.1 This procedure verifies valve positions in different systems to ensure that the Operability of the ECCS flow paths is maintained and Availability of the Boron Injection flow paths is maintained in accordance with the requirements specified in Section 2.2.1.

1.2 Equipment Data Base (EDB) Equipment

1.2.1 The following equipment tags are listed in the Equipment Data Base as being affected by this procedure:

Equipment listed in Enclosures 1 through 6.

2.0 REFERENCES

2.1 Developmental References

2.1.1 Technical Specification References

| LCO/Other | | | |
|-------------------|--------------|--------------|-------|
| Applicable | Surv. Perf. | Requirements | Surv. |
| <u>References</u> | During Modes | During Modes | Freq. |
| FPC Comm. #62316 | 5,6 | 5,6 | Μ |
| FPC Comm. #62188 | 5,6 | 5,6 | Μ |
| FPC Comm. #62190 | 1 thru 4 | 1 thru 4 | Μ |
| FPC Comm. #62315 | 1 thru 4 | 1 thru 4 | Μ |
| FPC Comm. #62148 | 1 thru 6 | 1 thru 6 | Μ |
| 3.5.2.1 | 1 thru 4 | 1,2,3 | Μ |
| 3.5.3.1 | 4 | 4 | Μ |
| 3.7.8.1 | 1 thru 4 | 1 thru 4 | Μ |
| 3.7.10.1 | 1 thru 4 | 1 thru 4 | Μ |
| 3.6.6.1 | 1 thru 4 | 1 thru 4 | Μ |
| 3.5.1.5 | 1,2,3 | 1,2,3 | Μ |
| 3.5.2.5 | 1,2,3 | 1,2,3 | R |
| | | | |

SURVEILLANCE FREQUENCY:

- M At least once per 31 days
- R At least once per 24 months

- 2.1.2 OPS-NGGC-1301, Equipment Clearance
- 2.1.3 CP-115B, Personal Danger Tags, Cautions Tags and Test Tags
- 2.1.4 OP-401, Core Flooding System
- 2.1.5 OP-402, Makeup and Purification System
- 2.1.6 OP-404, Decay Heat Removal System
- 2.1.7 OP-405, Reactor Building Spray System
- 2.1.8 SP-381, Locked/Sealed Valve Check List
- 2.1.9 OP-209, Plant Cooldown
- 2.1.10 SP-351, Nuclear Services Flow Path Operability
- 2.1.11 IOC NEA 93-0859, Minimum initial RB pressure limit to mitigate accidental RB Spray Actuation effects
- 2.1.12 FSAR Sections 4.2.5.5, 9.1.2.6.e, and 9.4.2.7.d
- 2.1.13 AP-490, Reactor Coolant System Boration
- 2.1.14 OP-403B, Chemical Addition Boric Acid System
- 2.1.15 MAR 97-02-12-01, HPI Upgrade
- 2.1.16 MAR 98-12-04-01, HPI Upgrade
- 2.1.17 AR 47194, CAP-1A Availability with low system pressure
- 2.1.18 M-93-0035, Rev. 2, Boric Acid Storage Tanks (CAT-5A/5B) Volume and System Hydraulic Analysis
- 2.1.19 3F0599-01, Letter to NRC Clarifying the Process for SR 3.5.2.5 Valve Position Verification

3.0 PERSONNEL INDOCTRINATION

3.1 Setpoints

None

3.2 Description

3.2.1 The operability of two independent ECCS subsystems ensures sufficient emergency core cooling capability is available in the event of a loss of coolant accident (LOCA) assuming the loss of one sub-system through any one single failure consideration. The verification of correct flow path valve positions assures the proper ECCS flows are maintained in the event of a LOCA. The valve position verifications also assure that flow paths for emergency boration are available.

3.3 Definitions

Available - Ready for use within a short enough time to meet the intended need.

3.4 Responsibilities

- 3.4.1 The CR-3 operations department performs this procedure.
- 3.4.2 Nuclear Operations Support is responsible for the content of this procedure.

3.5 Limits & Precautions

- 3.5.1 <u>Before</u> operating valves, check the plant configuration to ensure that MU flow and RC pump (RCP) seal flow (if applicable) will not be interrupted.
- 3.5.2 If a valve is not in the position specified in the Valve Check List, notify the CRS/SSO.
- 3.5.3 For work located in radiation controlled areas, give consideration to the ALARA program. This may result in a determination that special preparations and/or precautions are necessary.
- 3.5.4 The minimum RB pressure allowed during the performance of this procedure is -0.25 psig using BS-93-PIR or -0.43 psig using the plant computer. [NOCS 40795]

3.6 Acceptance Criteria

NOTE

Acceptance Criteria below, except Steps 3.6.2.1 and 3.6.4.1, originate from Technical Specifications. The two exceptions are FSAR requirements.

3.6.1 Modes 1, 2, 3

3.6.1.1 Two ECCS trains shall be OPERABLE.

Surveillances

- a) Every 31 days, verify each ECCS manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.
- b) Every 24 months, verify the correct settings of stops for the following HPI stop check valves: [NOCS 62209]
- 1) MUV-2
- 2) MUV-6
- 3) MUV-10
- c) Every 24 months, visually verify the welds securing the following HPI throttle valves are intact:
- 1) MUV-590
- 2) MUV-591
- 3) MUV-592
- 4) MUV-593
- 3.6.1.2 Two CFTs shall be OPERABLE (in Modes 1 and 2, Mode 3 with RCS pressure > 750 psig).

Surveillance

a) Every 31 days, verify power is removed from each CFT isolation valve operator.

3.6.2 **Modes 1, 2, 3 and 4**

NOTE

- o During Modes 4, 5, and 6 with the RCS pressure less than 150 psig, at least one DH pump in the boron injection path is required. (FSAR 9.4.2.7.d)
- o During Modes 4 and 5 with RCS pressure greater than or equal to 150 psig, at least one Makeup pump in the boron injection path is required. (FSAR 9.1.2.6.e)
- 3.6.2.1 A flow path from the concentrated boric acid storage system via a boric acid pump and makeup (MU) pump to the Reactor Coolant system (RCS) shall be available,

<u>AND</u>

A flow path from the borated water storage tank (BWST) via MU (Modes 1-4) or DHR pump (Mode 4) to the RCS shall be available. (FSAR 4.2.5.5)

Surveillance

- a) Every 31 days, each of the Boron Injection Flow paths specified above shall be demonstrated available by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.
- 3.6.2.2 Two Decay Heat Closed Cycle Cooling Water (DC) System trains shall be OPERABLE.

NOTE

Isolation of DC flow to individual components does not render the DC System inoperable.

