

**CLINTON POWER STATION**

**Job Performance Measure**

Review a Completed Control Rod / Position Indication Operability Surveillance  
and Identify Discrepancies (Faulted)

JPM Number: 901101.0101

Revision Number: 02

Date: 07/17/2003

<b>Developed By:</b>	<u>T. Pickley</u>	<u>7/17/03</u>
	<b>Instructor</b>	<b>Date</b>
<b>Validated By:</b>	<u>J. Anderson</u>	<u>10/16/03</u>
	<b>SME or Instructor</b>	<b>Date</b>
<b>Review By:</b>	<u>P. K. Ryan</u>	<u>7/28/03</u>
	<b>Operations Representative</b>	<b>Date</b>

## JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

**NOTE:** All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

- \_\_\_\_\_ 1. Task description and number, JPM description and number are identified.
- \_\_\_\_\_ 2. Knowledge and Abilities (K/A) references are included.
- \_\_\_\_\_ 3. Performance location specified. (in-plant, control room, or simulator)
- \_\_\_\_\_ 4. Initial setup conditions are identified.
- \_\_\_\_\_ 5. Initiating and terminating cues are properly identified.
- \_\_\_\_\_ 6. Task standards identified and verified by SME review.
- \_\_\_\_\_ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (\*).
- \_\_\_\_\_ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:  
Procedure Rev. \_\_\_\_\_ Date \_\_\_\_\_
- \_\_\_\_\_ 9. Pilot test the JPM:
  - a. verify cues both verbal and visual are free of conflict, and
  - b. ensure performance time is accurate.
- \_\_\_\_\_ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.
- \_\_\_\_\_ 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

\_\_\_\_\_  
SME/Instructor

\_\_\_\_\_  
Date

\_\_\_\_\_  
SME/Instructor

\_\_\_\_\_  
Date

\_\_\_\_\_  
SME/Instructor

\_\_\_\_\_  
Date

### **Revision Record (Summary)**

1. **Revision 00,** This is a new SRO Administrative JPM
2. **Revision 01,** Incorporating NRC validation comments
3. **Revision 02,** New procedure revision

CLINTON POWER STATION  
SYSTEM JPM

**JPM NUMBER:** 901101.0101

**Revision 02**

Operator's Name: \_\_\_\_\_

Job Title:  SRO

JPM Title: Review a Completed Control Rod / Position Indication Operability Surveillance and Identify Discrepancies (Faulted)

JPM Number: 901101.0101

Task Number and Title: 999999.19, Review the results of surveillance tests

K/A Number: 2.2.12 Importance: 3.4

**Suggested Testing Environment:** Any

**Actual Testing Environment:**  Simulator  Plant  Control Room

**Testing Method:**  Simulate  Perform  
**Alternate Path / Faulted:**  Yes

**Time Critical:**  No

**Estimated Time to Complete:** 17 minutes **Actual Time Used:** \_\_\_\_\_ minutes

**References:** CPS No. 9011.01, CONTROL ROD/POSITION INDICATION OPERABILITY, Revision 27d

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CLINTON POWER STATION  
SYSTEM JPM

**JPM NUMBER:** 901101.0101

**Revision 02**

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**EVALUATION SUMMARY:**

Were all the Critical Elements performed satisfactorily?        Yes        No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be:        Satisfactory                Unsatisfactory

Comments: \_\_\_\_\_  
\_\_\_\_\_  
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Evaluator's Name: \_\_\_\_\_

Evaluator's Signature: \_\_\_\_\_                      Date: \_\_\_\_\_

**READ TO THE OPERATOR**

I will explain the initial conditions, which step(s) to simulate or discuss, and provide the initiating cues. When you complete the task successfully, the objective of this Job Performance Measure will be satisfied.

**SIMULATOR SET-UP CONDITIONS:**

Not Applicable

**TASK STANDARDS:**

Review of CPS 9011.01 Control Rod / Position Indication Operability surveillance has been completed.

Misaligned control rod has been identified.

Final Conditions of CPS 9011.01 not met has been determined.

**TOOLS, EQUIPMENT, OTHER SPECIAL REQUIREMENTS:**

Marked up copy of CPS 9011.01, signing off all steps as satisfactory (procedure attached).

Copy of an OD-7 Option 2, OD-7 Option 4 and an Official 3D Case.

**PROCEDURAL/REFERENCES:**

CPS 9011.01, CONTROL ROD/POSITION INDICATION OPERABILITY, Revision 27d

**EVALUATOR INSTRUCTIONS:**

Amplifying cues are provided within the JPM steps.

Provide CPS 9011.01, initial 3D, and OD-7 and surveillance after reading the initiating cue.

**INITIAL CONDITIONS:** 100% Power

**INITIATING CUE:**

The plant is operating at 90% power. The A RO has completed CPS 9011.01 Control Rod/Position Indication Operability for the weekly surveillance. You are to review the completed surveillance for approval. Report when the task is complete.

