JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 1

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: _____

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: _____ / _____

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	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.
Control	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.
Conservatism	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.
Teamwork	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.
Knowledge	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.

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

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 0”
- RPV pressure is being controlled by Low-Low Set
- 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:

Torus water temperature is calculated correctly with point four inoperable and an SRV has actuated in accordance with 29.ESP.01 section 15, resulting in the correct value for torus average temperature per the evaluator key (84.59-0 +0.04 °F)

JPM Title Perform Torus Water Average Temperature Calculation	No.: JP-OP-802-3006-402 Revision: 0 Page 4

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

PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE:	**Provide examinee with Cue Sheet and copy of 29.ESP.01 (full procedure).**		
*** 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 actuated since Low-Low set is controlling RPV pressure and point 4 is INOP.
CUE:	**When asked for the instrument point readings, provide the examinee with the Data Sheet.**		
*** 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 124.35°F substituted for Point 4. (highest value + 45°F
*** 4.**	Calculate Average Torus Water Temperature.	*** 4.**	Calculates Average Torus Water Temperature **(84.59°F-84.63°F)**.
CUE:	**End JPM when Torus Water temperature has been determined by calculation.**		

_____ SATISFACTORY _____ UNSATISFACTORY

Stop Time _____

*** Critical Step**

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

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.

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.

TORUS WATER AVERAGE TEMPERATURE CALCULATION
Instrument: T23-R800, Torus Water Temperature Rec (H11-P601)
Instrument Points (if available): 1, 2, 3, 4, 5, 6, 7, 8
Calculation: $\frac{(1) + (2) + (3) + (4) + (5) + (6) + (7) + (8)}{8} =$ _____ °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
(84.59 to 84.63 is acceptable)

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

Simulator Setup

IC#:

N/A

Malfunctions:

Number	Title	Value	Delay	Ramp
N/A				

Remote Functions:

Number	Title	Value	Delay	Ramp
N/A				

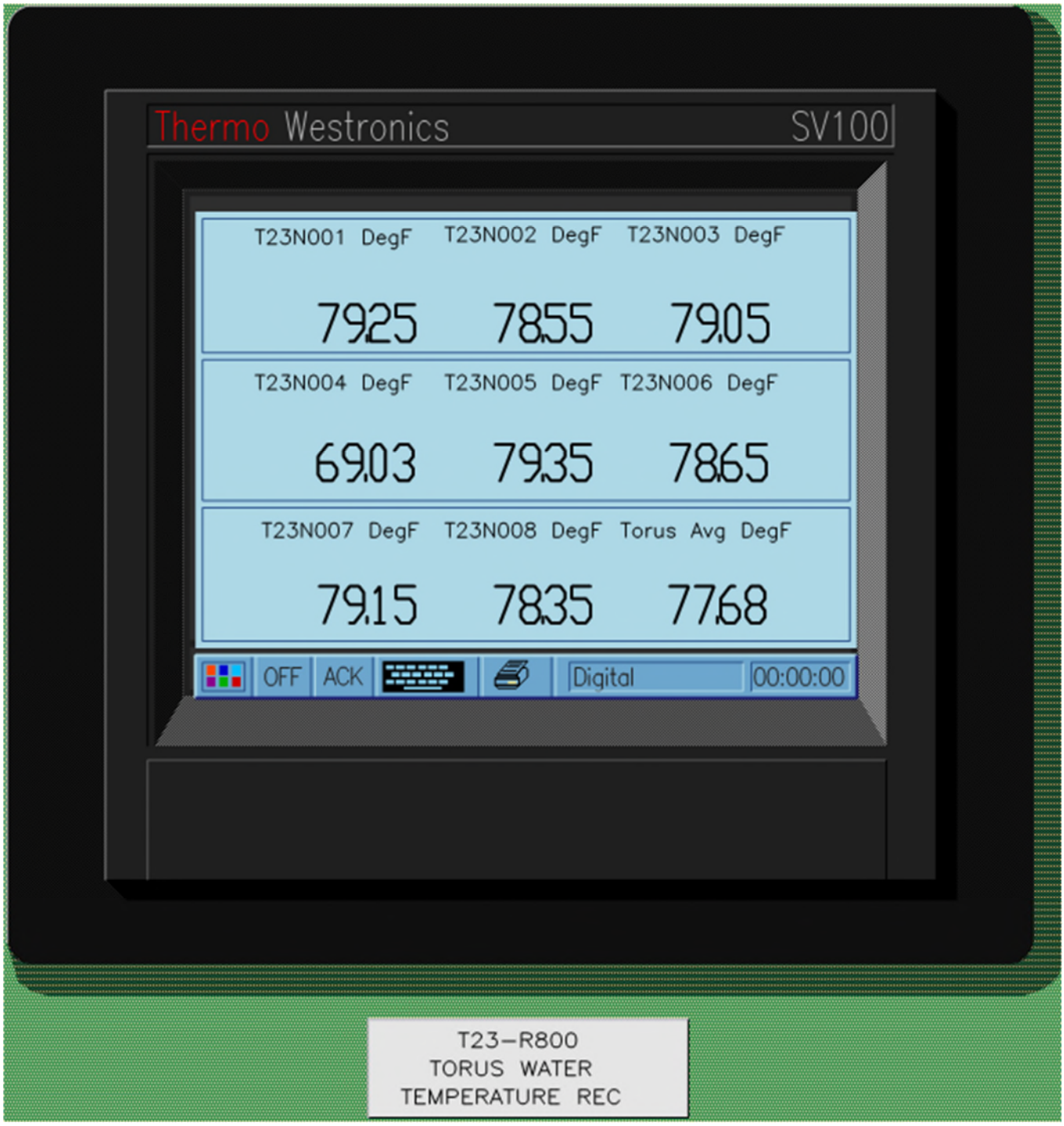
Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

Special Instructions:

N/A

Data Sheet: (JP-OP-802-3006-402)



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

Cue Sheet: (JP-OP-802-3006-402)

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 Low-Low Set
- Point T23N004 is INOPERABLE

Initiating Cue(s):

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

Data Sheet: (JP-OP-802-3006-402)

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

Cue Sheet: (JP-OP-802-3006-402)

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 Low-Low Set
- 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: _____ /

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	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.
Control	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.
Conservatism	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.
Teamwork	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.
Knowledge	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.

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

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 27.5 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.

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

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

PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE:	**Provide Cue Sheet and 20.000.18 (entire procedure) to Examinee.**		
***1.**	[20.000.18 Encl C 2.1.1] Determine RHRSW Heat Exchanger Return Temperature using information provided from I&C Technician.	***1.**	Determines RHRSW Return Temperature is **approximately 85°F** based on multimeter reading provided (**32.8 milliamps**) by interpolating the value between those provided in procedure note following step 2.1.1.2
***2.**	[2.1.2] Determine RHR Reservoir Temperature using information provided from I&C Technician and Enclosure B.	***2.**	Determines RHR Reservoir Temperature is **approximately 65°F** based on multimeter reading provided (**27.5 milliamps**) by plotting milliamp vs. temp using enclosure 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.	[2.2.1.1] 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.**	[2.2.1.2] 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 **85°F**.
*** 6.**	[2.2.1.4] When RHRSW Return Temperature is < 90°F, shutdown Cooling Tower Fan. **Note:** 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 **approximately 65°F** and (2) Outside ambient temperature is **23°F**.
CUE:	Terminate JPM when the requested information is provided to the evaluator.		