Surveillance

a) Every 31 days, verify each DC manual and power operated valve in the flow path servicing safety related equipment, that is not locked, sealed or otherwise secured in position, is in the correct position.

3.6.2.3 Two Reactor Building Spray trains and two Containment Cooling trains shall be OPERABLE.

Surveillance

a) Every 31 days, verify each reactor building spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.

3.6.3 **Mode 4**

3.6.3.1 One ECCS train shall be OPERABLE.

Surveillances

- a) Every 31 days, verify each ECCS manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.
- b) Every 24 months, verify the correct settings of stops for the following HPI stop check valves:
 - 1) MUV-2
 - 2) MUV-6
 - 3) MUV-10
- c) Every 24 months, visually verify the welds securing the following HPI throttle valves are intact:
 - 1) MUV-590
 - 2) MUV-591
 - 3) MUV-592
 - 4) MUV-593

3.6.4 **Modes 5 & 6**

NOTE

- o During Modes 4, 5, and 6 with the RCS pressure less than 150 psig, at least one DH pump in the boron injection path is required. (FSAR 9.4.2.7.d)
- o During Modes 4 and 5 with RCS pressure greater than or equal to 150 psig, at least one Makeup pump in the boron injection path is required. (FSAR 9.1.2.6.e)
- 3.6.4.1 At least one (1) of the following boron injection flow paths shall be available (FSAR 4.2.5.5):

A flow path from the concentrated boric acid storage system via a boric acid pump and a MU or DHR pump to the RCS.

<u>OR</u>

A flow path from the BWST via a MU or standby DHR pump to the RCS.

Surveillance

Every 31 days, at least one of the Boron Injection Flow paths specified above shall be demonstrated available by verifying that each valve (manual, power operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

3.7 Prerequisites

- 3.7.1 Performance requires one person approximately three hours.
- 3.7.2 Section 3.0 has been read and understood by those who will be performing this test.

ATK x/x/xx Initial/Date

3.7.3 Notify the CRS/SSO that this surveillance is to begin.

ATK x/x/xx Initial/Date

4.0 INSTRUCTIONS

4.1 Determine and RECORD Plant Mode below:

Mode <u>4</u>

ATK x/x/xx Initial/Date

4.1.1 <u>IF</u> in Mode 1, 2, 3 or 4 <u>THEN</u> N/A Steps 4.1.2, and 4.5 <u>AND</u> go to Step 4.2.

> ATK x/x/xx Initial/Date

4.1.2 <u>IF in Mode 5 or 6</u> <u>THEN</u> N/A steps 4.2 thru 4.4 <u>AND</u> go to Step 4.5.

> <u>N/A</u> Initial/Date

NOTE

One MUP must be aligned to BWST and one MUP must be aligned to MUT-1 in Modes 1, 2 & 3.

4.2 RECORD status of Makeup pumps (MUP) by completing the following:

| | Suction Source | | |
|--------|----------------|-----|------------|
| Pump | BWST | MUT | Tagged Out |
| | (√) | (√) | (Yes/No) |
| MUP-1A | | | Yes |
| MUP-1B | | | No |
| MUP-1C | \checkmark | | No |

ATK x/x/xx Initial/Date

4.3 VERIFY that the valves on Valve Check List I (Enclosure 1) are in their designated positions.

<u>IF</u> more than one position is listed for a component in a Valve Check List, <u>THEN</u> the position which exists should be circled and a determination should be made to verify if it is in the correct position for existing plant Mode/conditions.

ATK x/x/xx Initial/Date

4.4 Go to Step 4.6.

ATK x/x/xx Initial/Date

4.5 For Modes 5 or 6, VERIFY the valves on the appropriate valve check list are in their designated positions for the desired boron injection flow path. <u>IF</u> more than one position is listed for a component in a Valve Check List, <u>THEN</u> the position which exists should be circled and a determination should be made to verify if it is in the correct position for existing plant Mode/conditions.

| Boration Source | <u>DH Train</u> | in Operation | Check List |
|-------------------------|-----------------|--------------|------------|
| BWST (Using DHP | -1B) | A | 11 |
| BWST (Using DHP | -1A) | В | 111 |
| <u>BAST</u> (Using DHP) | | A or B | IV |
| BAST (Using MUP) |) | A or B | V |
| BWST (Using MUP |) | A or B | VI |

<u>N/A</u> Initial/Date

| | NOTE | | | |
|--|--|-------------------|----------------------------|--|
| It may be necessary to realign Makeup pumps in order to verify all the positions of the Makeup pump discharge stop check valves. | | | | |
| 4.6 | <u>IF</u> verification of the valves listed in Technical Specific 3.5.2.5 is scheduled to be performed (24 month frequent) THEN PERFORM steps 4.6.1 and 4.6.2. | ation SR ency) | [√] N/A | |
| 4.6.1 | UNLOCK MUV-2, MUV-6, and MUV-10 <u>AND</u> VERIFY the position of each valve against OP-4 <u>AND</u> RELOCK each of the valves. [NOCS 62209] | 02 | | |
| | | Verification | Concurrent Verification | |
| | MUV-2, MUP-1C Discharge Stop Check | / Initial/Date | / Initial/Date | |
| | MUV-6, MUP-1B Discharge Stop Check | / Initial/Date | / Initial/Date | |
| | MUV-10, MUP-1A Discharge Stop Check | / Initial/Date | / Initial/Date | |
| 4.6.2 | Visually VERIFY the HPI throttle valve welds are intac | ot. | | |
| | | | Verification | |
| | MUV-590, A2 HPI Throttle Valve | | / Initial/Date | |
| | MUV-591, A1 HPI Throttle Valve | | / Initial/Date | |
| | MUV-592, B1 HPI Throttle Valve | | / | |
| | MUV-593, B2 HPI Throttle Valve | | / Initial/Date | |

4.7 NOTIFY the CRS/SSO that this surveillance has been completed and of any discrepancies.

ATK x/x/xx Initial/Date

5.0 FOLLOW-UP ACTIONS

5.1 Restoration Instructions

None

5.2 Contingencies

NOTE

Acceptance Criteria of Section 3.6, except Steps 3.6.2.1 and 3.6.4.1, originate from Technical Specifications. The two exceptions are FSAR requirements.

- 5.2.1 <u>IF any Technical Specification Acceptance Criteria cannot be met,</u> <u>THEN</u> refer immediately to the Actions of the applicable LCO(s).
- 5.2.2 IF Acceptance Criteria 3.6.2.1 cannot be met, THEN perform the following:

With neither train of the concentrated boric acid storage system available, restore a train to available status within 7 days or initiate a problem report to document and tract the corrective actions.

If the BWST does not meet its acceptance criteria, then refer to the actions of LCO 3.5.4.