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

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**PERFORMANCE INFORMATION**

Critical steps are denoted with an asterisk (\*) to the left of the step number and appear in **BOLDED** letters. Failure to meet the standards for a critical step constitutes failure of the Job Performance Measure. The sequence of steps is assumed unless denoted in the comments section of the JPM.

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**PERFORMANCE STEPS**

1. Review completed CPS 9011.01

Standard Examinee begins review of 9011.01.  
CUE

Comments

SAT UNSAT Comment Number

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**\*2. Review the initial and final Control Rod Position printouts to verify proper rod positions.**

Standard Examinee performs review and identifies that rod 36-29 is at position 6  
CUE instead of position 4.

Comments

SAT UNSAT Comment Number

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3. Notify the SM that rod 36-29 is at position 6 instead of position 4.  
Standard Final conditions requirement is determined NOT met, Shift Manager is notified of discrepancy.

CUE Acknowledge notification of mis-positioned control rod.

Comments

SAT UNSAT Comment Number

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**Terminating Cue:**

Review of 9011.01 has been completed and the discrepancy identified.  
Shift Manager has been notified of mis-positioned control rod.

**STOP TIME:** \_\_\_\_\_

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CLINTON POWER STATION  
SYSTEM JPM

**JPM NUMBER:** 901101.0101

**Revision 02**

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**K/A REFERENCE NUMBERS**

<b><u>K/A SYSTEM NUMBER</u></b>	<b><u>K/A NUMBER</u></b>	Importance Rating	
		<b><u>RO</u></b>	<b><u>SRO</u></b>
GENERIC	2.2.12	3.0	3.4

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CLINTON POWER STATION

SYSTEM JPM

**JPM NUMBER 901101.0101**

**Revision 02**

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**INITIATING CUE**

The plant is operating at 90% power. The A RO has completed CPS 9011.01 Control Rod/Position Indication Operability for the weekly surveillance. You are to review the completed surveillance for approval. Report when the task is complete.

**CONTROL ROD/POSITION INDICATION OPERABILITY**

**SCOPE OF REVISION:**

- Incorporated PAC 0407-97: Editorial typo. Rev marks not retained.
- Format/Organizational title updates, placekeeping aid enhancements, section 5.1 updated to include annunciator impact per 1005.01.
- CR1-98-02-110 (MLSR Project):  
 Incorporated performance criteria and credit for  
 ITS SR 3.9.5.1 MODE 5 control rod position checks.
- Documentation content of canceled CPS 9011.01C001, Control Rod Operability Checklist incorporated into body of this procedure.
- ① Incorporated PAC 0502-99, PDRs 99-0906 and 00-0298.
- ② Added flags for critical steps.
- ③ Updates format, revised to make consistent with Limitations in CPS 3304.01, Control Rod Hydraulic & Control (RD).
- ④ Specific rev 27d [Sheffield]: CR 130905:  
 Added to review control rod database prior to movement of a single rod at elevated drive water pressure to establish what seal conditions are.

***CONTAINS CRITICAL STEPS***

***CONTINUOUS USE***

**ORIGINATOR** *Thomas J. Landin*  
:

**CLASS CODE:** *SNNN*

**ITR:** *K. Zipprich*

**APPROVAL** *SEP 16 1998*  
**DATE:**

**CURRENT CHANGES TO GENERAL REVISION**

	<b>Change #</b>	<b>Date</b>	<b>List of Affected Pages</b>
①	27a	02/21/01	1, 4, 6, 7
②	27b	08/13/01	1, 3, 6
③	27c	01/02/02	1, 4
④	27d	02/05/03	1 and 7
⑤			

c 1.0

**PURPOSE**

Provide instructions for verifying control rod insertion capability by inserting each applicable PARTIALLY or FULLY withdrawn control rod one notch and observing that the control rod moves, thereby ensuring the control rod is not stuck and is free to insert on a SCRAM.

Instructions are also provided to return the control rods to their original positions to verify each applicable control rod is operable and that the position indication for each applicable control rod is operable.

This surveillance satisfies ITS SR requirements:

3.1.3.2, Insert each FULLY withdrawn control rod one notch (7 days)

3.1.3.3, Insert each PARTIALLY withdrawn control rod one notch (31 days)

① 3.9.5.1, Insert each withdrawn control rod one notch (7 days - MODE 5)

2.0

**DISCUSSION/DEFINITIONS**

2.1

**FREQUENCY** «LBD-1»

2.1.1

Normal Frequency (MODEs 1, 2):

7 Days - for FULLY withdrawn control rods with  
THERMAL POWER > LPSP of the RPCS

31 Days - for PARTIALLY withdrawn control rods with  
THERMAL POWER > LPSP of the RPCS

2.1.2

Other Triggers:

a) Within 24 hours from discovery of any withdrawn control rod that is stuck (will not insert by either CRD drive water or scram pressure) - for all control rods either PARTIALLY or FULLY withdrawn, concurrent with THERMAL Power > the LPSP of the RPCS.

① b) MODE 5 when control rod withdrawn triggered via  
CPS 9000.01D002, Control Room Operator Surveillance Log - MODE 4,5 DATA SHEET (7 day frequency).

