

## Recommendation for 2023-301 CR/SIM 7

### (RESPOND TO THE TRIP OF A REACTOR RECIRC PUMP WHILE THE RECIRC PUMPS ARE RUNNING LESS THAN 35% SPEED, AND PLOT PLANT OPERATION ON THE POWER/FLOW MAP. ALT PATH)

Change step 2 of JPM CR/SIM 7 from a CRITICAL step to a NON-CRITICAL step and update remainder of JPM to reflect this change. After doing so, there will be three CRITICAL steps remaining in the JPM. Updated JPM is included in this package.

#### Reasoning:

CR/SIM 7 is modified from a bank JPM that was used on the 2011-301 NRC exam as JPM SIM 7. The 2011 version was a NORMAL JPM and modified to be an ALTERNATE path for the 2023-301 exam.

On the 2011-301 exam, the step for plotting on the Power/Flow map was NON-CRITICAL. (see screenshot below)

2011-301 SIM-7  
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| STEP # | PERFORMANCE STEP | STANDARD | SAT/NSAT (COMMENTS) |
|--------|------------------|----------|---------------------|
|--------|------------------|----------|---------------------|

**NOTE:** The operator may choose to plot position on the Power/Flow map at this time. These steps are NOT required to be done in order.

**NOTE:** The operator will calculate actual core flow as follows:

**1<sup>st</sup> step:** ADD Jet Pump Total Flow indications (2B21-R611A/R611B (P602)). The values total approx 24 MLB/hr for these plant conditions.

**2<sup>nd</sup> step:** This number is divided by 77 MLB/hr (rated core flow). The result is ACTUAL CORE FLOW, approx. 31% then,

**3<sup>rd</sup> step:** The operator uses 2C51-K620A&B, "APRM Display" (P603) to determine that Rx power is approx. 36%.

|    |  |   |  |
|----|--|---|--|
| 4. | Verify whether or not the plant is operating inside the Immediate Exit Region of the Power/Flow Map. | The operator has PLOTTED the operating point on the Power/Flow map (P603) and has DETERMINED the plant is operating in the ACCEPTABLE region with the following values:<br><br><u>ACTUAL CORE FLOW, approx. 31%</u> (Accept 28.0% - 34.0%)<br><br><u>Rx power is approx. 36%</u> (Accept ± 3%); |  |
|----|--|---|--|

When updating the JPM to its current version, Step 2 of the JPM was inadvertently changed to a critical step. While this step does allow for evaluating the applicant's ability to plot on the Power/Flow map, it is NOT CRITICAL to the response of a tripped Recirc pump in limiting Recirc Loop temperatures and, due to plant conditions, there are no resultant required operator

actions from the plot. A Power/Flow plot is also NOT CRITICAL to responding to the trip of the second Recirc Pump (ALT path), which requires the applicant to TRIP the reactor.

There is a prompt in the JPM for the examiner to direct the applicant to continue to respond to the tripped Recirc pump even if the plot places the reactor in the Safety Limit area of the Power/Flow map. (see below) If this action was truly CRITICAL, the applicant would have been allowed to continue with the appropriate actions based on the plot.

PROMPT: **IF** the operator reports that the plant is in the Safety Limit area of the Power/Flow Map, **DIRECT** the operator to continue responding to the tripped Recirc Pump (unless all required actions have previously been taken).

**Actions:**

A Condition Report, CR# 11030723, was written on 12/11/2023 to place the note that explains how to calculate core flow prior to any step in which the operator is to plot the operating point on the Power/Flow map.