5.2.3 <u>IF Acceptance Criteria 3.6.4.1 cannot be met,</u> <u>THEN perform the following:</u>

With none of the boron injection flow paths available, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one injection path is restored to available status.

ENCLOSURE 1 (Page 1 of 6)

VALVE CHECK LIST I [NOCS 000650, 000699]

Date <u>x/x/xx</u>

| Valve No. | Description | Position | Initials | |
|--------------------------|----------------------------------|-------------------------------|----------|--|
| ***MAIN CONTROL BOARD*** | | | | |
| BSV-17 | BWST Suction Iso. | Open | ATK | |
| BSV-3 | RB Spray Header Flow Controller | Closed ⁽¹⁾ | ATK | |
| DHV-34 | BWST Suction Iso. | Open | ATK | |
| DHV-42 | RB Sump Iso. | Closed | ATK | |
| DHV-39 | Dropline Iso. to "A" Header | Closed | ATK | |
| DHV-11 | DH Disch. to MUP Suction Iso. | Closed | ATK | |
| DHV-5 | DH Disch. Iso. to RCS | Closed | ATK | |
| DHV-210 | DHHE-1A Outlet Isolation/Test | Open | ATK | |
| DHV-110 | "A" LPI Flow Control | Throttled Open ⁽²⁾ | ATK | |
| DHV-91 | DH Iso. to PZR Spray | Closed | ATK | |
| DHV-75 | "A" DH Iso. from MU Purification | Closed | ATK | |
| DHV-8 | Recirc. Iso. to BWST | Closed | ATK | |
| CFV-5 | CFT-1A Iso. to RCS | Open/Close (3) | ATK | |
| BSV-16 | BWST Suction Iso. | Open | ATK | |
| BSV-4 | RB Spray Header Flow Controller | Closed ⁽¹⁾ | ATK | |
| DHV-35 | BWST Suction Iso. | Open | ATK | |
| DHV-43 | RB Sump Iso. | Closed | ATK | |
| DHV-40 | Dropline Iso. to "B" Header | Closed | ATK | |
| DHV-12 | DH Disch. to MUP Suction Iso. | Closed | ATK | |
| DHV-6 | DH Disch. Iso. to RCS | Closed | ATK | |
| DHV-211 | DHHE-1B Outlet Isolation/Test | Open | ATK | |
| DHV-111 | "B" LPI Flow Control | Throttled Open ⁽²⁾ | ATK | |

(1)

Control Station selected to "Auto/Remote." Control Station selected to "Auto/3000 GPM" and "ES STBY" light is illuminated CFV-5 must be Open with its breaker locked off when RC pressure is \geq 750 psig. CFV-5 must be (2) (3) Closed with its breaker locked off when RC pressure is ≤ 625 psig.

> ☆ OP-209 Clearance in Place. ATK x/x/xx

ENCLOSURE 1 (Page 2 of 6) Date x/x/xx

VALVE CHECK LIST I

| Valve No. | Description | Position | Initials | |
|--------------------------|--|----------------------------|----------|--|
| ***MAIN CONTROL BOARD*** | | | | |
| DHV-76 | "B" DH Iso. from MU Purification | Closed | ATK | |
| DHV-7 | Recirc. Iso. to BWST | Closed | ATK | |
| CFV-6 | CFT-1B Iso. to RCS | Oper Closed [™] ☆ | ATK | |
| MUV-23 | HPI to Loop "A" | Closed | ATK | |
| MUV-24 | HPI to Loop "A" | Closed | ATK | |
| MUV-25 | HPI to Loop "B" | Closed | ATK | |
| MUV-26 | HPI to Loop "B" | Closed | ATK | |
| MUV-586 | A2-B1 Crosstie Air Operated Isolation | Closed | ATK | |
| MUV-587 | A1-B2 Crosstie Air Operated Isolation | Closed | ATK | |
| MUV-596 | Common Seal Injection/Makeup Isolation | Open | ATK | |
| MUV-73 | BWST to MUP-1A | Open Closed (5) | ATK | |
| MUV-58 | BWST to MUP-1C | Open/Olosed ⁽⁶⁾ | ATK | |
| MUV-62 | MUP-1B/1C Suction X-Conn. | Open Closed 5 | ATK | |
| MUV-69 | MUP-1A/1B Suction X-Conn. | Open/Open (6) | ATK | |
| MUV-9 | MUP-1A/1B Dischge X-Conn. | Open | ATK | |
| MUV-53 | MUP Recirc. | Open | ATK | |
| MUV-257 | MUP Recirc. | Open | ATK | |
| MUV-27 | Normal Makeup Iso. | Open | ATK | |
| MUV-90 | MUFL-1B Outlet | Open | ATK | |
| MUV-91 | MUFL-1A Outlet | Open | ATK | |
| MUV-97 | MUFL-1B Inlet | Open/Cosed (/) | ATK | |
| MUV-96 | MUFL-1A Inlet | Open/Cosed (/) | ATK | |

(4) CFV-6 must be Open with its breaker locked off when RCS pressure is ≥ 750 psig. CFV-6 must be Closed with its breaker locked off when RCS pressure is ≤ 625 psig.
 (5) Closed when MUP-1C suction is from BWST and MUP-1A suction is from MUT (normal

(5) Closed when MUP-1C suction is from BWST and MUP-1A suction is from MUT (normal operating configuration). Open when MUP-1A suction is from BWST and MUP-1C suction is from MUT <u>OR</u> when MUP-1B is selected for ES in place of MUP-1C.

(6) Open when MUP-1C suction is from BWST and MUP-1A suction is from MUT (normal operating configuration) <u>OR</u> when MUP-1B is selected for ES in place of MUP-1A. Closed when MUP-1A suction is from BWST and MUP-1C suction is from MUT.

(7) At least one of these valves must be Open.

 \Rightarrow OP-209 Clearance in Place. ATK x/x/xx

ENCLOSURE 1 (Page 3 of 6)

