AEP
AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	15 MINUTES
NUMBER AND TITLE:	2020NRC-A1a-RO Boron Volume Determination	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedure:	2-OHP-4021-005-002	Operation of the Unit 2 Boric Acid Blender
K/A Number:	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc..
K/A Imp.:	RO: 4.1 SRO: 4.3	
Task Number:	0050080101	Borate the RCS.

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

Task Briefing
Copy of 2-OHP-4021-005-002 Attachment 9 Boron or Dilution Volume Determination
Copy of Unit 2 Technical Data Book curves (Sections 4, 5, 6, and 7)

ATTACHMENTS

None

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

1. Brief the operator (May be performed by giving out Task Briefing Sheet)
2. Announce start of the JPM
   Information to be provided via Cues:

RCS Boron Concentration	1000 ppm
BAST Concentration	6800 ppm
Core Burnup	8000 MWD/MTU
Effective Fuel Temperature	1179.3°F
DTC	-2.235 pcm/°F

3. Perform evolution
4. At completion of evolution, announce the JPM is complete.
5. Document evaluation performance.

TASK BRIEFING

You are an extra Control Room Operator on Unit 2.

The Unit Supervisor has directed you to calculate the required Boration or Dilution to restore T_{ave} to program.
Nuclear Engineering Reactor Design Summary (NERDS) is NOT available.

Reactor Power	96.3%
T_{ave}	574.2°F
T_{ref}	573°F

Calculate ONLY the amount of Boron or PW required to be added to the VCT. The previous blender operation was a boration.

GENERAL STANDARDS/PRECAUTIONS

The required Boron Addition has been determined

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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Operation of the Unit 2 Boric Acid Blender			
Attachment 9	Boron or Dilution Volume Determination		Pages: 52 - 55

1 PURPOSE AND SCOPE

1.1 Provide instructions for determining the amount of boration or dilution required.

2 PREREQUISITES

2.1 None

3 PRECAUTIONS AND LIMITATIONS

3.1 Calculations in this attachment are based on design information and are accurate to within engineering tolerances. Current plant conditions may vary the actual requirements.

3.2 Calculations are based on TRM minimum values of BA concentration. BA concentrations above minimum value will require a lower amount of BA.

3.3 Ensure adequate Shutdown Margin will be maintained following dilution.

3.4 If last addition to the RCS was PW, the first 27 gallons of next addition will be PW. This shall be considered in the total reactivity change to be made.

4 DETAILS

4.1 **IF** in MODES 1 or 2, **THEN** perform the following as applicable (N/A steps that are not applicable):

4.1.1 Amount determined for power change based on plant conditions.

a. Determine current RCS boron concentration from most recent representative sample.

_____ppm _____

STANDARD: Determines that section 4.1.1 is not applicable
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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b. Determine change in power defect associated with load change from Technical Data Book (Figure 6.1) **OR** Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 4).

_____pcm _____

c. Determine reactivity change (Δρ) required by boration or dilution.

_____pcm _____

d. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

_____pcm/ppm _____

e. Determine required RCS Critical Boron (ΔC_B) concentration change in PPM by the following:
$\Delta\rho/DBW = \Delta C_B$

(_____ pcm) / (_____ pcm/ppm) = (_____ ppm)
step 4.1.1c step 4.1.1d _____

f. Determine total amount of boration or dilution required to accomplish desired power change from Technical Data Book (2-Figure 7.5.1, or 2-Figure 7.2).

_____GAL – Boric Acid/Makeup Water
(circle one) _____

4.1.2 Amount determined for temperature change as follows:

a. Determine desired RCS temperature change based on Auctioneered Hi T_{avg}/T_{ref} error from appropriate indications.

$(T_{avg} - T_{ref})$_ _____ °F _____

b. Determine Core Burnup:

_____MWD/MTU _____

STANDARD**:** Determines that section 4.1.2 is applicable
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that 1.2°F temperature **change** is required (574.2 – 573 = 1.2) NOTE – the dash after (T_{avg}-T_{ref}) is not a negative sign
SAT: ☐ UNSAT: ☐

CUE: Provide Core burnup value (8,000 MWD/MTU after candidates explains Reactor Engineering tracks and supplies this number when NERDS is unavailable.
STANDARD**:** Determines 8000 MWD/MTU is burnup
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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c. Determine current RCS boron concentration from most recent representative sample.

_____ppm _____

d. Determine Moderator Temperature Coefficient (MTC) from Technical Data Book (Figure 5.1) or Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 2, 5).

_____pcm/°F _____

e. Determine Effective Fuel Temperature T_{ave} from NERDS Reactivity Parameters Menu (option 3, 3).

_____°F _____

f. Determine Doppler Temperature Coefficient (DTC) from NERDS Reactivity Parameters Menu (option 3,2).

_____pcm/°F _____

g. Determine Temperature Coefficient (TC) from the following:
MTC + DTC = TC

(_____pcm/°F) + (_____pcm/°F) = (_____pcm/°F)
step 4.1.2d step 4.1.2f _____

h. Determine required reactivity change (Δρ) in PCM by the following:
TC *Temperature Change = Δρ

(_____pcm/°F) * (_____°F) = (_____pcm)
step 4.1.2g step 4.1.2a _____

i. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

_____pcm/ppm _____

CUE: Provide RCS Boron (1,000 ppm) after candidates explains chemistry supplies this number after sampling and it is logged in the CR logs.

STANDARD**:** Records 1000 ppm.
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that MTC is -12.8 pcm/°F (Range -12.5 to -13.0)
SAT: ☐ UNSAT: ☐

CUE: Provide Effective Fuel Temp (1179.3 °F) after candidates explains Reactor Engineering would supply this number when NERDS is unavailable.

STANDARD**:** Determines that the Effective Fuel Temperature is 1179.3°F
SAT: ☐ UNSAT: ☐

CUE: Provide Doppler Temperature Coefficient (DTC = - 2.235 pcm/°F) after candidates explains Reactor Engineering would supply this number when NERDS is unavailable.

STANDARD**:** Determines that the DTC is -2.235 pcm/°F
SAT: ☐ UNSAT: ☐

(Continued on next page)

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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c. Determine current RCS boron concentration from most recent representative sample.

_____ppm _____

d. Determine Moderator Temperature Coefficient (MTC) from Technical Data Book (Figure 5.1) or Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 2, 5).

_____pcm/°F _____

e. Determine Effective Fuel Temperature T_{av} from NERDS Reactivity Parameters Menu (option 3, 3).

_____°F _____

f. Determine Doppler Temperature Coefficient (DTC) from NERDS Reactivity Parameters Menu (option 3,2).

_____ pcm/°F _____

g. Determine Temperature Coefficient (TC) from the following:
MTC + DTC = TC

(_____pcm/°F) + (_____pcm/°F) = (_____pcm/°F)
step 4.1.2d step 4.1.2f _____

h. Determine required reactivity change (Δρ) in PCM by the following:
TC *Temperature Change = Δρ

(_____pcm/°F) * (_____°F) = (_____pcm)
step 4.1.2g step 4.1.2a _____

i. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

_____pcm/ppm _____

(Continued from previous page)

STANDARD **(CS):** Determines that TC is -15.035 pcm/°F (-12.8 + -2.235) (Range -14.735 to -15.235)
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that PCM change is -18.042 (-15.035 pcm/°F x 1.2°F) (Range -17.682 to -18.282)
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that DBW is -8.05 pcm/ppm (Range –8.0 to -8.1)
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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j. Determine required RCS Critical Boron (ΔC_B) concentration change in PPM by the following: $\Delta\rho$ / DBW = ΔC_B

(_____pcm) / (_____pcm/ppm) = (_____ppm) _____
step 4.1.2h step 4.1.2i

k. Determine total amount of boration or dilution required to accomplish desired RCS temperature change from Technical Data Book (2-Figure 7.5.1 or 2-Figure 7.2).

_____GAL – Boric Acid/Makeup Water (circle one) _____

4.2 Use either of the following methods in MODES 3, 4 and 5:

4.2.1 Technical Data Book:

a. Determine current RCS boron concentration from most recent representative sample.

_____ppm _____

b. Determine total amount of boration or dilution required to accomplish desired RCS boron concentration from Technical Data Book (2-Figure 7.5.1, 12-Figure 7.5.2, 7.5.3 or 2-Figure 7.2).

_____GAL – Boric Acid/Makeup Water (circle one) _____

STANDARD **(CS):** Determines that Boron change is +2.24 ppm (-18.042 pcm/-8.05 pcm/ppm) (Range +2.18 to +2.29)
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that Boron change requires +24 gallons of Boric Acid (circle Boric Acid) (Range 22 to 26 gallons)
SAT: ☐ UNSAT: ☐

Note: Acceptable range based on graph reading from the lower limit line (20) and mid-scale (30) for the given boron concentration and required ppm change. The calculated limits of 23.92 to 25.66 is included within this range)

STANDARD**:** Determines that section 4.2 is not applicable
SAT: ☐ UNSAT: ☐

TERMINATION CUE: "JPM is complete when completed Attachment 9 is provided to evaluator".

Task Briefing

You are an extra Control Room Operator on Unit 2.

The Unit Supervisor has directed you to calculate the required Boration or Dilution to restore T_{ave} to program. Nuclear Engineering Reactor Design Summary (NERDS) is NOT available.

Reactor Power	96.3%
T_{ave}	574.2°F
T_{ref}	573°F

Calculate ONLY the amount of Boron or PW required to be added to the VCT. The previous blender operation was a boration.

AMERICAN ELECTRIC POWER

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Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	20 Minutes
NUMBER AND TITLE:	2020NRC-A1.b-RO Prepare Valve Stroke Data per 1-OHP-4030-114-011-Attachment 1	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:

1-OHP-4030-114-011	Containment Isolation And IST Valve Operability Test, Rev. 36
TDB-1-Fig-19.-1	Power Operated Valve Stroke Time Limits, Rev. 125

NRC KA

KA 2.2.12	Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)
RO/SRO Importance	3.7/4.1

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

PMP-4030-EXE-001, Conduct of surveillance Testing
1-OHP-4030-114-011, Containment Isolation and IST Valve Operability Test, Attachment 1
Copy of TDB Figure 1-19-1 Power Operated Valve Stroke Time limits

ATTACHMENTS

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

Note: This JPM is based on 1-OHP-4030-114-011, Rev. 36 and TDB-1-Fig-19.-1, Rev. 125. Any subsequent revisions to the procedures will require a review of this JPM to ensure that the content of the JPM is still valid. This JPM may be used without revision if the procedure changes do not affect the JPM.

Give copy of Task Briefing, procedure, and attachments to examinee.

TASK BRIEFING

You are the extra operator in Unit 1.

The Unit Supervisor has requested you to prepare 1-OHP-4030-114-011, Attachment 1 RCDT and Containment Sump Valves Test per step 2.4 of the attachment.

GENERAL STANDARDS/PRECAUTIONS

All data has been filled in for the valves to be tested in attachment 1.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 36	Page 10 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

1 PURPOSE AND SCOPE

1.1 To demonstrate OPERABILITY and satisfy testing requirements associated with the D.C. Cook Nuclear Plant IST Program for the following Containment Isolation Valves (CIVs), testable during plant operation in MODES 1 - 4, per TS SR 3.6.3.4 and the D.C. Cook Nuclear Plant IST Program:

- 1-DCR-201, RCDT And PRT To Rad Waste Gas Compressor Train 'A' Cntmt Isolation Valve
- 1-DCR-203, RCDT And PRT To Rad Waste Gas Compressor Train 'B' Cntmt Isolation Valve
- 1-DCR-205, RCDT Pumps Suction From RDCT Train 'A' Cntmt Isolation Valve
- 1-DCR-206, RCDT Pumps Suction From RDCT Train 'B' Cntmt Isolation Valve
- 1-DCR-207, Reactor Plant Nitrogen To RDCT 1-TK-1 Cntmt Isolation Valve
- 1-DCR-600, Containment Sump Pumps Discharge To Dirty Waste Holdup Tank Train 'A' Containment Isolation Valve
- 1-DCR-601, Containment Sump Pumps Discharge To Dirty Waste Holdup Tank Train 'B' Containment Isolation Valve

1.2 To satisfy full-stroke exercise requirements associated with the D.C. Cook Nuclear Plant IST Program by moving the valves listed above to the required position in both directions.

2 PREREQUISITES **INIT**

2.1 The working copy of this procedure is the current revision. _____

2.2 A pre-test briefing has been conducted with the SM, US, or WCC-SRO per PMP-4010-JOB-001, Pre-Job Briefs and Post-Job Reviews. _____

Cue: Procedure is current revision and pre-test briefing is complete.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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2.3 PMP-4030-EXE-001, Conduct of Surveillance Testing, Section 3.2, General Expectations for Surveillance Test Prerequisite Activity, has been reviewed. _____

2.4 IST MIN and IST MAX stroke time acceptance criteria from Technical Data Book has been recorded in applicable action steps. _____

2.5 **IF** Valve Position Indication (VPI) Verification Surveillance is scheduled for any valve listed in Step 1.1, **THEN** performance of this attachment is being coordinated with 1-OHP-4030-114-034, Local Valve Position Verification Test. _____

2.6 Record Stopwatch data:

Primary Instrument Number _____

Next Due Calibration Date _____ _____

Secondary Instrument Number _____ (N/A if not used)

Next Due Calibration Date _____ _____

3 PRECAUTIONS AND LIMITATIONS

3.1 Inform SM of any abnormalities or problems encountered during this test.

3.2 Recorded IST data shall be obtained from a calibrated instrument. Test instrumentation with a current calibration sticker and not identified as "rejected" is considered calibrated.

3.3 Valves outside of IST MIN and IST MAX stroke time acceptance criteria when collecting as-found data could require an immediate retest per OHI-4016, Conduct of Operations: Guidelines.

3.4 Components shall be evaluated against IST limits per OHI-4016 when determining OPERABILITY.

3.5 The IST Fail-Safe Testing requirement is satisfied by satisfactory performance of the open and closed stroke time testing.

STANDARD (**CS**) Operator determines that TDB-1-FIG 19.1 is required for the IST MIN and IST MAX Times

SAT: ☐ UNSAT: ☐

CUE: Have candidate explain where TDB Figure is located / obtained, then Supply Copy of TDB-1-FIG 19.

1

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 36	Page 12 of 206
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Attachment 1	RCDT and Containment Sumps Valves Test	Pages: 10 - 18	

3.6 On headers considered susceptible to pressure binding, the outer CIV shall remain open while the inner CIV is tested unless some other outlet for the displaced water has been established. Pressure binding can prevent an open CIV within an isolated segment from closing upon receipt of a signal. Pressure binding occurs when the required displacement of liquid necessary to allow for the movement of the air-operated isolation valve internals cannot occur due to a water-solid or near water-solid condition within the isolated piping segment caused by thermal expansion of the trapped fluid. Even if the CIV manages to fully close, sufficient pressure buildup in the isolated piping segment can cause the valve to reopen. This precaution applies to the following valves in this attachment: [Ref. 8.2.1i]

- 1-DCR-205
- 1-DCR-600

4 DETAILS **INIT**

4.1 Perform the following to test RCDT valves:

4.1.1 Perform the following for 1-DCR-201, RC Drain Tank to Vent Header:

a. Verify 1-DCR-201 - OPEN. _____

b. Stroke **AND** time 1-DCR-201 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

c. Open 1-DCR-201. _____

d. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

e. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-201	Closed	0	2.0	2.0	

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

4.1.2 Perform the following for 1-DCR-203, RC Drain Tank to Vent Header:

a. Verify 1-DCR-203 - OPEN. _____

b. Stroke **AND** time 1-DCR-203 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

c. Open 1-DCR-203. _____

d. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

e. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

NOTE: RCDT pressure should be considered when stroking Nitrogen Supply Valve.

4.1.3 Perform the following for 1-DCR-207, Nitrogen To RC Drain Tk:

a. Open 1-DCR-207. _____

b. Stroke **AND** time 1-DCR-207 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

c. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-203	Closed	0	2.0	2.0

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-207	Closed	0	2.0	2.0

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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Attachment 1	RCDT and Containment Sumps Valves Test	Pages: 10 - 18	

d. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

4.1.4 Perform the following for 1-DCR-205, RC Drain Tank Pumps Suction:

a. Verify Selector Switch for 1-DCR-205, RC Drain Tk Outlet Train A Cntmt Isolation, in - NORMAL. _____

b. Verify 1-DCR-206, RC Drain Tank Pump Suction - OPEN. _____

c. Open 1-DCR-205. _____

d. Stroke AND time 1-DCR-205 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

e. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

f. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

4.1.5 Perform the following for 1-DCR-206, RC Drain Tank Pump Suction:

a. Stroke AND time 1-DCR-206 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

b. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

c. Open 1-DCR-206. _____

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-205	Closed	1.2	3.3	4.4	2.3

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-206	Closed	1.3	3.7	4.9	2.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

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d. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

4.2 Perform the following to test Containment Sump to Dirty Waste Holdup Tank valves:

4.2.1 Verify the following pumps in - STOP:

- 1-PP-38A, Lower Cntmt Sump Pump 2A _____
- 1-PP-38B, Lower Cntmt Sump Pump 2B _____
- 1-PP-59A, Reactor Cavity Sump Pump 3A _____
- 1-PP-59B, Reactor Cavity Sump Pump 3B _____
- 1-PP-61A, Cntmt Pipe Tnl Sump Pump 2A _____
- 1-PP-61B, Cntmt Pipe Tnl Sump Pump 2B _____

4.2.2 Perform the following for 1-DCR-600, Cntmt Sumps To Dirty Waste Hld Tk:

a. Verify 1-DCR-601, Cntmt Sumps To Dirty Waste Hld Tk - OPEN. _____

b. Stroke **AND** time 1-DCR-600 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

c. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

d. Open 1-DCR-600. _____

e. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-600	Closed	0	2.0	2.0	*

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 36	Page 16 of 206
Containment Isolation And IST Valve Operability Test			
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4.2.3 Perform the following for 1-DCR-601, Cntmt Sumps To Dirty Waste Hld Tk:

a. Stroke **AND** time 1-DCR-601 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
Pri / Sec	_____ sec	_____ sec	_____ sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ❑ No _____

b. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No _____

c. Open 1-DCR-601. _____

d. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No _____

4.2.4 Place the following in - AUTO, as required:

- 1-PP-38A, Lower Cntmt Sump Pump 2A _____
- 1-PP-38B, Lower Cntmt Sump Pump 2B _____
- 1-PP-59A, Reactor Cavity Sump Pump 3A _____
- 1-PP-59B, Reactor Cavity Sump Pump 3B _____
- 1-PP-61A, Cntmt Pipe Tnl Sump Pump 2A _____
- 1-PP-61B, Cntmt Pipe Tnl Sump Pump 2B _____

STANDARD (**CS**): Operator enters IST MIN and IST MAX Times
SAT: ☐ UNSAT: ☐

1-DCR-601	Closed	0	2.0	2.0	

STANDARD (**CS**): Operator completes entering IST MIN and IST MAX Times for all valves on Attachment #1.
SAT: ☐ UNSAT: ☐

TERMINATION CUE: "JPM is complete when the examinee provides the filled in Attachment1 to the evaluator".