2.2

Individual sections or an individual step or individual steps within a section of this procedure may be performed independently for PMT or other maintenance activities. Those steps within a section that are not performed should be marked N/A. When only parts of a section are performed, it is the responsibility of the SMngt and the performer to ensure that all necessary prerequisites, precautions and limitations are met for those steps that will be performed. Additionally, the impact of NOT performing the remaining steps must also be understood.

2.0 DISCUSSION/DEFINITIONS (cont'd)

2.3 All applicable control rods (control rods not required to have their directional control valves disarmed electrically or hydraulically) will be moved at least one notch to verify proper rod motion and position indication response. Control rod exercising should be performed by a single notch insertion and single notch withdrawal, in as short a time as possible.

3.0 **RESPONSIBILITY**

Operations Department Head is responsible for the implementation of this procedure.

4.0 **PRECAUTIONS**

4.1 Plant evolutions which may result in reactivity changes should be avoided during performance of this surveillance.

4.2 Document control rod movement per  
CPS 9000.09, CPS Control Rod Manipulation Logs.

5.0 **PREREQUISITES** INITIAL

② 5.1 This procedure contains critical steps. A **Critical Step** is "Any action that, when performed improperly, will lead to an unintentional change that adversely impacts plant, system, or personnel". Performance of this procedure requires screening for a **High Risk/High Production Risk/Risk Sensitive** activity IAW WC-AA-104 and any existing requirements for Command and Control Standards. Critical steps are indicated by a {CS} in the left margin."

5.2 In conjunction with the SMngt, review the following impact statements to determine required plant status to perform this test:

OPERABILITY IMPACT:

ITS LCO 3.1.3 - Control Rod Operability

SYSTEMS AFFECTED:

① AFFECTED ANNUNCIATORS AND COMPUTER POINTS: None

RPS TRIP: N/A

CRVICS ISOLATION: N/A

REQUIRED OPERABLE CHANNELS: N/A

① PLANT/SYSTEM CONDITIONS REQUIRED TO CONDUCT TEST

When in MODEs 1, 2: Power > low power set point (LPSP) of the Rod Pattern Control System (RPCS).

When in MODEs 1, 2: For control rods not FULLY withdrawn, MAPRAT ≤ 0.96. If MAPRAT > 0.96 a power reduction will be required prior to testing control rods that are not FULLY withdrawn.

COINCIDENT CHANNELS TO PREVENT ACTUATION: N/A

		<u>SM / DL</u>	
		SMngt      Test Performer	
① 5.3	MODE 1, 2: Reactor power (> LPSP). [N/A when in MODE 5.]	90 %	<u>DL</u>
① 5.4	SM/CRS permission to perform this surveillance.		<u>SM</u> SMngt
		<u>XX:XX / XX/XX/XX</u>	
		Time/Date	

6.0 **LIMITATIONS**

6.1 **IF** a control rod (or gang) is found out of sequence, **THEN** enter CPS 4007.02, Inadvertent Rod Movement.

6.2 In the event of accidental insertion of more than one notch, withdrawal should be by single notch to avoid any possible over-notching on the withdrawal.

① 6.3 MODEs 1, 2: MAPRAT shall be  $\leq 0.96$  when exercising PARTIALLY withdrawn control rods. This limitation does not apply to FULLY withdrawn control rods.

①③ 6.4 The Rod Withdraw Limiter (RWL) function of the Rod Control and Information system establishes a 4 notch withdraw limit when reactor power is between the Low Power Set Point (LPSP) and the High Power Set Point (HPSP), and a 2 notch withdraw limit when power is above the HPSP. The purpose of the RWL is to prevent fuel damage, caused by rod withdrawal which would uncover fuel that has been operating at a relatively low power level. The limit is set at 2 or 4 notches (as applicable) from the position of the control rod, the first time a Withdraw signal is applied after the rod is selected.

**IF** a control rod is inserted with the intent of leaving the rod at the new inserted position, **OR** power condition have changed significantly (RR flow changes or Xenon transient) since the control rod was inserted, **THEN** prior to withdrawing that control rod, deselect and reselect the control rod, to establish the RWL notch limits.

**IF** a control rod is inserted with the intent of returning the control rod to its original position for notch testing, **THEN** withdrawing the control rod to its original position in the continuous withdraw mode is permitted, **AND** is within the design basis of the RWL as long as power condition have not changed significantly.

