

**JOB PERFORMANCE MEASURE**

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 1
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Job Position SRO / RO	No. JP-OP-802-3006-402	Revision 0
JPM Title Perform Torus Water Average Temperature Calculation	Duration 8 minutes*	Page 1

\*2 times Duration for ILO Exams

Examinee: \_\_\_\_\_ SRO / RO / NO

Evaluator: \_\_\_\_\_

Validating Representatives Name: Chris Chambers

JPM Type:                   **Normal** / Alternate Path / Time Critical                   Start Time \_\_\_\_\_

Evaluation Method:       **Perform** / Walkthrough / Discuss                   Stop Time \_\_\_\_\_

Location:                   Plant / Simulator / **Classroom**                   Total Time: \_\_\_\_\_

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
* 1.											
* 2.											
* 3.											
* 4.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

**OVERALL EVALUATOR COMMENTS:** \_\_\_\_\_  
\_\_\_\_\_

**REMEDIAL CONTENT:** \_\_\_\_\_

\_\_\_\_\_ **PASS**      \_\_\_\_\_ **FAIL**

Evaluator Signature / Date: \_\_\_\_\_ / \_\_\_\_\_

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 2
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**JPM Observation Criteria**

<b>Fundamental</b>	<b>Meets all Expectations</b>	<b>Opportunity for Improvement</b>	<b>Does not meet Expectations</b>
<b>Monitoring</b>	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
<b>Control</b>	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
<b>Conservatism</b>	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
<b>Teamwork</b>	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
<b>Knowledge</b>	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

## JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 3
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### JPM Information

**System:**

T5000 – Primary Containment Monitoring System

**Task:**

52016 - Calculate Torus Water Average Temperature

**References:** Required (R) / Available (A)

29.ESP.01, Supplemental Information, Section 15, Torus Water Temperature Calculation (R)

**Tools and Equipment Required:**

Calculator

**Initial Conditions:**

- You are an extra person on shift
- Primary Containment Control EOP has been entered due to Drywell temperature of 147°F
- Torus Water level is 140"
- RPV pressure is being controlled by Main Turbine Bypass Valves
- Point T23N004 is INOPERABLE

**Initiating Cue(s):**

The CRS directs you to calculate Torus Water Average Temperature in accordance with 29.ESP.01.

**Terminating Cue(s):**

Torus Water temperature has been determined by calculation.

**Task Standard:**

Perform Torus Water Average Temperature Calculation in accordance with 29.ESP.01, Section 15.0.

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 4
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**Licensed Operator Exam Information (required for NRC exams)**

**Safety Function/Category:**

10 - Emergency Plant Evolutions

**K/A Reference:** (from NUREG 1123)

**K/A SYSTEM:** 295026 - Suppression Pool High Water Temperature  
**K/A STATEMENT:**  
2.1.45 Ability to identify and interpret diverse indications to validate the response of another indication.....4.3/4.3  
EA2. Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature:  
EA2.01 Suppression Pool Water temperature ..... 4.1 / 4.2

**Maintenance Rule Safety Classification:**

N/A

**Maintenance Rule Risk Significant? (Yes or No)**

N/A

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 5
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PERFORMANCE EVALUATION

Start Time \_\_\_\_\_

ELEMENT		STANDARD	
<b>CUE: Provide examinee with Cue Sheet and copy of 29.ESP.01, Section 15.0</b>			
* 1.	[15.0 CAUTION] Evaluate Torus Water Level to determine which instrument(s) to use for determining Torus Water Temperature.	* 1.	Evaluates Torus Water Level and determines that T23-R800 instrument points can be used.
* 2.	[15.0 NOTE (1/2)] Determine if an SRV has actuated and point 4 is INOP	* 2.	Determines that an SRV has NOT actuated and point 4 is INOP.
<b>CUE: When asked for the instrument point readings, provide the examinee with the Data Sheet.</b>			
* 3.	Determine T23-R800, Torus Water Temperature Recorder, instrument point readings and substitute the highest reading temperature for the inoperable instrument point.	* 3.	T23-R800 instrument point readings determined and 79.35°F substituted for Point 4.
* 4.	Calculate Average Torus Water Temperature.	* 4.	Calculates Average Torus Water Temperature ( <b>78.96°F</b> ).
<b>CUE: End JPM when Torus Water temperature has been determined by calculation.</b>			

\_\_\_\_\_ SATISFACTORY

\_\_\_\_\_ UNSATISFACTORY

Stop Time \_\_\_\_\_

\* Critical Step

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 6
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**Evaluator Notes:**

**ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.**

**FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.**

**Generic Notes and Cues:**

None

**System Specific Notes and Cues:**

None

**Task Performance and Cues:**

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee. Notify Examinee that time compression may be used for activities performed outside of the Control Room. Notify Examinee if JPM is Time Critical (only if JPM is **NOT** Alternate Path.)

**Critical Steps:**

Critical Tasks are identified by asterisk (\*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 7
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29.ESP.01  
Revision 19  
Page 49

**15.0 TORUS WATER AVERAGE TEMPERATURE CALCULATION**

**CAUTION**

**With Torus Water Level less than -11 inches, Torus Water temperature must be obtained from T50-R800A/B, Div 1/2 PC Air And Water Temperatures Rec (H11-P601/P602), Points 11 and 12.**

**NOTE (1):** If an instrument point is inoperable and an SRV has not actuated, the inoperable instrument point must be replaced with the highest reading temperature of the operable instrument points.

**NOTE (2):** If an instrument point is inoperable and an SRV has actuated, for a period of 48 hours following the SRV actuation, the inoperable instrument point must be replaced with the highest reading temperature of the operable instrument points plus 45°F.

<b>TORUS WATER AVERAGE TEMPERATURE CALCULATION</b>
Instrument: T23-R800, Torus Water Temperature Rec (H11-P601)
Instrument Points (if available): 1, 2, 3, 4, 5, 6, 7, 8
Calculation:  $\frac{(1) + (2) + (3) + (4) + (5) + (6) + (7) + (8)}{8} = \text{_____ } ^\circ\text{F Average}$

**END OF SECTION**

**EVALUATOR KEY:**

**Per NOTE (2):**

- Point 4 is INOP
- Lo-Lo set controlling pressure indicates SRVs have operated within the last 48 hrs
- This results in substituted value of 124.35 (79.35+45) vice 69.03

**$(79.25+78.55+79.05+124.35+79.35+78.65+79.15+78.35) / 8 = 84.59$**

JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 8
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**FOLLOW-UP DOCUMENTATION QUESTIONS**

Reason for follow-up question(s):

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Question:

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Reference:

Response:

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Question:

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Reference

Response:

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JOB PERFORMANCE MEASURE

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 9
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**Simulator Setup**

**IC#:**

N/A

**Malfunctions:**

Number	Title	Value	Delay	Ramp
N/A				

**Remote Functions:**

Number	Title	Value	Delay	Ramp
N/A				

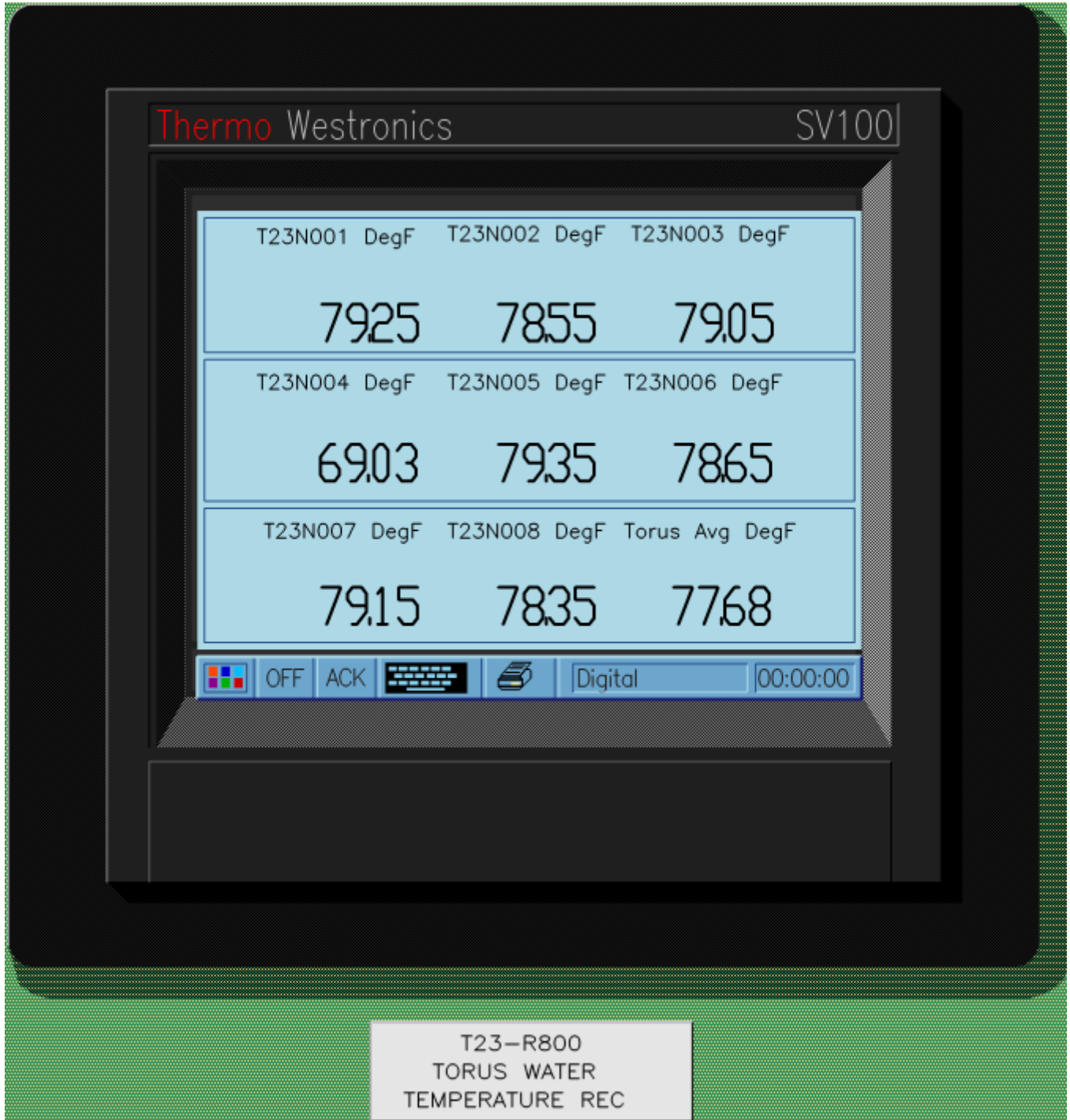
**Override Functions:**

Number	Title	Value	Delay	Ramp
N/A				

**Special Instructions:**

N/A

**Data Sheet: (JP-OP-802-3006-401)**



**T23-R800, Torus Water Temperature Recorder,  
Instrument Point Readings**

JOB PERFORMANCE MEASURE  
**Cue Sheet: (JP-OP-802-3006-401)**

**Initial Conditions:**

- You are an extra person on shift
- Primary Containment Control EOP has been entered due to Drywell temperature of 147°F
- Torus Water level is 0”
- RPV pressure is being controlled by Main Turbine bypass valves (SRVs have NOT opened)
- Point T23N004 is INOPERABLE

**Initiating Cue(s):**

The CRS directs you to calculate Torus Water Average Temperature in accordance with 29.ESP.01.

**JOB PERFORMANCE MEASURE**

Job Position SRO / RO	No. JP-OP-802-4101-211	Revision 0
JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	Duration 10 minutes	Page COVER SHEET

\*2 times Duration for ILO Exams

Examinee: \_\_\_\_\_ SRO / RO

Evaluator: \_\_\_\_\_

Validating Representatives Name: Chris Chambers

JPM Type: **Normal** / Alternate Path / Time Critical

Evaluation Method: **Perform** / Walkthrough / Discuss

(Circle method used) Plant / **Simulator** / Classroom

Start Time \_\_\_\_\_

Stop Time \_\_\_\_\_

Total Time: \_\_\_\_\_

PERFORMANCE EVALUATION SUMMARY							
Element	S	U	Comments	Element	S	U	Comments
* 1.							
* 2.							
3.							
4.							
* 5.							
* 6.							