Task Briefing

You are the extra operator in Unit 1.

The Unit Supervisor has requested you to prepare 1-OHP-4030-114-011, Attachment 1 RCDT and Containment Sump Valves Test per step 2.4 of the attachment.

AEP
AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	15 Minutes
NUMBER AND TITLE:	2020NRC-A2-RO Calculate QPTR	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:
2-OHP-4030-214-032 Quadrant Power Tilt Calculation

NRC KA

KA 2.2.12 Knowledge of surveillance procedures

RO/SRO Importance 3.7/4.1

TRAINING AIDS/TOOLS/EQUIPMENT

Calculator
Magnifying glass

HANDOUTS

Task Briefing
2-OHP-4030-214-032 and Data Sheet 2
Attachment 1 – N41, N42, N43, and N44 Pictures

ATTACHMENTS

NI Calibration Data Card
Attachment 1 – N41, N42, N43, and N44 Pictures

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

1. Ensure classroom setup is complete
2. Brief the operator (May be performed by giving out Task Briefing Sheet)
3. Announce start of the JPM
4. Perform evolution
5. At completion of evolution, announce the JPM is complete.
6. Document evaluation performance.

TASK BRIEFING

You are an extra RO.

The following conditions exist:

- Unit 2 is currently at 72% power.
- The Plant Process Computer (PPC) is INOPERABLE

The US directs you to perform a manual QPTR calculation per 2-OHP-4030-214-032, Quadrant Power Tilt Calculation.

The NI amp meters are set to display maximum resolution (.1 MILLI-APMS on the RANGE selector switches) and the fluke readings confirm that the indicators are reading properly.

NOTE
Simulator Indications are NOT applicable to this JPM

GENERAL STANDARDS/PRECAUTIONS

Candidate correctly calculates QPTR

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 2 of 12
Quadrant Power Tilt Ratio Calculation			

1 PURPOSE AND SCOPE

1.1 The purpose of this procedure is to determine the QUADRANT POWER TILT RATIO (QPTR) to satisfy Technical Specification SR 3.2.4.1.

2 PREREQUISITES **INIT**

2.1 If a fluke or equivalent test equipment will be used to determine QPTR, the instrument has been obtained from Measuring and Test Equipment Issue. _____

3 PRECAUTIONS AND LIMITIATIONS

3.1 Improper use of a fluke or equivalent test equipment may cause blown fuses or rate trips. Fluke or equivalent test equipment readings shall not be taken if bistables are tripped on any power range drawer. [Ref. 8.2.2e]

3.2 The 120% current values are obtained from calibration data cards located on the nuclear instrumentation (NI) drawers. If QPTR calculation is being performed during the quarterly card change out, using the "new" 120% current values is preferred. The "new" 120% current values, if not yet posted, may be obtained from MTI or Reactor Engineering.

3.3 Do not utilize 120% values from both "new" and "old" cards for a single calculation.

3.4 If a manual calculation is suspect, a verification calculation using a fluke or equivalent test equipment should be obtained prior to entering TS Conditions and Required Actions for QPTR.

Cue: NI readings will be used for QPTR.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 3 of 12
Quadrant Power Tilt Ratio Calculation			

4 DETAILS **INIT**

NOTE: Only Section 4.1, 4.2, or 4.3 need be performed to obtain a QPTR. Sections not used may be N/A.

4.1 Plant Process Computer (PPC) calculation of QPTR

4.1.1 Check the Plant Process Computer (PPC) OPERABLE for calculation of QPTR. _____

4.1.2 Select Tilting Factors. _____

4.1.3 **IF** desired to use a PPC printout **THEN** perform the following:

a. Print the Tilting Factors from the PPC screen. _____

b. Record the Highest Upper or Lower Radial Flux Tilt meter _____ _____

c. Record the Highest Upper or Lower Radial Flux Tilt reading _____ _____

d. Attach the printout to this procedure _____

4.1.4 **IF** desired to handwrite the PPC information **THEN** enter the Upper and Lower Radial Flux Tilts and the Highest Upper or Lower Radial Flux Tilt on Data Sheet 1, Quadrant Power Tilt Ratio From PPC. _____

4.2 Manual calculation of QPTR with all NIs operable

4.2.1 **IF** detector currents will be used to obtain power range excore amperages, **THEN** perform the following:

NOTE: All eight amp meter settings do not need to be on the same scale setting.

a. Select the amp meter scales for maximum resolution. _____

b. Read **AND** record each individual NI detector current on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet. _____

STANDARD Operator determines step 4.1 is N/A as PPC is INOPERABLE
SAT: ☐ UNSAT: ☐

STANDARD Operator determines step 4.2 is applicable and detector currents will be used.
SAT: ☐ UNSAT: ☐

CUE: Meter scales are selected for maximum resolution (.1 MILLI-AMPS [100 MICRO-AMPS] on the RANGE selector switches).
STANDARD (**CS**) Using the 0-100 MICROAMPERE scale, the Operator reads and records Upper & Lower Detector ~~blanks~~ currents for N-41, 42, 43 and 44 on Data Sheet 2.
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 4 of 12
Quadrant Power Tilt Ratio Calculation			

CAUTION: Fluke or equivalent test equipment readings shall not be taken if bistables are tripped on any power range drawer.

4.2.2 **IF** a FLUKE or equivalent test equipment will be used to determine QPTR, **THEN** perform the following:

a. Record instrument number and calibration due date on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet. _____

b. Verify MTI has setup the fluke or equivalent test equipment. _____

c. Obtain the individual NI detector voltages **AND** substitute this voltage for the selected NI detector current on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet. _____

d. **WHEN** all individual NI detector data has been collected, **THEN** have MTI remove the fluke or equivalent test equipment. _____

4.2.3 Enter the individual upper and lower power range 120% current values in the appropriate blanks. _____

4.2.4 Divide the individual NI current by its 120% current value. _____

4.2.5 Total the normalized values determined in Step 4.2.4. _____

4.2.6 Using the formula on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet, determine the upper and lower QPTR. _____

4.2.7 Enter the highest upper **OR** lower tilt ratio in the space provided on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet. _____

4.2.8 Obtain the Maximum QPTR from the Plant Process Computer by performing the following (N/A if the PPC is unavailable or inoperable):

a. Select Tilting Factors. _____

b. Enter the highest Upper or Lower Radial Flux Tilt on Data Sheet 2, Quadrant Power Tilt Ratio Calculation Sheet. _____

STANDARD Operator determines step 4.2.2 is N/A as Fluke will not be used.
SAT: ☐ UNSAT: ☐

STANDARD Operator enters 120% current values on Data Sheet 2.
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator divides respective NI channel with its 120% value
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator totals the Normalized Values
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator completes formula calculations to determine QPTR
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator enters the highest tilt ratio on Data Sheet 2
SAT: ☐ UNSAT: ☐

STANDARD Operator determines step 4.2.8 is N/A as PPC is INOP
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 5 of 12
Quadrant Power Tilt Ratio Calculation			

4.3 Manual calculation of QPTR with <u>one</u> NI inoperable

4.3.1 Record the OPERABLE NI numbers in the appropriate blanks on Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIs. _____

4.3.2 Obtain power range excore amperages as follows:

NOTE: All eight amp meter settings do not need to be on the same scale setting.

a. Select the amp meter scales for maximum resolution. _____

b. Read **AND** record each individual NI detector current on Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIs. _____

4.3.3 Enter the individual upper and lower power range 120% current values in the appropriate blanks on Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIs. _____

4.3.4 Divide each individual NI current by its 120% amperage. _____

4.3.5 Total the normalized values determined in Step 4.3.4. _____

4.3.6 Using the formula on Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIs, determine the upper and lower QPTR. _____

4.3.7 Enter the highest upper **OR** lower tilt ratio in the space provided on Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIs. _____

4.3.8 **IF** reactor power is greater than 75%, **THEN** request Reactor Engineering verify that QPTR is consistent with Incore Detector Readings. [Ref. SR 3.2.4.2] _____

5 ACCEPTANCE CRITERIA

5.1 Acceptance Criteria: QPTR is less than **OR** equal to 1.02.

STANDARD Operator determines step 4.3 is N/A as all NI's are OPERABLE
SAT: ☐ UNSAT: ☐

STANDARD **(CS)** Operator determines ACCEPTANCE CRITERIA is NOT MET
SAT: ☐ UNSAT: ☐

TERMINATION CUE: "JPM is complete when examinee returns the completed surveillance package"

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 10 of 12
Quadrant Power Tilt Ratio Calculation			
Data Sheet 2	Quadrant Power Tilt Ratio Calculation Sheet		Pages: 10 - 11

NOTE: **IF** Unit 2 is operating at greater than 75% power, **THEN** consideration should be given to performing QPTR calculations immediately prior to declaring a Power Range INOPERABLE. This will lower the need to perform Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIS, and required Flux Map to comply with SR 3.2.4.2.

Upper Detector	Record Detector "A" Current	Record Detector "A" 120% value	Normalized Value Detector A ÷ 120% value
N-41	99	135.4	.7311
N-42	97.5	134.4	.7254
N-43	98	134.4	.7292
N-44	97.5	136.7	.7132
		Upper Total	2.8990

Lower Detector	Record Detector "B" Current	Record Detector "B" 120% value	Normalized Value Detector B ÷ 120% value
N-41	91.5	135.6	.6748
N-42	96	134.7	.7127
N-43	99	134.7	.7345
N-44	98	136.2	.7195
		Lower Total	2.8419

Upper Tilt Ratio = $\frac{\text{Max Upper Normalized Value}}{\text{Upper Total}}$ x 4 = 1.009 ← Range 1.0063 to 1.0165

Lower Tilt Ratio = $\frac{\text{Max Lower Normalized Value}}{\text{Lower Total}}$ x 4 = 1.034 ← Range 1.0265 to 1.0424

Enter the max upper or lower tilt ratio (Calculated QPTR) 1.034 ← Value is the highest ratio entered in above 2 lines.

Highest Upper or Lower Radial Flux Tilt from PPC (N/A if unavailable or inoperable) N/A

Notification Limit: 1.015

Acceptance Criteria: Calculated QPTR is less than **OR** equal to 1.02

Expected values

Acceptable Ranges Based on Scale used on Pictures

Detector A (UPPER)

SCALE	5	5	1	1	500	500	100	100
	Low	High	Low	High	Low	High	Low	High
N-41	4.925	4.975	0.985	0.995	493	498	98.5	99.5
N-42	4.85	4.9	0.97	0.98	485	490	97	98
N-43	4.875	4.925	0.975	0.985	488	493	97.5	98.5
N-44	4.85	4.9	0.97	0.98	485	490	97	98

Using the 100 Scale (UPPER QPTR ranges calculated using combinations of High/Low values above)
N41-High (99.5), N42-Low (97), N43-Low(97.5),N44-Low (97) ---- 1.0165

N41-low (98.5), N42-Low (97), N43-Low(97.5),N44-High (98)----- 1.0063

Detector B (LOWER)

SCALE	5	5	1	1	500	500	100	100
	Low	High	Low	High	Low	High	Low	High
N-41	4.55	4.6	0.91	0.92	455	460	91	92
N-42	4.775	4.825	0.955	0.965	478	483	95.5	96.5
N-43	4.925	4.975	0.985	0.995	493	498	98.5	99.5
N-44	4.875	4.925	0.975	0.985	488	493	97.5	98.5

(LOWER QPTR Ranges Calculated using combinations of High/Low values above)
N41-Low (91), N42-Low (95.5), N43-High (99.5),N44-Low (97.5) ---- 1.0424

N41-High (92), N42-High (96.5), N43-Low(98.5),N44-High (97.5)----- 1.0265

Task Briefing

You are an extra RO.

The following conditions exist:

- Unit 2 is currently at 72% power.
- The Plant Process Computer (PPC) is INOPERABLE

The US directs you to perform a manual QPTR calculation per 2-OHP-4030-214-032, Quadrant Power Tilt Calculation.

The NI amp meters are set to display maximum resolution and the fluke readings confirm that the indicators are reading properly.