_____ SATISFACTORY _____ UNSATISFACTORY

Stop Time _____

*** Critical Step**

JPM Title Determine RHR Reservoir and RHR Cooling Tower Operation	No.: JP-OP-802-4101-211 Revision: 0 Page 5

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.

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

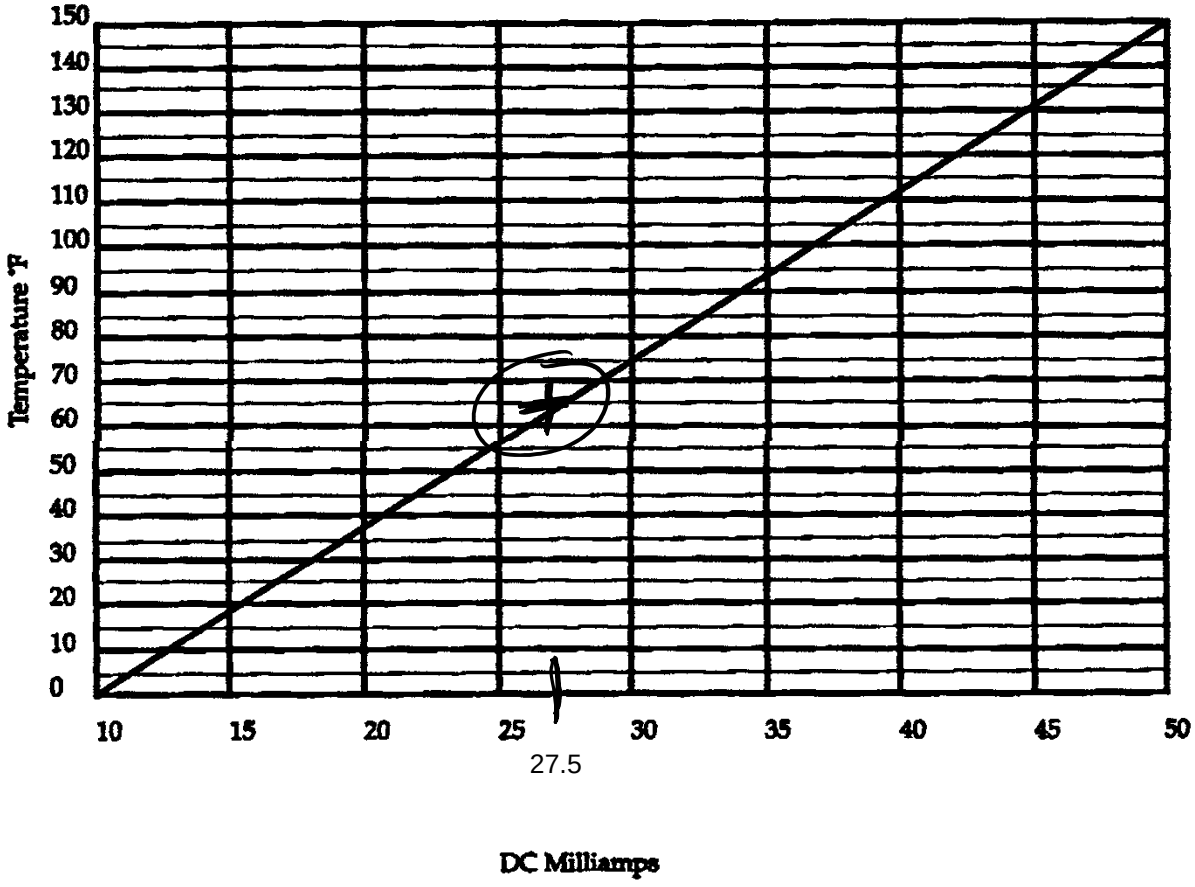
Response:

Question:

Reference

Response:

RHR RESERVOIR TEMPERATURE VS. INSTRUMENT MILLIAMP READINGS



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 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 27.5 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.

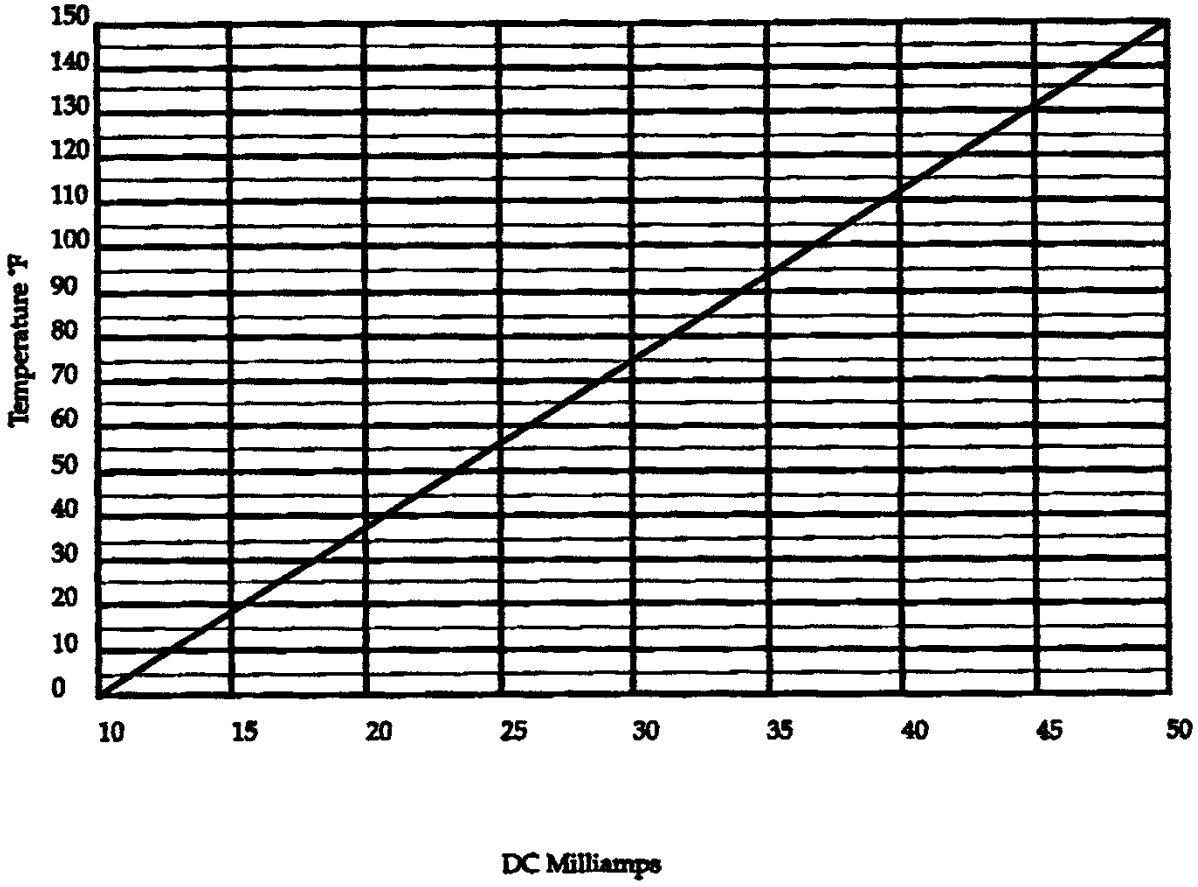
Initial Conditions:

- 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 27.5 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.

RHR RESERVOIR TEMPERATURE VS. INSTRUMENT MILLIAMP READINGS



RHR RESERVOIR AND RHR COOLING TOWER OPERATION

1.0 Prerequisites

1.1 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.

2.0 Detailed Procedure

NOTE: If Temperature readings are unavailable or inaccessible, operate MDCT Fan E1156C001C continuously in high speed.