Control rods should be deselected, any time that MCR personnel are **NOT** actively engaged in control rod movement activities. «CM-1»

7.0 **MATERIALS/TEST EQUIPMENT** - None

8.0	<b><u>PROCEDURE</u></b>	<u>Initial</u>
① 8.1	Obtain a Plant Monitoring System (PMS) Control Rod Position printout, using either: OD-7 Option 2, OD-7 Option 4, or Official 3D Case.	___ <u>DL</u> ___
① 8.1.1	From the OD-7 edit or Official 3D Case, determine which control rods are not required to be tested because they are not withdrawn.	___ <u>DL</u> ___
8.1.2	Identify any control rods which are disarmed.	___ <u>DL</u> ___
8.1.3	Identify any control rods which are PARTIALLY withdrawn.	___ <u>DL</u> ___

**NOTE**

*When exercising PARTIALLY withdrawn rods during the monthly test, a “P/” should be used before initials to differentiate between partially withdrawn and fully withdrawn rods.*

*In this manner, the MODE 1, 2 requirement to limit MAPRAT  $\leq 0.96$  can be more readily determined.*

8.1.4 On the CORE MAP (page 7):

- Mark disarmed control rods with “DA”. \_\_\_ DL \_\_\_
- Mark FULLY inserted control rods with “N/A”. \_\_\_ DL \_\_\_
- Mark partially withdrawn control rods with “P/” (if exercising PARTIALLY inserted rods). \_\_\_ DL \_\_\_
- Mark partially withdrawn control rods with “N/A” (if not exercising PARTIALLY inserted rods). \_\_\_ N/A \_\_\_

**NOTE**

***Drives with new seals should not be moved per single notch with elevated drive water pressure, due to increase potential for double-notching. Consult control rod database for seal condition***

**MODE 1 or 2:**

*Individual and/or ganged rod movement may be used to perform this surveillance.*

*FULLY withdrawn control rods are not required to be performed until 8 days 18 hours after the control rod is fully withdrawn and THERMAL POWER is > LPSP of the RPCS.*

*Rods at position 46 for cooling shall be considered FULLY withdrawn and subject to the 7 day frequency. These rods may be required to be returned to position 48 first to perform the surveillance.*

*PARTIALLY withdrawn control rods are not required to be performed until 38 days 18 hours after the control rod is withdrawn and THERMAL POWER > LPSP of the RPCS.*

**MODE 5:**

*Individual rod movement shall be used to perform this surveillance.*

*Withdrawn control rods are not required to be performed until 7 days after the control rod is withdrawn.*

8.2 **Exercise of FULLY (PARTIALLY) Withdrawn Control Rods**

Initial

0

8.2.1 MODEs 1, 2 PARTIALLY withdrawn rods only (N/A for FULLY withdrawn rods or MODE 5):

Verify MAPRAT  $\leq$  0.96. 0.821 MAPRAT

DL

If MAPRAT > 0.96, then a power reduction shall be required to achieve MAPRAT  $\leq$  0.96 prior to testing any PARTIALLY withdrawn control rods.

2{CS}

8.2.2 Select and insert the desired rod(s) one notch, noting proper position indication tracking.

X  
Place Keeping Aid

2{CS}

8.2.3 Withdraw the selected rod(s) one notch to original position.

X  
Place Keeping Aid

a) Observe proper rod position indication tracking to the original rod position.

X  
Place Keeping Aid

b) Check off the selected rod(s) after the rod(s) is tested by initialing the rod(s). [Document on CORE MAP]

X  
Place Keeping Aid

8.2.4 Repeat steps 8.2.2 and 8.2.3 for each  
FULLY (PARTIALLY) withdrawn control rod.

  X    
Place Keeping Aid

8.3 **RESTORATION**

Initial

- 8.3.1 Obtain a PMS Control Rod Position printout:  
OD-7 Option 2, OD-7 Option 4, or  
Official 3D Case.   DL
- 8.3.2 Compare the initial and final Control Rod Position printouts to verify proper rod  
positions.   DL
- 8.3.3 Notify the SMngt of the completion of this test.   DL

TODAY / NOW  
Time/Date

9.0 **ACCEPTANCE CRITERIA**

- 9.1 Operability Requirements - Failure to meet the Acceptance Criteria shall constitute a failure to comply with the applicable LCO. ITS should be immediately reviewed to identify Action Statements needed for implementation. Refer to Supplemental Review Sheet for applicable LCOs.

  - 9.1.1 All withdrawn control rods not required to have their directional control valves disarmed electrically or hydraulically are inserted at least 1 notch.
  - 9.1.2 The indicated control rod position changes during movement of the Control Rod Drive.
- 9.2 Other Requirements - None

10.0 **FINAL CONDITIONS**

The control rods are returned to their original positions.

11.0 **REFERENCES**

- 11.1 CPS 4007.02, Inadvertent Rod Movement
- 11.2 CPS 9000.01D002, Control Room Operator Surveillance  
Log - MODE 4,5 Data Sheet
- 11.3 CPS 9000.09, CPS Control Rod Manipulation Logs
- 11.4 LBD-1: ITS SR 3.1.3.2, SR 3.1.3.3, SR 3.9.5.1
- 11.5 USAR 3.1.2.3.2.1, 4.6.3.1.1.5
- 11.6 GE Control Rod Drive Design Spec Data Sheet 22A5395 AE
- 11.7 GE Letter GGJ-88-100 dated 7-29-88
- ① 11.8 CM-1: CR 1-99-04-097