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

**OVERALL EVALUATOR COMMENTS:**

\_\_\_\_\_

**REMEDIAL CONTENT:**

\_\_\_\_\_

\_\_\_\_\_ **PASS**      \_\_\_\_\_ **FAIL**

Evaluator Signature / Date: \_\_\_\_\_ / \_\_\_\_\_

**JOB PERFORMANCE MEASURE**

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 0
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**JPM Observation Criteria**

<b>Fundamental</b>	<b>Meets all Expectations</b>	<b>Opportunity for Improvement</b>	<b>Does not meet Expectations</b>
<b>Monitoring</b>	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
<b>Control</b>	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
<b>Conservatism</b>	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
<b>Teamwork</b>	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
<b>Knowledge</b>	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 1
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**JPM Information**

**System:**

N/A

**Task:**

Determine RHR Reservoir and RHR Cooling Tower Operation

**References:** Required (R) / Available (A)

20.000.18, Control of the Plant from the Dedicated Shutdown Panel (R)

**Tools and Equipment Required:**

None

**Initial Conditions:**

- You are an extra licensed operator assigned to shift.
- There was a confirmed fire in Zone 12A.
- 20.000.18, Control of the Plant from the Dedicated Shutdown Panel, has been entered and Condition N is being performed.
- The fire is out but there is severe damage.
- RHR Shutdown Cooling is in service.
- Outside air temperature is 23°F.
- An I & C technician reports the RHRSW return temperature multimeter reading is 32.8 milliamps.
- An I & C technician reports the RHRSW Reservoir Temperature multimeter reading is 27 milliamps.

**Initiating Cue(s):**

The CRS directs you to determine the correct configuration for MDCT Fan operation and RHRSW flow configuration IAW 20.000.18.

**Terminating Cue(s):**

Terminate the JPM when information is provided to the examiner.

**Task Standard:**

Using the information provided and 20.000.18 Enclosures B and C, determines that the MDCT Fans should be OFF and RHRSW flow should be through the Cooling Towers.

JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 2
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**Licensed Operator Exam Information (required for NRC exams)**

**Safety Function:**

SF4 – Heat Removal from Reactor Core

**K/A Reference:** (from NUREG 1123)

**K/A SYSTEM:** Generic  
**K/A STATEMENT:**  
2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc... .....3.9 / 4.2

**Maintenance Rule Safety Classification:**

N/A

**Maintenance Rule Risk Significant? (Yes or No)**

No

JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 0
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**PERFORMANCE EVALUATION**

Start Time \_\_\_\_\_

ELEMENT	STANDARD
<b>CUE: Provide Cue Sheet to Examinee.</b>	
*1. Determine RHRSW Heat Exchanger Return Temperature using information provided from I&C Technician.	*1. Determines RHRSW Return Temperature is <b>approximately 85°F</b> based on multimeter reading provided ( <b>32.8 milliamps</b> ).
*2. Determine RHR Reservoir Temperature using information provided from I&C Technician and Enclosure B.	*2. Determines RHR Reservoir Temperature is <b>approximately 65°F</b> based on multimeter reading provided ( <b>27 milliamps</b> ).
3. Refer to Step 2.2.1 due to outdoor ambient temperature <36°F.	3. Refers to 20.000.18 Enclosure C Step 2.2.1.
4. Anytime RHR Reservoir Temperature approaches 75°F, operate the Cooling Tower and Fan as needed. Otherwise, use the following steps.	4. Determines RHR Reservoir Temperature is not approaching 75°F and uses following steps.
* 5. When RHRSW Return Temperature is ≥ 80°F, align RHRSW Flow through the Cooling Tower.	* 5. Determines that RHRSW flow should be aligned through the Cooling Tower based on RHRSW Return Temperature of <b>85°F</b> .
* 6. When RHRSW Return Temperature is ≥ 90°F, run Cooling Tower Fan. <b>Note:</b> Prerequisite 1.1 also applies Minimum outside ambient temperature should be greater than 36°F for Mechanical Draft Cooling Fan operation unless Reservoir Temperature cannot be maintained below 75°F.	* 6. Determines that MDCT Fans should be OFF based on (1) RHR Reservoir Temperature is <b>approximately 65°F</b> and (2) Outside ambient temperature is <b>23°F</b> .
<b>CUE:</b> Terminate JPM when the requested information is provided to the evaluator.	

\_\_\_\_\_ SATISFACTORY

\_\_\_\_\_ UNSATISFACTORY

Stop Time \_\_\_\_\_

\* **Critical Step**



JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 1
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**Evaluator Notes:**

**ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.**

**Generic Notes and Cues:**

None

**System Specific Notes and Cues:**

None

**Task Performance and Cues:**

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

**Critical Steps:**

Critical Tasks are identified by asterisk (\*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 2
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**FOLLOW-UP DOCUMENTATION QUESTIONS**

Reason for follow-up question(s):

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Question:

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Reference:

Response:

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Question:

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Reference

Response:

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JOB PERFORMANCE MEASURE

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 3
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**EVALUATOR KEY**

<b>MDCT Fan Recommendation (Check one):</b>  OFF: <u>  X  </u> Running: <u>          </u>
<b>RHR SW Flow Recommendation (Check one):</b>  Cooling Tower Bypassed: <u>      </u> Flow Through Cooling Tower: <u>  X  </u>

**Cue Sheet: (JP-OP-802-4101-211)**

**Initial Conditions:**

- You are an extra licensed operator assigned to shift.
- There was a confirmed fire in Zone 12A.
- 20.000.18, Control of the Plant from the Dedicated Shutdown Panel has been entered.
- The fire is out but there is severe damage.
- RHR Shutdown Cooling is in service.
- Outside air temperature is 23°F.
- An I & C technician reports the RHRSW return temperature multimeter reading is 32.8 milliamps.
- An I & C technician reports the RHRSW Reservoir Temperature multimeter reading is 27 milliamps.

**Initiating Cue(s):**

The CRS directs you to determine the correct configuration for MDCT Fan operation and RHRSW flow configuration IAW 20.000.18 Enclosures B and C.

<p><b>MDCT Fan Recommendation (Check one):</b></p> <p>OFF: _____ Running: _____</p>
<p><b>RHRSW Flow Recommendation (Check one):</b></p> <p>Cooling Tower Bypassed: _____ Flow Through Cooling Tower: _____</p>

**JOB PERFORMANCE MEASURE**

Job Position RO	No. JP-OP-315-0004-101	Revision 0
JPM Title Perform Jet Pump Operability Test	Duration 20 minutes*	Page 1

\*2 times Duration for ILO Exams

Examinee: \_\_\_\_\_ SRO / RO

Evaluator: \_\_\_\_\_

Validating Representatives Name:     C. Chambers    

JPM Type:                   **Normal** / Alternate Path / Time Critical                   Start Time \_\_\_\_\_

Evaluation Method:       **Perform** / Walkthrough / Discuss                   Stop Time \_\_\_\_\_

Location:                   Plant / Simulator / **Classroom**                   Total Time: \_\_\_\_\_

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
* 1.				* 9.				* 17.			
* 2.				10.				* 18.			
* 3.				* 11.				* 19.			
* 4.				* 12.				* 20.			
* 5.				* 13.				* 21.			
* 6.				* 14.				* 22.			
7.				15.				* 23.			
8.				16.				* 24.			
								25.			

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

**OVERALL EVALUATOR COMMENTS:** \_\_\_\_\_  
 \_\_\_\_\_

**REMEDIAL CONTENT:** \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_ **PASS**      \_\_\_\_\_ **FAIL**

Evaluator Signature / Date: \_\_\_\_\_ / \_\_\_\_\_

JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 2
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**JPM Observation Criteria**

<b>Fundamental</b>	<b>Meets all Expectations</b>	<b>Opportunity for Improvement</b>	<b>Does not meet Expectations</b>
<b>Monitoring</b>	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
<b>Control</b>	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
<b>Conservatism</b>	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
<b>Teamwork</b>	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
<b>Knowledge</b>	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 3
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**JPM Information**

**System:**

B3100 - Reactor Recirculation System

**Task:**

02B3100049 – Perform Jet Pump Operability Test

**References:** Required (R) / Available (A)

23.138.06, Jet Pump Operability Test (R)

**Tools and Equipment Required:**

None

**Initial Conditions:**

- You are an extra operator on shift.
- The plant is operating at 100% power.

**Initiating Cue(s):**

The CRS directs you to perform Surveillance Procedure 24.138.06, Jet Pump Operability Test, sections 5.1, 5.2, and 5.5.

- The 24.138.06 Excel spreadsheet is NOT available.
- All section 4.0 prerequisites are met.
- Utilize provided panel indication photos for data.
- An operator in the Relay Room has reported individual Jet Pump indications.

**Terminating Cue(s):**

Surveillance complete, all data properly recorded and acceptance criteria evaluated.

**Task Standard:**

Perform Surveillance Procedure 24.138.06, Jet Pump Operability Test and evaluate data for compliance with acceptance criteria.

**Licensed Operator Exam Information (Required for NRC Exams Only)**

**Safety Function:**

N/A

**K/A Reference:** (from NUREG 1123)

**K/A SYSTEM:** Generic  
**K/A STATEMENT:**  
G2.2.12 Knowledge of Surveillance Procedures.....3.7 / 4.1

**Maintenance Rule Safety Classification:**

B2100-05

**Maintenance Rule Risk Significant? (Yes or No)**

Yes

JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 4
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**PERFORMANCE EVALUATION**

Start Time \_\_\_\_\_

ELEMENT	STANDARD
<b>CUE: Provide examinee with Cue Sheet, procedure copy, calculator, and photos of recorders and instruments.</b>	
*1. [5.1.1] Record operating value of Recirculation Loop A Drive Flow from B31-R614, Recirc Loops Flow Recorder, Blue Pen.	*1. Refers to photo of B31-R614, records loop A drive flow value, and initials procedure.
*2. [5.1.2] Record operating value of Recirculation Pump A Speed from C32-K816, FW and RR Flat Panel Display.	*2. Refers to photo of C32-K816, FW and RR Flat Panel Display, records loop A speed value, and initials procedure.
*3. [5.1.3] Record operating value of Recirculation Loop B Drive Flow from B31-R614, Recirc Loops Flow Recorder, Red Pen.	*3. Refers to photo of B31-R614, records loop B drive flow value, and initials procedure.
*4. [5.1.4] Record operating value of Recirculation Pump B Speed from C32-K816, FW and RR Flat Panel Display.	*4. Refers to photo of C32-K816, FW and RR Flat Panel Display, records loop B speed value, and initials procedure.
*5. [5.1.5] Using the data from Steps 5.1.1 and 5.1.2, plot and verify point is between -10% and +10% curve on Attachment 1.	*5. Refers to attachment 1, plots data from 5.1.1 and 5.1.2 and verifies point is between -10% and +10% curve. Determines the plot meets the acceptance criteria and initials procedure.
*6. [5.1.6] Using the data from Steps 5.1.1 and 5.1.2, plot and verify point is between -10% and +10% curve on Attachment 2.	*6. Refers to attachment 2, plots data from 5.1.3 and 5.1.4 and verifies point is between -10% and +10% curve. Determines the plot meets the acceptance criteria and initials procedure.
7. [5.1.7] Record Reactor power.	7. Records current reactor power (from cue sheet), and initials procedure.
8. [5.1.8] Record test personnel.	8. Records printed name, initials, and signature.
*9. [5.2.1] Record total core flow indication from B21-R613, Reactor Core DP & Jet Pump Total Flow Rec, Red Pen.	*9. Refers to photo of B31-R613, records total core flow value, and initials procedure.
10. [5.2.2] Record core differential pressure from B21-R613, Reactor Core DP & Jet Pump Total Flow Rec, Blue Pen.	10. Refers to photo of B31-R613, records core dP value, and initials procedure.
*11. [5.2.3] Record Recirculation Loop A Drive Flow from B31-R614, Recirc Loops Flow Recorder, Blue Pen.	*11. Refers to photo of B31-R614, records loop A drive flow value, and initials procedure.
*12. [5.2.4] Record Recirculation Loop B Drive Flow from B31-R614, Recirc Loops Flow Recorder, Red Pen.	*12. Refers to photo of B31-R614, records loop B drive flow value, and initials procedure.



JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 5
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*13. [5.2.5] Calculate Total Recirculation Loop Drive Flow below by adding recorded values of Recirculation Loop A and Loop B Drive Flows.	*13. Calculate Total Recirculation Loop Drive Flow, records result, and initials procedure.
*14. [5.2.6] Using the data from Steps 5.2.1 and 5.2.5, plot and verify point is between -10% and +10% curve on Attachment 3.	*14. Refers to attachment 3, plots data from 5.2.1 and 5.2.5 and verifies point is between -10% and +10% curve. Determines the plot meets the acceptance criteria and initials procedure.
15. [5.2.7] Record Reactor power and Rod Line.	15. Records current reactor power (from cue sheet), and initials procedure.
16. [5.2.8] Record test personnel.	16. Records printed name, initials, and signature.
<b>NOTE: Data for Table 1 (step 5.5.1) and table 2 (step 5.5.5) may be gathered at the same time</b>	
*17. [5.5.1] Record individual percent dP indications for Jet Pumps 11 through 20 in Table 1 (RR H11-P619).	*17. Refers to photo of RR H11-P619, records individual Jet Pump dP indications in applicable table, and initials procedure.
*18. [5.5.2] Calculate and record Recirculation Loop A Average dP (Average A) by adding dP values recorded in TABLE 1 for Jet Pumps 11 through 20 and dividing sum by 10.	*18. Calculates and records loop A average Jet Pump dP, and initials procedure.
*19. [5.5.3] Calculate and record in TABLE 1, percent deviation from Loop Average for Jet Pumps 11 through 20.	*19. Calculates and records loop A percent deviation for each Jet Pump, and initials procedure.
*20. [5.5.3] Using the deviation from Average % points recorded on Table 1, plot and verify all points are between -20% and +20% points on Attachment 5.	*20. Refers to attachment 5, plots data Table 1 and verifies all points are between -20% and +20% points on attachment 5. Determines the plots meet the acceptance criteria and initials procedure.
<b>NOTE: Data for Table 2 may have been previously recorded when step 5.5.1 was performed.</b>	
*21. [5.5.5] Record individual percent dP indications for Jet Pumps 1 through 10 in Table 2 (RR H11-P619).	*21. Refers to photo of RR H11-P619, records individual Jet Pump dP indications in applicable table, and initials procedure.
*22. [5.5.6] Calculate and record Recirculation Loop B Average dP (Average B) by adding dP values recorded in TABLE 2 for Jet Pumps 1 through 10 and dividing sum by 10.	*22. Calculates and records loop B average Jet Pump dP, and initials procedure.
*23. [5.5.7] Calculate and record in TABLE 2, percent deviation from Loop Average for Jet Pumps 1 through 10.	*23. Calculates and records loop B percent deviation for each Jet Pump, and initials procedure.
*24. [5.5.8] Using the deviation from Average % points recorded on Table 2, plot and verify all points are between -20% and +20% points on Attachment 6.	*24. Refers to attachment 6, plots data Table 2 and verifies all points are between -20% and +20% points on attachment 6. Determines the plots meet the acceptance criteria and initials procedure.

JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 6
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25. [5.5.9] Record test personnel.	25. Records printed name, initials, and signature.
<b>CUE: Stop the JPM when the surveillance has been completed for sections 5.1, 5.2, and 5.5.</b>	

\_\_\_\_\_ SATISFACTORY

\_\_\_\_\_ UNSATISFACTORY

Stop Time \_\_\_\_\_

\* **Critical Step**

## JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 7
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### Evaluator Notes:

**ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.**  
**FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.**

### Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

### System Specific Notes and Cues:

None

### Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

### Critical Steps:

Critical Tasks are identified by asterisk (\*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 8
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**FOLLOW-UP DOCUMENTATION QUESTIONS**

Reason for follow-up question(s):

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Question:

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**Reference**

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JOB PERFORMANCE MEASURE

JPM Title Perform Jet Pump Operability Test	No.: JP-OP-315-0004-101 Revision: 0 Page 9
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**Simulator Setup**

N/A

**IC#:**

**Malfunctions:**

Number	Title	Value	Delay	Ramp
None				

**Remote Functions:**

Number	Title	Value	Delay	Ramp
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**Override Functions (Setup Steps):**

Number	Title	Value	Delay	Ramp
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**Override Functions (JPM Steps):**

Number	Title	Value	Delay	Ramp
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Notes:

**Special Instructions:**

**Cue Sheet: (JP-OP-315-0004-101)**

**Initial Conditions:**

- You are an extra operator on shift
- The plant is operating at 100% power

**Initiating Cue(s):**

The CRS directs you to perform Surveillance Procedure 24.138.06, Jet Pump Operability Test, sections 5.1, 5.2, and 5.5 for current plant conditions.

- The 24.138.06 Excel spreadsheet is NOT available.
- All section 4.0 prerequisites are met.
- Utilize provided panel indication photos for data.
- An operator in the Relay Room has reported individual Jet Pump indications.