VALVE CHECK LIST I

Date <u>x/x/xx</u>

| Valve No. | Description | Position | Initials | | |
|--------------------------------------|-------------------------------|--------------------------------|----------|--|--|
| | ***MAIN CONTROL BOARD*** | | | | |
| MUV-100 | MUFL-1A/1B Bypass | Closed | ATK | | |
| CAV-57 | Normal Boration Supply | Closed ⁽⁸⁾ | ATK | | |
| CAV-60 | Emergency Boration Supply | Closed ⁽⁸⁾ | ATK | | |
| MUV-541 | MUT-1 Makeup Iso. | Closed | ATK | | |
| MUV-108 | MU Feed Flow Controller | Available ⁽⁸⁾ | ATK | | |
| MUV-31 | Normal Makeup Flow Controller | Controlling 7Closed | ATK | | |
| | ***95' AUX. BLDG.TRIANGLE | ROOM*** | | | |
| DHV-110 | "A" LPI Flow Controller | Throttled Open ⁽¹⁰⁾ | ATK | | |
| DHV-111 | "B" LPI Flow Controller | Throttled Open ⁽¹⁰⁾ | ATK | | |
| | ***"A" DECAY HEAT PIT' | :** | | | |
| DCV-177 | DHHE-1A Outlet Controller | Open ⁽¹¹⁾ | ATK | | |
| DCV-17 | DHHE-1A Bypass Controller | Closed ⁽¹¹⁾ | ATK | | |
| | ***"B" DECAY HEAT PIT* | *** | | | |
| DCV-178 | DHHE-1B Outlet Controller | Open ⁽¹¹⁾ | ATK | | |
| DCV-18 | DHHE-1B Bypass Controller | Closed ⁽¹¹⁾ | ATK | | |
| | ***95' AUX. BLDG. SEAWATER | ROOM*** | | | |
| DCV-59 | DCT-1A DW Iso. | Open | ATK | | |
| DCV-10 | DCT-1A Fill Valve | Open/Closed ⁽¹²⁾ | ATK | | |
| DCV-91 | Chemical Add to "A" DC Train | Closed | ATK | | |
| DCV-60 | DCT-1B DW Iso. | Open | ATK | | |
| DCV-12 | DCT-1B Fill Valve | Oper/Closed ⁽¹²⁾ | ATK | | |
| DCV-92 | Chemical Add to "B" DC Train | Closed | ATK | | |
| ***95' AUX. BLDG. BETWEEN DH PITS*** | | | | | |
| DHV-120 | DHV-39 Bypass | Closed | ATK | | |
| DHV-121 | DHV-40 Bypass | Closed | ATK | | |
| BSV-13 | DW Iso. to "A" BS Train | Closed | ATK | | |
| BSV-14 | DW Iso. to "B" BS Train | Closed | ATK | | |

(8) Either CAV-60 must be available <u>OR</u> CAV-57, MUV-108 and MUV-541 must be available.

(9) Controlling at setpoint.

(10) Valve is at the 3000 GPM mark using local position indication.

(11) These valves are "Air-Failed" to their maximum ES cooling positions per OP-404.

(12) Closed unless DC Surge Tank is filling.

ENCLOSURE 1 (Page 4 of 6)

VALVE CHECK LIST I

Date <u>x/x/xx</u>

| Valve No. | Description | Position | Initials | |
|---|--|---|----------|--|
| ***95' AUX. BLDG. MAKEUP VALVE ALLEY*** | | | | |
| MUV-5 | MUP-1B Discharge Header to CF Tank Iso | Closed | ATK | |
| MUV-13 | Filters Outlet Line to MUP-1B Isolation | Closed | ATK | |
| MUV-28 | Downstream Iso. for MUV-31 | Open | ATK | |
| MUV-29 | Upstream Iso for MUV-31 | Open | ATK | |
| MUV-30 | Minimum Makeup Manual Flow Control Valve | Sealed Throttle ⁽¹³⁾ | ATK | |
| MUV-32 | Downstream Iso. for MUV-30 | Open | ATK | |
| MUV-33 | Upstream Iso. for MUV-30 | Open | ATK | |
| ***9 | 'AUX. BLDG EAST RB PENETRATION ARE | A BY HPI VALVES ** | * | |
| MUV-573 | A2 HPI Line Maintenance Valve | Sealed OPEN | ATK | |
| MUV-574 | A1 HPI Line Maintenance Valve | Sealed OPEN | ATK | |
| MUV-575 | B1 HPI Line Maintenance Valve | Sealed OPEN | ATK | |
| MUV-576 | B2 HPI Line Maintenance Valve | Sealed OPEN | ATK | |
| MUV-588 | A2-B1 Crosstie Isolation Maintenance Valve | Sealed OPEN | ATK | |
| MUV-589 | A1-B2 Crosstie Isolation Maintenance Valve | Sealed OPEN | ATK | |
| MUV-595 | Makeup Line Stop Check Valve | Fixed in Place Throttled 5-3/4 Turns Closed from Full Open | АТК | |
| | ***119' BLOCK ORIFICE ROOM & VAL | VE ALLEY*** | | |
| MUV-156 | Upstream Iso. for MUV-108 | Open | ATK | |
| MUV-158 | MUV-108 Bypass | Closed | ATK | |
| MUV-155 | Downstream Iso. for MUV-108 | Open | ATK | |
| MUV-114 | Emergency Boration Iso. | Open | ATK | |
| MUV-106 | Batch Controller FT Inlet Iso. | Open | ATK | |
| MUV-107 | Batch Controller FT Bypass | Closed | ATK | |
| MUV-105 | Batch Controller FT Outlet Iso. | Open | ATK | |
| CAV-56 | CAP-1A/B Disch. to SF Pool | Closed | ATK | |

(13) OP-402 sets the throttle position (20 gpm to 36 gpm with MUV-31 closed)
ENCLOSURE 1

(Page 5 of 6)

VALVE CHECK LIST I

Date <u>x/x/xx</u>

| Valve No. | Description | Position | Initials | |
|-----------|-------------------------------------|--|----------|--|
| | ***119' AUX. BLDG. NEAR BAST'S*** | | | |
| CAV-38 | CAT-5A Outlet Iso. | Open ⁽¹⁴⁾ | ATK | |
| CAV-48 | CAP-1A Suction | Open ⁽¹⁴⁾ | ATK | |
| CAV-51 | CAP-1A Discharge | Sealed Throttled 1 ¹ / ₂ Turns OPEN ⁽¹⁴⁾ | ATK | |
| CAV-41 | CAT-5A to Drain Connection | Closed ⁽¹⁴⁾ | ATK | |
| CAV-43 | CAT-5B Outlet Iso. | Open ⁽¹⁵⁾ | ATK | |
| CAV-44 | CAT-5B to Drain Connection | Closed ⁽¹⁵⁾ | ATK | |
| CAV-49 | CAP-1B Suction | Open ⁽¹⁵⁾ | ATK | |
| CAV-50 | CAP-1B Discharge | Open ⁽¹⁵⁾ | ATK | |
| CAV-120 | CAT-1 Supply to CAP-1B and CAP-1C | Closed ⁽¹⁵⁾ | ATK | |
| CAV-40 | Demin Water Flush for CAT-5A Outlet | Closed | ATK | |
| CAV-45 | Demin Water Flush for CAT-5B Outlet | Closed | ATK | |
| CAV-46 | CAT-5A to CAT-5B X-Conn. | Closed | ATK | |
| CAV-55 | CAP-1B Recirc. | Closed | ATK | |
| CAV-412 | CAP-1A Recirc. | Closed | ATK | |
| CAV-119 | CAP's Combined Discharge | Open | ATK | |
| CAV-35 | CAP-1C Discharge | Closed | ATK | |
| CAV-114 | Demin Water Flush to CAP-1A | Closed | ATK | |
| CAV-116 | Demin Water Flush to CAP-1B | Closed | ATK | |
| CAV-53 | CAP's Discharge to CFT's | Closed | ATK | |
| CAV-59 | CAP's Discharge to BWST | Closed | ATK | |

(14) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5A in service; otherwise NA.