NI CALIBRATION DATA
DET A 120% I in µAmps

N41 =	**135.4**
N42 =	**134.4**
N43 =	**134.4**
N44 =	**136.7**

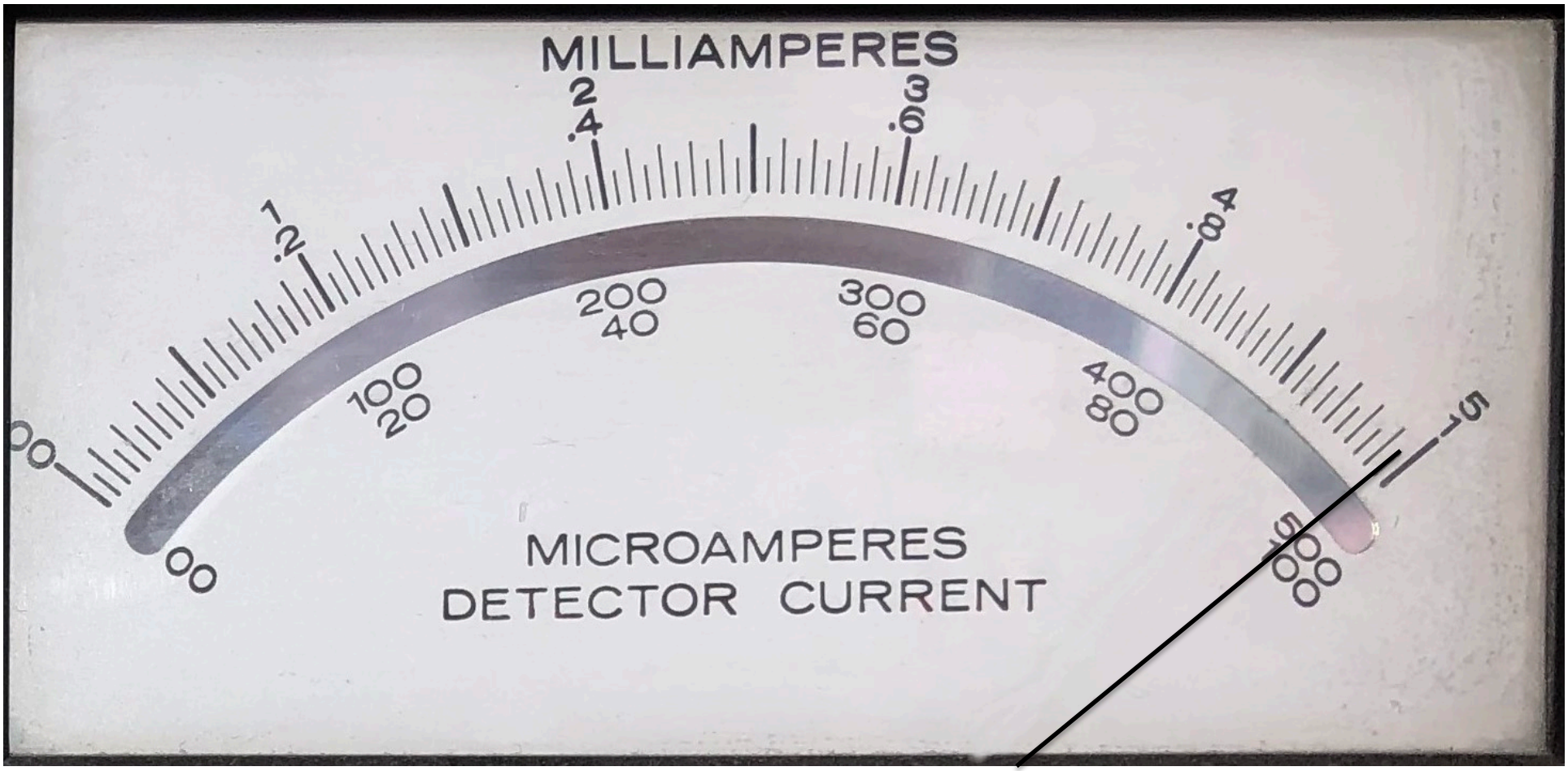
DET B 120% I in µAmps

N41 =	**135.6**
N42 =	**134.7**
N43 =	**134.7**
N44 =	**136.2**

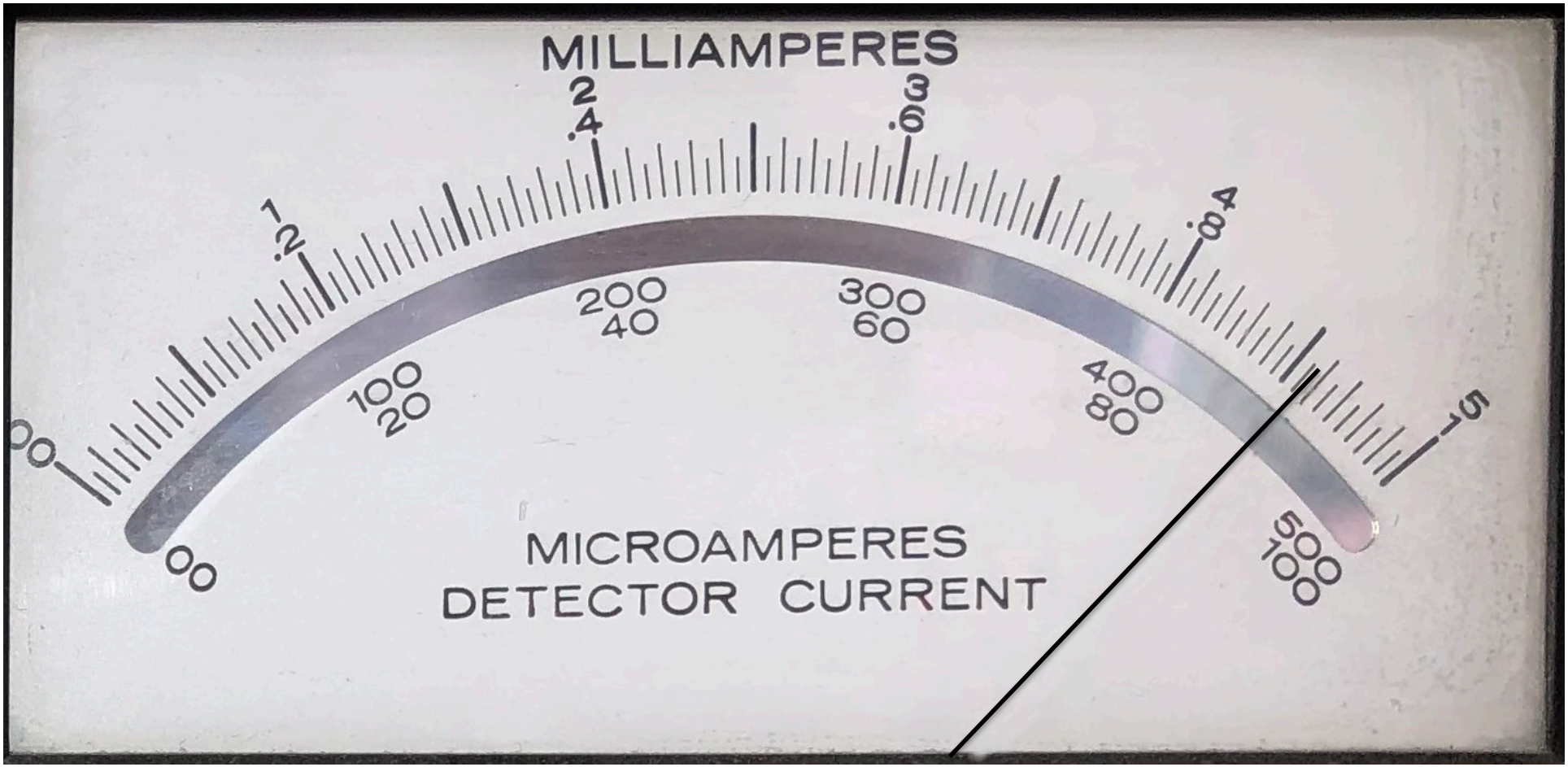
Verified: Print John Smithe
Sign *John Smithe*
Date 5/11/2020