# JOB PERFORMANCE MEASURE

## POWER - FLOW MAP

PWR MAINT MWT

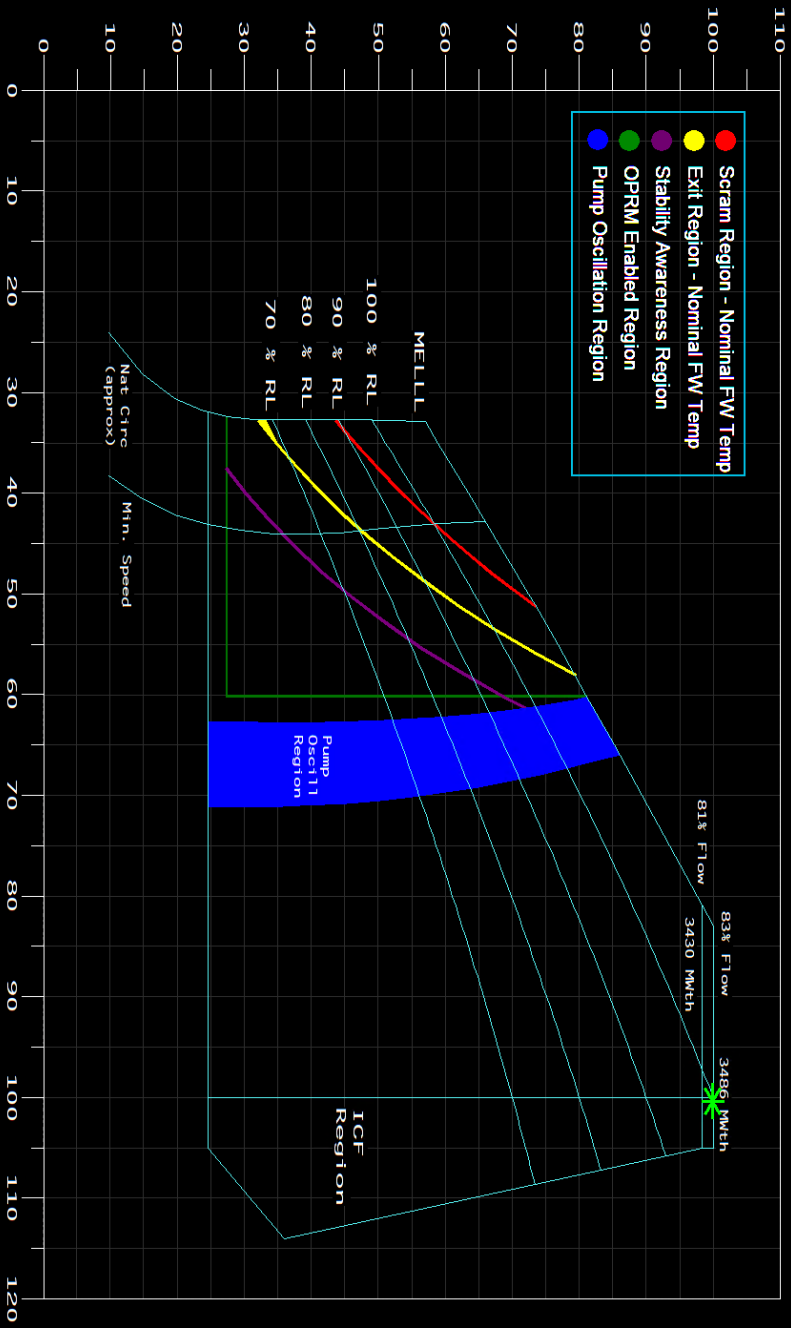
AVERAGED ABOVE 871.5

10 MIN	3480.10
1 HOUR	3481.51
4 HOUR	3480.84
7 HOUR	3479.92
8 HOUR	3479.87

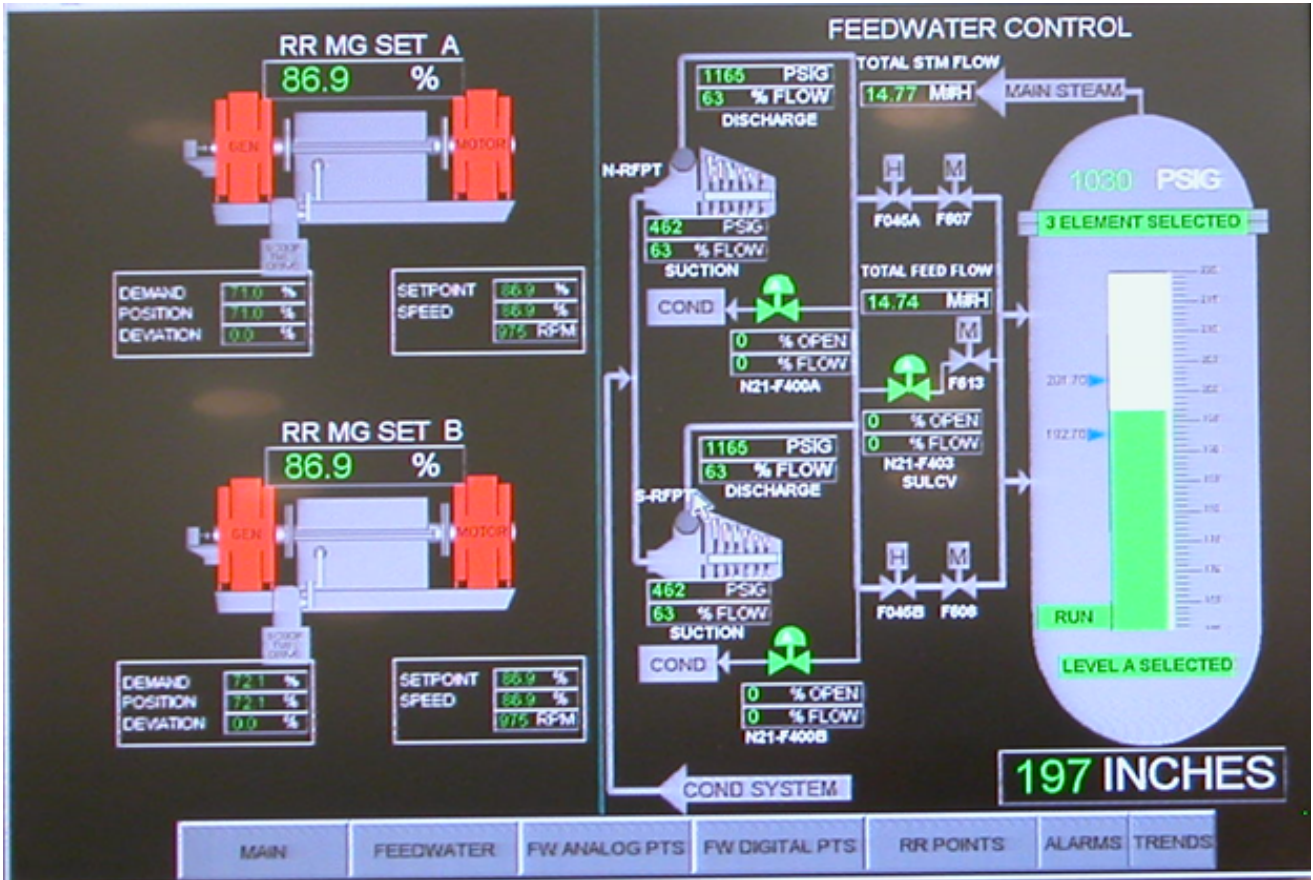
DENOTES VENTURI  
 DENOTES LEFM

99.8 %  
 REACTOR  
 POWER

100 %  
 CALCULATED  
 ROD LINE



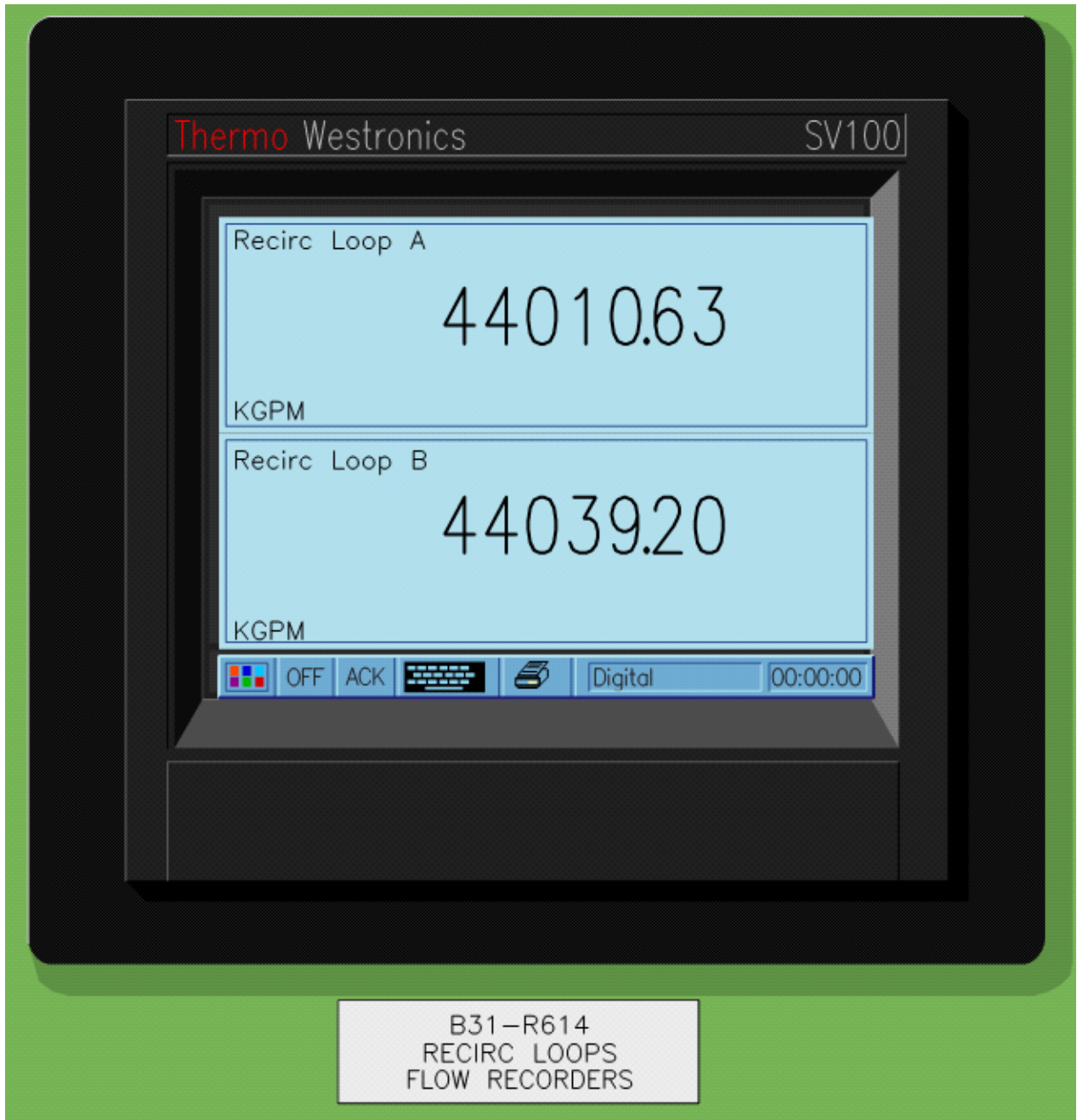
JOB PERFORMANCE MEASURE



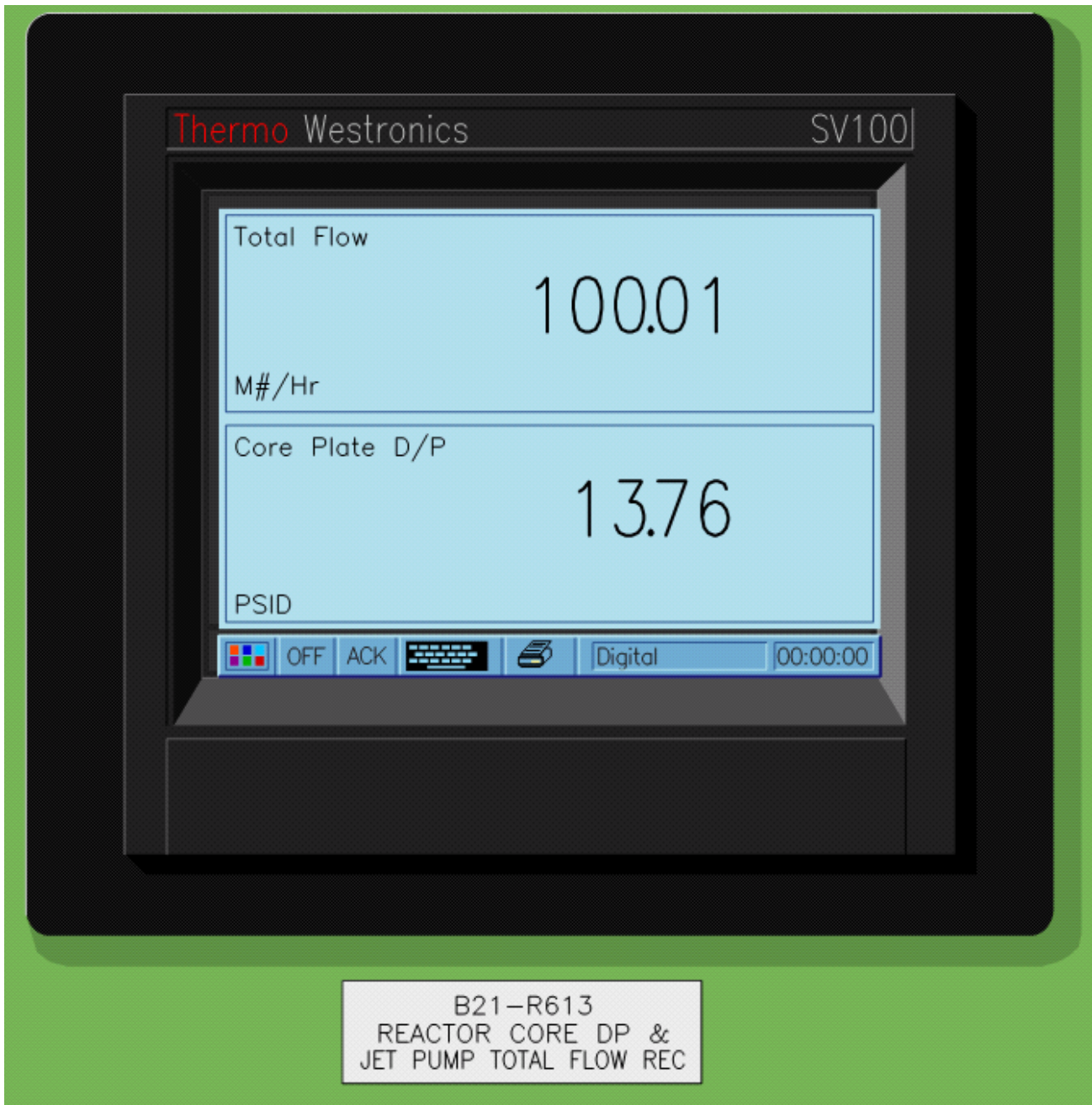
Jet Pump Data Reported by Relay Room Operator

Jet Pump	Indicator	dP (%)	Jet Pump	Indicator	dP (%)
1	B21-R608B	34	11	B21-R608A	32
2	B21-R608D	34	12	B21-R608C	29
3	B21-R608F	32	13	B21-R608E	31
4	B21-R608H	30	14	B21-R608G	28
5	B21-R608K	32	15	B21-R608J	32
6	B21-R608M	34	16	B21-R608L	31
7	B21-R608P	30	17	B21-R608N	29
8	B21-R608S	30	18	B21-R608R	30
9	B21-R608U	32	19	B21-R608T	28
10	B21-R608W	32	20	B21-R608V	30





JOB PERFORMANCE MEASURE



**EVALUATOR KEY**  
**FOR TRAINING USE ONLY**

Plant Technical Procedure - Fermi 2  
Surveillance Procedure

Continuous Use

24.138.06  
Revision 47  
Page 1

<b>JET PUMP OPERABILITY TEST</b>
----------------------------------

**Revision Summary**

- 1) Revised Step 1.1 deleting Frequency statement to align procedure with WG-001.
- 2) Updated ARMs Stamp per WG-001, no rev bar used.

**Attachments**

- 1 050914 Reactor Recirc Pump A Speed Versus Drive Flow Curves
- 2 050914 Reactor Recirc Pump B Speed Versus Drive Flow Curves
- 3 050914 Total Recirculation Drive Flow Versus Two Loop Total Core Flow
- 4 050914 Active Loop Drive Flow Versus Single Loop Total Core Flow
- 5 050914 Jet Pump Differential Pressure Deviation From Average - Loop A
- 6 050914 Jet Pump Differential Pressure Deviation From Average - Loop B

**Enclosures**

<i>Information and Procedures</i>								
DTC	DSN	Revision	Date Issued	DCR#	File #	IP	ISFSI	Recipient
TPNPP	24.138.06	47		20-0065	1703.02	I	N	

A 041716 Planning and Preparation  
B 070700 Impact Statement

## 1.0 PURPOSE

1.1 To demonstrate the operability of all installed jet pumps.

Tech Spec: SR 3.4.2.1

Applicability: Modes 1 and 2

Testing Mode: Mode 1 or 2

Section: Two Loop Operation - 5.1, 5.2, 5.5

Single Loop Operation - 5.3, 5.4, 5.5

Note: 1) This surveillance is not required to be performed until 4 hours after associated recirculation loop is in operation.  
2) Not required to be performed until 24 hours after exceeding 25% of rated thermal power.

## ~~2.0~~ PRECAUTIONS AND LIMITATIONS

~~2.1~~ For constant recirculation loop drive flow, jet pump flow inherently fluctuates as a result of feedback effects between lower plenum and jet pumps (jet pump noise). Pump vortexing, differential pressure (dP) variations of about 3 to 4 times the normal dP variation, may also exist.

~~2.1.1~~ Relative time to observe jet pump noise and jet pump vortexing varies. Jet pump noise occurs over 30 seconds to one minute. Jet pump vortexing (if it exists) occurs randomly. Normally, approximately 20 seconds per jet pump indicator is required to obtain a reading. If vortexing is occurring/suspected, time period may increase.

~~2.1.2~~ For jet pump average dP pressure, take the average of maximum and minimum values observed if jet pump vortexing is occurring.

~~2.2~~ During single loop operations at high Recirculation Pump speed, the outer jet pumps (Jet Pumps 1, 2, 9, 10, 11, 12, 19, and 20) dP indication tends to be noisy. Should problems occur in meeting Section 5.5 acceptance criteria, contact System Engineering for assistance.

~~2.3~~ The core flow summer is not calibrated to be accurate for single recirculation loop operation with Active loop drive flow less than 21,500 gpm. When operating below 21,500 gpm in the active loop, Section 5.4 shall not be performed.

~~N/A~~ 3.0 REQUIRED EQUIPMENT - None

~~4.0~~ PREREQUISITES

~~4.1~~ Verify that reactor is operating with steady state recirculation flow for duration of data acquisition.

abc  
INITIALS

~~4.2~~ Verify Jet Pumps (1 – 10) Loop B flow and Jet Pumps (11 – 20) Loop A flow are matched if in two loop operation. Otherwise, N/A this step.

abc  
INITIALS

~~4.3~~ Verify Post Accident Sampling System sampling is not in progress.

abc  
INITIALS

**5.0 PROCEDURE**

**NOTE (1):** The preferred methods to obtain Loop Drive Flows are from Recirculation Loop Flow Recorders, B31-R614 blue pen and B31-R614 red pen. Drive Flow Indicators, B31-R613 and B31-R617, may be used as an alternate indication if the flow recorders are unavailable.

**NOTE (2):** The preferred method to obtain Total Core Flow is from the Flow Recorder B21-R613 red pen. The IPCS Core Power and Flow Report may be used to indicate Total Core Flow as an alternate method. Ensure WT flag = 2 when using IPCS.

**NOTE (3):** The preferred method to obtain Core Differential Pressure is from recorder B21-R613 Blue Pen. The IPCS Core Power and Flow Report may be used to indicate Core Differential Pressure as an alternate method.

**NOTE (4):** Sections 5.1, 5.2, 5.3, 5.4, and 5.5 may be performed in any order.

**5.1 Two Recirculation Loop Drive Flow Deviation Verification**

**NOTE (1):** This section is only applicable in two loop operation. If not applicable, steps may be marked N/A.

**NOTE (2):** All indications are on COP H11-P603.

5.1.1 Record operating value of Recirculation Loop A Drive Flow from B31-R614, Recirc Loops Flow Recorder, Blue Pen.

44.0 kgpm

abe  
INITIALS

5.1.2 Record operating value of Recirculation Pump A Speed from C32-K816, FW and RR Flat Panel Display.

86.9 %

abe  
INITIALS

~~5.1.3~~

Record operating value of Recirculation Loop B Drive Flow from B31-R614, Recirc Loops Flow Recorder, Red Pen.