12.0 **APPENDICES** - None② 13.0 **DOCUMENTS** - None

**CORE MAP**

	<u>DL</u> 16-53	<u>DL</u> 20-53	<u>DL</u> 24-53	<u>DL</u> 28-53	<u>DL</u> 32-53	<u>DL</u> 36-53	<u>DL</u> 40-53
	<u>DL</u> 12-49	<u>DL</u> 20-49	<u>DL</u> 24-49	<u>DL</u> 28-49	<u>DL</u> 32-49	<u>DL</u> 36-49	<u>DL</u> 40-49
	<u>DL</u> 12-45	<u>DL</u> 20-45	<u>DL</u> 24-45	<u>DL</u> 28-45	<u>DL</u> 32-45	<u>DL</u> 36-45	<u>DL</u> 40-45
	<u>DL</u> 08-45	<u>DL</u> 20-45	<u>DL</u> 24-45	<u>DL</u> 28-45	<u>DL</u> 32-45	<u>DL</u> 36-45	<u>DL</u> 40-45
	<u>DL</u> 08-41	<u>DL</u> 20-41	<u>DL</u> 24-41	<u>DL</u> 28-41	<u>DL</u> 32-41	<u>DL</u> 36-41	<u>DL</u> 40-41
04-41	<u>DL</u> 12-41	<u>DL</u> 20-41	<u>DL</u> 24-41	<u>DL</u> 28-41	<u>DL</u> 32-41	<u>DL</u> 36-41	<u>DL</u> 40-41
	<u>DL</u> 12-37	<u>P/ DL</u> 20-37	<u>DL</u> 24-37	<u>P/ DL</u> 28-37	<u>DL</u> 32-37	<u>P/ DL</u> 36-37	<u>DL</u> 40-37
04-37	<u>DL</u> 12-37	<u>P/ DL</u> 20-37	<u>DL</u> 24-37	<u>P/ DL</u> 28-37	<u>DL</u> 32-37	<u>P/ DL</u> 36-37	<u>DL</u> 40-37
	<u>DL</u> 12-33	<u>DL</u> 20-33	<u>DL</u> 24-33	<u>DL</u> 28-33	<u>DL</u> 32-33	<u>DL</u> 36-33	<u>DL</u> 40-33
04-33	<u>DL</u> 12-33	<u>DL</u> 20-33	<u>DL</u> 24-33	<u>DL</u> 28-33	<u>DL</u> 32-33	<u>DL</u> 36-33	<u>DL</u> 40-33
	<u>DL</u> 12-29	<u>P/ DL</u> 20-29	<u>DL</u> 24-29	<u>DL</u> 28-29	<u>DL</u> 32-29	<u>P/ DL</u> 36-29	<u>DL</u> 40-29
04-29	<u>DL</u> 12-29	<u>P/ DL</u> 20-29	<u>DL</u> 24-29	<u>DL</u> 28-29	<u>DL</u> 32-29	<u>P/ DL</u> 36-29	<u>DL</u> 40-29
	<u>DL</u> 12-25	<u>DL</u> 20-25	<u>DL</u> 24-25	<u>DL</u> 28-25	<u>DL</u> 32-25	<u>DL</u> 36-25	<u>DL</u> 40-25
04-25	<u>DL</u> 12-25	<u>DL</u> 20-25	<u>DL</u> 24-25	<u>DL</u> 28-25	<u>DL</u> 32-25	<u>DL</u> 36-25	<u>DL</u> 40-25
	<u>DL</u> 12-21	<u>P/ DL</u> 20-21	<u>DL</u> 24-21	<u>P/ DL</u> 28-21	<u>DL</u> 32-21	<u>P/ DL</u> 36-21	<u>DL</u> 40-21
04-21	<u>DL</u> 12-21	<u>P/ DL</u> 20-21	<u>DL</u> 24-21	<u>P/ DL</u> 28-21	<u>DL</u> 32-21	<u>P/ DL</u> 36-21	<u>DL</u> 40-21
	<u>DL</u> 12-17	<u>DL</u> 20-17	<u>DL</u> 24-17	<u>DL</u> 28-17	<u>DL</u> 32-17	<u>DL</u> 36-17	<u>DL</u> 40-17
04-17	<u>DL</u> 12-17	<u>DL</u> 20-17	<u>DL</u> 24-17	<u>DL</u> 28-17	<u>DL</u> 32-17	<u>DL</u> 36-17	<u>DL</u> 40-17
	<u>DL</u> 12-13	<u>DL</u> 20-13	<u>DL</u> 24-13	<u>DL</u> 28-13	<u>DL</u> 32-13	<u>DL</u> 36-13	<u>DL</u> 40-13
08-13	<u>DL</u> 12-13	<u>DL</u> 20-13	<u>DL</u> 24-13	<u>DL</u> 28-13	<u>DL</u> 32-13	<u>DL</u> 36-13	<u>DL</u> 40-13
	<u>DL</u> 12-09	<u>DL</u> 20-09	<u>DL</u> 24-09	<u>DL</u> 28-09	<u>DL</u> 32-09	<u>DL</u> 36-09	<u>DL</u> 40-09
08-09	<u>DL</u> 12-09	<u>DL</u> 20-09	<u>DL</u> 24-09	<u>DL</u> 28-09	<u>DL</u> 32-09	<u>DL</u> 36-09	<u>DL</u> 40-09
	<u>DL</u> 16-05	<u>DL</u> 20-05	<u>DL</u> 24-05	<u>DL</u> 28-05	<u>DL</u> 32-05	<u>DL</u> 36-05	<u>DL</u> 40-05
16-05	<u>DL</u> 16-05	<u>DL</u> 20-05	<u>DL</u> 24-05	<u>DL</u> 28-05	<u>DL</u> 32-05	<u>DL</u> 36-05	<u>DL</u> 40-05