NOTE
Simulator Indications are NOT applicable to this JPM

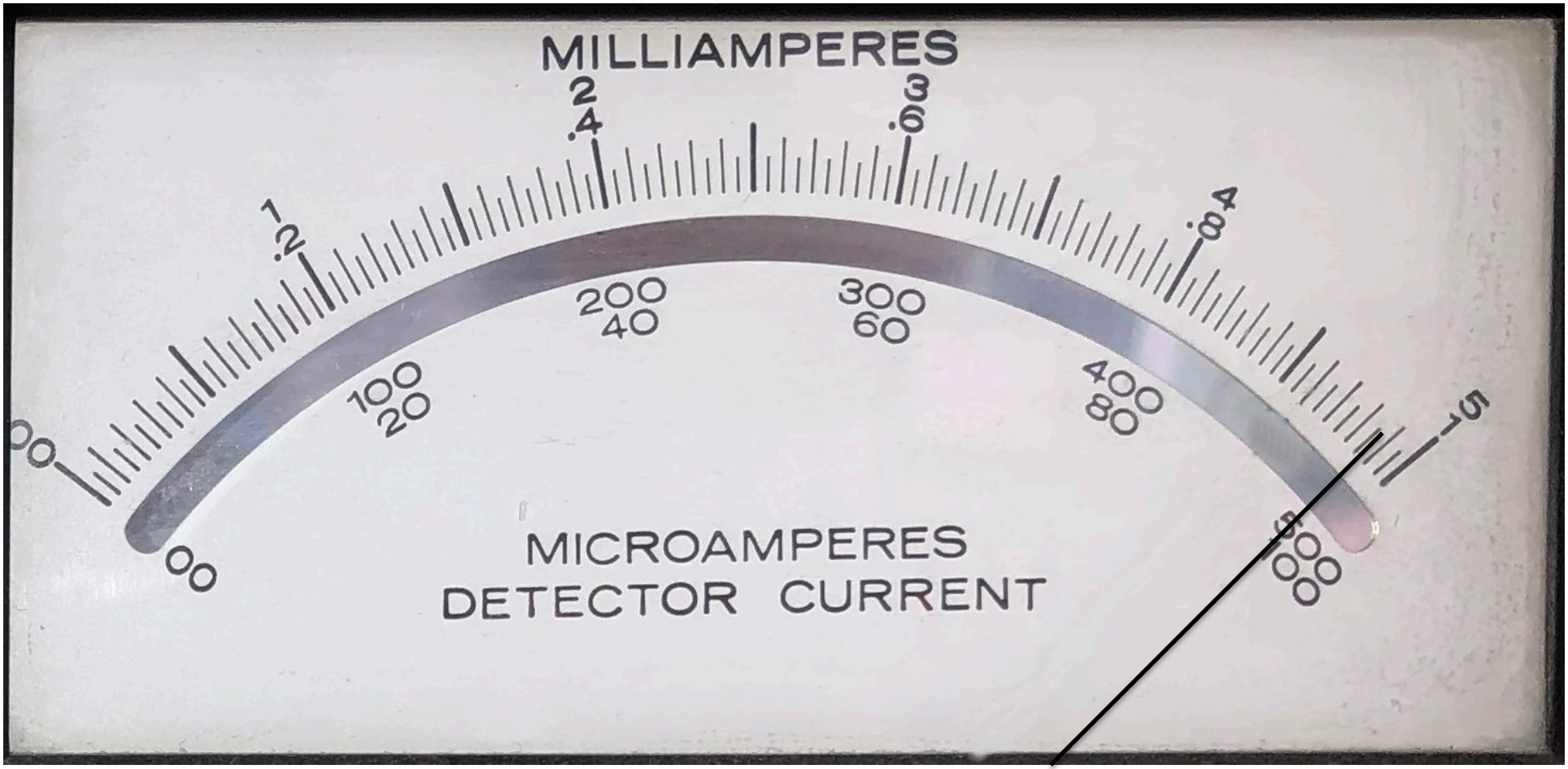
N41 Upper Detector A



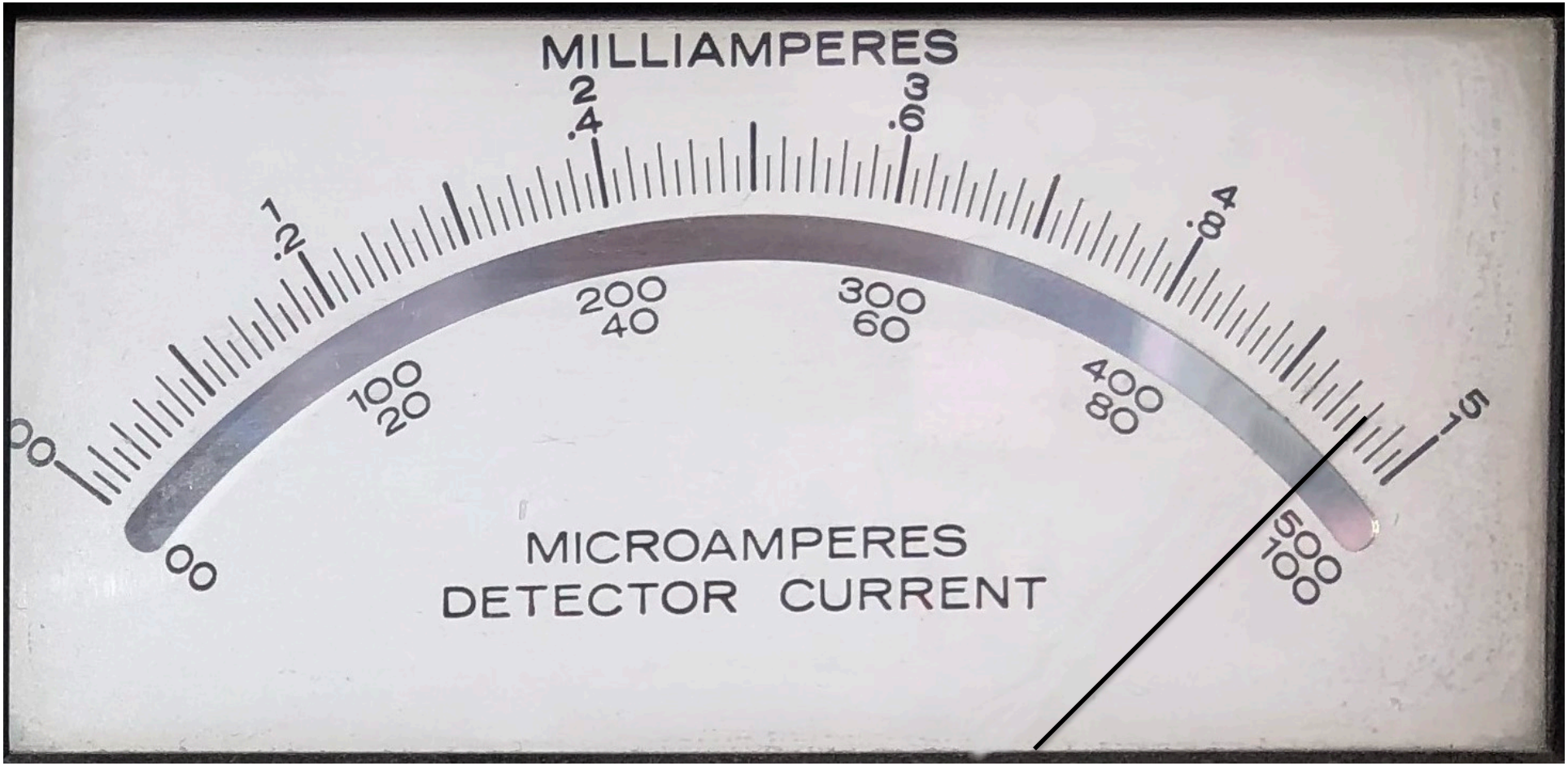
N41 Lower Detector B



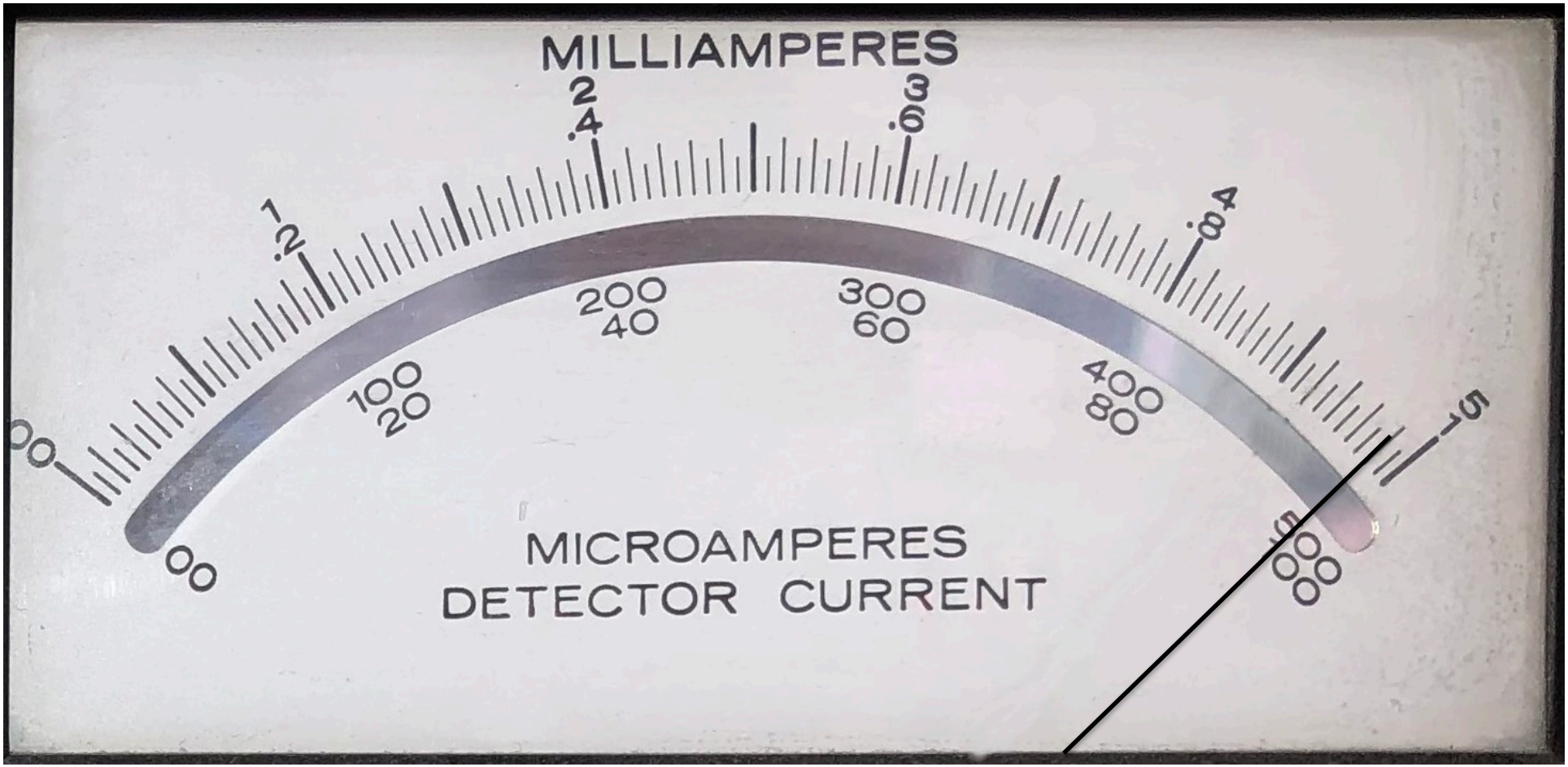
N42 Upper Detector A



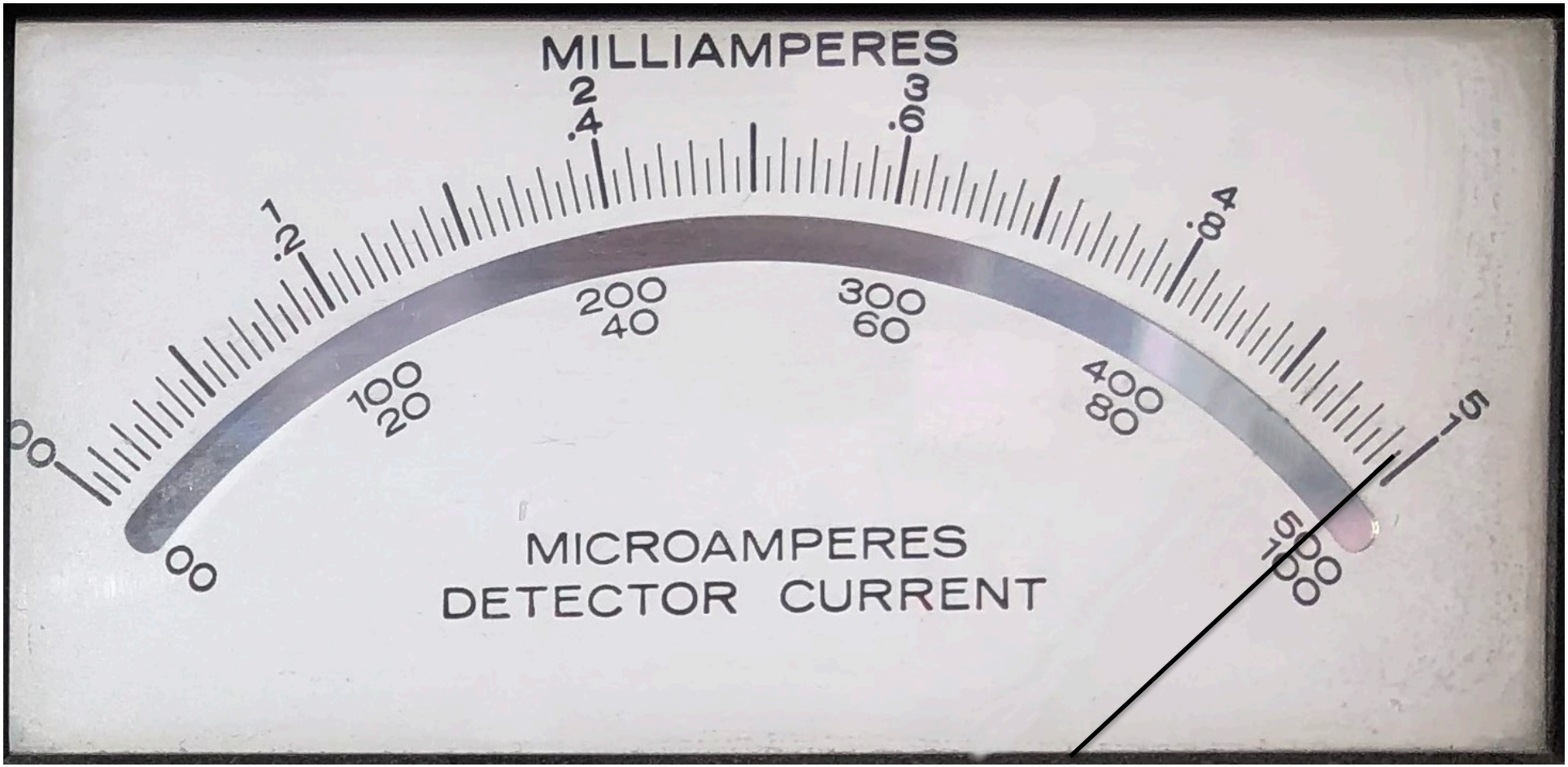
N42 Lower Detector B



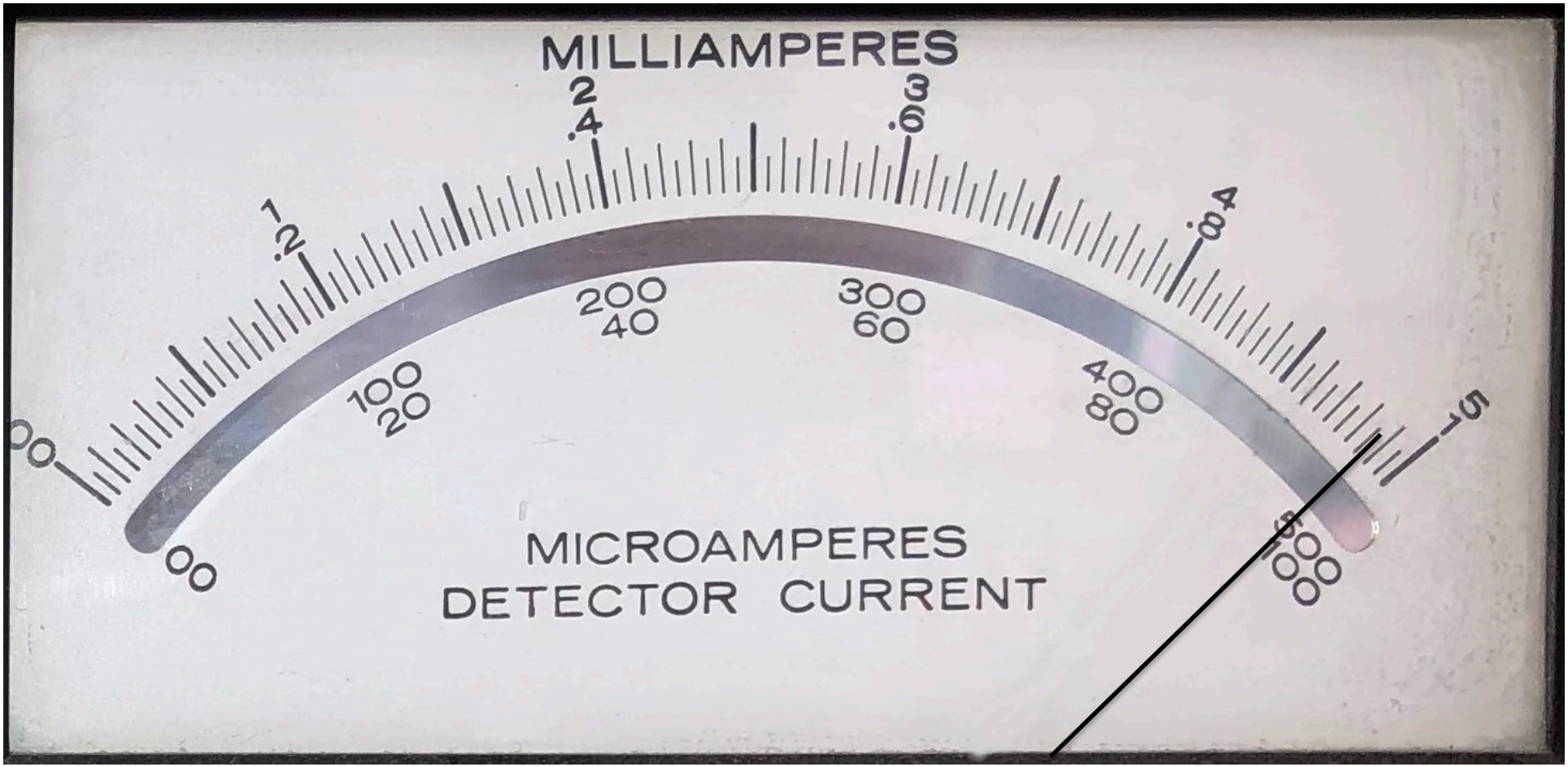
N43 Upper Detector A



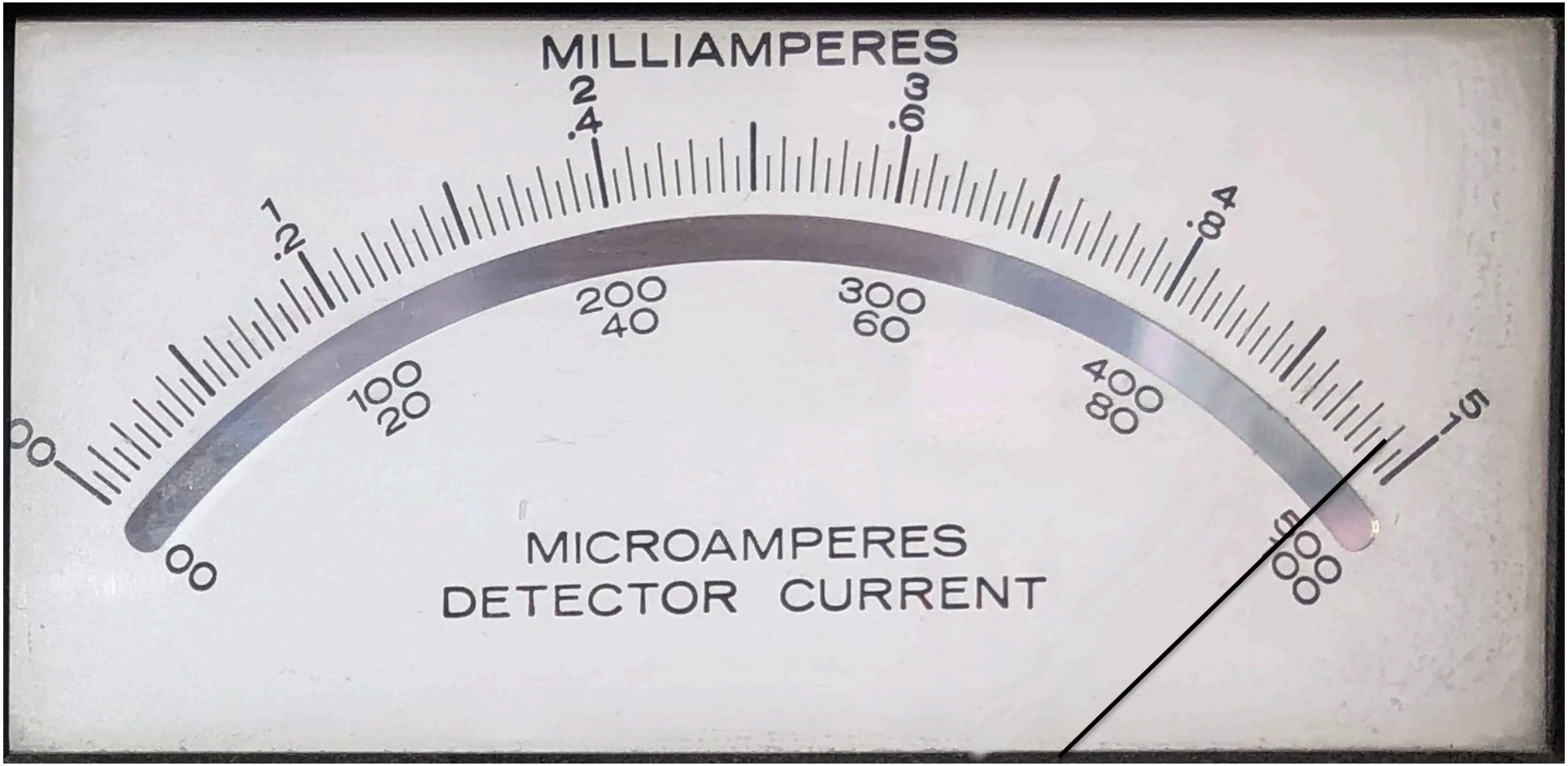
N43 Lower Detector B



N44 Upper Detector A



N44 Lower Detector B



AEP
AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	15 Minutes
NUMBER AND TITLE:	2020NRC-A3-RO Respond to Failed Radiation Monitor Channel	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:

2-OHP-4024-211	Annunciator #211 Response: Delta T
12-OHP-4024-139	Annunciator #139 Response: Radiation

NRC KA

KA 2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.12 / 45.9)
RO/SRO Importance	2.9/3.1

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

2-OHP-4024-211 Annunciator #211 Response: Delta T

12-OHP-4024-139 Annunciator #139 Response: Radiation

ATTACHMENTS

None

EVALUATION SETTINGS

Simulator

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

Disable emulator for ERS-8306.

EVALUATOR INSTRUCTIONS

Note: This JPM is based on 2-OHP-4024-211, Rev. 25 and 12-OHP-4024-139 Rev. 25. Any subsequent revisions to the procedures will require a review of this JPM to ensure that the content of the JPM is still valid. This JPM may be used without revision if the procedure changes do not affect the JPM.

Give copy of Task Briefing to examinee. Once examinee has located Annunciator response procedures provide attachment 2-OHP-4024-211 to examinee.

TASK BRIEFING

You are the extra operator in Unit 2.

The Unit Supervisor has requested you to respond to Annunciator Panel 211: Drop 49, identify, and take all actions required for Unit 2.

GENERAL STANDARDS/PRECAUTIONS

All actions for failed RMS Channel have been completed or identified

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

2-OHP-4024-211

Level of Use: REFERENCE **Drop 49**

ANNUNCIATOR #211 RESPONSE: DELTA T

INITIATING DEVICE(S) AEP	Alias	NOMINAL SETPOINT
Unit 2 PPC Digital Output (2-DOUT 02) via Unit 2 Control Terminal.		N/A

PPC-RMS U2 CT ALARM OR ABNORMAL

NOTE
Each point has reflash capability.

1.0 PROBABLE CAUSE(S):

1.1 Non TS RMS Points Quality

1.2 TS RMS Quality

Whenever a Technical Specification related RMS channel has a background color other than green, indicating a quality other than normal, the annunciator will alarm.

1.3 CT Failure

2.0 AUTOMATIC ACTION(S):

2.1 Refer to 12-OHP-4024-139 for applicable Immediate Automatic Actions.

3.0 OPERATOR ACTION(S):

3.1 Check PPC RMS Annunciator display (RMSAN3) or the CT.

3.2 Check RMS CT **AND** refer to Annunciator response in 12-OHP-4024-139, Radiation Monitoring System.

3.3 **IF** it is desired to remove a point from RMS, **THEN** complete Attachment No. 2 [Page 114].

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STANDARD**:** Operator reviews Drop 49 Probable Causes and automatic actions.
SAT: ☐ UNSAT: ☐

STANDARD: Operator determines that 12-OHP-4024-139 is required to be reviewed for channel in alarm.
SAT: ☐ UNSAT: ☐

STANDARD (**CS)**: Operator identifies from the RMSAN1 channel ERA-8306 in alarm.
SAT: ☐ UNSAT: ☐

CUE: Once examinee indicates location of Annunciator Response provide copy of 12-OHP-4024-139 for Channel ERA-8300

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

12-OHP-4024-139

Level of Use: REFERENCE **2-ERA-8300**

ANNUNCIATOR #139 RESPONSE: RADIATION

ERS-8300, Aux Building Equipment Room Area Monitor

AEP	INITIATING DEVICE(S) Alias	NOMINAL SETPOINT
2-ERA-8300	CHANNEL ID: 8303 U2 East CCP Room 8304 U2 West CCP Room 8305 U2 East RHR Pump Room 8306 U2 West RHR Pump Room 8307 U2 North Safety Injection Pump Room 8308 U2 South Safety Injection Pump Room 8309 U2 Reactor Coolant Filter Room	Refer to Channel Parameter File

1.0 PROBABLE CAUSE(S):

1.1 RED / YELLOW:

- Heat exchanger leakage
- Movement of radioactive material in specified area
- Crud burst upstream
- Possible trouble sources separated by channel:
  - ERA-8303, 8304: CCW heat exchanger leakage
  - ERA-8305, 8306: RHR system crud burst. During refueling may indicate fuel handing accident.
  - ERA-8307, 8308: SIS actuation
  - ERA-8309: Fuel cladding failure or RCS crud burst

1.2 WHITE:

- Monitor is in POLL OFF at RMS HMI
- Channel status is COMM FAIL, DELETED, MAINTENANCE, or PARAMETER DISAGREE, at RMS HMI

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NOTE: Candidate must perform actions from the RMS CT located on the back wall of the simulator.

STANDARD: Operator reviews probable causes for channel in WHITE alarm.
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)
12-OHP-4024-139 **Level of Use: REFERENCE** **2-ERA-8300** **2.0 AUTOMATIC ACTION(S):** 2.1 None **3.0 OPERATOR ACTION(S):** 3.1 RED: 3.1.1 Notify TS RP Technician of radiation monitor alarm. 3.1.2 Request RP verify requirements of 12-THP-6010-RPP-708, Response To Area Radiation Monitor Alarms, has been met. 3.1.3 **IF** the following rooms alarm, **THEN** place running AES Fan Charcoal Filter Test Selector switch in CHAR FILT: • ERA-8303 U2 East CCP Room • ERA-8304 U2 West CCP Room • ERA-8305 U2 East RHR Pump Room • ERA-8306 U2 West RHR Pump Room • ERA-8307 U2 North SI Pump Room • ERA-8308 U2 South SI Pump Room 3.1.4 **WHEN** condition has cleared in previous step, **THEN** place AES Fan Charcoal Filter Test Selector switch in BYPASS. 3.1.5 **IF** the following rooms alarm, **THEN** refer to 12-OHP-4022-002-019, High Reactor Coolant Activity or Failed Fuel. • ERA-8303 U2 East CCP Room • ERA-8304 U2 West CCP Room • ERA-8305 U2 East RHR Pump Room • ERA-8306 U2 West RHR Pump Room • ERA-8309 U2 Reactor Coolant Filter Room 3.2 YELLOW: 3.2.1 Notify TS RP Technician of radiation monitor alarm. 3.2.2 Request RP verify requirements of 12-THP-6010-RPP-708, Response To Area Radiation Monitor Alarms, has been met. **Page 145 of 148** **Rev. 25**	**THIS PAGE INCLUDED FOR REFERENCE. NO ACTIONS REQUIRED AS ALARM IS WHITE.**

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)
12-OHP-4024-139 **Level of Use: REFERENCE** **2-ERA-8300** 3.3 WHITE: 3.3.1 Attempt to restore affected channel(s) to Normal. 3.3.2 **IF** channel is declared Inoperable and it is desired to prevent nuisance alarms, **THEN** perform the following: • Coordinate with RP to remove desired RMS monitor/channel(s) from service • Remove desired RMS monitor/channel(s) from Scan on the PPC per 2-OHP-4024-211, Annunciator #211 Response: Delta T, Drop 48/49, Attachment's 1 and 2 • Initiate Action **4.0 REFERENCE INDEX:** 4.1 Source Documents: 4.1.1 Elementary Diagram: a. OP-2-98822, Radiation Monitoring System Area Monitor ERA-8300 4.1.2 EC-0000053364, Unit Two Radiation Monitoring System (RMS) Replacement 4.2 Reference Documents: 4.2.1 12-THP-6010-RPP-708, Response To Area Radiation Monitor Alarms 4.2.2 12-OHP-4022-002-019, High Reactor Coolant Activity or Failed Fuel 4.2.3 2-OHP-4024-211, Annunciator #211 Response: Delta T 4.3 Commitment Documents: 4.3.1 None **Page 146 of 148** **Rev. 25**	**CUE:** Inform the operator the Unit Supervisor has declared the channel Inoperable and it is desired to prevent nuisance alarms. **CUE:** RP has been contacted for removing channel from service. STANDARD (**CS):** Operator identifies Attachment **2** is required for removing channel from scan on Unit2. (**Only identifying Attachment 2 completion is critical** and will be completed). SAT: ☐ UNSAT: ☐ **CUE:** Another operator will complete Attachment 1 to remove the channel from Scan on the Unit 1 PPC.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)
2-OHP-4024-211 **Attachment 2** **Level of Use: N/A** **DROP 49 – REMOVING/REPLACING RMS CHANNEL** **INSTRUCTIONS** **1.0** Record at least one of the following (N/A information not used): 1.1 Record at least one of the following (N/A information not used) • RMS Channel: _____ • Field Unit Database Point-ID: _____ • Cook Plant Tag Number: _____ 1.2 Reason for Removing Channel: _____ _____ 1.3 Approved by:_____ Time:_____ Date:_____ SRO **2.0** From Unit 2 PPC, perform the following: 2.1 Activate U2 RMS Annunciator Status Tree from the Main Menu by clicking on the RMS button then the RMS Annunciator Status Tree U2 button, or typing in the turn-on code RMSAN3. 2.2 Uncheck the box next to the specific RMS Channel or the box for the entire field unit that is being removed from the Unit 2 RMS annunciator control logic. **3.0** Specifically note the RMS channel is removed from scan in the appropriate section of the Open Items Log or Abnormal Position Control Log as appropriate. Channel Removed by:_____ Time:_____ Date:_____ Independently Verified by:_____ Time:_____ Date:_____ **4.0** Place Attachment in the RMS section of the Blocked Alarm Log. **Page 114 of 115** **Rev. 25**	STANDARD (**CS**)**:** Operator fills in the required information. SAT: ☐ UNSAT: ☐ **NOTE:** Only RMS Channel of ERA-8306 (west RHR Pump Room) is required **NOTE:** Enters channel is in ***Fail Status or other description. Exact wording is not required.*** STANDARD (**CS**)**:** Operator activates U2 RMS Annunciator Status Tree. SAT: ☐ UNSAT: ☐ STANDARD (**CS**)**:** Operator unchecks the box next to ERA-8306. SAT: ☐ UNSAT: ☐ **TERMINATION CUE: "JPM is Complete when examinee unchecks the box for ERA-8306 to remove it from scan.**

Task Briefing

You are the extra operator in Unit 2.