44.0 kgpm

abc

INITIALS

~~5.1.4~~

Record operating value of Recirculation Pump B Speed from C32-K816, FW and RR Flat Panel Display.

86.9 %

abc

INITIALS

~~5.1.5~~

Using the data from Steps 5.1.1 and 5.1.2, plot and verify point is between -10% and +10% curve on Attachment 1.

ACCEPTANCE CRITERIA

abc

INITIALS

~~5.1.6~~

Using the data from Steps 5.1.3 and Step 5.1.4, plot and verify point is between -10% and +10% curve on Attachment 2.

ACCEPTANCE CRITERIA

abc

INITIALS

~~5.1.7~~

Record Reactor power below:

99.8 %

abc

INITIALS

~~5.1.8~~

Record test personnel.

Printed Name

Initials

Signatures

NAME

Init.

Signature

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



~~5.2~~ **Two Recirculation Loop Total Core Flow Deviation Verification**

**NOTE (1):** This section is only applicable in two loop operation. If not applicable, steps may be marked N/A.

**NOTE (2):** All indicators are on COP H11-P603.

~~5.2.1~~ Record total core flow indication from B21-R613, Reactor Core DP & Jet Pump Total Flow Rec, Red Pen.  
100.01 Mlb/hr abc  
INITIALS

~~5.2.2~~ Record core differential pressure from B21-R613, Reactor Core DP & Jet Pump Total Flow Rec, Blue Pen.  
13.76 psid abc  
INITIALS

~~5.2.3~~ Record Recirculation Loop A Drive Flow from B31-R614, Recirc Loops Flow Recorder, Blue Pen.  
44.0 kgpm abc  
INITIALS

~~5.2.4~~ Record Recirculation Loop B Drive Flow from B31-R614, Recirc Loops Flow Recorder, Red Pen.  
44.0 kgpm abc  
INITIALS

~~5.2.5~~ Calculate Total Recirculation Loop Drive Flow below by adding recorded values of Recirculation Loop A and Loop B Drive Flows.

$$\frac{\text{Loop A}}{44.0 \text{ kgpm}} \text{ (Step 5.2.3)} + \frac{\text{Loop B}}{44.0 \text{ kgpm}} \text{ (Step 5.2.4)} = \frac{88.0 \text{ kgpm}}{\text{INITIALS}}$$

5.2.6

Using the data from Steps 5.2.1 and 5.2.5, plot and verify point is between -10% and +10% curve on Attachment 3.

ACCEPTANCE CRITERIA

abc  
INITIALS

5.2.7

Record Reactor power and rod line below:

Reactor Power: 99.8 %

Rod Line: 100 %

abc  
INITIALS

5.2.8

Record test personnel

Printed Name

Initials

Signature

NAME

Init.

Signature

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

**5.3 Single Recirculation Loop Drive Flow Deviation Verification**

**NOTE (1):** This section is only applicable in single loop operation. If not applicable, steps may be marked N/A.

**NOTE (2):** All indications are on COP H11-P603.

5.3.1 Record operating loop value of Recirculation Drive Flow from B31-R614, Recirc Loops Flow Recorder.

Operating Loop: \_\_\_\_\_

Recirc Loop Flow: \_\_\_\_\_ kgpm

\_\_\_\_\_  
**INITIALS**

5.3.2 Record operating value of Recirculation Pump Speed from C32-K816, FW and RR Flat Panel Display.

Operating Loop: \_\_\_\_\_

Recirc Pump Speed: \_\_\_\_\_ %

\_\_\_\_\_  
**INITIALS**

5.3.3 Using the data from Steps 5.3.1 and Step 5.3.2, plot and verify point is between -10% and +10% curve on Attachment 1 or 2, as applicable.

**ACCEPTANCE CRITERIA**

\_\_\_\_\_  
**INITIALS**

5.3.4 Record Reactor power below.

\_\_\_\_\_ %

\_\_\_\_\_  
**INITIALS**

5.3.5 Record test personnel.

Printed Name

Initials

Signatures

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### 5.4 Single Recirculation Loop Total Core Flow Deviation Verification

**NOTE (1):** This section is only applicable in single loop operation. If not applicable, steps may be marked N/A.

**NOTE (2):** All indicators are on COP H11-P603.

**NOTE (3):** The core flow summer is not calibrated to be accurate for single recirculation loop operation with Active loop drive flow less than 21,500 gpm. When operating below 21,500 gpm in the active loop, Section 5.4 shall not be performed.

5.4.1 Record total core flow indication from B21-R613, Reactor Core DP & Jet Pump Total Flow Rec, Red Pen.

\_\_\_\_\_ Mlb/hr

\_\_\_\_\_  
INITIALS

5.4.2 Record operating recirculation loop drive flow from B31-R614, Recirc Loops Flow Recorder.

\_\_\_\_\_ kgpm

\_\_\_\_\_  
INITIALS

5.4.3 Using the data from Steps 5.4.1 and 5.4.2, plot and verify point is between -10% and +10% curve on Attachment 4.

**ACCEPTANCE CRITERIA** \_\_\_\_\_

\_\_\_\_\_  
INITIALS

5.4.4 Record Reactor thermal power and rod line below.

Reactor Power: \_\_\_\_\_ %

Rod Line: \_\_\_\_\_ %

\_\_\_\_\_  
INITIALS

5.4.5 Record test personnel

Printed Name

Initials

Signature

_____	_____	_____
_____	_____	_____
_____	_____	_____

N

A

~~5.5~~

### Jet Pump Differential Pressure Deviation Verification

**NOTE (1):** Data for Tables 1 and 2 may be gathered at the same time.

**NOTE (2):** Steps 5.5.1 through 5.5.4 are only required if the Recirculation Loop A is in operation. Otherwise, N/A these steps.

~~5.5.1~~

Record individual percent dP indications for Jet Pumps 11 through 20 in Table 1 (RR H11-P619).

abc  
INITIALS

**TABLE 1**  
Recirculation Loop A

Jet Pump #	Indicator PIS #	Symbol	dP (%)	Deviation from Average (%)
11	B21-R608A	JP11	32	+6.7
12	B21-R608C	JP12	29	-3.3
13	B21-R608E	JP13	31	+3.3
14	B21-R608G	JP14	28	-6.7
15	B21-R608J	JP15	32	+6.7
16	B21-R608L	JP16	31	+3.3
17	B21-R608N	JP17	29	-3.3
18	B21-R608R	JP18	30	0
19	B21-R608T	JP19	28	-6.7
20	B21-R608V	JP20	30	0

~~5.5.2~~

Calculate and record Recirculation Loop A Average dP (Average A) by adding dP values recorded in TABLE 1 for Jet Pumps 11 through 20 and dividing sum by 10.

$$\frac{(300)}{\text{Sum (Table 1)}} / 10 = \frac{30.0}{\text{Average A}} \%$$

abc  
INITIALS

~~5.5.3~~

Calculate and record in TABLE 1, percent deviation from Loop Average for Jet Pumps 11 through 20, using the following equation:

$$[(\text{Jet Pump dP} - \text{Average A}) / (\text{Average A})] \times 100$$

abc  
INITIALS

~~5.5.4~~

Using the deviation from Average % points recorded on Table 1, plot and verify all points are between -20% and +20% points on Attachment 5.

ACCEPTANCE CRITERIA

ABC  
INITIALS

~~NOTE:~~ Steps 5.5.5 through 5.5.8 are only required if the Recirculation Loop B is in operation. Otherwise, N/A these steps.

~~5.5.5~~

Record individual percent dP indications for Jet Pumps 1 through 10 in Table 2 (RR H11-P619).

ABC  
INITIALS

**TABLE 2**  
Recirculation Loop B

Jet Pump #	Indicator PIS #	Symbol	dP (%)	Deviation from Average (%)
1	B21-R608B	JP1	34	6.3
2	B21-R608D	JP2	34	6.3
3	B21-R608F	JP3	32	0
4	B21-R608H	JP4	30	-6.3
5	B21-R608K	JP5	32	0
6	B21-R608M	JP6	34	6.3
7	B21-R608P	JP7	30	-6.3
8	B21-R608S	JP8	30	-6.3
9	B21-R608U	JP9	32	0
10	B21-R608W	JP10	32	0

~~5.5.6~~

Calculate and record Recirculation Loop B Average dP (Average B) by adding dP values recorded in Table 2 for Jet Pumps 1 through 10 and dividing sum by 10.

$$\frac{(320)}{\text{Sum (Table 2)}} / 10 = \frac{32.0}{\text{Average B}} \%$$

ABC  
INITIALS

~~5.5.7~~

Calculate and record in Table 2, percent deviation from Loop Average for Jet Pumps 1 through 10, using the following equation:

$$[(\text{Jet Pump dP} - \text{Average B}) / (\text{Average B})] \times 100$$

ABC  
INITIALS

~~5.5.8~~

Using the deviation from Average % points recorded on Table 2, plot and verify all points are between -20% and +20% points on Attachment 6.

ACCEPTANCE CRITERIA

abc  
INITIALS

~~5.5.9~~

Record test personnel

Printed Name

NAME  
\_\_\_\_\_

Initials

Init.  
\_\_\_\_\_

Signature

Signature  
\_\_\_\_\_



~~6.0~~ **INDEPENDENT VERIFICATION - None**

**7.0 ACCEPTANCE CRITERIA**

**NOTE:** Acceptance Criteria shall be reviewed by STA or an SRO other than test performer.

7.1 Verification of the following meets requirements of SR 3.4.2.1.

7.1.1 All calculations are correct.

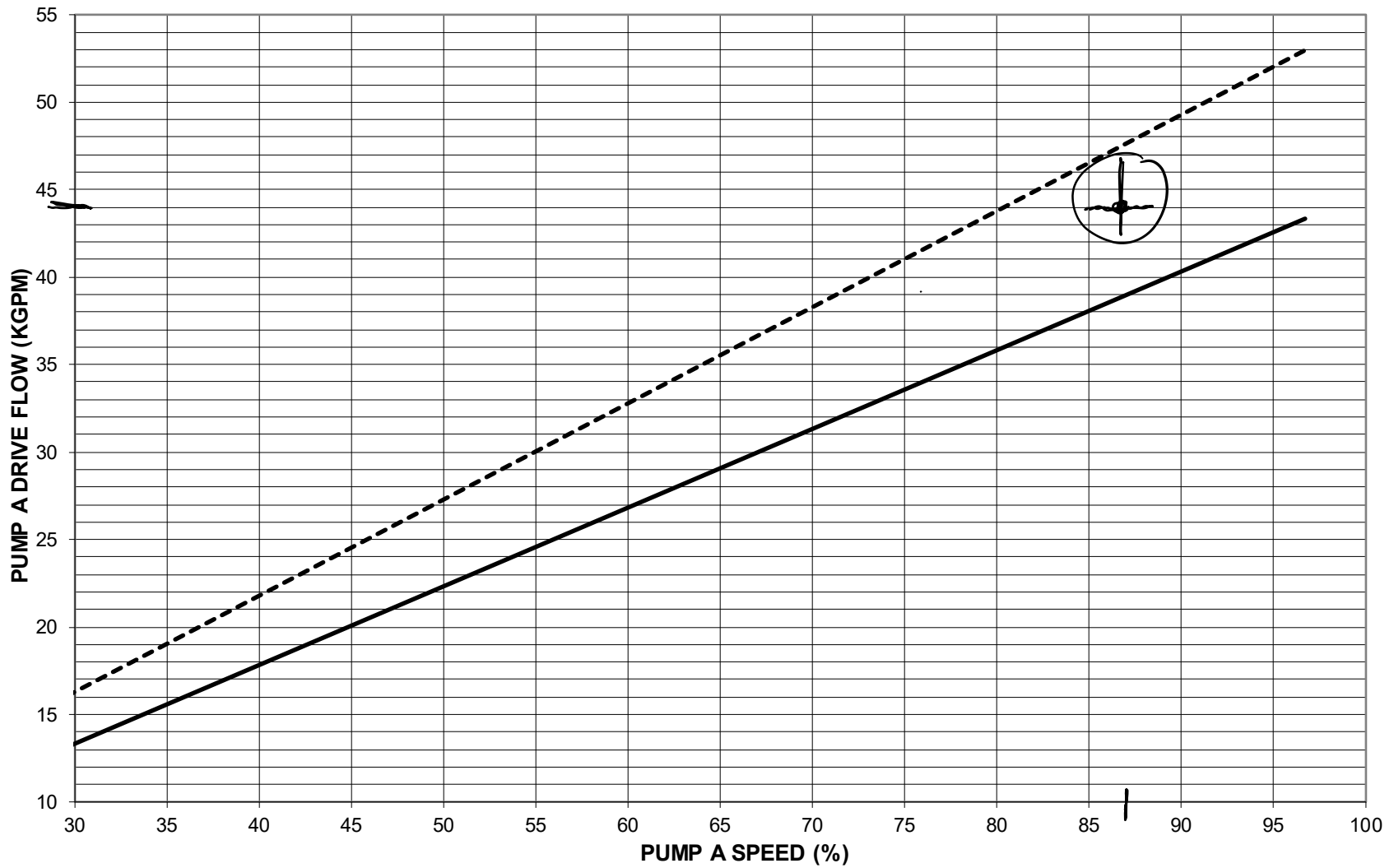
7.1.2 Two of the following have been satisfactorily completed (check sections completed).