2.1 Obtain RHR Reservoir and RHRSW Heat Exchanger Outlet Temperatures:

2.1.1 Determine RHRSW Heat Exchanger Return Temperature by contacting the Instrument Shop and directing an I&C Repairman to perform the following:

1. At RR H11-P836, disconnect wire at Point 161 on Terminal Strip B.

2. Connect digital multimeter in series at Point 161 on Terminal Strip B.

NOTE: If reading on digital multimeter is 31.4 milliamps, the RHRSW Return Temperature is approximately 80°F. A reading of 34.1 milliamps is approximately 90°F.

3. Obtain digital multimeter reading and determine RHRSW Heat Exchanger Return Temperature.

2.1.2 Determine RHR Reservoir Temperature:

1. At RR H11-P836, disconnect wire at Point 163 on Terminal Strip B.

2. Connect digital multimeter in series at Point 163 on Terminal Strip B.

3. Obtain digital multimeter reading.

4. See Enclosure B to obtain RHR Reservoir Temperature.

RHR RESERVOIR AND RHR COOLING TOWER OPERATION

2.2 Maintain RHR Reservoir Temperatures between 43 and 75°F within the following guidelines:

NOTE: Only MDCT Fan E1156C001C and Tower E1156B001B are available for service due to electrical system alignment.

2.2.1 **If** outdoor ambient temperature is ≤ 36°F:

1. Anytime RHR Reservoir Temperature approaches 75°F, operate the Cooling Tower and Fan as needed. Otherwise, use the following steps.

2. When RHRSW Return Temperature is ≥ 80°F, align RHRSW Flow through the Cooling Tower.

3. When RHRSW Return Temperature is ≥ 90°F, run Cooling Tower Fan.

4. When RHRSW Return Temperature is < 90°F, shutdown Cooling Tower Fan.

5. When RHRSW Return Temperature is < 80°F, align RHRSW Flow to bypass the Cooling Towers.

2.2.2 **If** outdoor ambient temperature is > 36°F before exceeding RHR Reservoir Temperature of 75°F, align RHRSW Flow through the Cooling Tower and run Cooling Tower Fan as needed.

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: _____

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: _____ /

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	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.
Control	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.
Conservatism	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.
Teamwork	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.
Knowledge	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.

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 with data and control room indications provided, perform required calculations and data plots and determine that Jet Pump 15 dP is out of tolerance, properly annotate findings on surveillance form and report to CRS.

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

PERFORMANCE EVALUATION

Start Time _____

ELEMENT	STANDARD
CUE: Provide examinee with Cue Sheet, procedure copy, calculator, and photos of recorders and instruments.	
*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 5.1.3 and 5.1.4, 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.

*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.
NOTE: Data for Table 1 (step 5.5.1) and table 2 (step 5.5.5) may be gathered at the same time	
*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 plot for JP 15 is out of tolerance.**
NOTE: Data for Table 2 may have been previously recorded when step 5.5.1 was performed.	
*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.

25. [5.5.9] Record test personnel.	25. Records printed name, initials, and signature.
CUE: Stop the JPM when the surveillance has been completed for sections 5.1, 5.2, and 5.5.	

_____ SATISFACTORY _____ UNSATISFACTORY

Stop Time _____

*** Critical Step**

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.

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Response:

Question:

Reference

Response:

Simulator Setup

N/A

IC#:

Malfunctions:

Number	Title	Value	Delay	Ramp
None				

Remote Functions:

Number	Title	Value	Delay	Ramp

Override Functions (Setup Steps):

Number	Title	Value	Delay	Ramp

Override Functions (JPM Steps):

Number	Title	Value	Delay	Ramp

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.

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

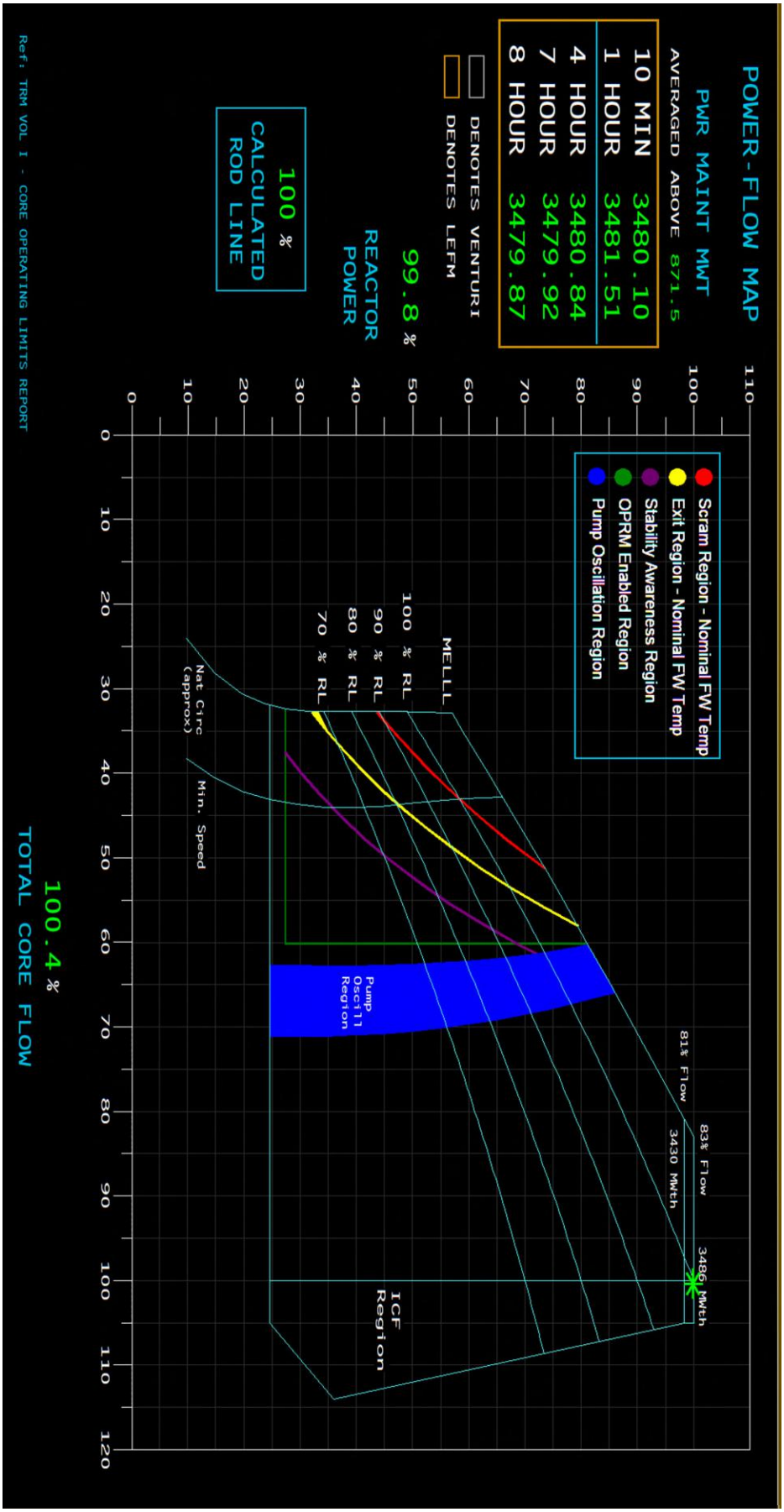
Initial Conditions:

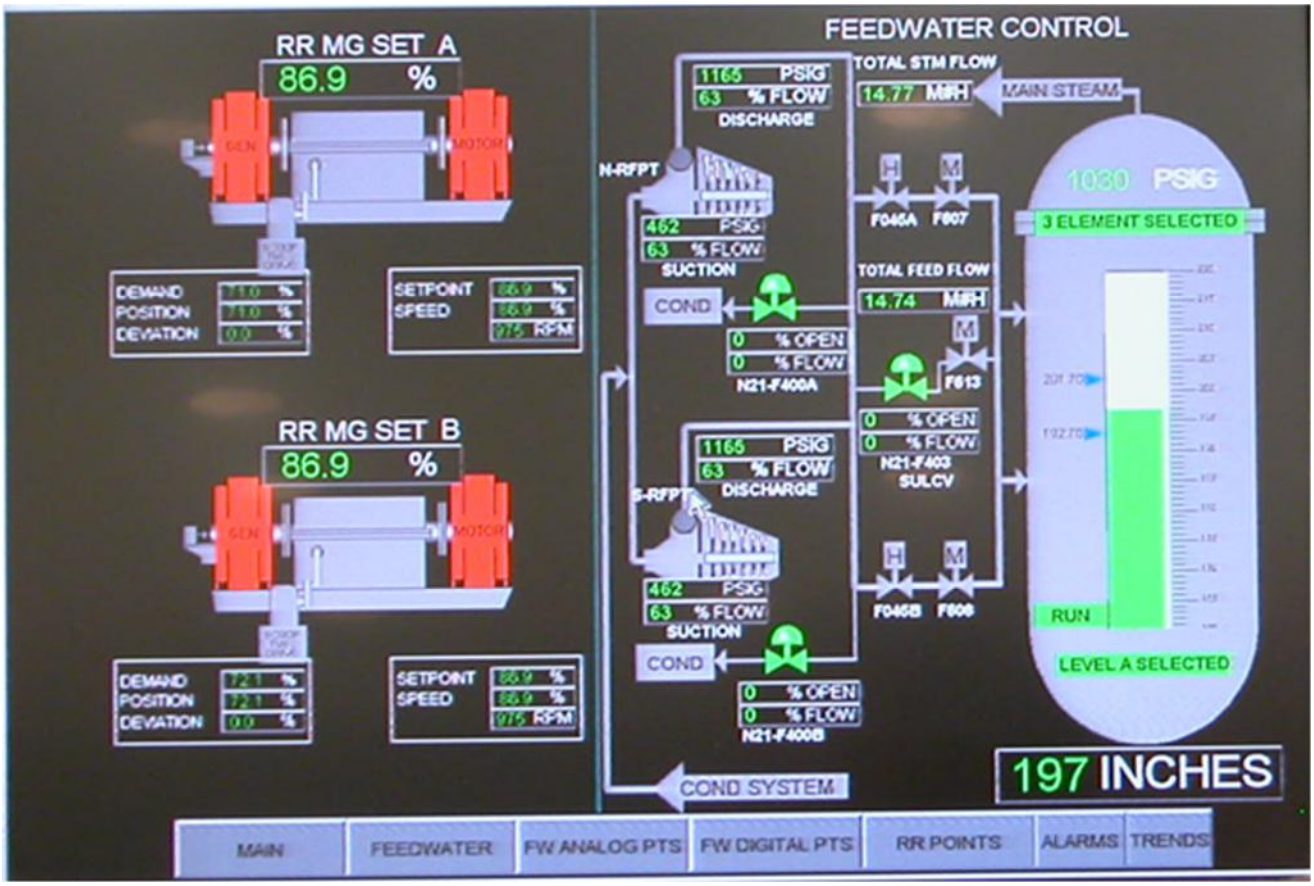
- You are an extra operator on shift
- The plant is operating at 100% power

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.


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
Ref: TRM VOL I - CORE OPERATING LIMITS REPORT
Scram Region - Nominal FW Temp
Exit Region - Nominal FW Temp
Stability Awareness Region
OPRM Enabled Region
Pump Oscillation Region
MELLL
100 % RL
90 % RL
80 % RL
70 % RL
Nat Circ (approx)
Min. Speed
Pump Oscill Region
ICF Region
81% Flow
83% Flow
3430 MWth
3486 MWth
100.4 %
TOTAL CORE FLOW



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	24
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


Thermo Westronics
SV100
Recirc Loop A
44010.63
KGPM
Recirc Loop B
44039.20
KGPM
OFF
ACK
Digital
00:00:00
B31-R614
RECIRC LOOPS
FLOW RECORDERS


Thermo Westronics
SV100
Total Flow
100.01
M#/Hr
Core Plate D/P
13.76
PSID
OFF
ACK
Digital
00:00:00
B21-R613
REACTOR CORE DP &
JET PUMP TOTAL FLOW REC

JET PUMP OPERABILITY TEST

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

A	041716	Planning and Preparation
B	070700	Impact Statement

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

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.

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.

INITIALS

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

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

INITIALS

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

86.9 %

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

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

INITIALS

5.1.7 Record Reactor power below:

99.8 %

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.

Loop A		Loop B		
44.0 kgpm	+	44.0 kgpm	=	88.0 kgpm
(Step 5.2.3)		(Step 5.2.4)		

abc
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 _____
INITIALS

5.2.7 Record Reactor power and rod line below:

Reactor Power: 99.8 %

Rod Line: 100 %

_____
INITIALS

5.2.8 Record test personnel

Printed Name	Initials	Signature
NAME	Init.	Signature

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.