The Unit Supervisor has requested you to respond to Annunciator Panel 211: Drop 49, identify, and take all actions required for Unit 2.

AEP
AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	15 MINUTES
NUMBER AND TITLE:	2020NRC-A1.a-SRO Review Boron Volume Determination	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____

_____

_____

REFERENCES/NRC KA/TASKS

Procedure:	2-OHP-4021-005-002	Operation of the Unit 2 Boric Acid Blender
K/A Number:	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc..
K/A Imp.:	RO: 4.1 SRO: 4.3	
Task Number:	0050080101	Borate the RCS.

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

Task Briefing
Copy of 2-OHP-4021-005-002 Attachment 9 Boron or Dilution Volume Determination
Copy of Unit 2 Technical Data Book curves (Sections 4, 5, 6, and 7)

ATTACHMENTS

None

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

1. Brief the operator (May be performed by giving out Task Briefing Sheet)
   Provide the following information as the examinee needs it for review verification:

RCS Boron Concentration	1000 ppm
BAST Concentration	6800 ppm
Core Burnup	8000 MWD/MTU
Effective Fuel Temperature	1179.3°F
DTC	-2.235 pcm/°F

2. Announce start of the JPM
3. Perform evolution
4. At completion of evolution, announce the JPM is complete.
5. Document evaluation performance.

TASK BRIEFING

You are unit supervisor in Unit 2.

You have directed the RO to calculate the required Boration or Dilution to restore T_{ave} to program. Nuclear Engineering Reactor Design Summary (NERDS) is NOT available.

Reactor Power	96.3%
T_{ave}	574.2°F
T_{ref}	573°F

He has calculated ONLY the amount of Boron or PW required to be added to the VCT. The blender line is full of acid.

Review his calculation for correctness identifying any errors.

GENERAL STANDARDS/PRECAUTIONS

The calculation has been reviewed and incorrect MTC and dilution / boration errors have been identified

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4021-005-002	Rev. 12	Page 52 of 76
Operation of the Unit 2 Boric Acid Blender			
Attachment 9	Boron or Dilution Volume Determination		Pages: 52 - 55

1 PURPOSE AND SCOPE

1.1 Provide instructions for determining the amount of boration or dilution required.

2 PREREQUISITES

2.1 None

3 PRECAUTIONS AND LIMITATIONS

3.1 Calculations in this attachment are based on design information and are accurate to within engineering tolerances. Current plant conditions may vary the actual requirements.

3.2 Calculations are based on TRM minimum values of BA concentration. BA concentrations above minimum value will require a lower amount of BA.

3.3 Ensure adequate Shutdown Margin will be maintained following dilution.

3.4 If last addition to the RCS was PW, the first 27 gallons of next addition will be PW. This shall be considered in the total reactivity change to be made.

4 DETAILS

4.1 **IF** in MODES 1 or 2, **THEN** perform the following as applicable (N/A steps that are not applicable):

4.1.1 Amount determined for power change based on plant conditions.

a. Determine current RCS boron concentration from most recent representative sample.

_____ppm

N/A JO today JO

STANDARD: Agrees that section 4.1.1 is not applicable
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4021-005-002	Rev. 12	Page 53 of 76
Operation of the Unit 2 Boric Acid Blender			
Attachment 9	Boron or Dilution Volume Determination		Pages: 52 - 55

b. Determine change in power defect associated with load change from Technical Data Book (Figure 6.1) **OR** Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 4).

_____pcm

c. Determine reactivity change (Δρ) required by boration or dilution.

_____pcm

d. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

_____pcm/ppm

e. Determine required RCS Critical Boron (ΔC_B) concentration change in PPM by the following:
$\Delta\rho/DBW = \Delta C_B$

(_____ pcm) / (_____ pcm/ppm) = (_____ ppm)
step 4.1.1c step 4.1.1d

f. Determine total amount of boration or dilution required to accomplish desired power change from Technical Data Book (2-Figure 7.5.1, or 2-Figure 7.2).

_____GAL – Boric Acid/Makeup Water
(circle one)

4.1.2 Amount determined for temperature change as follows:

a. Determine desired RCS temperature change based on Auctioneered Hi T_{avg}/T_{ref} error from appropriate indications.

$(T_{avg} - T_{ref})$_ 1.2 °F JB

b. Determine Core Burnup:

8000 MWD/MTU JB

CUE: If required, have candidate continue review of attachment after first error is identified.

STANDARD**:** Agrees that section 4.1.2 is applicable
SAT: ☐ UNSAT: ☐

STANDARD**:** Agrees that 1.2°F temperature **change** is required (574.2 – 573 = 1.2) NOTE – the dash after (T_{avg}-T_{ref}) is not a negative sign
SAT: ☐ UNSAT: ☐

CUE: Provide Core burnup value (8,000 MWD/MTU after candidates explains Reactor Engineering tracks and supplies this number when NERDS is unavailable.

STANDARD**:** Agrees 8000 MWD/MTU is burnup
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4021-005-002	Rev. 12	Page 54 of 76
Operation of the Unit 2 Boric Acid Blender			
Attachment 9	Boron or Dilution Volume Determination		Pages: 52 - 55

c. Determine current RCS boron concentration from most recent representative sample.

1000 ppm JB

d. Determine Moderator Temperature Coefficient (MTC) from Technical Data Book (Figure 5.1) or Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 2, 5).

-10.5 pcm/°F JB

e. Determine Effective Fuel Temperature T_{eff} from NERDS Reactivity Parameters Menu (option 3, 3).

1179.3 °F JB

f. Determine Doppler Temperature Coefficient (DTC) from NERDS Reactivity Parameters Menu (option 3,2).

-2.235 pcm/°F JB

g. Determine Temperature Coefficient (TC) from the following:
MTC + DTC = TC

(-10.5 pcm/°F) + (-2.235 pcm/°F) = (-12.735 pcm/°F)
step 4.1.2d step 4.1.2f JB

h. Determine required reactivity change (Δρ) in PCM by the following:
TC *Temperature Change = Δρ

(-12.735 pcm/°F) * (1.2 °F) = (-15.282 pcm)
step 4.1.2g step 4.1.2a JB

i. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

-8.05 pcm/ppm JB

CUE: Provide RCS Boron (1,000 ppm) after candidates explains chemistry supplies this number after sampling and it is logged in the CR logs.

STANDARD**:** Agrees 1000 ppm is from given information.
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that MTC is actually -12.8. (-10.5pcm/°F is from wrong part of curve) (Range –12.5 to -13.0)
SAT: ☐ UNSAT: ☐

CUE: Provide Effective Fuel Temp (1179.3 °F) after candidates explains Reactor Engineering would supply this number when NERDS is unavailable.

STANDARD**:** Agrees that the Effective Fuel Temperature is 1179.3°F
SAT: ☐ UNSAT: ☐

(Continued on next page)

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4021-005-002	Rev. 12	Page 54 of 76
Operation of the Unit 2 Boric Acid Blender			
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c. Determine current RCS boron concentration from most recent representative sample.

1000 ppm JB

d. Determine Moderator Temperature Coefficient (MTC) from Technical Data Book (Figure 5.1) or Nuclear Engineering Reactor Design Summary (NERDS) Reactivity Parameters Menu (option 2, 5).

-10.5 pcm/°F JB

e. Determine Effective Fuel Temperature T_{eff} from NERDS Reactivity Parameters Menu (option 3, 3).

1179.3 °F JB

f. Determine Doppler Temperature Coefficient (DTC) from NERDS Reactivity Parameters Menu (option 3,2).

-2.235 pcm/°F JB

g. Determine Temperature Coefficient (TC) from the following:
MTC + DTC = TC

(-10.5 pcm/°F) + (-2.235 pcm/°F) = (-12.735 pcm/°F)
step 4.1.2d step 4.1.2f JB

h. Determine required reactivity change (Δρ) in PCM by the following:
TC *Temperature Change = Δρ

(-12.735 pcm/°F) * (1.2 °F) = (-15.282 pcm)
step 4.1.2g step 4.1.2a JB

i. Determine Differential Boron Worth (DBW) from Technical Data Book (Figure 4.1.a) or NERDS Reactivity Parameters Menu (option 1, 5).

-8.05 pcm/ppm JB

(Continued from previous page)

CUE: Provide Doppler Temperature Coefficient (DTC = -2.235 pcm/°F) after candidates explains Reactor Engineering would supply this number when NERDS is unavailable.

STANDARD**:** Agrees that the DTC is -2.235 pcm/°F
SAT: ☐ UNSAT: ☐

STANDARD**:** Determines that TC is -15.035 pcm/°F (-12.735 is from incorrect value in d)(Range -14.735 to -15.235)
SAT: ☐ UNSAT: ☐

STANDARD**:** Determines that PCM change is -18.042 (-15.035 pcm/°F x 1.2°F) (Range -17.682 to -18.282)
(-15.282 is from incorrect value in g)
SAT: ☐ UNSAT: ☐

STANDARD**:** Agrees that DBW is -8.05 pcm/ppm (Range –8.0 to -8.1)
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4021-005-002	Rev. 12	Page 55 of 76
Operation of the Unit 2 Boric Acid Blender			
Attachment 9	Boron or Dilution Volume Determination		Pages: 52 - 55

j. Determine required RCS Critical Boron (ΔC_B) concentration change in PPM by the following: $\Delta\rho$ / DBW = ΔC_B

(-12.735 pcm) / (-8.05 pcm/ppm) = (1.58 ppm)
step 4.1.2h step 4.1.2i JB

k. Determine total amount of boration or dilution required to accomplish desired RCS temperature change from Technical Data Book (2-Figure 7.5.1 or 2-Figure 7.2).

120 GAL – Boric Acid/(Makeup Water)
(circle one) JB

4.2 Use either of the following methods in MODES 3, 4 and 5:

4.2.1 Technical Data Book:

a. Determine current RCS boron concentration from most recent representative sample.

_____ppm _____

b. Determine total amount of boration or dilution required to accomplish desired RCS boron concentration from Technical Data Book (2-Figure 7.5.1, 12-Figure 7.5.2, 7.5.3 or 2-Figure 7.2).

_____GAL – Boric Acid/Makeup Water
(circle one) _____

STANDARD **(CS):** Determines that required Boron change is +2.24 ppm (-18.042 pcm/-8.05 pcm/ppm) (Range +2.18 to +2.29) (1.58 is from incorrect value in g)
SAT: ☐ UNSAT: ☐

STANDARD **(CS):** Determines that Boron change requires +24 gallons of Boric Acid (circle Boric Acid) (Range 22 - 26 gallons). Identifies RO used Dilution graph to determine volume.
SAT: ☐ UNSAT: ☐

Note: Acceptable range based on graph reading from the lower limit line (20) and mid-scale (30) for the given boron concentration and required ppm change. The calculated limits of 23.92 to 25.66 is included within this range)

STANDARD**:** Determines that section 4.2 is not applicable
SAT: ☐ UNSAT: ☐

TERMINATION CUE: "JPM is complete when review of the completed Attachment 9 and any identified errors is provided to evaluator".

Task Briefing

You are unit supervisor in Unit 2.

You have directed the RO to calculate the required Boration or Dilution to restore T_{ave} to program.
Nuclear Engineering Reactor Design Summary (NERDS) is NOT available.

Reactor Power	96.3%
T_{ave}	574.2°F
T_{ref}	573°F

He has calculated ONLY the amount of Boron or PW required to be added to the VCT.

Review his calculation for correctness identifying any errors.

AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	Initial License Training	**TIME:**	20 Minutes
NUMBER AND TITLE:	2020NRC-A1.b-SRO Review Valve Stroke Data per 1-OHP-4030-114-011-Attachment 1	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:

1-OHP-4030-114-011	Containment Isolation And IST Valve Operability Test, Rev. 36
TDB-1-Fig-19.-1	Power Operated Valve Stroke Time Limits, Rev. 125

NRC KA

KA 2.2.12	Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)
RO/SRO Importance	3.7/4.1

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

PMP-4030-EXE-001, Conduct of surveillance Testing
1-OHP-4030-114-011, Containment Isolation and IST Valve Operability Test, Attachment 1
OHI-4016, Conduct of Operations: Guidelines (Available if requested)

ATTACHMENTS

None

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

Note: This JPM is based on 1-OHP-4030-114-011, Rev. 36 and TDB-1-Fig-19.-1, Rev. 125. Any subsequent revisions to the procedures will require a review of this JPM to ensure that the content of the JPM is still valid. This JPM may be used without revision if the procedure changes do not affect the JPM.

Give copy of Task Briefing and procedure to examinee.

TASK BRIEFING

The SM has requested you to perform the SRO Review the recently performed 1-OHP-4030-114-011 Attachment 1, RCDT and Containment Sump Valve Test.

GENERAL STANDARDS/PRECAUTIONS

The completed Attachment has been reviewed and any errors have been identified.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 10 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

1 PURPOSE AND SCOPE

1.1 To demonstrate OPERABILITY and satisfy testing requirements associated with the D.C. Cook Nuclear Plant IST Program for the following Containment Isolation Valves (CIVs), testable during plant operation in MODES 1 - 4, per TS SR 3.6.3.4 and the D.C. Cook Nuclear Plant IST Program:

- 1-DCR-201, RCDT And PRT To Rad Waste Gas Compressor Train 'A' Cntmt Isolation Valve
- 1-DCR-203, RCDT And PRT To Rad Waste Gas Compressor Train 'B' Cntmt Isolation Valve
- 1-DCR-205, RCDT Pumps Suction From RDCT Train 'A' Cntmt Isolation Valve
- 1-DCR-206, RCDT Pumps Suction From RDCT Train 'B' Cntmt Isolation Valve
- 1-DCR-207, Reactor Plant Nitrogen To RDCT 1-TK-1 Cntmt Isolation Valve
- 1-DCR-600, Containment Sump Pumps Discharge To Dirty Waste Holdup Tank Train 'A' Containment Isolation Valve
- 1-DCR-601, Containment Sump Pumps Discharge To Dirty Waste Holdup Tank Train 'B' Containment Isolation Valve

1.2 To satisfy full-stroke exercise requirements associated with the D.C. Cook Nuclear Plant IST Program by moving the valves listed above to the required position in both directions.

2 PREREQUISITES **INIT**

2.1 The working copy of this procedure is the current revision.

2.2 A pre-test briefing has been conducted with the SM, US, or WCC-SRO per PMP-4010-JOB-001, Pre-Job Briefs and Post-Job Reviews.

Note: Operator verifies prerequisites completed.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 11 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

2.3 PMP-4030-EXE-001, Conduct of Surveillance Testing, Section 3.2, General Expectations for Surveillance Test Prerequisite Activity, has been reviewed. JH

2.4 IST MIN and IST MAX stroke time acceptance criteria from Technical Data Book has been recorded in applicable action steps. JH

2.5 **IF** Valve Position Indication (VPI) Verification Surveillance is scheduled for any valve listed in Step 1.1, **THEN** performance of this attachment is being coordinated with 1-OHP-4030-114-034, Local Valve Position Verification Test. Not Scheduled per SRO today N/A

2.6 Record Stopwatch data:

Primary Instrument Number SP-05461

Next Due Calibration Date 09-15-18 JH

Secondary Instrument Number N/A (N/A if not used) JH

Next Due Calibration Date N/A

3 PRECAUTIONS AND LIMITATIONS

3.1 Inform SM of any abnormalities or problems encountered during this test.

3.2 Recorded IST data shall be obtained from a calibrated instrument. Test instrumentation with a current calibration sticker and not identified as "rejected" is considered calibrated.

3.3 Valves outside of IST MIN and IST MAX stroke time acceptance criteria when collecting as-found data could require an immediate retest per OHI-4016, Conduct of Operations: Guidelines.