1. Section 5.1 (Two loop operation only)
2. Section 5.2 (Two loop operation only)
3. Section 5.3 (Single loop operation only)
4. Section 5.4 (Single loop operation only)
5. Section 5.5

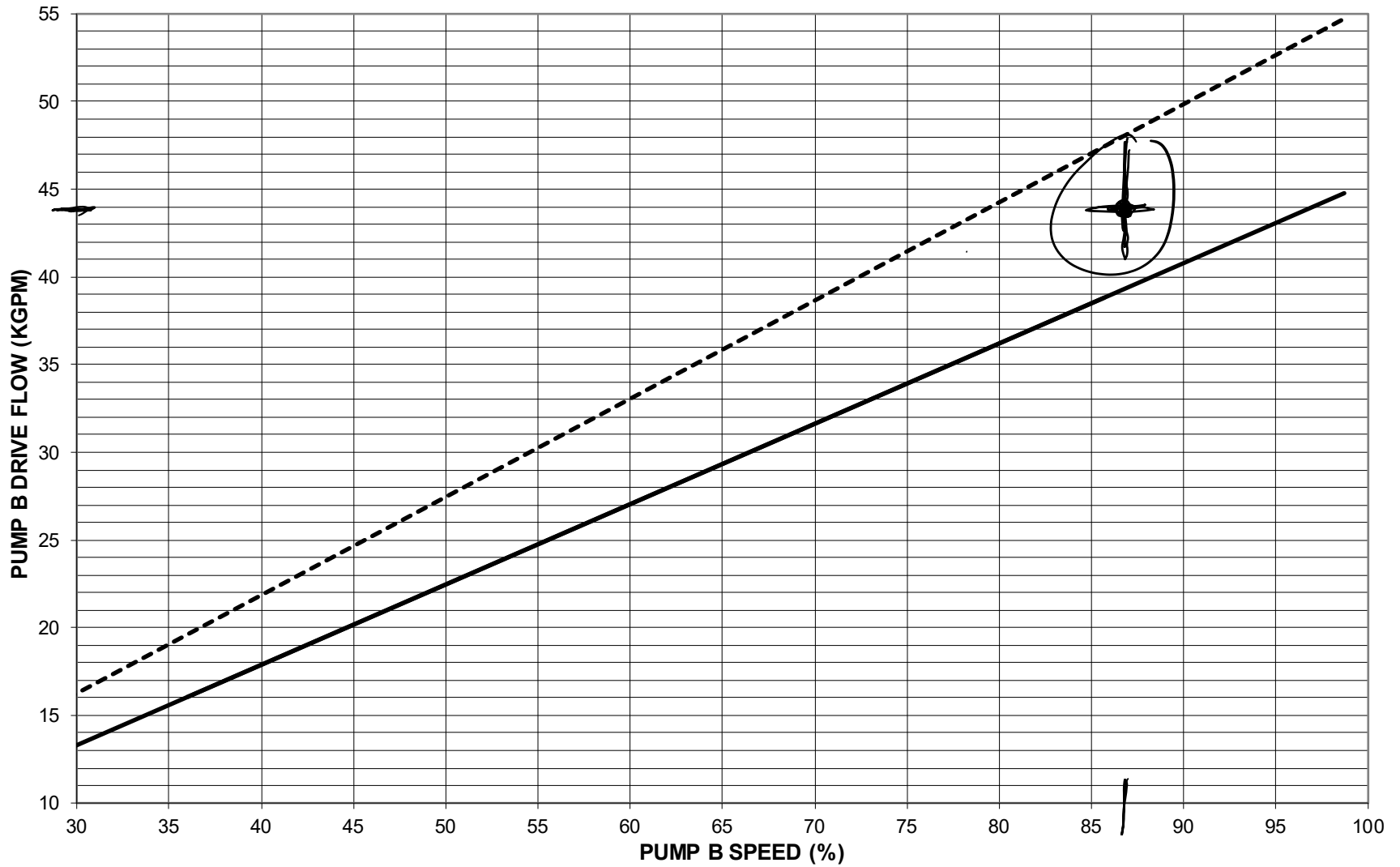
Delegated Reviewer \_\_\_\_\_  
Signature Date