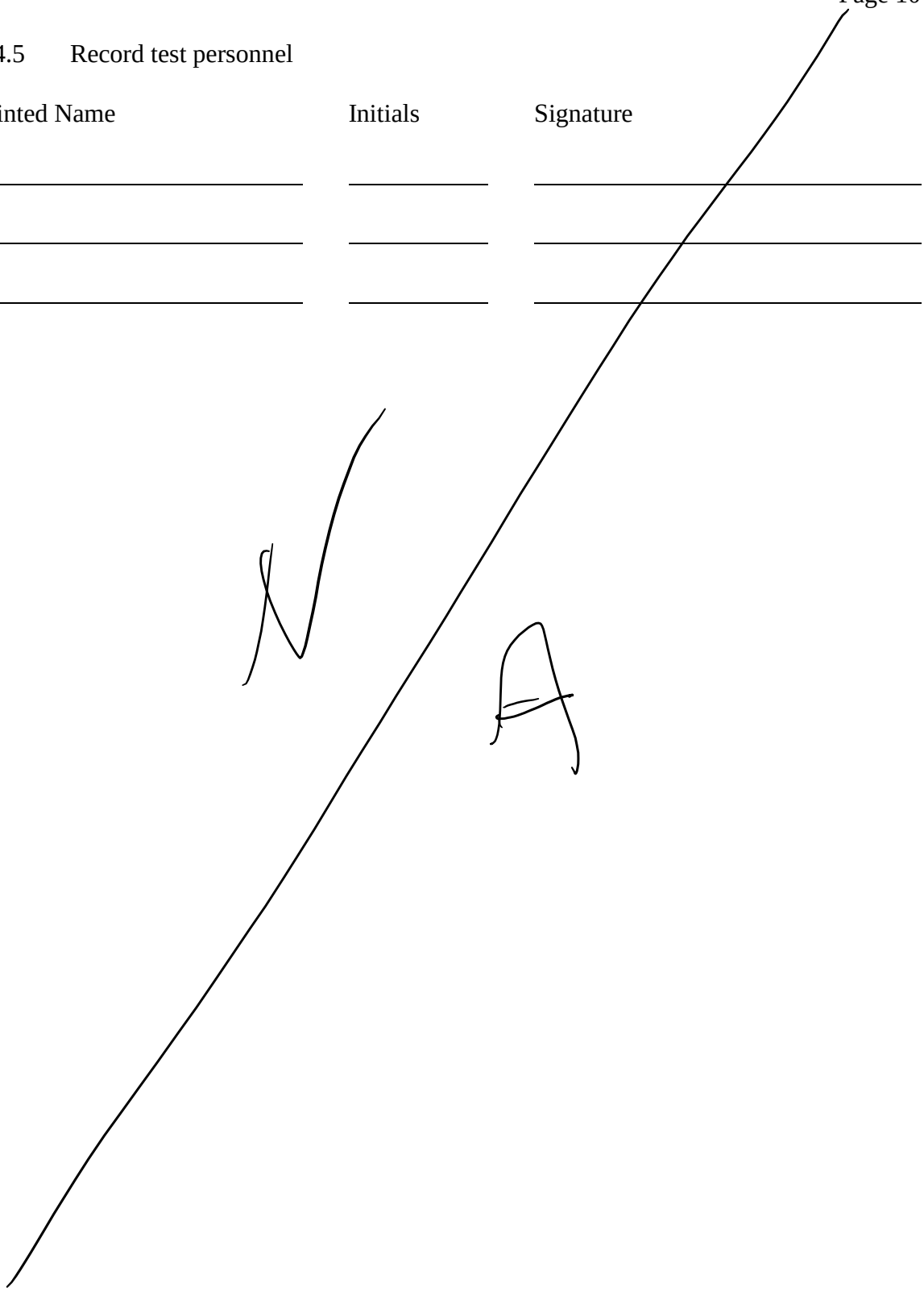
Reactor Power: _____ %

Rod Line: _____ %

_____
INITIALS

5.4.5 Record test personnel

Printed Name	Initials	Signature



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).

INITIALS

TABLE 1
Recirculation Loop A

Jet Pump #	Indicator PIS #	Symbol	dP (%)	Deviation from Average (%)
11	B21-R608A	JP11	32	9.6
12	B21-R608C	JP12	29	-0.7
13	B21-R608E	JP13	31	6.1
14	B21-R608G	JP14	28	-4.1
15	B21-R608J	JP15	24	-17.8
16	B21-R608L	JP16	31	6.1
17	B21-R608N	JP17	29	-0.7
18	B21-R608R	JP18	30	2.7
19	B21-R608T	JP19	28	-4.1
20	B21-R608V	JP20	30	2.7

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.

(292) /10 = 29.2 %
Sum (Table 1) Average A

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:

[(Jet Pump dP – Average A)/(Average A)] x 100

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 _____
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).

_____
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.

(320) /10 = 32.0 %
Sum (Table 2) Average B

_____
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:

[(Jet Pump dP – Average B)/(Average B)] x 100

_____
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	Initials	Signature
NAME	Init.	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).

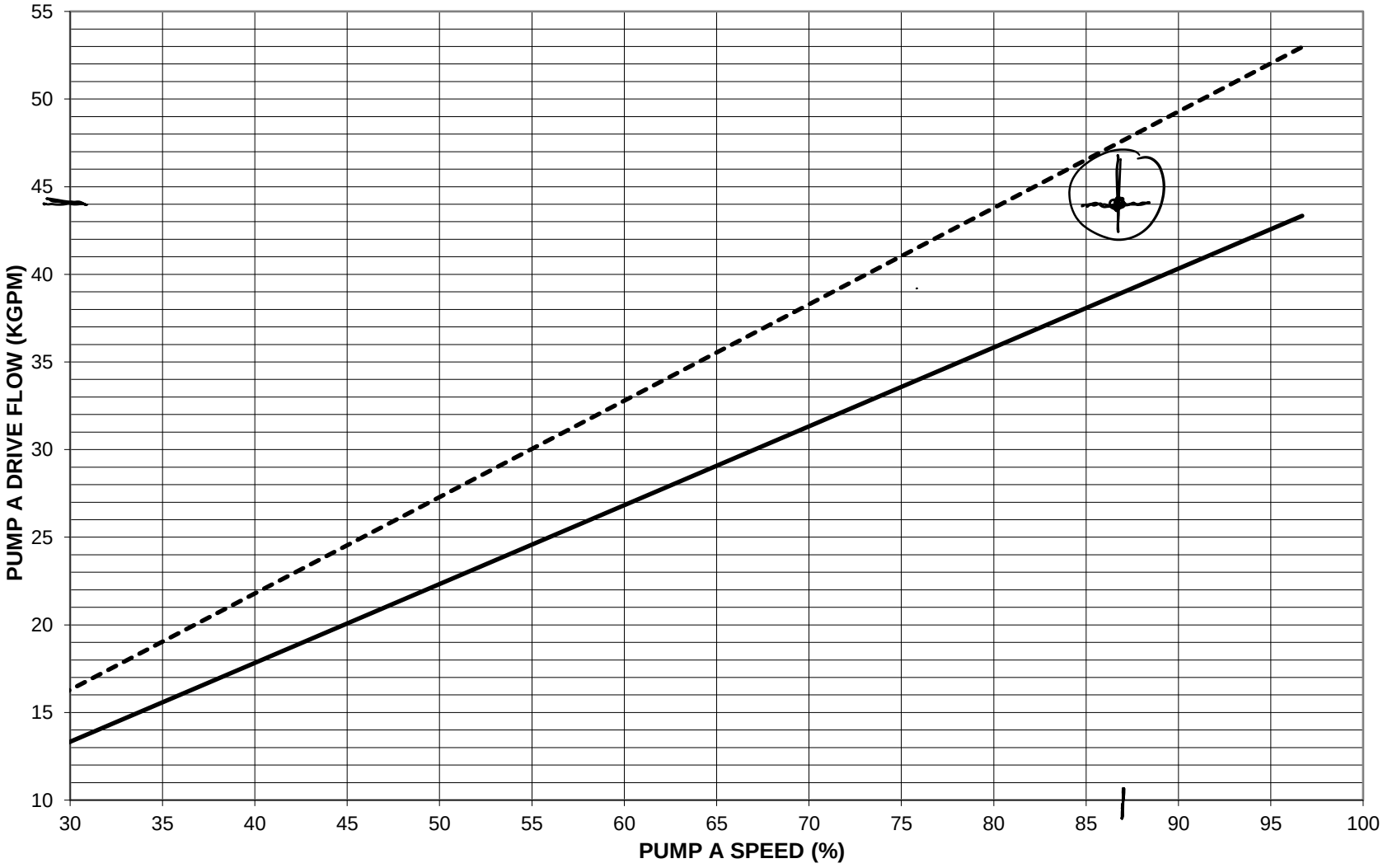
1. Section 5.1 (Two loop operation only) ❑
2. Section 5.2 (Two loop operation only) ❑
3. Section 5.3 (Single loop operation only) ❑
4. Section 5.4 (Single loop operation only) ❑
5. Section 5.5 ❑