**Job Performance Measure (JPM)**

PAGE 1, INITIAL

CORE PARAMETERS		CLINTON CYCLE 6	SEQUENCE NO 23
POWER MWT	3125	3D MONICORE	today-2xxx xx:xx CALCULATED
POWER MWE	1062	PERIODIC LOG	today-2xxx xx:xx PRINTED
FLOW MLB/HR	75.844	CALC RESULTS	CASE ID FMLD1950708205855
FPAPDR	0.824		RESTART FMLD1950708195845
SUBC BTU/LB	23.49	Keff	1.0000
PR PSIA	1027.9	XE WORTH %	-2.52
CORE MWD/sT	20850.8	XE/RATED	1.00
CYCLE MWD/sT	8741.6		
M CPR	1.268		

LOAD LINE SUMMARY  
 CORE POWER 89.9%  
 CORE FLOW 89.8%  
 LOAD LINE 100.0%

CORRECTION FACTOR: MFLCPR= 1.000 MFLPD= 1.000 MAPRAT= 0.999  
 OPTION: ARTS DUAL LOOP MANUAL FLOW MCPRLIM= 1.240

MOST LIMITING LOCATIONS (NON-SYMMETRIC)

MFLCPR	LOC	MFLPD	LOC	MAPRAT	LOC	PCRAT	LOC
0.978	37-28	0.912	17-22-18	0.821	7-28- 5	0.798	41-28-16
0.976	39-26	0.912	7-28- 5	0.817	15-30-16	0.798	19-28-16
0.975	41-28	0.912	41-28-16	0.817	11-22-13	0.797	7-28- 5
0.973	11-28	0.902	19-28-16	0.816	19-26-16	0.791	39-22-20
0.940	13-32	0.896	15-38-18	0.813	19-30-15	0.782	9-22-13
0.939	9-26	0.895	21-26-16	0.803	7-26-12	0.779	11-20-13
0.937	11-20	0.893	17-26-16	0.802	9-36-13	0.779	17-26-16
0.930	39-22	0.889	9-22-13	0.798	11-30-11	0.777	11-28-15
0.927	7-28	0.889	11-20-13	0.796	9-26- 5	0.776	13-32-16
0.923	9-22	0.888	13-32-16	0.795	39-22-20	0.774	47-26-12

SEQ. B-2 C=MFLCPR D=MFLPD M=MAPRAT P=PCRAT \*=MULTIPLE CORE AVE AXIAL

SEQ.	C	D	M	P	*	REL PW	LOC
53						00	25
49						02	24
L						04	23
45						06	22
						08	21
41			P			10	20
L						12	19
37		18	C4	18		14	18
						16	17
33						18	16
L						20	15
29		4		4		22	14
						24	13
25						26	12
L						28	11
21		18	4	18		30	10
						32	09
17		D				34	08
L						36	07
13						38	06
						40	05
09						42	04
L			M			44	03
05	L	L	L	L	L	46	02
	04	08	12	16	20	24	28
						32	36
						40	44
						48	52
						48	01

CORE AVERAGE RADIAL POWER DISTRIBUTION

RING #	1	2	3	4	5	6	7
REL PW	0.890	1.084	1.113	1.102	1.155	1.145	0.727

PAGE 2  
 CLINTON CYCLE 6 INSTRUMENT READINGS/STATUS SEQUENCE NO 23

**Job Performance Measure (JPM)**

CALIBRATED LPRM READINGS						
47D	40.1	49.8	55.7	45.9	30.2	
C	57.0	59.8	60.3	64.5	43.0	
B	61.2	63.6	60.9	69.2	41.9	
A	51.1	54.9	49.5	63.0	27.7	
39D	35.4	51.3	58.4	61.1	57.5	46.0
C	55.8	62.7	60.3	59.6	66.5	67.9
B	60.0	65.2	60.7	57.0	66.7	70.2
A	52.7	61.1	50.4	44.4	54.7	63.8
31D	39.9	51.6	55.8	56.0C	55.7	48.5
C	63.7	71.1	68.3	63.1	72.6P	70.4
B	69.6	71.2	66.7	59.2	72.9	73.4
A	67.6M	69.0	61.1	45.4	71.1	71.8
23D	40.0	54.3	58.1	57.9	59.5	48.0
C	62.2	67.3D	63.7	59.2	66.8	69.0
B	67.1	67.1	61.4	56.9	66.6	71.1
A	66.5	58.6	48.7	44.2	55.6	66.1
15D	28.5	46.2	55.5	57.2	0.0	39.4
C	42.4	63.6	62.8	59.1	65.4	59.1
B	43.2	68.6	61.9	57.4	67.6	62.2
A	0.0	61.7	49.9	44.3	64.3	50.4
07D		29.1	39.3	40.7	36.6	
C		41.4	58.6	56.6	54.5	
B		42.3	64.8	61.8	58.3	
A		31.2	57.2	55.6	48.4	
	06	14	22	30	38	46