(15) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5B in service; otherwise NA.

ENCLOSURE 1 (Page 6 of 6)

VALVE CHECK LIST I

Date <u>x/x/xx</u>

| Valve No. | Description | Position | Initials |
|-----------------------|----------------------------------|---------------------------|----------|
| | ***119' AUX. BLDG SEAL RETURN V | ALVE ALLEY* ** | |
| MUV-357 | MUT Inlet Isolation | Open | ATK |
| | ***119' AUX. BLDG MISC. AF | REAS *** | |
| CFV-5 Breaker | ES MCC 3AB, UNIT 6B | Locked off ⁽³⁾ | ATK |
| CFV-6 Breaker | ES MCC 3AB, UNIT 6C | Locked off ⁽⁴⁾ | ATK |
| SFV-13 | BWST to SF System Iso. | Open Closed (16) | ATK |
| MUV-202 | MUFL-1B Outlet to DH | Closed | ATK |
| MUV-203 | MUFL-1A Outlet to DH | Closed | ATK |
| ***143' AUX. BLDG.*** | | | |
| MUV-9 Breaker | RX MCC 3B1, UNIT 8D [NOCS 97803] | Locked off | ATK |

(3) CFV-5 must be Open with its breaker locked off when RC pressure is ≥ 750 psig. CFV-5 must be Closed with its breaker locked off when RC pressure is ≤ 625 psig. NA if neither condition exists.

(4) CFV-6 must be Open with its breaker locked off when RC pressure is ≥ 750 psig. CFV-6 must be Closed with its breaker locked off when RC pressure ≤ 625 psig. NA if neither condition exists.

(16) SFV-13 can only be open if BWST is on recirculation with SFP-2 per OP-406.

ENCLOSURE 2

VALVE CHECK LIST II - BWST Using DHP-1B)

Date _____

| Valve No. | Description | Position | Initials |
|--|------------------------------------|---------------------------------------|----------|
| | ***MAIN CONTROL BOARI | D*** | |
| DHV-35 | BWST Suction Iso. | Closed | |
| DHV-43 | RB Sump Iso. | Closed | |
| DHV-40 | Dropline Iso. to "B" Header | Closed | |
| DHV-12 | DH Disch. to MUP Suction Iso. | Closed | |
| DHV-6 | DH Disch. Iso. to RCS | Available | |
| DHV-211 | DHHE-1B Outlet Isolation/Test | Available | |
| DHV-111 | "B" LPI Flow Control | Available | |
| DHV-76 | DH Iso. from MU Purification | Closed | |
| DHV-106 | DH Iso. to MU Purification | Closed | |
| DHV-7 | Recirc. Iso. to BWST | Closed | |
| BSV-16 | BSP-1B Suction Iso. | Closed | |
| MUV-58 | BWST to MUP-1C | Open/Closed | |
| 2002-00-00-00-00-00-00-00-00-00-00-00-00 | ***"B" DECAY HEAT PIT [*] | *** | |
| DHV-32 | DHP-1B Suction Iso. | Sealed Open | |
| | ***95' AUX. BLDG.*** | | |
| BSV-58 | DHP-1B DW Flush Iso. | Locked Closed | |
| BSV-98 | BST-2 to DHP-1B Suction Iso. | Sealed Closed | |
| | ***119' AUX. BLDG.*** | · · · · · · · · · · · · · · · · · · · | |
| SFV-13 | BWST Supply Iso. | Closed | |

ENCLOSURE 3

VALVE CHECK LIST III - BWST Using DHP-1A)

Date _____

| Valve No. | Description | Position | Initials | | |
|-----------|-------------------------------|---------------|---|--|--|
| | ***MAIN CONTROL BOAR | D*** | | | |
| DHV-34 | BWST Suction Iso. | Closed | | | |
| DHV-42 | RB Sump Iso. | Closed | | | |
| DHV-39 | Dropline Iso. to "A" Header | Closed | | | |
| DHV-11 | DH Disch. to MUP Suction Iso. | Closed | Ann an 1999 - 1994 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | | |
| DHV-5 | DH Disch. Iso. to RCS | Available | | | |
| DHV-210 | DHHE-1A Outlet Isolation/Test | Available | | | |
| DHV-110 | "A" LPI Flow Control | Available | <u></u> | | |
| DHV-75 | DH Iso. from MU Purification | Closed | <u></u> | | |
| DHV-105 | DH Iso. to MU Purification | Closed | | | |
| DHV-8 | Recirc. Iso. to BWST | Closed | | | |
| BSV-17 | BSP-1A Suction Iso. | Closed | | | |
| MUV-73 | BWST to MUP-1A | Open/Closed | | | |
| | ***"B" DECAY HEAT PIT | *** | | | |
| DHV-21 | DHP-1A Suction Iso. | Sealed Open | | | |
| | ***95' AUX. BLDG.*** | | | | |
| BSV-57 | DHP-1A DW Flush Iso. | Locked Closed | | | |
| BSV-97 | BST-2 to DHP-1A Suction Iso. | Sealed Closed | | | |

ENCLOSURE 4 (Page 1 of 2)

VALVE CHECK LIST IV - (BAST Using DHP)

Date _____

| Valve No. | Description | Position | Initials |
|-----------|----------------------------------|----------------------------|----------|
| | ***MAIN CONTROL BOAR | D*** | |
| DHV-75 | "A" DH Iso. from MU Purification | Available ⁽¹⁾ | |
| DHV-76 | "B" DH Iso. from MU Purification | Available ⁽²⁾ | |
| CAV-57 | Normal Boration Supply | Available ⁽³⁾ | |
| CAV-60 | Emergency Boration Supply | Available ⁽³⁾ | |
| MUV-541 | MUT-1 Makeup Iso. | Available ⁽³⁾ | |
| MUV-108 | MU Feed Flow Controller | Available ⁽³⁾ | |
| MUV-97 | MUFL-1B Inlet | Open/Closed ⁽⁴⁾ | |
| MUV-96 | MUFL-1A Inlet | Open/Closed ⁽⁴⁾ | |
| MUV-90 | MUFL-1B to MUT-1 Iso. | Closed | |
| MUV-91 | MUFL-1A to MUT-1 Iso. | Closed | |
| MUV-100 | MUFL-1A/1B Bypass | Closed | |
| | ***119' SEAL RETURN / POST FILT | ER AREA*** | |
| MUV-202 | MUFL-1B Outlet to DH | Open | |
| MUV-203 | MUFL-1A Outlet to DH | Open | |
| | ***119' BLOCK ORIFICE ROOM & VA | LVE ALLEY*** | |
| MUV-156 | Upstream Iso. for MUV-108 | Open | |
| MUV-155 | Downstream Iso. for MUV-108 | Open | |
| MUV-114 | Emergency Boration Iso. | Open | |
| MUV-106 | Batch Controller FT Inlet Iso. | Open | |
| MUV-105 | Batch Controller FT Outlet Iso. | Open | |
| CAV-56 | CAP's Disch. to SF Pool | Closed | |

(1) (2) (3) When "A" DH train is in use; otherwise NA.