**Southern Nuclear Company**

**Operations Training**  
**Job Performance Measure (JPM)**

**FINAL**  
**CR/SIM 7 (RO & SRO-I)**

|   |   |                              |
|---|---|------------------------------|
| <b>Title:</b><br>RESPOND TO THE TRIP OF A REACTOR RECIRC PUMP WHILE THE RECIRC PUMPS ARE RUNNING AT LESS THAN 35% SPEED, AND PLOT PLANT OPERATION ON THE POWER/FLOW MAP. (ALT PATH) |   | <b>Version:</b><br>0.2       |
| <b>Author:</b><br>Anthony Ball  | <b>Media Number:</b><br>2023-301 CR-SIM 7 | <b>Time:</b><br>15.0 Minutes |
| <b>Line Technical Review By (N/A for minor revisions)</b><br>N/A  |   | <b>Date:</b><br>N/A          |
| <b>Reviewed by Instructional Technologist or designee (N/A for minor revisions)</b><br>N/A  |   | <b>Date:</b><br>N/A          |
| <b>Approved By (Training Program Manager or Lead Instructor)</b><br>Charlie Edmund  |   | <b>Date:</b><br>10/30/2023   |





UNIT 1 ( ) UNIT 2 (X)

**TASK TITLE:** RESPOND TO THE TRIP OF A REACTOR RECIRC PUMP WHILE THE RECIRC PUMPS ARE RUNNING AT LESS THAN 35% SPEED, AND PLOT PLANT OPERATION ON THE POWER/FLOW MAP. (ALT PATH)

**JPM NUMBER:** 2023-301 CR-SIM 7

**TASK STANDARD:** The task shall be completed when the tripped Recirc Pump Discharge valve has been closed and then re-opened, AND then performs the Immediate Operator Actions of 34AB-B31-001-2.

**TASK NUMBER:** 200.037

**OBJECTIVE NUMBER:** 200.037.A

**PLANT HATCH JTA IMPORTANCE RATING:**

RO

SRO

**K/A CATALOG NUMBER:** 216000A2.14

**K/A CATALOG JTA IMPORTANCE RATING:**

RO 3.6

SRO 3.3

**OPERATOR APPLICABILITY:** Nuclear Plant Operator (NPO)

|                            |   |
|----------------------------|---|
| <b>GENERAL REFERENCES:</b> | <b>Unit 2</b>   |
|                            | 34AB-B31-001-2 (Ver 12.0)<br>34GO-OPS-005-2 (Ver 31.9)<br>34SO-B31-001-2 (Ver 48.5) |
| <b>REQUIRED MATERIALS:</b> | <b>Unit 2</b>   |
|                            | 34AB-B31-001-2 (Ver 12.0)<br>34GO-OPS-005-2 (Ver 31.9)<br>34SO-B31-001-2 (Ver 48.5) |

**APPROXIMATE COMPLETION TIME:** 15 Minutes

**SIMULATOR SETUP:** REFER TO SIMULATOR SETUP SHEET ON THE FOLLOWING PAGE

## SIMULATOR A SETUP

### Simulator Initial Conditions:

1. **RESET** the Simulator to **IC #110** or **SNAP 617** and leave in **FREEZE**.
2. **INSERT** the following **MALFUNCTIONS**:

| RB#         | MALF #    | TITLE                               | FINAL VALUE | RAMP RATE | ACT. TIME |
|-------------|-----------|-------------------------------------|-------------|-----------|-----------|
| <b>RB-1</b> | mfB31_38B | Recirc Pump B Motor Protection Trip | N/A         | N/A       | 9999      |

3. **INSERT** the following **EVENT TRIGGER**

| ET #           | Description   |
|----------------|---|
| <b>EGB31-5</b> | Inserts <b>EGB31-6</b> when 2B31-F031B is full closed, red light out.                                       |
| <b>EGB31-6</b> | Inserts mfB31_37A when 2B31-F031B is throttled open, red light on.<br><b>(DO NOT LOAD IN SCENARIO FILE)</b> |

4. Take the Simulator **OUT OF FREEZE** and **PERFORM** the following **MANIPULATIONS OR RUN SCENARIO FILE** and **EVENT TRIGGER** (current rev) **2023-CR-SIM 7**:
  - A. **REDUCE** Reactor Recirc Pumps to **MINIMUM** speed.
  - B. **INSERT** control rods to reduce power to **approx. 33%**, with the goal of remaining below the 78% load line.
  - C. **PRESS RB-1** to activate Recirc Pump B Motor Protection Trip.
  - D. Allow plant conditions to **STABILIZE**.
  - E. Acknowledge/reset alarms.
  - F. **TURN OFF** the Process Computer monitor.
5. **PLACE** the Simulator in **FREEZE** until the **INITIATING CUE** is given.
6. **ESTIMATED Simulator SETUP TIME: 25 Minutes**