3.4 Components shall be evaluated against IST limits per OHI-4016 when determining OPERABILITY.

3.5 The IST Fail-Safe Testing requirement is satisfied by satisfactory performance of the open and closed stroke time testing.

STANDARD: Operator determines that TDB-1-FIG 19.1 is required for the IST MIN and IST MAX Times

SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 12 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

3.6 On headers considered susceptible to pressure binding, the outer CIV shall remain open while the inner CIV is tested unless some other outlet for the displaced water has been established. Pressure binding can prevent an open CIV within an isolated segment from closing upon receipt of a signal. Pressure binding occurs when the required displacement of liquid necessary to allow for the movement of the air-operated isolation valve internals cannot occur due to a water-solid or near water-solid condition within the isolated piping segment caused by thermal expansion of the trapped fluid. Even if the CIV manages to fully close, sufficient pressure buildup in the isolated piping segment can cause the valve to reopen. This precaution applies to the following valves in this attachment: [Ref. 8.2.1i]

- 1-DCR-205
- 1-DCR-600

4 DETAILS **INIT**

4.1 Perform the following to test RCDT valves:

4.1.1 Perform the following for 1-DCR-201, RC Drain Tank to Vent Header:

a. Verify 1-DCR-201 - OPEN.

b. Stroke **AND** time 1-DCR-201 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
Pri / Sec	0 sec	1.7 sec	2 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ☐ Yes ☑ No

c. Open 1-DCR-201.

d. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ☐ No

e. Fail-Safe Test Satisfactory? (✓) ☑ Yes ☐ No

STANDARD: Operator determine IST MIN and IST MAX Times entered correctly and results are acceptable

SAT: ☐ UNSAT: ☐

1-DCR-201	Closed	0	2.0	2.0

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 13 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

4.1.2 Perform the following for 1-DCR-203, RC Drain Tank to Vent Header:

a. Verify 1-DCR-203 - OPEN.

b. Stroke **AND** time 1-DCR-203 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	0 sec	1.6 sec	2 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ☑ No

c. Open 1-DCR-203.

d. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ❑ No

e. Fail-Safe Test Satisfactory? (✓) ☑ Yes ❑ No

NOTE: RCDT pressure should be considered when stroking Nitrogen Supply Valve.

4.1.3 Perform the following for 1-DCR-207, Nitrogen To RC Drain Tk:

a. Open 1-DCR-207.

b. Stroke **AND** time 1-DCR-207 - CLOSED.

Stopwatch (Circle) Pri / Sec	IST MIN	As Found	IST MAX
	0 sec	1.7 sec	2 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ☑ No

c. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ❑ No

STANDARD: Operator determine IST MIN and IST MAX Times entered correctly and results are acceptable

1-DCR-203	Closed	0	2.0	2.0

STANDARD: Operator determine IST MIN and IST MAX Times entered correctly and results are acceptable

1-DCR-207	Closed	0	2.0	2.0

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 14 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test	Pages: 10 - 18	

d. Fail-Safe Test Satisfactory? (✓) ❑ Yes ❑ No ____

4.1.4 Perform the following for 1-DCR-205, RC Drain Tank Pumps Suction:

a. Verify Selector Switch for 1-DCR-205, RC Drain Tk Outlet Train A Cntmt Isolation, in - NORMAL.

b. Verify 1-DCR-206, RC Drain Tank Pump Suction - OPEN.

c. Open 1-DCR-205.

d. Stroke **AND** time 1-DCR-205 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
PI / Sec	1.2 sec	4.6 / 4.3 sec	4.4 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ☑ Yes ❑ No

e. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ❑ No

f. Fail-Safe Test Satisfactory? (✓) ☑ Yes ❑ No

4.1.5 Perform the following for 1-DCR-206, RC Drain Tank Pump Suction:

a. Stroke **AND** time 1-DCR-206 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
PI / Sec	1.3 sec	4.0 sec	4.9 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ☑ No

b. Fail-Safe Test Satisfactory? (✓) ❑ Yes ☑ No

c. Open 1-DCR-206.

STANDARD (**CS**): Operator determines Box not checked and Initials missed
SAT: ☐ UNSAT: ☐

STANDARD (**CS**): Operator determines IST MAX Times were incorrectly entered from the limits column
SAT: ☐ UNSAT: ☐

1-DCR-205	Closed	1.2	3.3	4.4	2.3

STANDARD (**CS**): Operator determines IST MAX Time and LIMIT was exceeded and re-test is NOT allowed
SAT: ☐ UNSAT: ☐

STANDARD (**CS**): Operator determines IST Limit Time was not exceeded but the IST MAX was exceeded so restest is allowed
SAT: ☐ UNSAT: ☐

1-DCR-206	Closed	1.3	3.7	4.9	2.5

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 15 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

d. Full-Stroke Exercise Satisfactory? (✓) ❑ Yes ❑ No ____

4.2 Perform the following to test Containment Sump to Dirty Waste Holdup Tank valves:

4.2.1 Verify the following pumps in - STOP:

- 1-PP-38A, Lower Cntmt Sump Pump 2A
- 1-PP-38B, Lower Cntmt Sump Pump 2B
- 1-PP-59A, Reactor Cavity Sump Pump 3A
- 1-PP-59B, Reactor Cavity Sump Pump 3B
- 1-PP-61A, Cntmt Pipe Tnl Sump Pump 2A
- 1-PP-61B, Cntmt Pipe Tnl Sump Pump 2B

4.2.2 Perform the following for 1-DCR-600, Cntmt Sumps To Dirty Waste Hld Tk:

a. Verify 1-DCR-601, Cntmt Sumps To Dirty Waste Hld Tk - OPEN.

b. Stroke **AND** time 1-DCR-600 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
Hr / Sec	0 sec	1.5 sec	2 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ❑ Yes ☑ No

c. Fail-Safe Test Satisfactory? (✓) ☑ Yes ❑ No

d. Open 1-DCR-600.

e. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ❑ No

STANDARD (**CS**): Operator determines Box not checked and Initials missed
SAT: ☐ UNSAT: ☐

STANDARD: Operator determine IST MIN and IST MAX Times entered correctly and results are acceptable

1-DCR-600	Closed	0	2.0	2.0	

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 16 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

4.2.3 Perform the following for 1-DCR-601, Cntmt Sumps To Dirty Waste Hld Tk:

a. Stroke **AND** time 1-DCR-601 - CLOSED.

Stopwatch (Circle)	IST MIN	As Found	IST MAX
Pri / Sec	0 sec	15 sec	2 sec

Is an Immediate Valve Retest Required per OHI-4016? (✓) ☐ Yes ☑ No

b. Fail-Safe Test Satisfactory? (✓) ☑ Yes ☐ No

c. Open 1-DCR-601.

d. Full-Stroke Exercise Satisfactory? (✓) ☑ Yes ☐ No

4.2.4 Place the following in - AUTO, as required:

- 1-PP-38A, Lower Cntmt Sump Pump 2A
- 1-PP-38B, Lower Cntmt Sump Pump 2B
- 1-PP-59A, Reactor Cavity Sump Pump 3A
- 1-PP-59B, Reactor Cavity Sump Pump 3B
- 1-PP-61A, Cntmt Pipe Tnl Sump Pump 2A
- 1-PP-61B, Cntmt Pipe Tnl Sump Pump 2B

STANDARD: Operator determine IST MIN and IST MAX Times entered correctly and results are acceptable

1-DCR-601	Closed	0	2.0	2.0	

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 17 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test	Pages: 10 - 18	

5 ACCEPTANCE CRITERIA

The As-Found stroke times obtained were within IST MIN and IST MAX stroke times as delineated in the Technical Data Book. (Steps 4.1.1b, 4.1.2b, 4.1.3b, 4.1.4d, 4.1.5a, 4.2.2b, and 4.2.3a)

Valves requiring full-stroke exercise checks were moved to the required position in both directions. (Steps 4.1.1d, 4.1.2d, 4.1.3c, 4.1.4e, 4.1.5d, 4.2.2e and 4.2.3d)

Valves requiring fail-safe testing traveled to required fail-safe position. (Steps 4.1.1e, 4.1.2e, 4.1.3d, 4.1.4f, 4.1.5b, 4.2.2c and 4.2.3b)

6 CORRECTIVE MEASURES **INIT**

6.1 **IF** any Acceptance Criteria is not met during this test, **THEN** notify SM or US **AND** initiate corrective action per PMP-7030-CAP-001, Action Initiation.

6.2 **IF** any condition is found to be unsatisfactory during conduct of this test, **THEN** initiate corrective action per PMP-7030-CAP-001, Action Initiation, to effect necessary corrective action as required.

STANDARD (**CS**)**:** Operator determines

- DCR 207 "Fail-Safe" (not the Full-Stroke test) was not signed off;
- DCR-205, failed the "Stroke-Time" test, and was inappropriately re-tested as well as failing the "Stroke-Time" test on the re-test; and
- DCR-206 also failed the "Stroke-Time" test, but should have been re-tested, and the "Full-Stroke" test was not signed off.

SAT: ☐ UNSAT: ☐

STANDARD (**CS**)**:** Determine That DCR-205 and DCR-206 were incorrectly tested and should be declared inoperable (DCR-206 could be retested)

SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4030-114-011	Rev. 32	Page 18 of 206
Containment Isolation And IST Valve Operability Test			
Attachment 1	RCDT and Containment Sumps Valves Test		Pages: 10 - 18

7 FINAL CONDITIONS

7.1 **Test Performance:**

Start Time: 0500 Date: Today Stop Time: 0600 Date: Today

Comments: none

Test Performer or Lead Worker

7.2 **Department Review:**

Were all applicable Acceptance Criteria met?: ☒ Yes ☐ No, Action _____
Is this a Scheduled Surveillance? ☒ Yes, Work Order: 2020567 ☐ No
If yes, is this a complete surveillance? ☒ Yes ☐ No, Action: _____ ☐ N/A

Additional Work Orders: _____ _____ _____

Comments: _____

Reviewed By: P. Sanderson Time: 0800 Date: Today
Dept Supervisor or Designee

7.3 **Senior Reactor Operator (SRO) Review and Acceptance:**

☐ A review of the test results was performed and the applicable Acceptance Criteria were met. Equipment is OPERABLE or the corresponding Event Initiated Surveillance has been satisfied.

☐ A review of the test results was performed and NOT all of the applicable Acceptance Criteria were met. Equipment is INOPERABLE with applicable Technical Specification LCO Actions in effect.

Comments: _____

Reviewed By: _____ Time: _____ Date: __/__/__
Work Control or On-Shift SRO

STANDARD (**CS**)**:** Determine that Acceptance Criteria was NOT met
SAT: ☐ UNSAT: ☐

STANDARD**:** examinee signs and dates or explains why he would not sign the attachment
SAT: ☐ UNSAT: ☐

TERMINATION CUE: JPM is complete when examinee signs or explains why he would not sign the attachment.

Task Briefing

The SM has requested you to perform the SRO Review the recently performed 1-OHP-4030-114-011 Attachment 1, RCDT and Containment Sump Valve Test.

AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	INITIAL LICENSE TRAINING	**TIME:**	20 Minutes
NUMBER AND TITLE:	2020NRC-A2-SRO Review QPTR	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:
2-OHP-4030-214-032 Quadrant Power Tilt Calculation

NRC KA

KA 2.2.40 Ability to apply Technical Specifications for a system

RO/SRO Importance 3.4/4.7

Task Number: 0130180201 Perform Quadrant Power Tilt Ratio Calculation

TRAINING AIDS/TOOLS/EQUIPMENT

Calculator
Ruler
Magnifying glass

HANDOUTS

Task Briefing
Completed 2-OHP-4030-214-032 and Data Sheet 2
Attachment 1 – N41, N42, N43, and N44 Pictures

ATTACHMENTS

NI Calibration Data Card
Attachment 1 – N41, N42, N43, and N44 Pictures

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

1. Brief the operator (May be performed by giving out Task Briefing Sheet)
2. Announce start of the JPM
3. Perform evolution
4. At completion of evolution, announce the JPM is complete.
5. Document evaluation performance.

TASK BRIEFING

You are the Unit SRO.

The following conditions exist:

- Unit 2 is currently at 72% power.
- The Plant Process Computer (PPC) is INOPERABLE

The SM directs you to Review the manual 2-OHP-4030-214-032, Quadrant Power Tilt Calculation.

The NI amp meters are set to display maximum resolution (.1 MILLI-APMS on the RANGE selector switches).

NOTE
Simulator Indications are NOT applicable to this JPM

GENERAL STANDARDS/PRECAUTIONS

Completed QPTR has been reviewed and identifies that values for N42 Upper, N41 Lower and N43 Lower were incorrectly read/entered

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 10 of 12
Quadrant Power Tilt Ratio Calculation			
Data Sheet 2	Quadrant Power Tilt Ratio Calculation Sheet		Pages: 10 - 11

NOTE: **IF** Unit 2 is operating at greater than 75% power, **THEN** consideration should be given to performing QPTR calculations immediately prior to declaring a Power Range INOPERABLE. This will lower the need to perform Data Sheet 3, Quadrant Power Tilt Ratio Calculation Sheet Using 3 NIS, and required Flux Map to comply with SR 3.2.4.2.

Upper Detector	Record Detector "A" Current	Record Detector "A" 120% value	Normalized Value Detector A ÷ 120% value
N-41	99	135.4	.7311
N-42	97.5 (95.5)	136.6	.7138 (.6991)
N-43	98	134.4	.7292
N-44	97.5	136.7	.7132
		Upper Total	2.887 (2.873)

Lower Detector	Record Detector "B" Current	Record Detector "B" 120% value	Normalized Value Detector B ÷ 120% value
N-41	96.5 (91.5)	135.6	.7117 (.6748)
N-42	96	133.6	.7186
N-43	98 (99)	134.7	.7275 (.7350)
N-44	98	136.2	.7195
		Lower Total	2.877 (2.848)

Upper Tilt Ratio = $\frac{\text{Max Upper Normalized Value}}{\text{Upper Total}}$ x 4 = 1.0129

Lower Tilt Ratio = $\frac{\text{Max Lower Normalized Value}}{\text{Lower Total}}$ x 4 = 1.0114

Enter the max upper or lower tilt ratio (Calculated QPTR) 1.0129

Highest Upper or Lower Radial Flux Tilt from PPC (N/A if unavailable or inoperable) N/A

Notification Limit: 1.015

Acceptance Criteria: Calculated QPTR is less than **OR** equal to 1.02

STANDARD (**CS**) Operator identifies that values for N42 Upper, N41 Lower and N43 Lower were incorrectly read/entered.
(Correct Values are: N42 Upper- 95.5, N41 Lower – 91.5, N43 Lower – 99)
(Range +/- 0.5 Micro-Amps for all readings)
SAT: ☐ UNSAT: ☐

If required Direct Operator to makes required corrections and recalculate.

STANDARD (**CS**) Operator enters and calculates correct values for:

- N42 upper 95.5 (95.0 to 96.0) Normalized - .6991 (.6955 to .7028)
- Upper Total 2.873 (2.869 to 2.876)
- N41 Lower 91.5 (91.0 to 92.0) Normalized - .6748 (.6711 to .6785)
- N43 Lower 99 (98.5 to 99.5) Normalized - .7350 (.7313 to .7387)
- Lower Total 2.848 (2.840 to 2.855)

- Upper QPTR 1.018 (1.0168 to 1.0194)
- Lower QPTR 1.032 (1.0244 to 1.040)

SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator identifies that value was incorrectly calculated. Should be 1.032 resulting in excessive QPTR.
1.032 (range 1.0244 to 1.040)
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Operator Determines that Both Upper and Lower are > Notification Limit
SAT: ☐ UNSAT: ☐

STANDARD Operator Determines that Acceptance Criteria is NOT Met (QPTR > 1.02)
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	2-OHP-4030-214-032	Rev. 6	Page 6 of 12
Quadrant Power Tilt Ratio Calculation			

6 CORRECTIVE MEASURES

6.1 **IF** QPTR exceeds Notification Limit of 1.015, **THEN** notify SM and Reactor Engineering.

6.2 **IF** QPTR exceeds Acceptance Criteria, **THEN** perform the following:

- Notify SM and Reactor Engineering.
- Enter appropriate Conditions and Required Actions of TS 3.2.4.

STANDARD (**CS)** Operator Determines that Acceptance Criteria is NOT Met (QPTR > 1.02) and Notifies SM & Reactor Engineering
SAT: ☐ UNSAT: ☐

CUE: SM Acknowledges that QPTR has Exceeded TS value requests that you review the Required Technical Specification and determine the required Actions.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

QPTR
3.2.4

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02.

APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. QPTR not within limit.	A.1	Reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	2 hours after each QPTR determination
	AND		
	A.2	Determine QPTR.	Once per 12 hours
	AND		
	A.3	Perform SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.2.1.	24 hours after achieving equilibrium conditions from a THERMAL POWER reduction per Required Action A.1
			AND
			Once per 7 days thereafter
	AND		

Cook Nuclear Plant Unit 2 3.2.4-1 Amendment No. 269

CUE: (If Required) Ask Operator to determine the Technical Specification LCO that applies.