When "B" DH train is in use; otherwise NA.

Either CAV-60 must be available <u>OR</u> CAV-57, MUV-108 and MUV-541 must be available.

(4) At least one of these valves must be Open.

ENCLOSURE 4 (Page 2 of 2)

VALVE CHECK LIST IV - (BAST Using DHP)

Date _____

| Valve No. | Description | Position | Initials |
|-----------|-------------------------------------|---|----------|
| | ***119' AUX. BLDG. NEAR B | AST'S*** | |
| CAV-38 | CAT-5A Outlet Iso. | Open ⁽⁵⁾ | |
| CAV-48 | CAP-1A Suction | Open ⁽⁵⁾ | |
| CAV-51 | CAP-1A Discharge | Seal Throttled 1 ½ Turns OPEN ⁽⁵⁾ | |
| CAV-41 | CAT-5A to Drain Connection | Closed ⁽⁵⁾ | |
| CAV-43 | CAT-5B Outlet Iso. | Open ⁽⁶⁾ | |
| CAV-44 | CAT-5B to Drain Connection | Closed ⁽⁶⁾ | |
| CAV-49 | CAP-1B Suction | Open ⁽⁶⁾ | |
| CAV-50 | CAP-1B Discharge | Open ⁽⁶⁾ | |
| CAV-120 | CAT-1 Supply to CAP-1B and CAP-1C | Closed ⁽⁶⁾ | |
| CAV-40 | Demin Water Flush for CAT-5A Outlet | Closed | |
| CAV-45 | Demin Water Flush for CAT-5B Outlet | Closed | |
| CAV-46 | CAT-5A to CAT-5B X-Conn. | Closed | |
| CAV-55 | CAP-1B Recirc. | Closed | |
| CAV-412 | CAP-1A Recirc. | Closed | |
| CAV-119 | CAP's Combined Discharge | Open | |
| CAV-35 | CAP-1C Discharge | Closed | |
| CAV-114 | Demin Water Flush to CAP-1A | Closed | |
| CAV-116 | Demin Water Flush to CAP-1B | Closed | |
| CAV-53 | CAP's Discharge to CFT's | Closed | |
| CAV-59 | CAP's Discharge to BWST | Closed | |

(5) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5A in service; otherwise NA.

(6) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5B in service; otherwise NA.

ENCLOSURE 5 (Page 1 of 5) Date

VALVE CHECK LIST V - (BAST Using MUP)

| Valve No. | Description | Position | Initials |
|--------------------------|--|----------------------------|----------|
| ***MAIN CONTROL BOARD*** | | | |
| DHV-105 | "A" DH Iso. to MU Purification | Closed | |
| DHV-106 | "B" DH Iso. to MU Purification | Closed | |
| DHV-11 | DH Disch. to MUP Suction Iso. | Closed | |
| DHV-12 | DH Disch. to MUP Suction Iso. | Closed | |
| CAV-57 | Normal Boration Supply | Available ⁽¹⁾ | |
| CAV-60 | Emergency Boration Supply | Available ⁽¹⁾ | |
| MUV-541 | MUT-1 Makeup Iso. | Available ⁽¹⁾ | |
| MUV-108 | MU Feed Flow Controller | Available ⁽¹⁾ | |
| MUV-90 | MUFL-1B Outlet | Open | |
| MUV-91 | MUFL-1A Outlet | Open | |
| MUV-97 | MUFL-1B Inlet | Open/Closed ⁽²⁾ | |
| MUV-96 | MUFL-1A Inlet | Open/Closed ⁽²⁾ | |
| MUV-31 | Normal Makeup Flow Controller | Available | |
| MUV-596 | Common Seal Injection/Makeup Isolation | Open | |
| MUV-27 | Normal Makeup Iso. | Open | |
| MUV-53 | MUP recirc | Open | |
| MUV-257 | MUP recirc | Open | |
| MUV-69 | MUP-1A to MUP-1B Suction X-Conn. | Open ⁽⁴⁾ | |
| MUV-9 | MUP-1A to MUP-1B Disch. X-Conn. | Open ⁽⁴⁾ | |
| MUV-62 | MUP-1B to MUP-1C Suction X-Conn. | Open ⁽⁵⁾ | |
| MUV-3 | MUP-1B to MUP-1C Disch. X-Conn. | Open ⁽⁵⁾ | |

(1) (2) (4) Either CAV-60 must be available <u>OR</u> CAV-57, MUV-108 and MUV-541 must be available.

At least one of these valves must be Open.

When MUP-1A is in the boration path; otherwise NA

.(5) When MUP-1C is in the boration path; otherwise NA.

ENCLOSURE 5 (Page 2 of 5)

VALVE CHECK LIST V - (BAST Using MUP)

Date _____

| Valve No. | Description | Position | Initials |
|-----------|-----------------------------------|--------------------------------------|----------|
| | ***119' SEAL RETURN / POST FIL1 | ER AREA*** | |
| MUV-77 | Seal Return Cooler 1A Inlet Iso. | Sealed Open/Closed ⁽⁶⁾ | |
| MUV-78 | Seal Return Cooler 1B Inlet Iso. | Sealed Open/Closed ⁽⁶⁾ | |
| MUV-79 | Seal Return Cooler 1B Outlet Iso. | Sealed Open/Closed ⁽⁶⁾ | |
| MUV-80 | Seal Return Cooler 1A Outlet Iso. | Sealed Open/Closed ⁽⁶⁾ | |
| MUV-357 | MUT Inlet Iso. | Open | |
| MUV-202 | MUFL-1B Outlet to DH | Closed | |
| MUV-203 | MUFL-1A Outlet to DH | Closed | |
| | ***119' BLOCK ORIFICE ROOM & VA | LVE ALLEY*** | |
| MUV-156 | Upstream Iso. for MUV-108 | Open | |
| MUV-155 | Downstream Iso. for MUV-108 | Open | |
| MUV-114 | Emergency Boration Iso. | Open | |
| MUV-106 | Batch Controller FT Inlet Iso. | Open | |
| MUV-105 | Batch Controller FT Outlet Iso. | Open | |
| CAV-56 | CAP's Disch. to SF Pool | Closed | |

(6) A flow path must be maintained through at least one Seal Return Cooler at all times.