**EVALUATOR COPY**

**UNIT 2**

**READ TO THE OPERATOR**

**INITIAL CONDITIONS:**

1. Unit 2 was operating approximately 33% power.
2. Both Reactor Recirc Pumps were running at minimum speed.
3. All OPRMs are operable.
4. The Process Computer monitor is NOT functional.
5. The “2B” Reactor Recirc pump has just tripped.
6. Personnel have been directed to investigate the cause of the pump trip.

**INITIATING CUES:**

1. RESPOND to the trip of the 2B Reactor Recirc Pump  
IAW 34AB-B31-001-2.

AND

2. PLOT the plant operating point on the Unit 2 Power/Flow map.

| STEP # | PERFORMANCE STEP | STANDARD | SAT/UNSAT (COMMENTS) |
|--------|------------------|----------|----------------------|
|--------|------------------|----------|----------------------|

For **INITIAL** Operator Programs:  
**For OJT/OJE**; ALL PROCEDURE STEPS must be completed for Satisfactory Performance.  
**For License Examinations**; ALL CRITICAL STEPS must be completed for Satisfactory Performance.

|             | IF  | THEN   |
|-------------|---|--|
| <b>PASS</b> | <input type="checkbox"/> Human performance tools, safety, PPE met (1), <b>AND</b><br><input type="checkbox"/> For initial trg <b>all</b> steps completed correctly OR<br><input type="checkbox"/> For continuing trg, <b>critical</b> steps (if used) completed correctly | <input type="checkbox"/> Mark the JPM as a <b>PASS</b> |
| <b>FAIL</b> | <input type="checkbox"/> Above standards not met  | <input type="checkbox"/> Mark the JPM as a <b>FAIL</b> |

(1) The standard for human performance tools, safety, PPE, and other pertinent expectations is considered met provided any deviations are minor and have little or no actual or potential consequence. Errors may be self-corrected provided the action would not have resulted in significant actual or potential consequences.

**START TIME:** \_\_\_\_\_

**NOTE:** Provide the operator with a copy of 34AB-B31-001-2.

|    |   |  |  |
|----|---|--|--|
| 1. | The operator identifies correct procedure SECTION to use. | The operator has IDENTIFIED the correct section: Section 1 Loss Of A Single Reactor Recirculation Pump A or B. |  |
|----|---|--|--|

**NOTE:** The operator may choose to plot position on the Power/Flow map at this time. These steps are NOT required to be done in order.

**NOTE:** It is expected that the operator will read the NOTE, located just after step 4.4. The NOTE describes how to determine core flow with one Recirc Pump out of service when the Running pump is operating below 35% pump speed.

(\*\* Indicates critical step)





| STEP # | PERFORMANCE STEP  | STANDARD  | SAT/UNSAT (COMMENTS) |
|--------|---|---|----------------------|
| 4.     | Verify the Running Recirc. Pump is operating below rated flow for one pump.<br><br>(Step 4.6) | The operator has VERIFIED that the "2A" Recirc pump is operating below rated flow using 2B31-R617, "Drive Flow" indicator (P602). |                      |

|      |  |  |  |
|------|--|--|--|
| **5. | Close Reactor Recirc Pump Discharge Valve, 2B31-F031B and record the time.<br><br>(Step 4.7) | At Panel 2H11-P602, the operator has PLACED the PUMP DISCH VLV, 2B31-F031B into the close position, green light ILLUMINATED, red light EXTINGUISHED, and the operator has RECORDED the time the valve is fully CLOSED. (NOT critical to record time) |  |
|------|--|--|--|

PROMPT: **IF** addressed, **INFORM** the Operator it is desired to maintain Recirc loop temperature.