STANDARD (**CS**) Determines that Power is limited to 3% for each 1% over 1.00 (3.2 x 3% = 9.6%) per LCO 3.2.4 Action A.1 – (note action is met at current power – 90.4% is limit)
(Range of 7.32% to 12.0% reduction with a 92.68% to 88.0% power limit)
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Determines that QPTR must be calculated every 12 hours,
SAT: ☐ UNSAT: ☐

STANDARD (**CS**) Verify $F_Q^C(Z)$ is within limit, Verify $F_Q^W(Z)$ is within limit, & Verify $F_{\Delta h}^N$ is within limits specified in the COLR every 7 days
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

QPTR
3.2.4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.4 Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	AND	
	A.5 ----------NOTES---------- 1. Perform Required Action A.5 only after Required Action A.4 is completed. 2. Required Action A.6 shall be completed whenever Required Action A.5 is performed. ----------	
	Normalize excore detectors to restore QPTR to within limit.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
	AND	
	A.6 ----------NOTE---------- Perform Required Action A.6 only after Required Action A.5 is completed. ----------	
	Perform SR 3.2.1.1, SR 3.2.1.2, and SR 3.2.2.1.	Within 24 hours after achieving equilibrium conditions at RTP not to exceed 48 hours after increasing THERMAL POWER above the limit of Required Action A.1

Cook Nuclear Plant Unit 2 3.2.4-2 Amendment No. 269

STANDARD (**CS):** Identify that safety analyses must be evaluated before raising power above the limit.(90.4% power limit)
SAT: ☐ UNSAT: ☐

STANDARD (**CS):** A.5 & A.6 required prior to raising power above the limit.(90.4% power limit)
SAT: ☐ UNSAT: ☐

TERMINATION CUE: JPM is complete when examinee identifies all applicable Tech Spec Required Actions

Task Briefing

You are the Unit SRO.

The following conditions exist:

- Unit 2 is currently at 72% power.
- The Plant Process Computer (PPC) is INOPERABLE

The SM directs you to Review the manual 2-OHP-4030-214-032, Quadrant Power Tilt Calculation.

The NI amp meters are set to display maximum resolution.

NI CALIBRATION DATA
DET A 120% I in µAmps

N41 =	**135.4**
N42 =	**136.6**
N43 =	**134.4**
N44 =	**136.7**

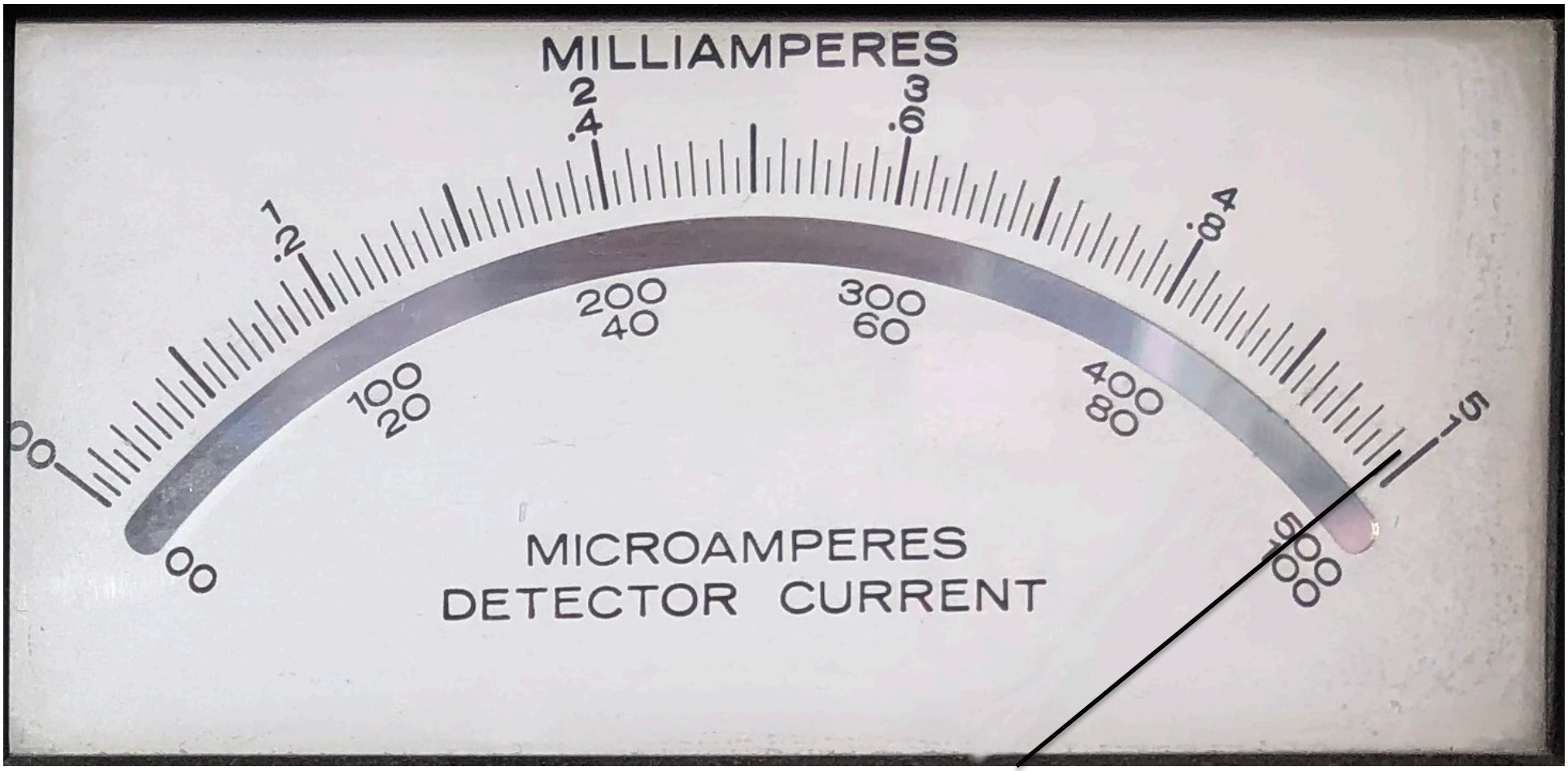
DET B 120% I in µAmps

N41 =	**135.6**
N42 =	**133.6**
N43 =	**134.7**
N44 =	**136.2**

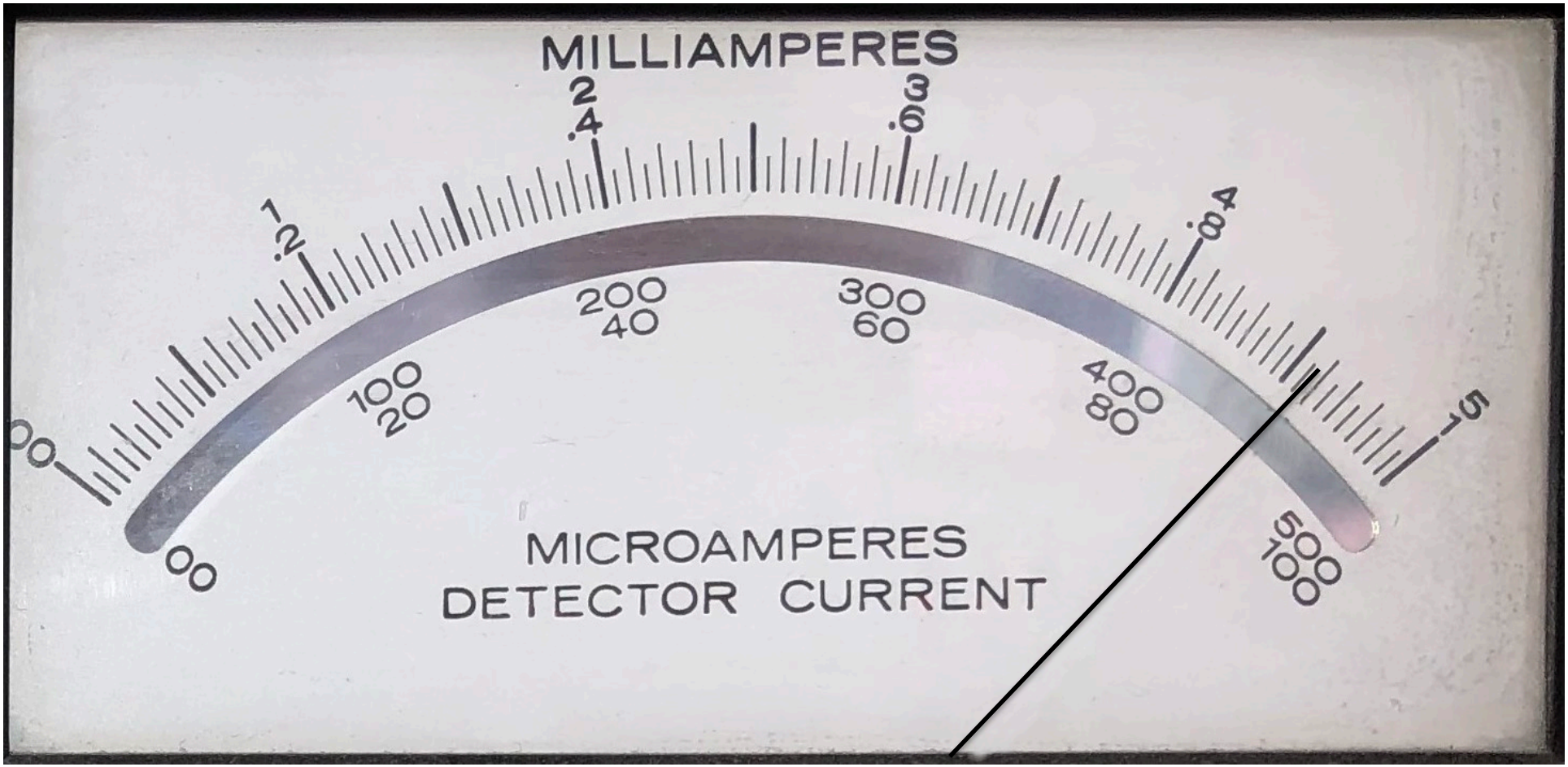
Verified: Print John Smithe
Sign *John Smithe*
Date 5/11/2016

NOTE
Simulator Indications are NOT applicable to this JPM – Use Supplied Pictures for readings.