Delegated Reviewer_____

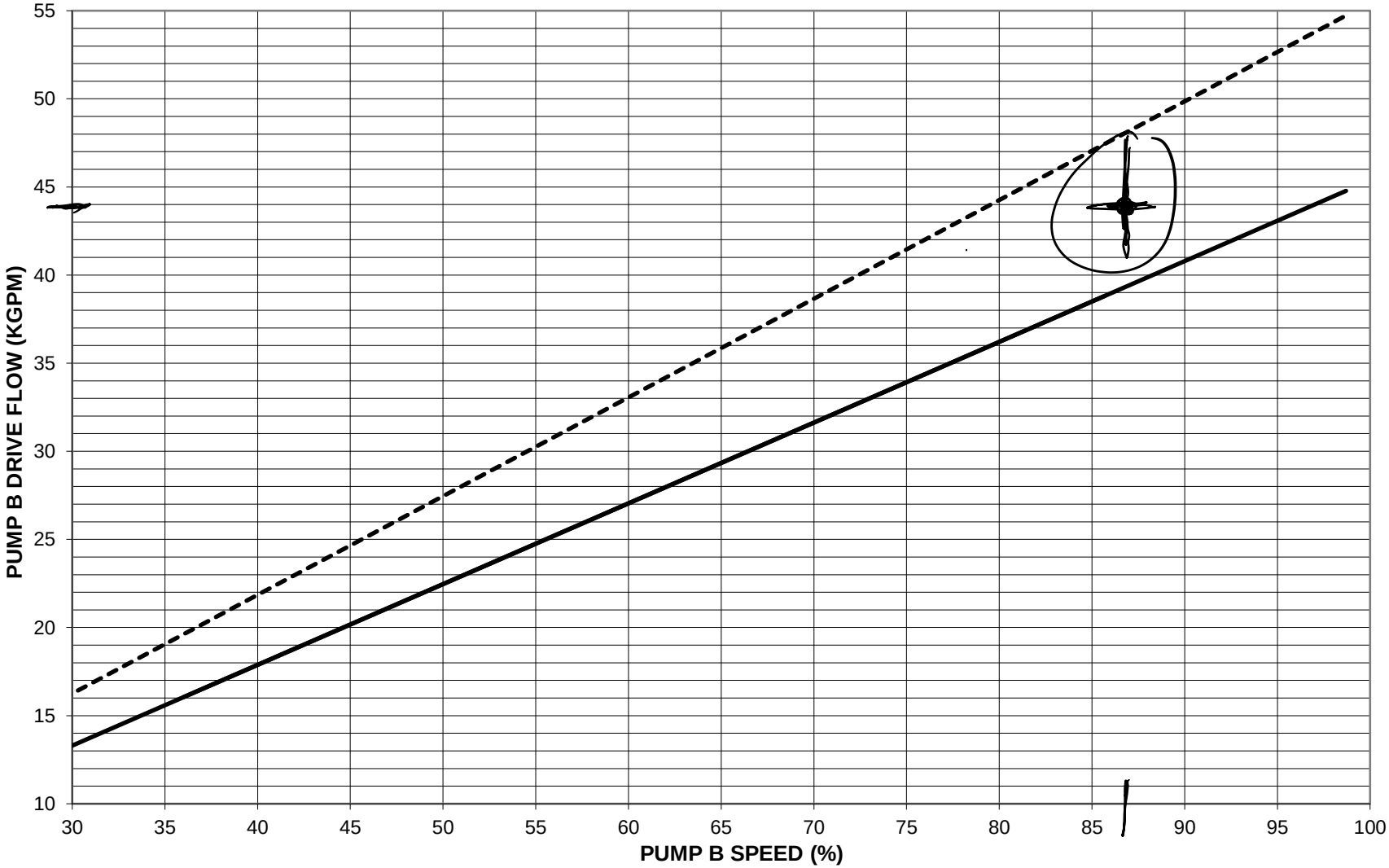
Signature **Date**

END OF TEXT

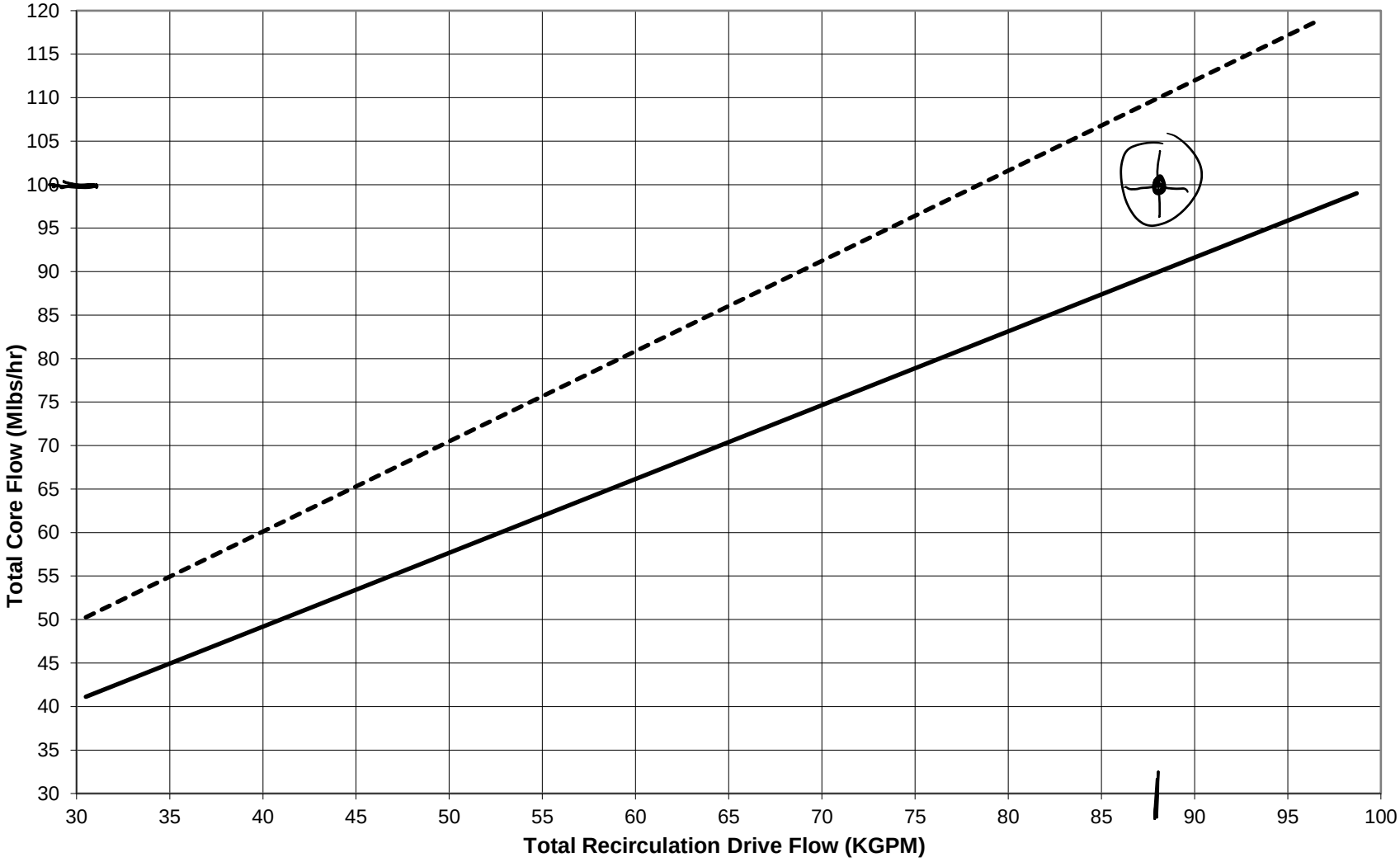
REACTOR RECIRC PUMP A SPEED VERSUS DRIVE FLOW CURVES



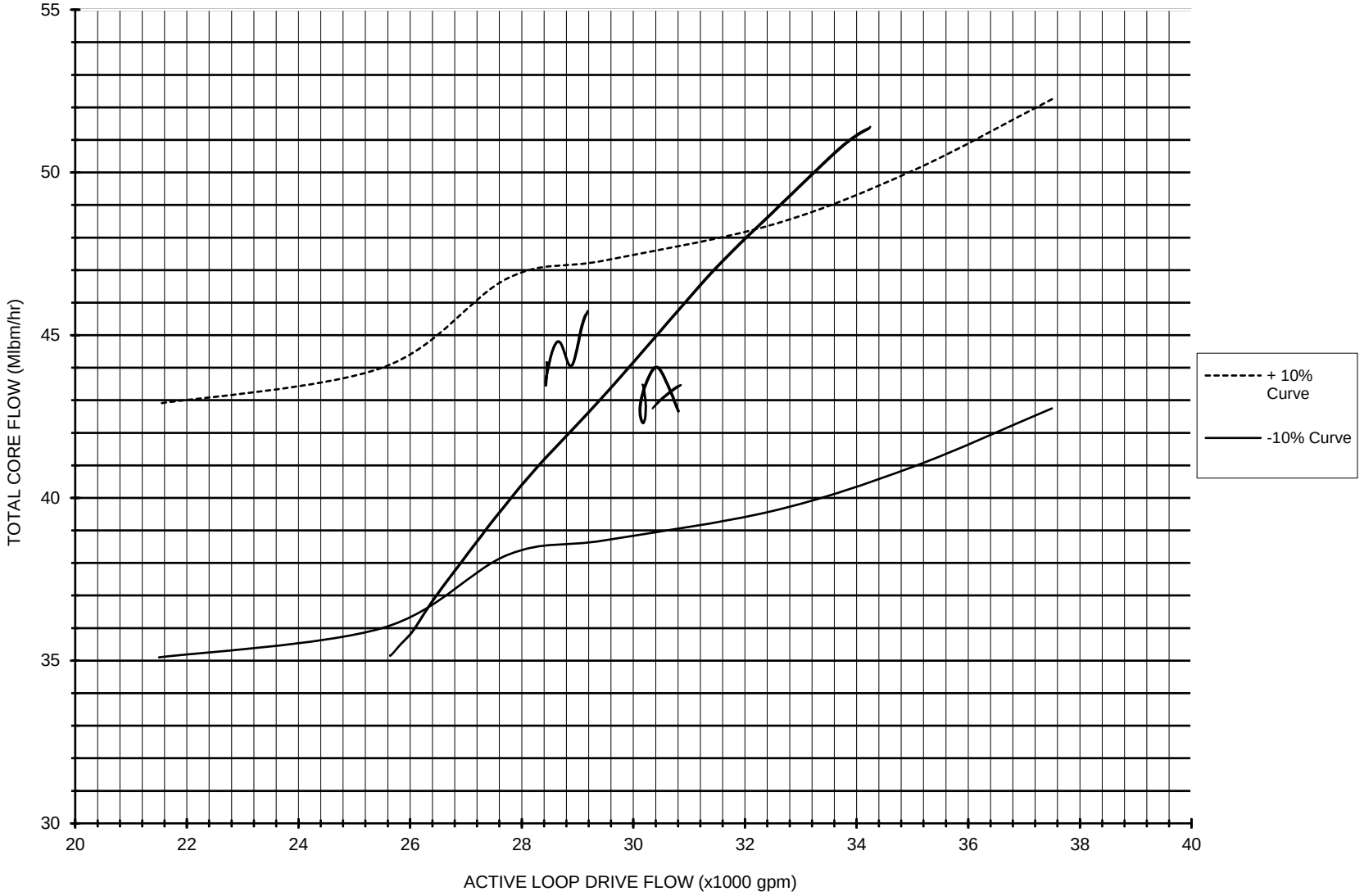
REACTOR RECIRC PUMP B SPEED VERSUS DRIVE FLOW CURVES



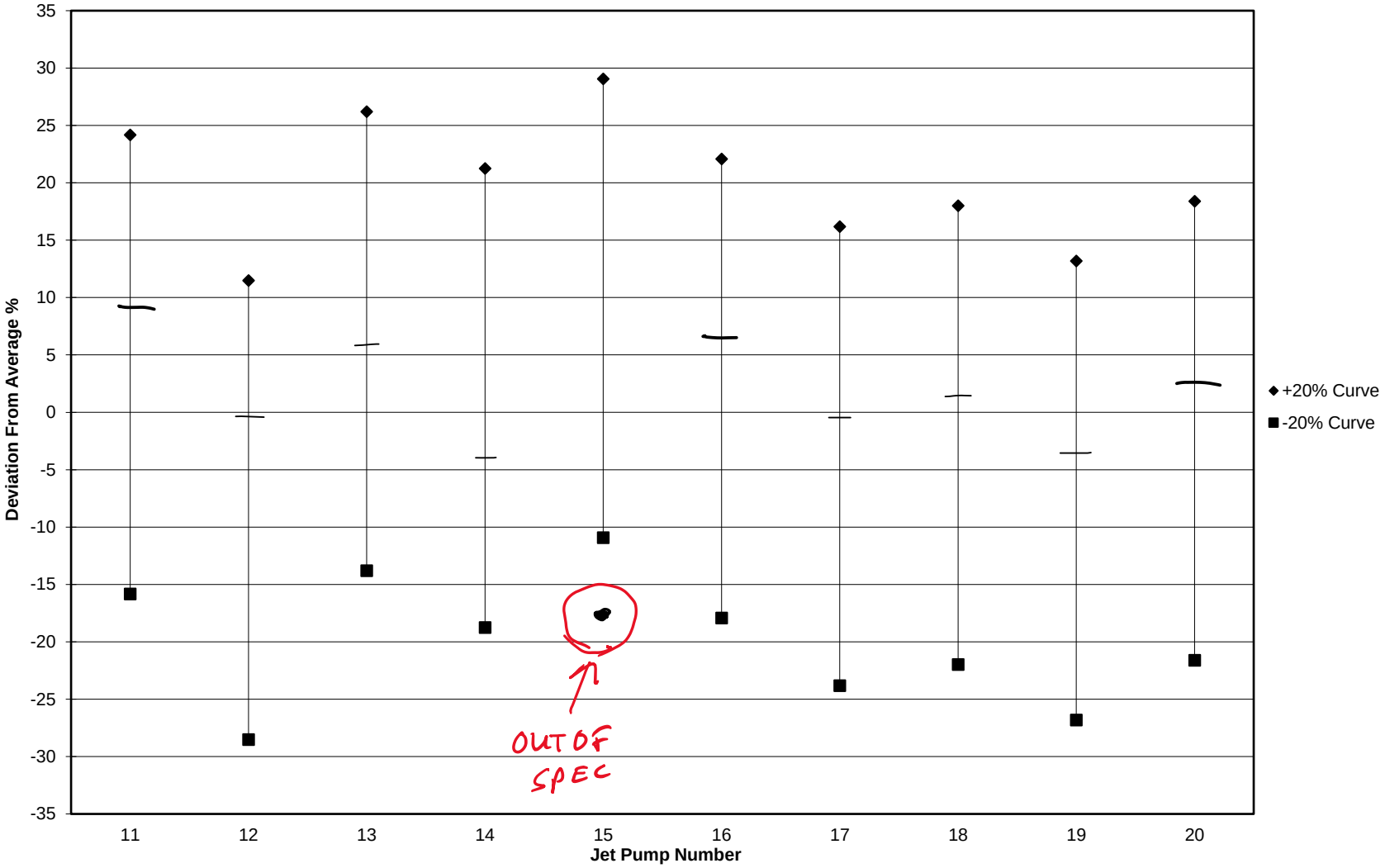
TOTAL RECIRCULATION DRIVE FLOW VERSUS TWO LOOP TOTAL CORE FLOW



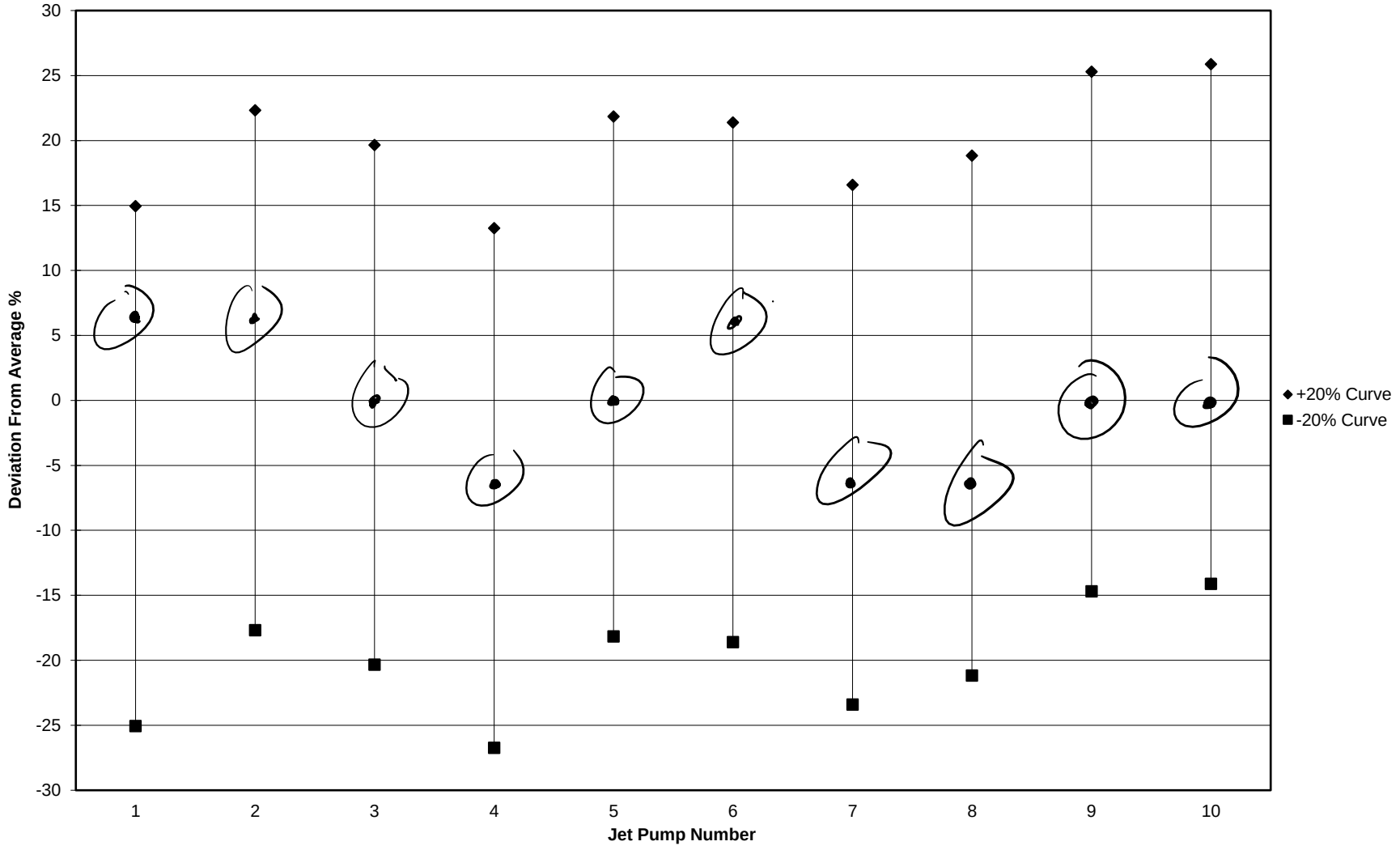
ACTIVE LOOP DRIVE FLOW VERSUS SINGLE LOOP TOTAL CORE FLOW



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: _____

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: _____ / _____

JPM Observation Criteriaj

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	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.
Control	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.
Conservatism	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.
Teamwork	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.
Knowledge	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.

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

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

PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE:	**Provide Examinee with Cue Sheet. Provide copy of 20.000.07 <u>after</u> applicant locates the correct procedure in the simulator.**		