PROMPT: **AFTER** the Operator has fully closed 2B31-F031B, **INFORM** the Operator, using Time Compression, four (4) minutes has elapsed.

|      |  |  |  |
|------|--|--|--|
| **6. | After 4 - 5 minutes, throttle open Reactor Recirc Pump Discharge Valve, 2B31-F031B to maintain less than 50°F suction temperature differential between the loops, as indicated on 2B31-R650, Recirc Pump Suction Temperature, panel 2H11-P602.<br><br>(Step 4.8) | The operator has THROTTLED PUMP DISCH VLV, 2B31-F031B OPEN (P602) within 4 - 5 minutes of the time recorded in JPM step 6, red and green lights ILLUMINATED. |  |
|------|--|--|--|

(\*\* Indicates critical step)

| STEP # | PERFORMANCE STEP | STANDARD | SAT/UNSAT (COMMENTS) |
|--------|------------------|----------|----------------------|
|--------|------------------|----------|----------------------|

**ALTERNATE PATH STARTS HERE (Step 7)**

**(Event Trigger EGB31-6 TRIPS ASD 2A after 2B31-F031B is THROTTLED OPEN).**

**NOTE: INSERTING A MANUAL SCRAM IS AN IMMEDIATE OPERATOR ACTION IF BOTH RECIRC PUMPS ARE TRIPPED.**

|      |  |  |  |
|------|--|--|--|
| **7. | <b>Enter</b> 34AB-C71-001-2, Scram Procedure, <b>AND SCRAM</b> the reactor<br><br>(Section II, Step 3.1) | On 2H11-P603, the Operator <b>INSERTS</b> a <b>MANUAL SCRAM</b> (depresses at least one scram pushbutton in RPS channels A and B). |  |
|------|--|--|--|

PROMPT: **WHEN** the operator addresses subsequent steps in the procedure as the Shift Supervisor, **INFORM** the operator that another operator will complete the rest of the procedure steps.

**END TIME:** \_\_\_\_\_

**NOTE:** The terminating cue shall be given to the operator when:

- When the operator completes step 7.
- With NO reasonable progress, the operator exceeds double the allotted time.
- Operator states the task is complete.

