NRC REGION III

INITIAL LICENSE EXAM

JOB PERFORMANCE MEASURE

JPM: RO/SRO-ADMIN a

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 interpatation.

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

Preferred Evaluation Location: Simulator __X__ In Plant _____

Preferred Evaluation Method: Perform __X__ 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: _____ Date: _____
Signature

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**
Comment: Notes: ***Evaluator provides candidate with a Working Copy.***			

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 ±1% (0.01) of the answer key.	**S U**
Comment: **CRITICAL STEP**			

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 ±1% (0.01) of the answer key.	**S U**
Comment: **CRITICAL STEP**			

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

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 ±1% (0.01) of the answer key.	**S U**
Comment: ***Evaluator: Acceptance criteria is all four Quadrant Tilts should add up to zero (0) ± 0.01*** **CRITICAL STEP**			

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

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**
Comment:			

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.

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**