

NRC REGION III
INITIAL LICENSE EXAM
JOB PERFORMANCE MEASURE

JPM: RO/SRO ADMIN 1a

**TITLE: DETERMINE QUADRANT POWER TILT
PER PO-3**

CANDIDATE: _____

EXAMINER: _____

JOB PERFORMANCE MEASURE
DATA PAGE

Task: Determine Quadrant Power Tilt PER PO-3

Alternate Path: N/A

Facility JPM #: PL-OPS-ENG-014J

K/A: G2.1.7 Importance: RO: 4.4 SRO: 4.7

K/A Statement: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Task Standard: Correctly calculate a Quadrant Power Tilt Per PO-3

Preferred Evaluation Location: Simulator In Plant

Preferred Evaluation Method: Perform Simulate

References: PO-3, Alternate Incore and Excore Applications

Validation Time: 12 minutes Time Critical: NO

Candidate: _____

Time Start: _____ Time Finish: _____

Performance Time: _____ minutes

Performance Rating: SAT _____ UNSAT _____

Comments:

Examiner: _____
Signature

Date: _____

EXAMINER COPY ONLY

Tools/Equipment/Procedures Needed:

- PO-3, Attachment 2, Rev. 2

Also see **Simulator Operator Instructions** (last page of this document).

READ TO CANDIDATE**DIRECTION TO CANDIDATE:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- Plant was at full power.
- Incores #9 and #35 are inoperable.
- CRD #11 has dropped into the core.

INITIATING CUES:

- During performance of PO-3, Alternate Incore and Excore Applications, the Control Room Supervisor directs you to calculate Excore Quadrant Power Tilt utilizing Power Range NI Channels on Panel C-06.

Proc. Step	TASK ELEMENT 1	STANDARD	Grade
n/a	Correct Procedure located	PO-3, Attachment 2, Excore Quadrant Power Tilt, located.	S U
<p>Comment: Notes: <i>Evaluator provides candidate with a Working Copy.</i></p>			

Proc. Step	TASK ELEMENT 2	STANDARD	Grade
5.2.1	Obtain lower and upper excore readings as required. (S_{AL} , S_{BL} , S_{CL} , S_{DL} and S_{AU} , S_{BU} , S_{CU} , S_{DU}).	Lower and upper excore readings from the PPC using NI5L, NI5U, NI6L, NI6U, NI7L, NI7U, NI8L and NI8U or from the Upper and Lower NI Detector meters on EC-06 are entered on PO-3, Attachment 2, within $\pm 1\%$ (0.01) of the answer key.	S U
<p>Comment: CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 3	STANDARD	Grade
5.2.1	Calculate the sum from the Lower + Upper excore readings (S_A , S_B , S_C , S_D)	Lower + Upper excore readings (S_A , S_B , S_C , S_D) summed and entered on PO-3, Attachment #2, within $\pm 1\%$ (0.01) of the answer key.	S U
<p>Comment: CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 4	STANDARD	Grade
5.2.1	1. Calculate the sum of all excore readings divided by 4: ($S = \Sigma$ all detectors/4).	Sum of all excores reading divided by 4 calculated and entered on PO-3, Attachment 2, within $\pm 1\%$ (0.01) of the answer key.	S U
<p>Comment:</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 5	STANDARD	Grade
5.2.1	Calculate the Quadrant Tilt.	Using the formula $T_{EX} = [(S_x - S)/S]$, calculate the tilt for each Quadrant, within $\pm 1\%$ (0.01) of the answer key.	S U
<p>Comment:</p> <p>Evaluator: Acceptance criteria is all four Quadrant Tilts should add up to zero (0) ± 0.01</p> <p>CRITICAL STEP</p>			

Proc. Step	TASK ELEMENT 6	STANDARD	Grade
5.2.1	Have calculations verified.	Have another qualified individual verify the calculations.	S U
<p>Comment:</p> <p>Notes: Evaluator CUE: State to operator that someone else will verify the calculation.</p>			

Proc. Step	TASK ELEMENT 7	STANDARD	Grade
n/a	Notify the CRS that Excore Quadrant Power Tilt has been completed per PO-3, Attachment 2.	Operator notifies CRS of completion of PO-3, Attachment 2, Excore Quadrant Power Tilt	S U
<p>Comment:</p>			

END OF TASK

CANDIDATE CUE SHEET

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

INITIAL CONDITIONS:

- Plant was at full power.
- Incores #9 and #35 are inoperable.
- CRD #11 has dropped into the core.

INITIATING CUES:

- During performance of PO-3, Alternate Incore and Excore Applications, the Control Room Supervisor directs you to calculate Excore Quadrant Power Tilt utilizing Power Range NI Channels on Panel C-06.

SIMULATOR OPERATOR INSTRUCTIONS

SIMULATOR SET UP:

Simulator Setup Instructions:

- Full power IC
- Drop CRD #11 fully into the core with RD-11 (Final Value = 2) on PIDRD02
- When plant has stabilized, freeze the Simulator and SNAP. ***See NOTE #1 below.
- Use PO-3, Attachment 2 and record/calculate from the Upper and Lower NI Detector meters on EC-06) and use as answer key.
- Leave the Simulator in freeze during performance of this JPM to ensure that the conditions will not change

Excore	Lower Reading(%) S _{AL} , S _{BL} , S _{CL} , S _{DL}	Upper Reading(%) S _{AU} , S _{BU} , S _{CU} , S _{DU}	Lower + Upper S _A , S _B , S _C , S _D	S = (Σ All Detectors)/4 = (S _A + S _B + S _C + S _D)/4	Excore Quadrant Tilt T _{EA} , T _{EB} , T _{EC} , T _{ED}	
5 (CH A)	S _{AL} = 50.5	S _{AU} = 50	S _A = S _{AL} + S _{AU} 100.5	95.125	T _{EA} = [(S _A -S)/S] .0565	QUAD 1
6 (CH B)	S _{BL} = 40	S _{BU} = 39	S _B = S _{BL} + S _{BU} 79		T _{EB} = [(S _B -S)/S] -.1695	QUAD 3
7 (CH C)	S _{CL} = 50	S _{CU} = 50	S _C = S _{CL} + S _{CU} 100		T _{EC} = [(S _C -S)/S] .0512	QUAD 4
8 (CH D)	S _{DL} = 52	S _{DU} = 49	S _D = S _{DL} + S _{DU} 101		T _{ED} = [(S _D -S)/S] .0618	QUAD 2

NOTE: The four QPTs should sum to approximately zero.

Comments: _____

Performed By: Pat Person Date: Today Time: Now

Calculations Verified By: _____ Date: _____

After calculations are verified, forward to Reactor Engineering Supervisor or designee for final review.

Reactor Engineering Supervisor or designee: _____ Date: _____

ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY ANSWER KEY