ENCLOSURE 5 (Page 3 of 5)

VALVE CHECK LIST V.- (BAST Using MUP)

Date _____

| Valve No. | Description | Position | Initials |
|-----------------------------------|-------------------------------------|---|----------|
| ***119' AUX. BLDG. NEAR BAST'S*** | | | |
| CAV-38 | CAT-5A Outlet Iso. | Open ⁽⁷⁾ | |
| CAV-48 | CAP-1A Suction | Open ⁽⁷⁾ | |
| CAV-51 | CAP-1A Discharge | Sealed Throttled 1 ¹ / ₂ Turns OPEN ⁽⁷⁾ | |
| CAV-41 | CAT-5A to Drain Connection | Closed ⁽⁷⁾ | |
| CAV-43 | CAT-5B Outlet Iso. | Open ⁽⁸⁾ | |
| CAV-44 | CAT-5B to Drain Connection | Closed ⁽⁸⁾ | |
| CAV-49 | CAP-1B Suction | Open ⁽⁸⁾ | |
| CAV-50 | CAP-1B Discharge | Open ⁽⁸⁾ | |
| CAV-120 | CAT-1 Supply to CAP-1B and CAP-1C | Closed ⁽⁸⁾ | |
| CAV-40 | Demin Water Flush for CAT-5A Outlet | Closed | |
| CAV-45 | Demin Water Flush for CAT-5B Outlet | Closed | |
| CAV-46 | CAT-5A to CAT-5B X-Conn. | Closed | |
| CAV-55 | CAP-1B Recirc. | Closed | |
| CAV-412 | CAP-1A Recirc. | Closed | |
| CAV-119 | CAP's Combined Discharge | Open | |
| CAV-35 | CAP-1C Discharge | Closed | |
| CAV-114 | Demin Water flush to CAP-1A | Closed | |
| CAV-116 | Demin Water flush to CAP-1B | Closed | |
| CAV-53 | CAP's Discharge to CFT's | Closed | |
| CAV-59 | CAP's Discharge to BWST | Closed | |

(7) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5A in service; otherwise NA.

(8) Either CAT-5A or CAT-5B must be in Service. Valve position shown for CAT-5B in service; otherwise NA.

ENCLOSURE 5 (Page 4 of 5)

VALVE CHECK LIST V.- (BAST Using MUP)

Date ____

| Valve No. | Description | Position | Initials | |
|-----------|---|---|----------|--|
| | ***95' AUX. BLDG. MAKEUP VALVE ALLEY*** | | | |
| MUV-29 | Upstream Iso. for MUV-31 | Open | | |
| MUV-28 | Downstream Iso. for MUV-31 | Open | | |
| MUV-68 | MUP-1A to MUP-1B Suction X-Conn. | Open ⁽⁴⁾ | | |
| MUV-10 | MUP-1A Disch. Stop Check | Locked Open ⁽⁴⁾ | | |
| MUV-147 | MUP-1A Recirc | Sealed Open ⁽⁴⁾ | | |
| MUV-153 | MUP-1A Recirc | Sealed Open ⁽⁴⁾ | | |
| MUV-8 | MUP-1A to MUP-1B Disch. X-Conn. | Open ⁽⁴⁾ | | |
| MUV-6 | MUP-1B Disch. Stop Check | Locked Throttled 5-1/4 Turns Open ⁽⁹⁾ | | |
| MUV-266 | MUP-1B recirc | Sealed Open ⁽⁹⁾ | | |
| MUV-267 | MUP-1B recirc | Sealed Open ⁽⁹⁾ | | |
| MUV-63 | MUP-1B to MUP-1C Suction X-Conn. | Open ⁽⁵⁾ | | |
| MUV-2 | MUP-1C Disch. Stop Check | Locked Open ⁽⁵⁾ | | |
| MUV-264 | MUP-1C Recirc | Sealed Open ⁽⁵⁾ | | |
| MUV-265 | MUP-1C Recirc | Sealed Open ⁽⁵⁾ | | |
| MUV-4 | MUP-1B to MUP-1C Disch. X-Conn. | Open ⁽⁵⁾ | | |
| | ***95' AUX. BLDG. NEAR RC EVAPO | RATOR ROOM*** | | |
| MUV-64 | Makeup Tank Iso. to Makeup Pumps | Open | | |
| | ***95' AUX. BLDG. NEAR MAKEU | IP PUMPS*** | | |
| MUV-70 | MUP-1A Suction Iso. | Open ⁽⁴⁾ | | |
| MUV-66 | MUP-1B Suction Iso. | Open ⁽⁹⁾ | | |
| MUV-59 | MUP-1C Suction Iso. | Open ⁽⁵⁾ | | |

(4) When MUP-1A is in the boration path; otherwise NA.

(5) When MUP-1C is in the boration path; otherwise NA.

(9) When MUP-1B is in the boration path; otherwise NA.

ENCLOSURE 5 (Page 5 of 5)

VALVE CHECK LIST V.- (BAST Using MUP)

Date _____

| Valve No. | Description | Position | Initials | | |
|-----------|---------------------------------------|---|----------|--|--|
| | ***95' AUX. BLDG. PENETRATION AREA*** | | | | |
| MUV-595 | Makeup Line Stop Check Valve | Fixed in Place Throttled 5-3/4 Turns Closed from Full Open | | | |
| MUV-574 | A1 HPI Line Maintenance Valve | Sealed Open | | | |

•

ENCLOSURE 6 (Page 1 of 4) Date

VALVE CHECK LIST VI - (BWST Using MUP)

| Valve No. | Description | Position | Initials | |
|--------------------------|--|---------------------|----------|--|
| ***MAIN CONTROL BOARD*** | | | | |
| MUV-100 | MUFL-1A/1B Bypass | Closed | | |
| MUV-73 | BWST Suction Iso. for MUP-1A | Open ⁽¹⁾ | | |
| MUV-58 | BWST Suction Iso. for MUP-1C | Open ⁽²⁾ | | |
| MUV-62 | Suction Crosstie between MUP-1C and MUP-1B | Open ⁽⁵⁾ | | |
| MUV-69 | Suction Crosstie between MUP-1A and MUP-1B | Open ⁽⁶⁾ | | |
| MUV-3 | MUP-1C Discharge Crosstie | Open ⁽³⁾ | | |
| MUV-9 | MUP-1A Discharge Crosstie | Open ⁽⁴⁾ | | |
| MUV-31 | Normal Makeup Valve | Auto/Closed | | |
| MUV-596 | Common Seal Injection/Makeup Isolation | Open | | |
| MUV-27 | Normal Makeup Iso. | Open | | |
| MUV-53 | MUP recirc | Open | | |
| MUV-257 | MUP recirc | Open | | |
| DHV-11 | DHP-1A Disch. to MUP Suction Iso. | Closed | ····· | |
| DHV-12 | DHP-1B Disch to MUP Suction Iso. | Closed | | |
| DHV-34 | BWST Suction Iso. | Closed | | |
| DHV-35 | BWST Suction Iso. | Closed | | |

(1) When MUP-1A is in the boration path <u>OR</u> MUP-1B is in the boration path aligned for suction via MUV-68 and MUV-69; otherwise NA.