**END OF TEXT**

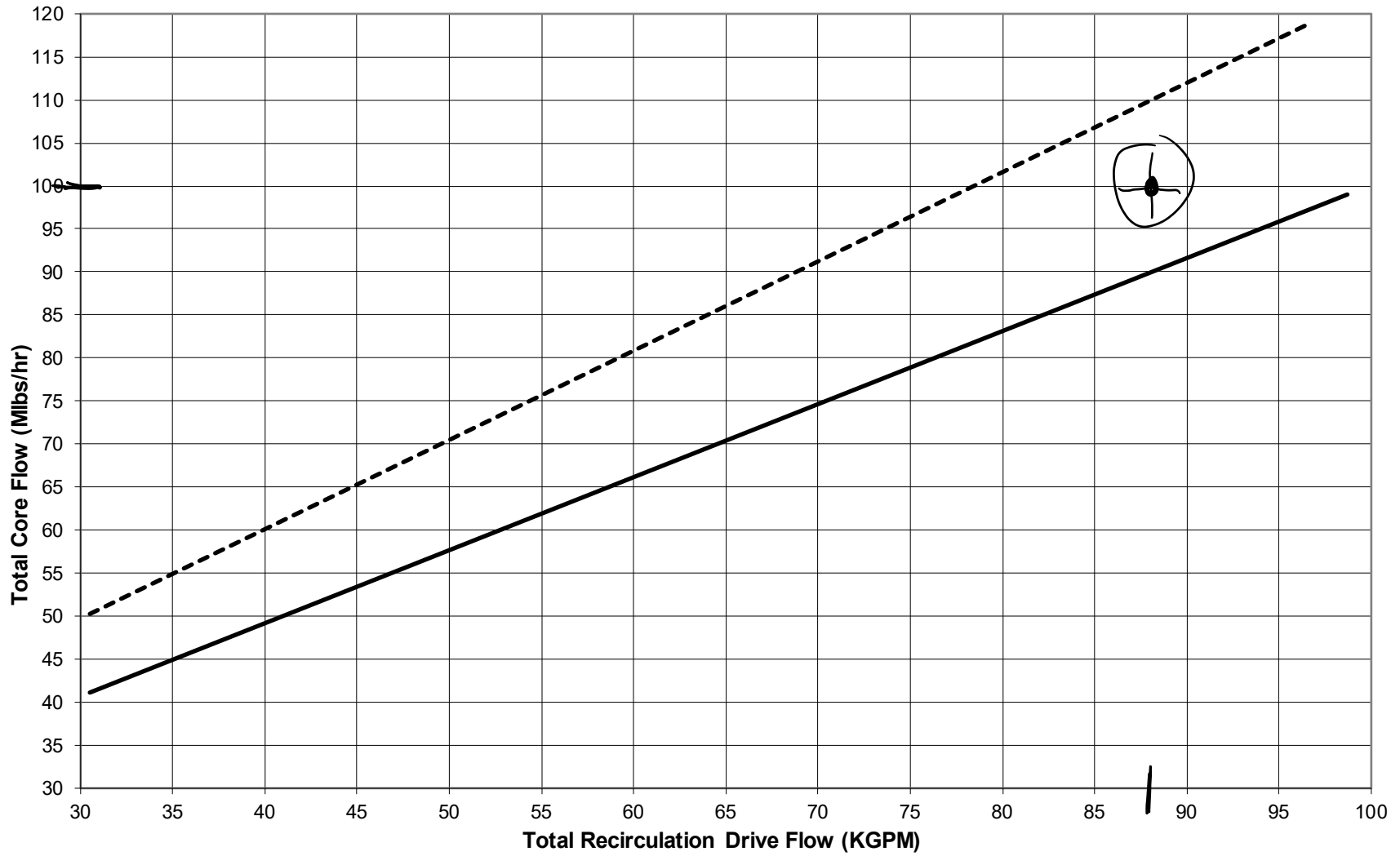
### REACTOR RECIRC PUMP A SPEED VERSUS DRIVE FLOW CURVES



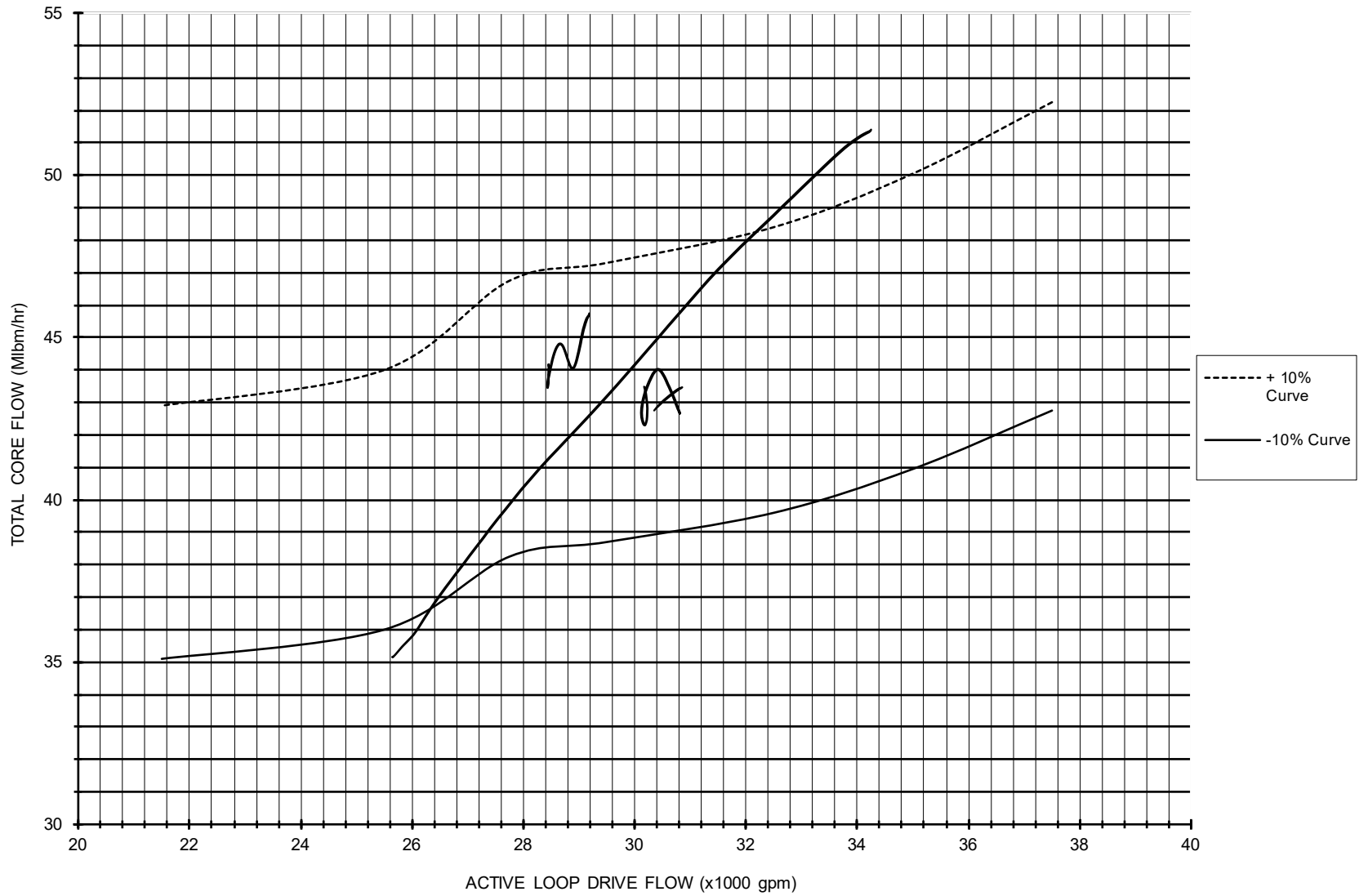
### REACTOR RECIRC PUMP B SPEED VERSUS DRIVE FLOW CURVES



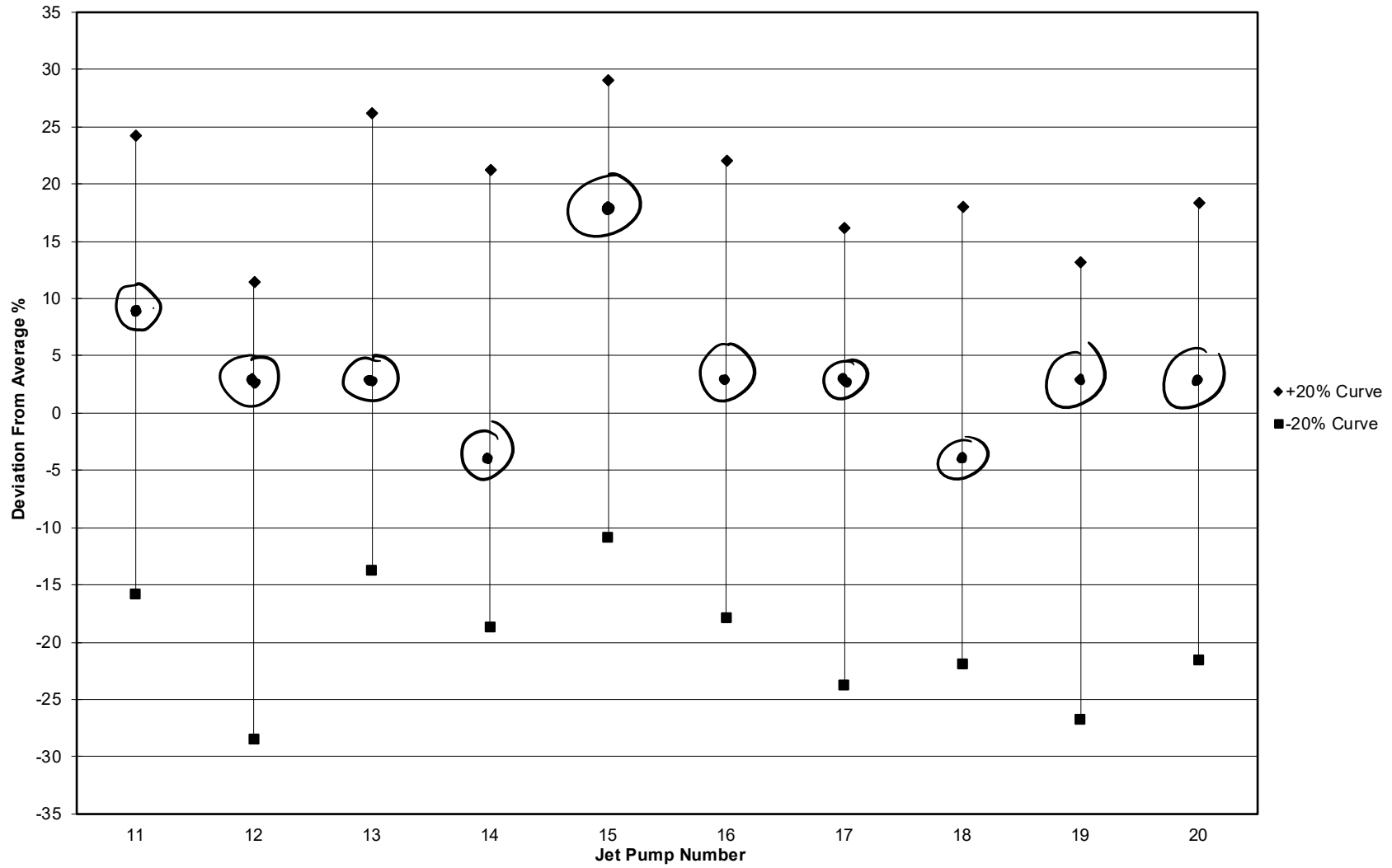
### TOTAL RECIRCULATION DRIVE FLOW VERSUS TWO LOOP TOTAL CORE FLOW



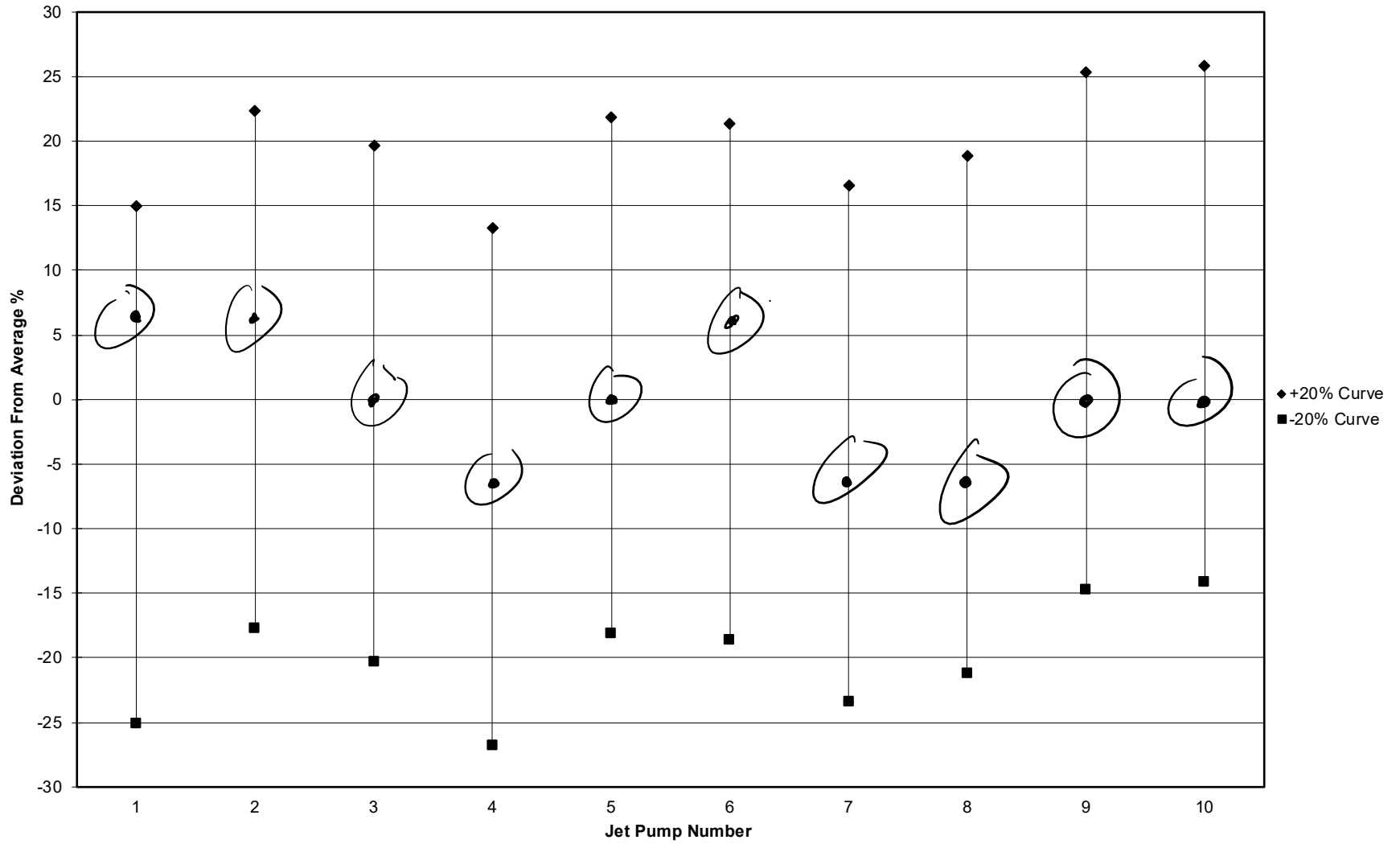
### ACTIVE LOOP DRIVE FLOW VERSUS SINGLE LOOP TOTAL CORE FLOW



### JET PUMP DIFFERENTIAL PRESSURE DEVIATION FROM AVERAGE - LOOP A



### JET PUMP DIFFERENTIAL PRESSURE DEVIATION FROM AVERAGE - LOOP B



**JOB PERFORMANCE MEASURE**

Job Position RO	No. JP-OP-802-4101-454	Revision 0
JPM Title Calculate Offgas Release Rate During Fuel Failure	Duration 15 minutes*	Page 1

\*2 times Duration for ILO Exams

Examinee: \_\_\_\_\_ SRO / RO

Evaluator: \_\_\_\_\_

Validating Representatives Name: John Holdwick/Chris Chambers/Art Snowberger

JPM Type: **Normal** / Alternate Path / Time Critical      Start Time \_\_\_\_\_

Evaluation Method: **Perform** / Walkthrough / Discuss      Stop Time \_\_\_\_\_

Location: Plant / **Simulator** / **Classroom**      Total Time: \_\_\_\_\_

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
*1.											
*2.											
*3.											
*4.											
*5.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

**OVERALL EVALUATOR COMMENTS:** \_\_\_\_\_

**REMEDIAL CONTENT:** \_\_\_\_\_

\_\_\_\_\_ **PASS**    \_\_\_\_\_ **FAIL**

Evaluator Signature / Date: \_\_\_\_\_ / \_\_\_\_\_



**JOB PERFORMANCE MEASURE**

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 2
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**JPM Observation Criteria**

<b>Fundamental</b>	<b>Meets all Expectations</b>	<b>Opportunity for Improvement</b>	<b>Does not meet Expectations</b>
<b>Monitoring</b>	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
<b>Control</b>	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
<b>Conservatism</b>	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
<b>Teamwork</b>	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
<b>Knowledge</b>	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 3
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**JPM Information**

**System:**

NA

**Task:**

**References:** Required (R) / Available (A)

20.000.07, Fuel Cladding Failure (R)  
Fermi 2 Tech Spec 3.7.5 (R)

**Tools and Equipment Required:**

Calculator

**Initial Conditions:**

- The plant is operating at 100% power.
- You are the CRLNO.
- A fuel cladding failure has occurred, and the crew has entered 20.000.07, Fuel Cladding Failure.

**Initiating Cue(s):**

The CRS directs you to calculate Offgas radioactivity release rate and determine if the Tech Spec 3.7.5 LCO value has been exceeded.

**Terminating Cue(s):**

Offgas release rate has been calculated and TS LCO 3.7.5 compliance evaluated

**Task Standard:**

Offgas release rate is calculated in accordance with AOP 20.000.07 and the "Offgas Log Radiation Monitors Conversion Factors For Technical Specifications 3.7.5" posted worksheet; and verified within Tech Spec LCO 3.7.5 required value.

**Licensed Operator Exam Information (Required for NRC Exams Only)**

**Safety Function:**

9 - Radioactivity Release

**K/A Reference:** (from NUREG 1123)

**K/A SYSTEM:** Generic 2.3 – Radiation Control  
**K/A STATEMENT:**  
2.3.5 Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.. ..... 2.9 / 2.9

**Maintenance Rule Safety Classification:**

NA

**Maintenance Rule Risk Significant? (Yes or No)**

NA

**JOB PERFORMANCE MEASURE**

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 4
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**PERFORMANCE EVALUATION**

Start Time \_\_\_\_\_

ELEMENT	STANDARD
<b>CUE: Provide Examinee with Cue Sheets and copy of 20.000.07</b>	
<b>*1.</b> [Condition B Note 1] To obtain mCi/sec use the "Off Gas Log Radiation Monitors Conversion Factors" sheet (posted on the rear of the H11-P601).	<b>*1.</b> Refers to the "Offgas Log Radiation Monitors Conversion Factors For Technical Specifications 3.7.5" sheet.
<b>*2.</b> Obtain readings from Offgas Rad Monitors D11-K601A & B	<b>*2.</b> Obtains readings from Offgas Rad Monitors D11-K601A & B.
<b>*3.</b> Obtain reading from N62-R808, Outlet Flow Recorder, Charcoal Unit Flow	<b>*3.</b> Obtains reading from N62-R808, Outlet Flow Recorder, Charcoal Unit Flow
<b>*4.</b> Calculates Offgas Release Rate using $mCi/sec = (conversion\ factor) \times (rad\ monitor\ reading) \times (offgas\ flow\ rate)$	<b>*4.</b> Calculates Offgas Release Rate: <u>Rad Monitor A</u> <b>0.68 mCi/sec</b> = $(2.703E-4) \times (200\ mr/hr) \times (12.63\ scfm)$ <u>Rad Monitor B</u> <b>0.68 mCi/sec</b> = $(2.403E-4) \times (223\ mr/hr) \times (12.63\ scfm)$
<b>*5.</b> Evaluates Offgas Release Rate per TS LCO 3.7.5	<b>*5.</b> Evaluates Offgas Release Rate per TS LCO 3.7.5, and determines release rate is below the TS limit of 340 mCi/sec
<b>CUE: End JPM when Offgas release rates have been calculated and TS limit evaluated.</b>	