***1**.	[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).	***1.**	Refers to the "Offgas Log Radiation Monitors Conversion Factors For Technical Specifications 3.7.5" sheet.
CUE:	**After applicant locates the conversion factor sheet behind P601, provide a copy of the sheet**		
***2.**	Obtain readings from Offgas Rad Monitors D11-K601A & B	***2.**	Obtains readings from Offgas Rad Monitors D11-K601A & B.
***3.**	Obtain reading from N62-R808, Outlet Flow Recorder, Charcoal Unit Flow	***3.**	Obtains reading from N62-R808, Outlet Flow Recorder, Charcoal Unit Flow
***4.**	Calculates Offgas Release Rate using mCi/sec = (conversion factor) X (rad monitor reading) X (offgas flow rate)	***4.**	Calculates Offgas Release Rate: <u>Rad Monitor A</u> **334.6 mCi/sec (± 4.0)** = (2.703E-4) X (9.8E4 mr/hr) X (12.63 scfm) <u>Rad Monitor B</u> **333.8 mCi/sec (± 4.0)** = (2.403E-4) X (1.1E5 mr/hr) X (12.63 scfm)
***5.**	Evaluates Offgas Release Rate per TS LCO 3.7.5	***5**.	Evaluates Offgas Release Rate per TS LCO 3.7.5, and determines release rate is **below** the TS limit of 340 mCi/sec
CUE:	**End JPM when Offgas release rates have been calculated and TS limit evaluated.**		

_____ SATISFACTORY _____ UNSATISFACTORY

Stop Time _____

*** Critical Step**

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

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.