(2) When MUP-1C is in the boration path <u>OR</u> MUP-1B is in the boration path aligned for suction via MUV-62 and MUV-63; otherwise NA.

- (3) When MUP-1C is in the boration path; otherwise NA.
- (4) When MUP-1A is in the boration path; otherwise NA.
- (5) When MUP-1B is in the boration path and suction is from BWST via MUV-58; otherwise NA.
- (6) When MUP-1B is in the boration path and suction is from BWST via MUV-73; otherwise NA.

ENCLOSURE 6 (Page 2 of 4)

VALVE CHECK LIST VI - (BWST Using MUP)

Date _____

| Valve No. | Description | Position | Initials | | |
|--|-----------------------------------|--------------------------------------|----------|--|--|
| ***119' SEAL RETURN / POST FILTER AREA*** | | | | | |
| MUV-77 | Seal Return Cooler 1A Inlet Iso. | Sealed Open/Closed ⁽⁷⁾ | | | |
| MUV-78 | Seal Return Cooler 1B Inlet Iso. | Sealed Open/Closed ⁽⁷⁾ | | | |
| MUV-79 | Seal Return Cooler 1B Outlet Iso. | Sealed Open/Closed ⁽⁷⁾ | | | |
| MUV-80 | Seal Return Cooler 1A Outlet Iso. | Sealed Open/Closed ⁽⁷⁾ | | | |
| MUV-357 | Filters Outlet to MUT Isolation | Open | | | |
| ***95' AUX. BLDG. NEAR RC EVAPORATOR ROOM*** | | | | | |
| MUV-64 | MUT Outlet to MUP Iso. | Sealed Open | | | |
| ***95' AUX. BLDG. MAKEUP VALVE ALLEY*** | | | | | |
| MUV-28 | Downstream Iso. for MUV-31 | Open | | | |
| MUV-29 | Upstream Iso for MUV-31 | Open | | | |
| MUV-10 | MUP-1A Discharge | Locked Open | | | |
| MUV-147 | MUP-1A Recirc | Sealed Open ⁽⁴⁾ | | | |
| MUV-153 | MUP-1A Recirc | Sealed Open ⁽⁴⁾ | | | |
| MUV-8 | MUP-1A Discharge X-Connect | Locked Open ⁽⁴⁾ | | | |

(4) When MUP-1A is in the boration path; otherwise NA.

(7) A flow path must be maintained through at least one Seal Return Cooler at all times.

ENCLOSURE 6 (Page 3 of 4)

VALVE CHECK LIST VI - (BWST Using MUP)

Date

| Valve No. | Description | Position | Initials | | |
|---|--------------------------------|---|----------|--|--|
| ***95' AUX. BLDG. MAKEUP VALVE ALLEY*** | | | | | |
| MUV-2 | MUP-1C Discharge | Locked Open | | | |
| MUV-264 | MUP-1C Recirc | Sealed Open ⁽³⁾ | | | |
| MUV-265 | MUP-1C Recirc | Sealed Open ⁽³⁾ | | | |
| MUV-4 | MUP-1C Discharge X-Connect | Locked Open ⁽³⁾ | | | |
| MUV-63 | MUP-1B X-tie suction to MUP-1C | Sealed Open ⁽⁵⁾ | | | |
| MUV-68 | MUP-1B X-tie suction to MUP-1A | Sealed Open ⁽⁶⁾ | | | |
| MUV-6 | MUP-1B Discharge | Locked Throttled 5-1/4 Turns Open ⁽⁸⁾ | | | |
| MUV-266 | MUP-1B recirc | Sealed Open ⁽⁸⁾ | | | |
| MUV-267 | MUP-1B recirc | Sealed Open ⁽⁸⁾ | | | |
| ***95' AUX. BLDG. NEAR MAKEUP PUMPS*** | | | | | |
| MUV-70 | MUP-1A Suction | Sealed Open ⁽⁴⁾ | | | |
| MUV-66 | MUP-1B Suction | Sealed Open ⁽⁸⁾ | | | |
| MUV-59 | MUP-1C Suction | Sealed Open ⁽³⁾ | | | |

- (3) When MUP-1C is in the boration path; otherwise NA.
- (4) When MUP-1A is in the boration path; otherwise NA.
- (5) When MUP-1B is in the boration path and suction is from BWST via MUV-58; otherwise NA.
- (6) When MUP-1B is in the boration path and suction is from BWST via MUV-73; otherwise NA.
- (8) When MUP-1B is in the boration path; otherwise NA.

ENCLOSURE 6 (Page 4 of 4)

VALVE CHECK LIST VI - (BWST Using MUP)

Date _____

| Valve No. | Description | Position | Initials | | | |
|---------------------------------------|-------------------------------|--|----------|--|--|--|
| ***95' AUX. BLDG. PENETRATION AREA*** | | | | | | |
| MUV-595 | Makeup Line Stop Check Valve | Fixed in Place Throttled 5-3/4 Turns Closed from Full Open | | | | |
| MUV-574 | A1 HPI Line Maintenance Valve | Sealed Open | | | | |

Summary of Changes PRR# 66298

SECTION

CHANGE

Enclosure 1, Added seal throttled to CAV-51. CAV-51 was added to SP-381 as a sealed valve (Ref 4 and 5 PRR 66298)

Enclosure 1 Removed the word standby following "Selected for ES". This may be confused to mean page 2 of 6 - that MUP-1B could be selected for ES but not be running. This condition would require

Note 5 and 6 entry into ITS 3.5.2. (Ref PRR 94084)

Enclosure 1 Added seal Throttled to MUV-30. MUV-30 was added SP-381 as a sealed valve (Ref page 4 of 6 EC 51536) Baying Note 12 to state that OP 402 will get a the throttle position (20 appr to 26 appr

Revised Note 13 to state that OP-402 will sets the throttle position (20 gpm to 36 gpm with MUV-31 closed)