today-2xxx xx:xx CALCULATED  
today-2xxx xx:xx PRINTED  
CASE ID FMLD1950708205855  
LPRM SHAPE - FULL CORE  
# OF TIPS REJECTED: 1  
FAILED SENSORS:  
LPRM ( 2 SIGNAL FAILED)  
615A 3815D  
LPRM ( 0 PANACEA REJECTED)  
OTHER SENSORS ( 0 TOTAL)  
SUB RODS  
NONE  
T = TIP RUN RECOMMENDED  
C = MFLCPR LOCATION  
M = MAPRAT LOCATION  
D = MFLPD LOCATION  
P = PCRAT LOCATION  
\* = MULTIPLE LIMIT

CORE SUMMARY

CORE POWER	89.9%	CALC SUB FLOW	91.3%	DP MEAS PSI	15.52
CORE FLOW	89.8%	OPER SUB FLOW	-1.2%	DP CALC PSI	20.52
LOAD LINE	100.0%	FLOW BASIS	MEAS	FEEDWTR FLOW MLB/HR	13.5

APRM CALIBRATION

	A	B	C	D
READING	100.4	100.6	100.2	100.2
AGAF	0.994	0.992	0.997	0.997

TIP RUNS RECOMMENDED

STRINGS: NONE

**Job Performance Measure (JPM)**

UNIT 1, PAGE 1 OF 1

**INITIAL  
Positions**

OD-7, CONTROL ROD NOTCH POSITIONS, NEW SCAN  
OPTION 2

53				48	48	48	48	48	48	48			
49			48	48	48	48	48	48	48	48	48	48	
45		48	48	48	48	48	48	48	48	48	48	48	48
41	48	48	48	48	48	48	48	48	48	48	48	48	48
37	48	48	48	48	18	48	4	48	18	48	48	48	48
33	48	48	48	48	48	48	48	48	48	48	48	48	48
29	48	48	48	48	4	48	48	48	4	48	48	48	48
25	48	48	48	48	48	48	48	48	48	48	48	48	48
21	48	48	48	48	18	48	4	48	18	48	48	48	48
17	48	48	48	48	48	48	48	48	48	48	48	48	48
13		48	48	48	48	48	48	48	48	48	48	48	
9			48	48	48	48	48	48	48	48	48		
5				48	48	48	48	48	48	48			
	4	8	12	16	20	24	28	32	36	40	44	48	52

**Job Performance Measure (JPM)**

PAGE 1, FINAL

CORE PARAMETERS		CLINTON CYCLE 6	SEQUENCE NO 23
POWER MWT	3125	3D MONICORE	today-2xxx xx:xx CALCULATED
POWER MWE	1062	PERIODIC LOG	today-2xxx xx:xx PRINTED
FLOW MLB/HR	75.844	CALC RESULTS	CASE ID FMLD1950708205855
FPAPDR	0.824		RESTART FMLD1950708195845
SUBC BTU/LB	23.49	Keff 1.0000	LPRM SHAPE - FULL CORE
PR PSIA	1027.9	XE WORTH % -2.52	LOAD LINE SUMMARY
CORE MWD/sT	20850.8	XE/RATED 1.00	CORE POWER 89.9%
CYCLE MWD/sT	8741.6		CORE FLOW 89.8%
MCPR	1.268		LOAD LINE 100.0%

CORRECTION FACTOR: MFLCPR= 1.000 MFLPD= 1.000 MAPRAT= 0.999  
 OPTION: ARTS DUAL LOOP MANUAL FLOW MCPRLIM= 1.240

MOST LIMITING LOCATIONS (NON-SYMMETRIC)

MFLCPR	LOC	MFLPD	LOC	MAPRAT	LOC	PCRAT	LOC
0.978	37-28	0.912	17-22-18	0.821	7-28- 5	0.798	41-28-16
0.976	39-26	0.912	7-28- 5	0.817	15-30-16	0.798	19-28-16
0.975	41-28	0.912	41-28-16	0.817	11-22-13	0.797	7-28- 5
0.973	11-28	0.902	19-28-16	0.816	19-26-16	0.791	39-22-20
0.940	13-32	0.896	15-38-18	0.813	19-30-15	0.782	9-22-13
0.939	9-26	0.895	21-26-16	0.803	7-26-12	0.779	11-20-13
0.937	11-20	0.893	17-26-16	0.802	9-36-13	0.779	17-26-16
0.930	39-22	0.889	9-22-13	0.798	11-30-11	0.777	11-28-15
0.927	7-28	0.889	11-20-13	0.796	9-26- 5	0.776	13-32-16
0.923	9-22	0.888	13-32-16	0.795	39-22-20	0.774	47-26-12