\_\_\_\_\_ SATISFACTORY

\_\_\_\_\_ UNSATISFACTORY

Stop Time \_\_\_\_\_

**\* Critical Step**

JOB PERFORMANCE MEASURE

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 5
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**Evaluator Notes:**

**ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.  
FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.**

**Generic Notes and Cues:**

None

**System Specific Notes and Cues:**

None

**Task Performance and Cues:**

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

**Critical Steps:**

Critical Tasks are identified by asterisk (\*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 6
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**FOLLOW-UP DOCUMENTATION QUESTIONS**

Reason for follow-up question(s):

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Question:

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Reference:

Response:

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Question:

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Reference

Response:

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JOB PERFORMANCE MEASURE

JPM Title Calculate Offgas Release Rate During Fuel Failure	No.: JP-OP-802-4101-454 Revision: 0 Page 7
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**Simulator Setup**

**IC#:**

20

**Malfunctions:**

Number	Title	Value	Delay	Ramp
N/A				

**Remote Functions:**

Number	Title	Value	Delay	Ramp
N/A				

**Override Functions:**

Number	Title	Value	Delay	Ramp
H_P601_C046_1	Log rad monitor recorder channel A	200	0	0
H_P601_C046_2	Log rad monitor recorder channel B	223	0	0
H_P806_C006_2	Offgas flow (charcoal bed) flow recorder	12.63	0	0

**Special Instructions:**

1. Reset to IC-20 or predetermined IC as desired
2. Execute and trigger JP4101-454 Calculate Release Rate.Isn (N/A if using preset IC)
3. Freeze simulator and perform JPM

**Examiner Reference Sheet**

Training Use Only

**Formula:**

Offgas Rad Release Rate = Conversion Factor X Offgas Log Rad Monitor Reading X Offgas Flowrate

- Rad Monitor A conversion factor = 2.703E-4
- Rad Monitor A indication = 200 mr/hr
- Rad Monitor B conversion factor = 2.403E-4
- Rad Monitor B indication = 223 mr/hr

**Rad Monitor A calculation:**

$$(2.703E-4) (200 \text{ mr/hr}) (12.63 \text{ scfm}) = \mathbf{0.683 \text{ mCi/sec}}$$

**Rad Monitor B calculation:**

$$(2.403E-4) (223 \text{ mr/hr}) (12.63 \text{ scfm}) = \mathbf{0.677 \text{ mCi/sec}}$$

**Tech Spec 3.7.5 required value:  $\leq 340 \text{ mCi/sec}$**

**Cue Sheet 1: (JP-OP-802-4101-454)**

**Initial Conditions:**

- The plant is operating at 100% power.
- You are the CRLNO.
- A fuel cladding failure has occurred, and the crew has entered 20.000.07, Fuel Cladding Failure.

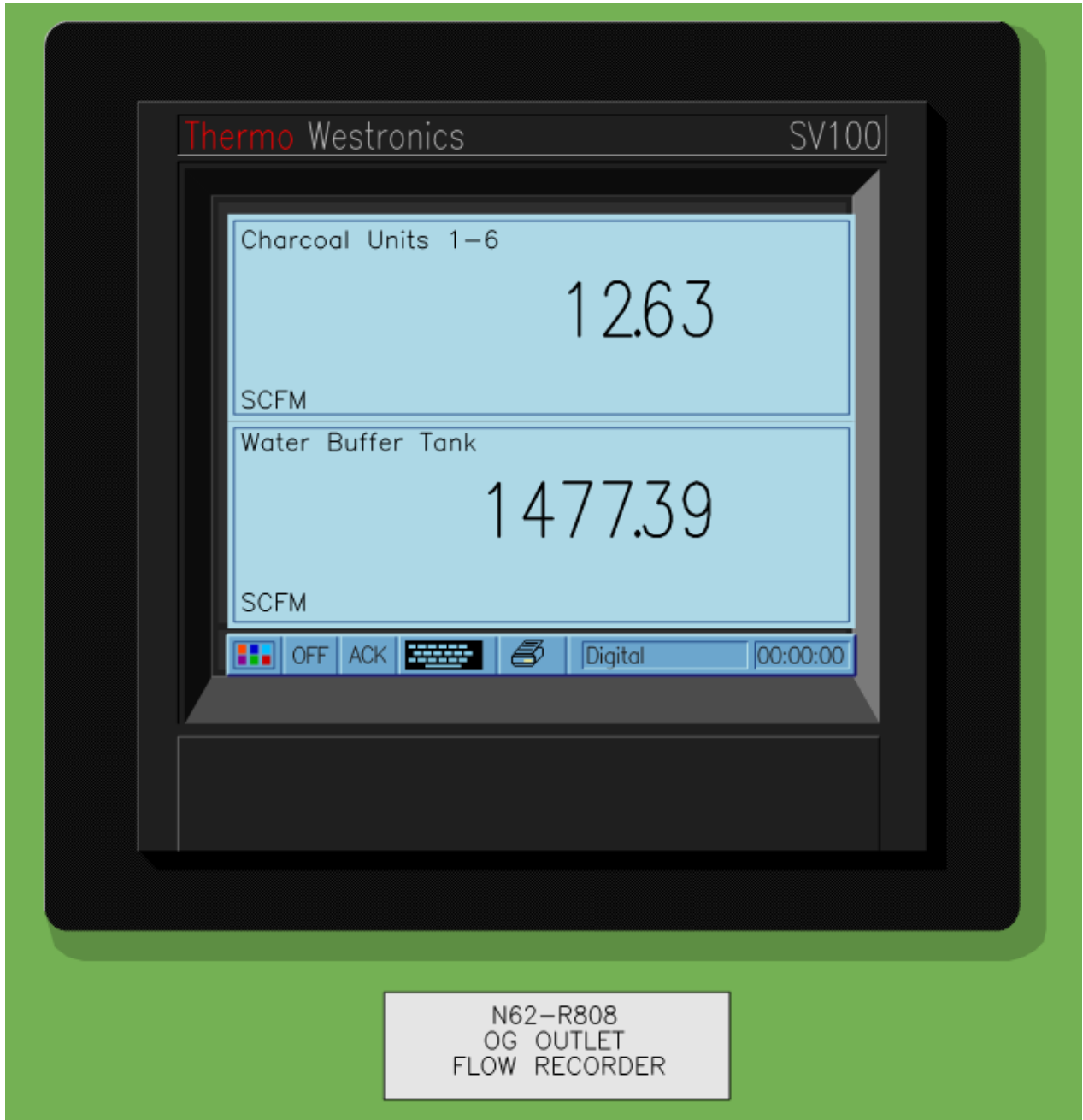
**Initiating Cue(s):**

The CRS directs you to calculate Offgas radioactivity release rate and determine if the Tech Spec 3.7.5 LCO value has been exceeded.



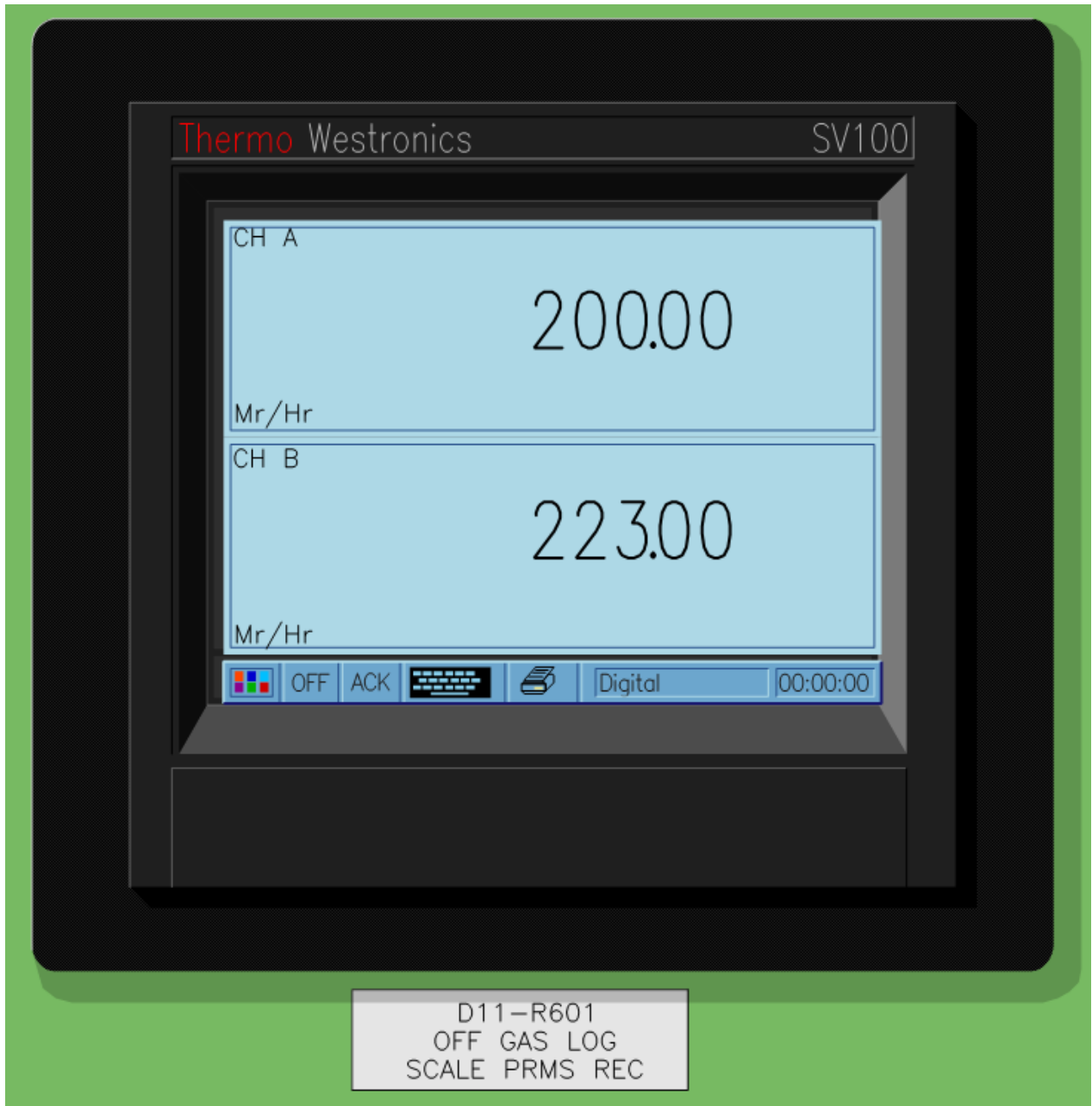
JOB PERFORMANCE MEASURE  
**Cue Sheet 2: (JP-OP-802-4101-454)**

Training Use Only



JOB PERFORMANCE MEASURE  
**Cue Sheet 2 (cont.): (JP-OP-802-4101-454)**

Training Use Only



78.000.09 Att 3 P1/1 033016

DTC: TGCHEM DSN: \_\_\_\_\_ File: 1327.01 IP: I

**FOR TRAINING USE ONLY**

**FOR TRAINING USE ONLY**

**OFFGAS LOG RADIATION MONITORS CONVERSION FACTORS FOR  
TECHNICAL SPECIFICATIONS 3.7.5**

**SAMPLE INFORMATION**

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Offgas Radioactivity Rate.....	4.29E-01 mCi/sec
Offgas System Flow Rate .....	12.4 SCFM
Offgas Log Rad Monitor D11-K601A Reading .....	12.8 mR/hr
Offgas Log Rad Monitor D11-K601B Reading .....	14.4 mR/hr

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**CONVERSION FACTORS**

<b>2.703E-</b>	<b><u>mCi/sec</u> mr/hr x</b>
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<b>2.403E-</b>	<b><u>mCi/sec</u> mr/hr x</b>
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THESE CONVERSION FACTORS ARE TO BE USED TO OBTAIN A mCi/sec RELEASE RATE FROM OFFGAS LOG RADIATION MONITORS.

TO USE CONVERSION FACTORS, MULTIPLY FACTOR BY CURRENT OFFGAS LOG RADIATION MONITOR READING (mr/hr) AND CURRENT OFFGAS FLOW RATE (cfm):

$$\text{mCi/sec} = \text{FACTOR} \times \text{MONITOR READING} \times \text{OFFGAS FLOW}^*$$

\* Flow as read from N62-R808, O/G Outlet Flow Rec pen labeled Charcoal Unit 1-6.

Performed By *[Signature]* Date TODAY

Approved By *[Signature]* Date Today  
Chemist/designee

Noted By *[Signature]* Date TODAY  
SM