**TERMINATING CUE:** We will stop here.

**EVALUATOR** – **PICK UP** the Initiating Cue sheet.

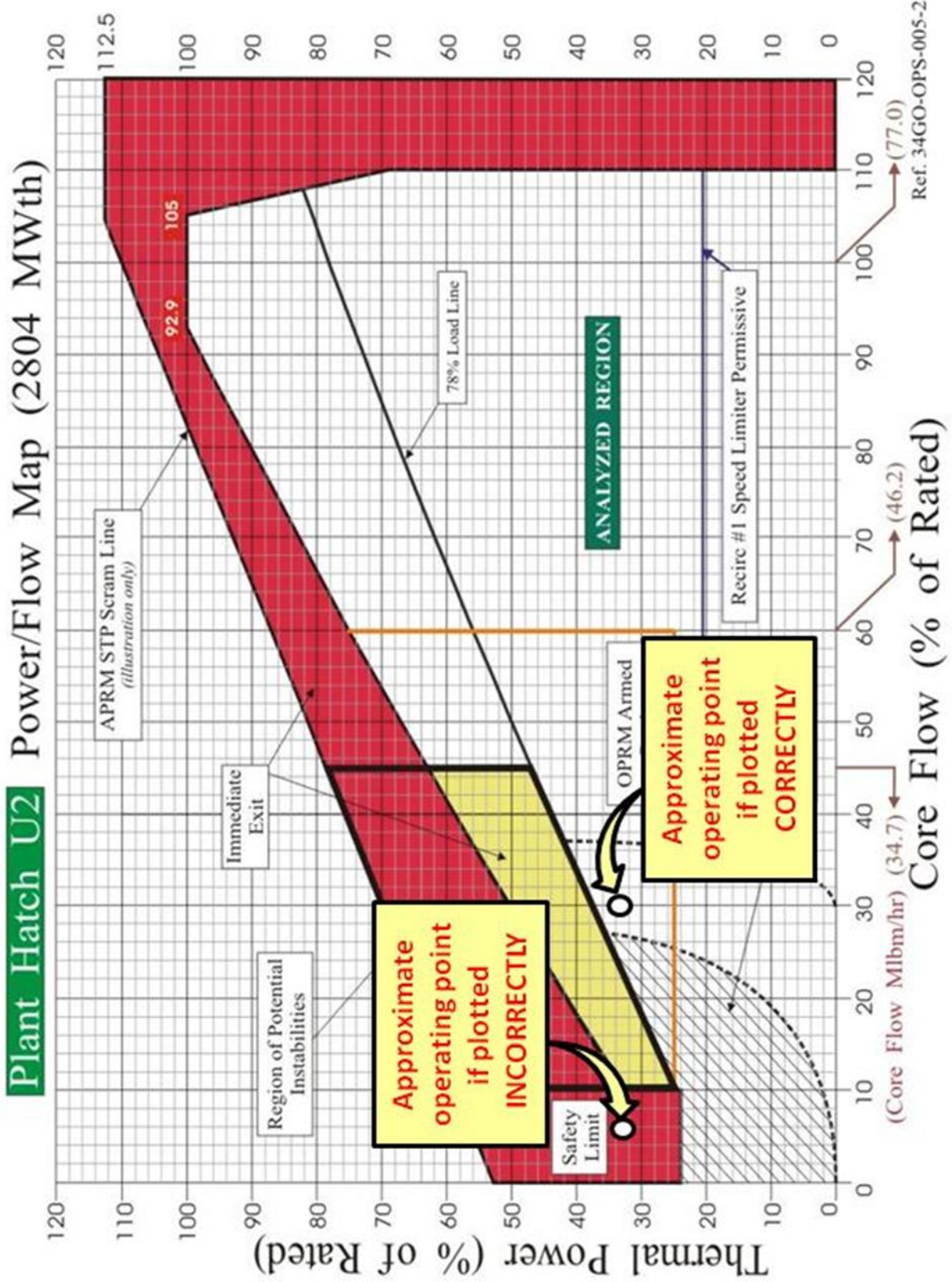
## Summary of JPM Attributes

JPM 2023-301 CR-SIM 7:

### SUMMARY OF JPM QUANTITATIVE ATTRIBUTES

| <u>CATEGORY</u>                                 | <u>Minimum NRC Attributes</u> | <u>JPM CONTENT</u>   |
|---|-------------------------------|--|
| <b><u>Total Critical Steps</u></b>              | At least 2                    | 3  |
| Step 5 <b>Close 2B31-F031B</b>                  |                               | Allows pump to stop rotating.  |
| Step 6 <b>Open 2B31-F031B</b>                   |                               | Allows natural circulation to flow through recirc loop.  |
| Step 7 <b>Performs Manual Scram</b>             |                               | Immediate Operator Action without forced circulation.  |
| <b><u>Number of JPM Steps</u></b>               | <30                           | 7  |
| <b><u>Time to Perform JPM</u></b>               | <45 min                       | 15 min   |
| <b><u>Normal / Faulted / Alternate Path</u></b> |                               |  |
| <b>Alternate Path</b>                           |                               | When 2B31-F031B is throttled open ASD 2A will trip resulting in loss of forced Recirc circulation requiring a manual scram to be inserted. |
| <b><u>Setting (administered)</u></b>            |                               |  |
| <b>Simulator</b>                                |                               |  |
| <b><u>Is LOD “1” or “5”</u></b>                 | NO                            | NO   |

**Evaluator Answer Key**



## **UNIT 2**

### **READ TO THE OPERATOR**

#### **INITIAL CONDITIONS:**

1. Unit 2 was operating approximately 33% power.
2. Both Reactor Recirc Pumps were running at minimum speed.
3. All OPRMs are operable.
4. The Process Computer monitor is NOT functional.
5. The “2B” Reactor Recirc pump has just tripped.
6. Personnel have been directed to investigate the cause of the pump trip.

#### **INITIATING CUES:**

1. RESPOND to the trip of the 2B Reactor Recirc Pump  
IAW 34AB-B31-001-2.

AND

2. PLOT the plant operating point on the Unit 2 Power/Flow map.