SEQ. B-2 C=MFLCPR D=MFLPD M=MAPRAT P=PCRAT \*=MULTIPLE CORE AVE AXIAL

SEQ	LOC	MFLPD	LOC	MAPRAT	PCRAT	REL PW	LOC
53						00	25
						02	24
49						04	23
L						06	22
45						08	21
						10	20
41			P			12	19
L						14	18
37		18	C4	18		16	17
						18	16
33						20	15
L						22	14
29		4		6		24	13
						26	12
25						28	11
L						30	10
21		18	4	18		32	09
						34	08
17			D			36	07
L						38	06
13						40	05
						42	04
09						44	03
L			M			46	02
05	L	L	L	L	L	48	01
	04	08	12	16	20		
			24	28	32		
				36	40		
					44		
					48		
					52		

CORE AVERAGE RADIAL POWER DISTRIBUTION

RING #	1	2	3	4	5	6	7
REL PW	0.890	1.084	1.113	1.102	1.155	1.145	0.727

PAGE 2

**Job Performance Measure (JPM)**

CLINTON CYCLE 6	INSTRUMENT READINGS/STATUS					SEQUENCE NO 23	
	CALIBRATED LPRM READINGS					today-2xxx xx:xx CALCULATED	
						today-2xxx xx:xx PRINTED	
47D	40.1	49.8	55.7	45.9	30.2	CASE ID FMLD1950708205855	
C	57.0	59.8	60.3	64.5	43.0	LPRM SHAPE - FULL CORE	
B	61.2	63.6	60.9	69.2	41.9		
A	51.1	54.9	49.5	63.0	27.7	# OF TIPS REJECTED: 1	
39D	35.4	51.3	58.4	61.1	57.5	46.0	FAILED SENSORS:
C	55.8	62.7	60.3	59.6	66.5	67.9	LPRM ( 2 SIGNAL FAILED)
B	60.0	65.2	60.7	57.0	66.7	70.2	615A 3815D
A	52.7	61.1	50.4	44.4	54.7	63.8	LPRM ( 0 PANACEA REJECTED)
31D	39.9	51.6	55.8	56.0C	55.7	48.5	OTHER SENSORS ( 0 TOTAL)
C	63.7	71.1	68.3	63.1	72.6P	70.4	SUB RODS
B	69.6	71.2	66.7	59.2	72.9	73.4	NONE
A	67.6M	69.0	61.1	45.4	71.1	71.8	T = TIP RUN RECOMMENDED
23D	40.0	54.3	58.1	57.9	59.5	48.0	C = MFLCPR LOCATION
C	62.2	67.3D	63.7	59.2	66.8	69.0	M = MAPRAT LOCATION
B	67.1	67.1	61.4	56.9	66.6	71.1	D = MFLPD LOCATION
A	66.5	58.6	48.7	44.2	55.6	66.1	P = PCRAT LOCATION
15D	28.5	46.2	55.5	57.2	0.0	39.4	* = MULTIPLE LIMIT
C	42.4	63.6	62.8	59.1	65.4	59.1	
B	43.2	68.6	61.9	57.4	67.6	62.2	
A	0.0	61.7	49.9	44.3	64.3	50.4	
07D		29.1	39.3	40.7	36.6		
C		41.4	58.6	56.6	54.5		
B		42.3	64.8	61.8	58.3		
A		31.2	57.2	55.6	48.4		
	06	14	22	30	38	46	

CORE SUMMARY

CORE POWER	89.9%	CALC SUB FLOW	91.3%	DP MEAS PSI	15.52
CORE FLOW	89.8%	OPER SUB FLOW	-1.2%	DP CALC PSI	20.52
LOAD LINE	100.0%	FLOW BASIS	MEAS	FEEDWTR FLOW MLB/HR	13.5

APRM CALIBRATION

	A	B	C	D
READING	100.4	100.6	100.2	100.2
AGAF	0.994	0.992	0.997	0.997

TIP RUNS RECOMMENDED

STRINGS: NONE

UNIT 1, PAGE 1 OF 1

**Final  
Positions**

OD-7, CONTROL ROD NOTCH POSITIONS, NEW SCAN  
OPTION 2

53

48 48 48 48 48 48 48

**Job Performance Measure (JPM)**

49			48	48	48	48	48	48	48	48	48	48	
45		48	48	48	48	48	48	48	48	48	48	48	48
41	48	48	48	48	48	48	48	48	48	48	48	48	48
37	48	48	48	48	18	48	4	48	18	48	48	48	48
33	48	48	48	48	48	48	48	48	48	48	48	48	48
29	48	48	48	48	4	48	48	48	6	48	48	48	48
25	48	48	48	48	48	48	48	48	48	48	48	48	48
21	48	48	48	48	18	48	4	48	18	48	48	48	48
17	48	48	48	48	48	48	48	48	48	48	48	48	48
13		48	48	48	48	48	48	48	48	48	48	48	
9			48	48	48	48	48	48	48	48	48		
5				48	48	48	48	48	48	48			
	4	8	12	16	20	24	28	32	36	40	44	48	52