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

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_2	Log rad monitor recorder channel A	9.8E4	0	0
H_P601_C046_1	Log rad monitor recorder channel B	1.1E5	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.lsn (N/A if using preset IC)
3. Ensure
4. 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 = 9.8e4 mr/hr

- Rad Monitor B conversion factor = 2.403e-4
- Rad Monitor B indication = 1.1e5 mr/hr

Rad Monitor A calculation:

(2.703E-4) (9.8e4 mr/hr) (12.63 scfm) = **334.6 mCi/sec**

Rad Monitor B calculation:

(2.403E-4) (1.1e5 mr/hr) (12.63 scfm) = **333.8 mCi/sec**

Tech Spec 3.7.5 required value: ≤ 340 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.

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.

OFFGAS LOG RADIATION MONITORS CONVERSION FACTORS FOR TECHNICAL SPECIFICATIONS 3.7.5

SAMPLE INFORMATION

Offgas Radioactivity Rate..... 4.29E-02 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

CONVERSION FACTORS

2.703E-04	**mCi/sec** **mr/hr x cfm**

2.403E-04	**mCi/sec** **mr/hr x cfm**

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):

mCi/sec = FACTOR x MONITOR READING x OFFGAS FLOW*

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

Performed By _____ Date TODAY

Approved By _____ Date Today
Chemist/designee

Noted By _____ Date TODAY
SM