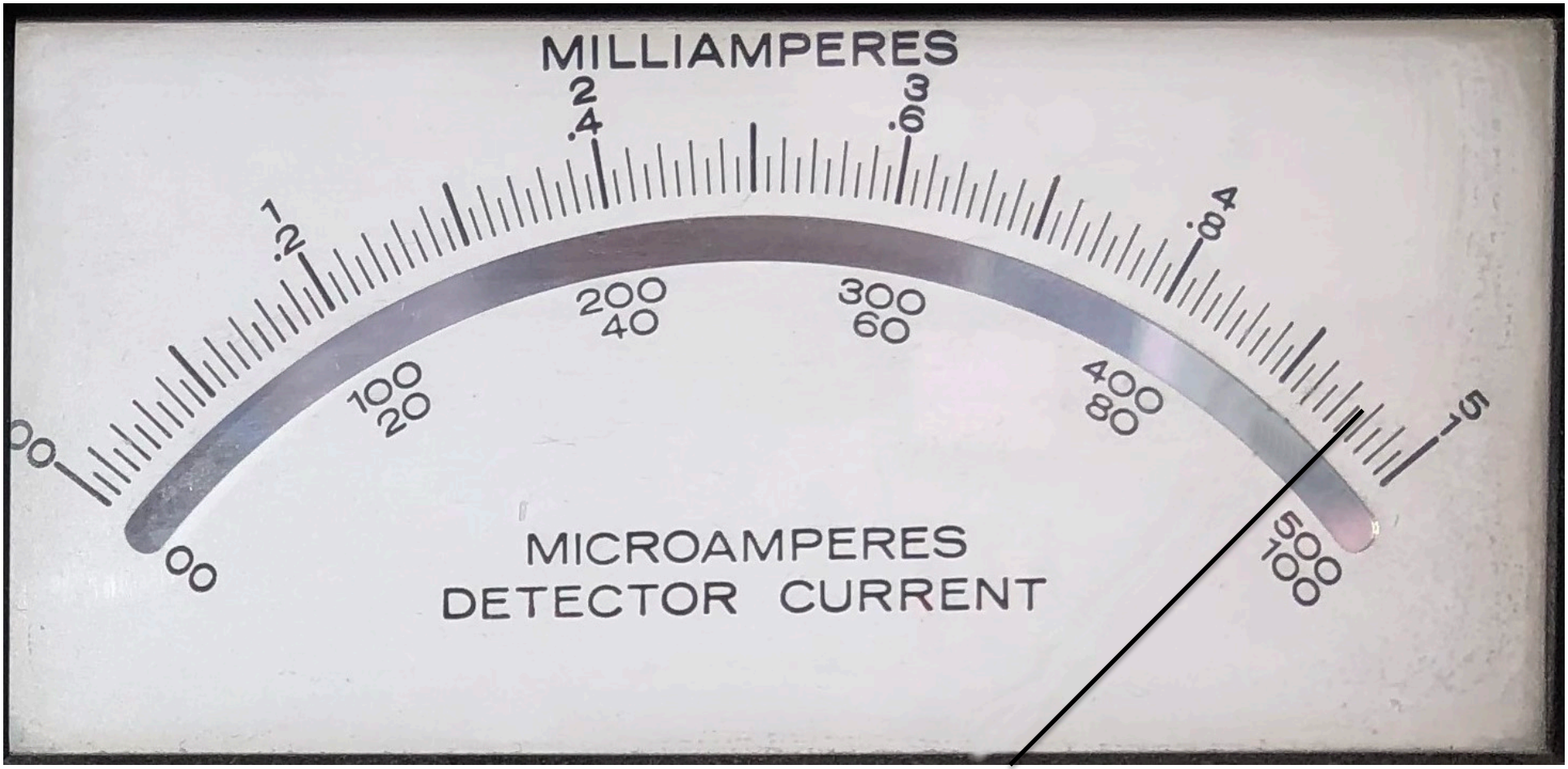
N41 Upper Detector A



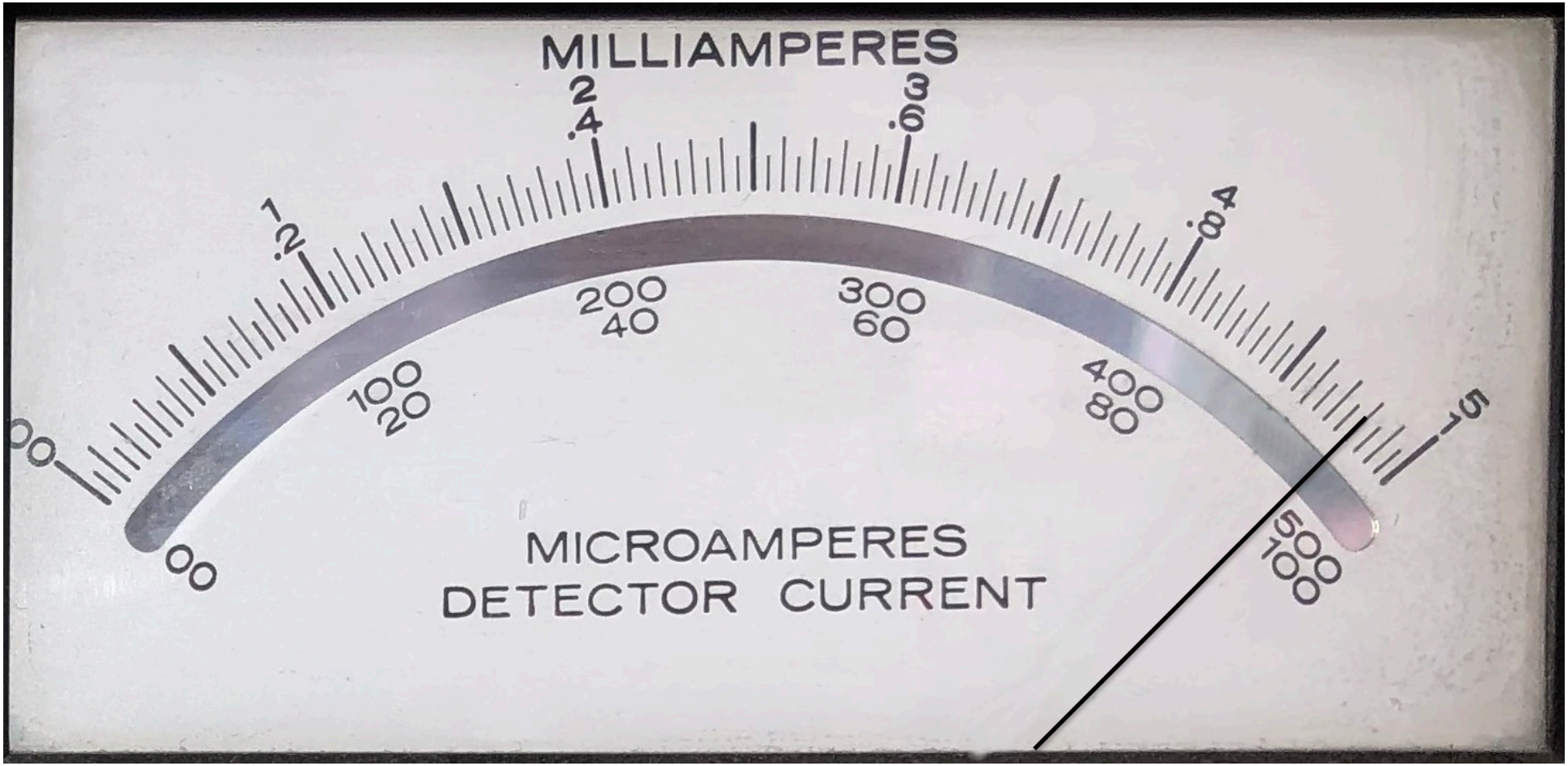
N41 Lower Detector B



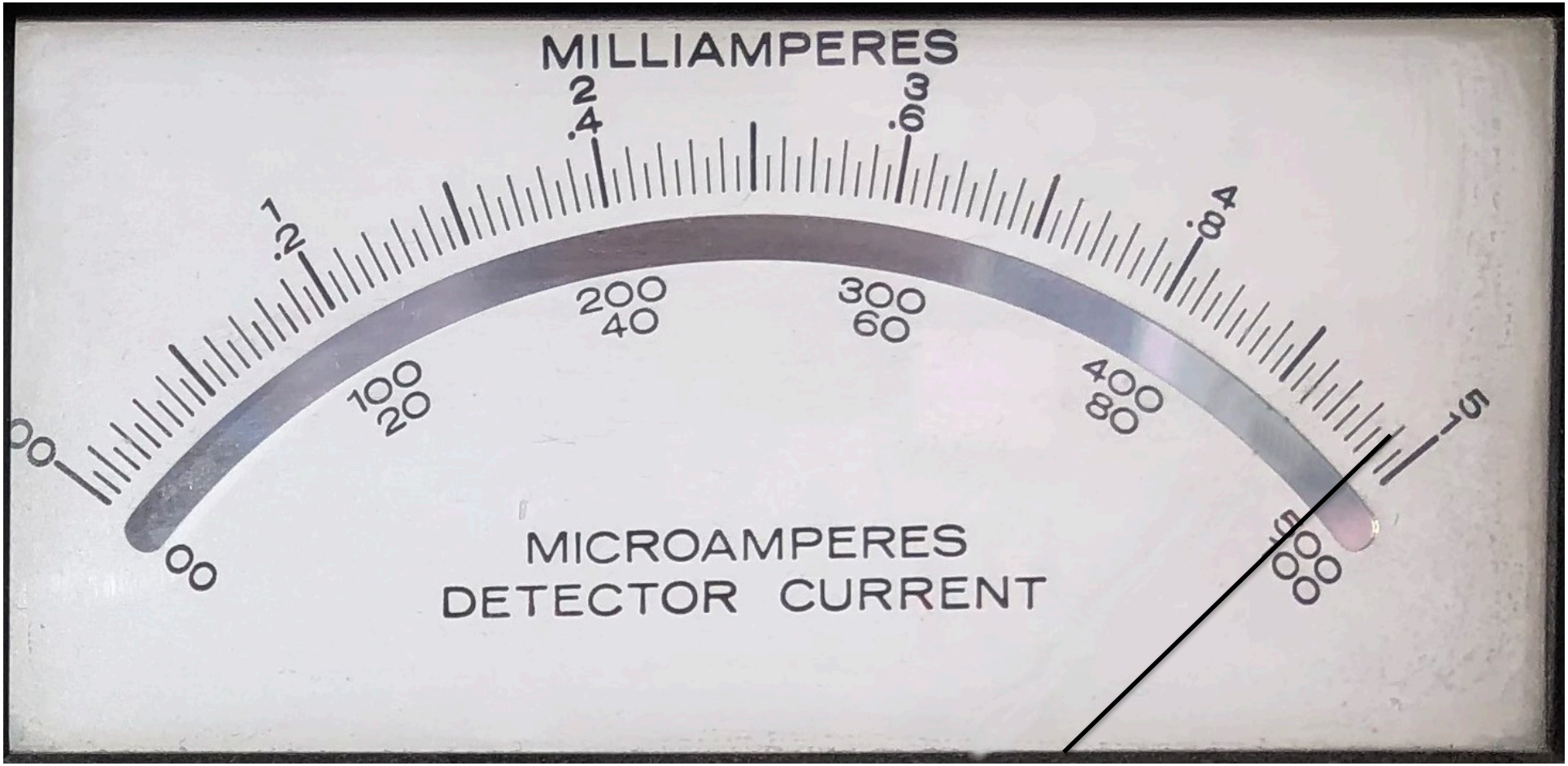
N42 Upper Detector A



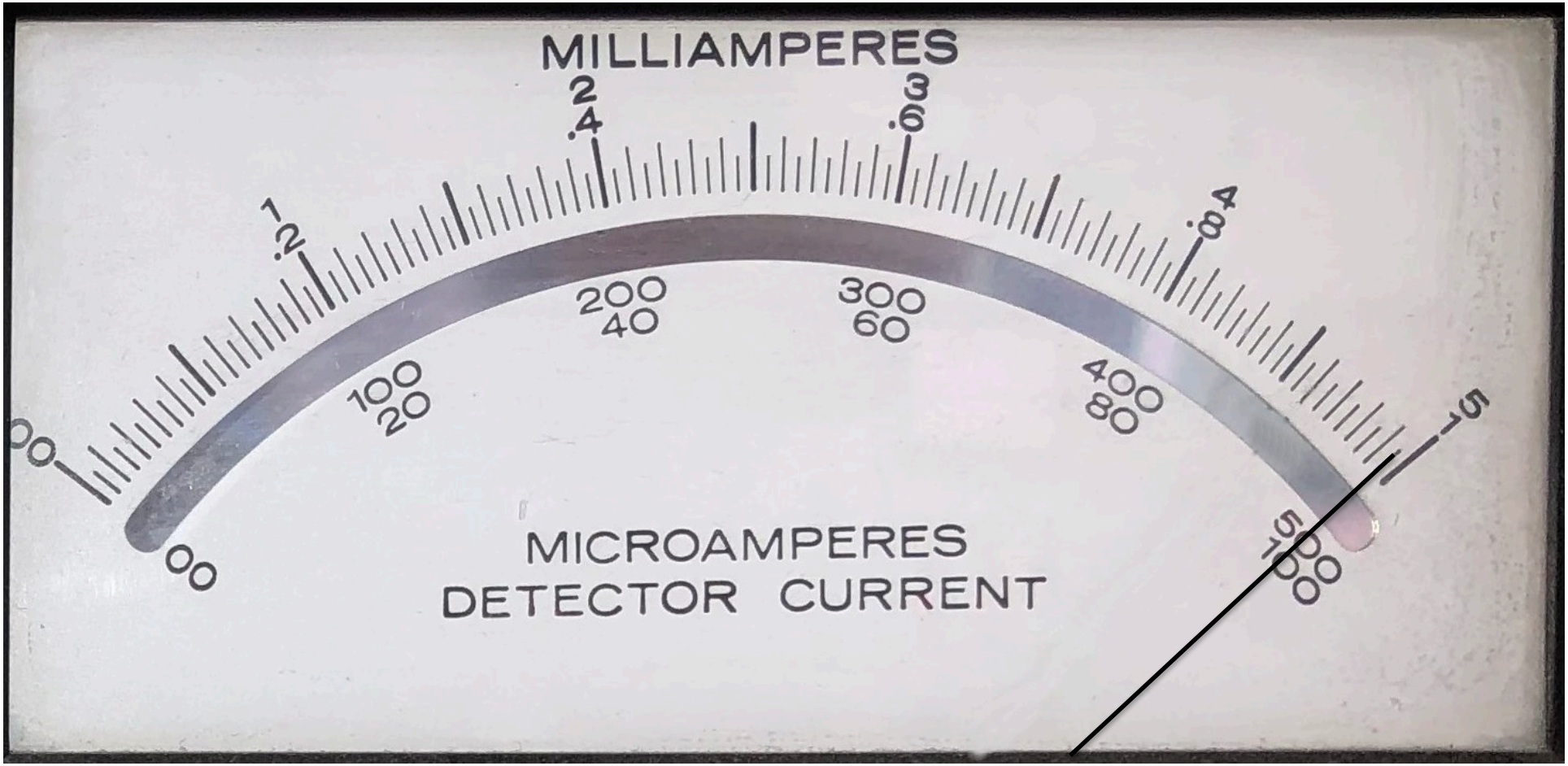
N42 Lower Detector B



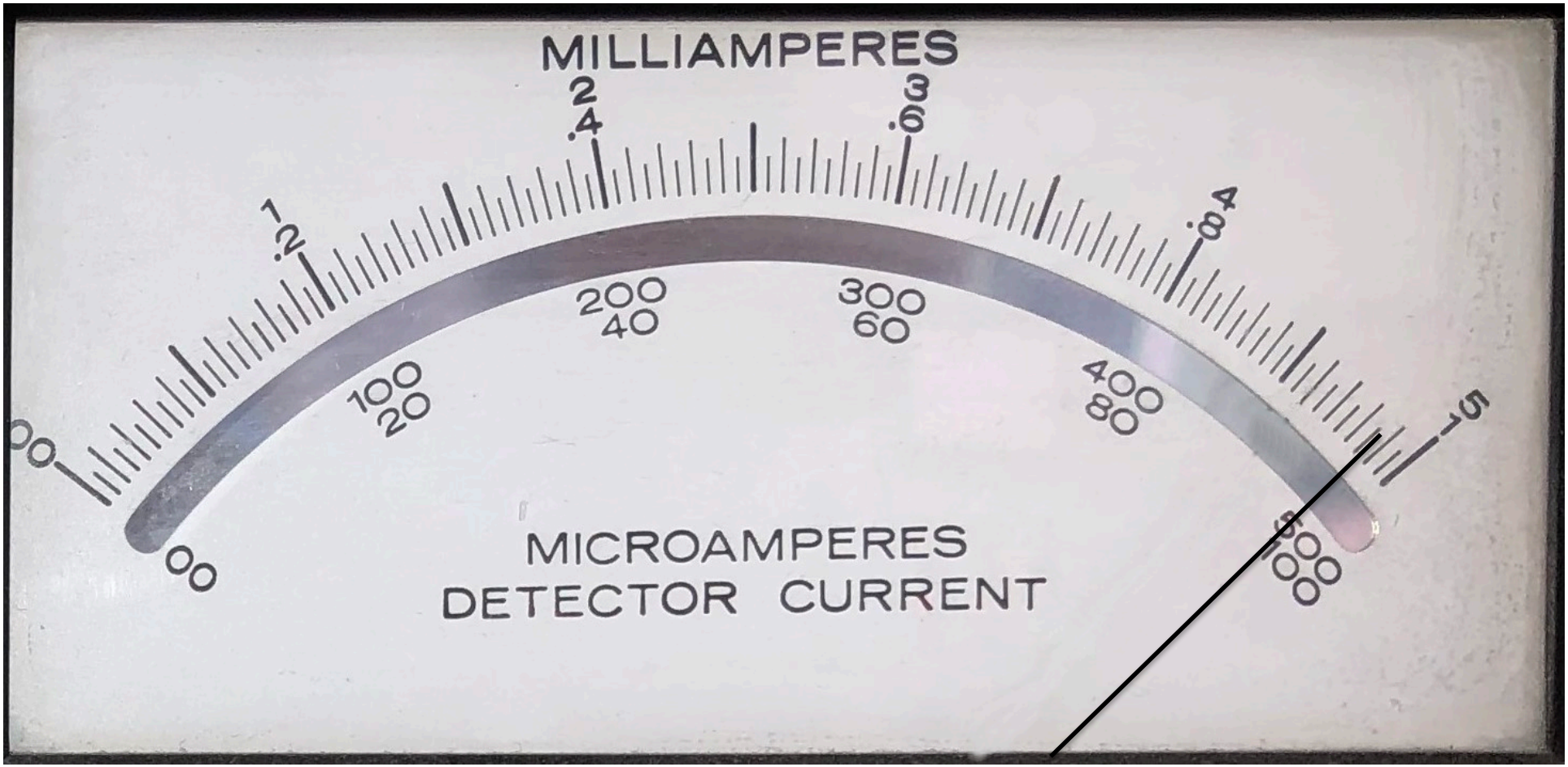
N43 Upper Detector A



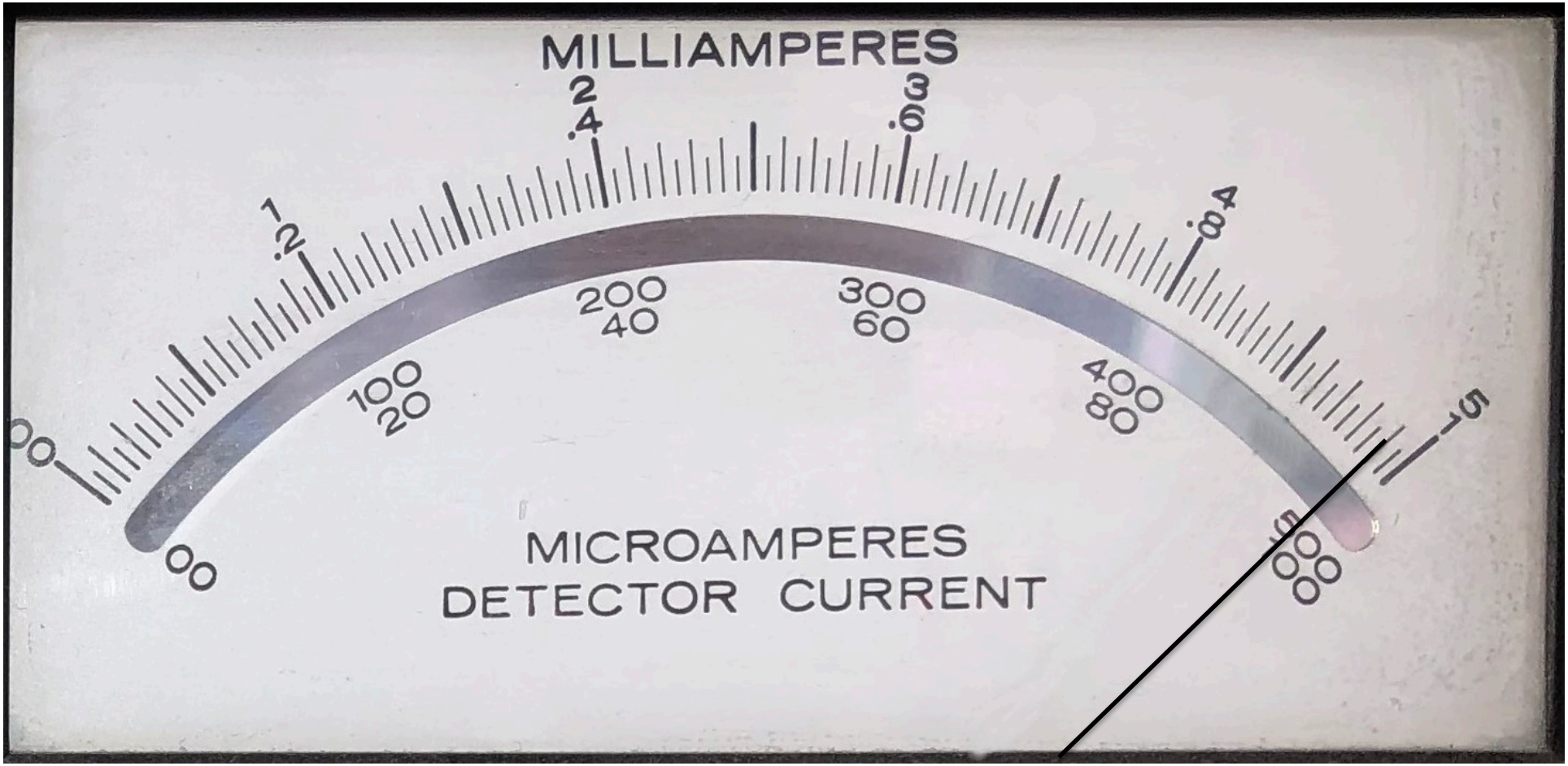
N43 Lower Detector B



N44 Upper Detector A



N44 Lower Detector B



AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	Initial License Training	**TIME:**	15 Minutes
NUMBER AND TITLE:	2020NRC-A3-SRO Approve a Containment Purge release	**REVISION:**	0

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:

1-OHP-4021-028-005	Operation of the Containment Purge System

NRC KA

KA 2.3.6	Ability to approve release permits. (CFR: 41.12 / 45.10)
RO/SRO Importance	2.0/3.8

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

1-OHP-4021-028-005 data Sheet 1, Containment Purge Release Permit

ATTACHMENTS

None

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

Note: This JPM is based on 1-OHP-4030-028-005, Rev. 38. Any subsequent revisions to the procedures will require a review of this JPM to ensure that the content of the JPM is still valid. This JPM may be used without revision if the procedure changes do not affect the JPM.

Give copy of Task Briefing and procedure to examinee.

TASK BRIEFING

The Unit was shut down yesterday due to an RCS leak. RCS cooldown is in progress with RCS temperature currently at 425 F.

The SM has requested you to review and approve the Containment Purge Release Permit to allow containment entry for leak location identification.

GENERAL STANDARDS/PRECAUTIONS

The Containment Purge Release Permit has been reviewed and identifies Purge cannot be authorized due to incorrect Purge method and <24-hour time requirement has expired.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4021-028-005	Rev. 38	Page 50 of 57
Operation Of The Containment Purge System			
Data Sheet 1	Containment Purge Release Permit		Pages: 50 - 53

RELEASE NO. 6-20-14

SECTION 1.0 - OPERATIONS

It has been deemed necessary to PURGE the Unit 1 Containment. Samples of Upper Containment, Lower Containment, and the Instrument Room are requested for PURGE release.

T Kaspar
Supervisor/Manager

STANDARD: Operator verifies release number entered.
SAT: ☐ UNSAT: ☐

STANDARD: Operator verifies Operations signed for initiating release permit.
SAT: ☐ UNSAT: ☐

NOTE:

- Good coordination between RP and Chemistry is required to ensure the limitations on radionuclide LLDs are met.
- Flowrates in parenthesis are not design values but reference values, determined by testing, for off site dose calculations. Actual flowrates may be lower and operators are not required to maintain these reference values. The 1-VRS-1505 (Primary)/1-VRS-1525 (backup) setpoint will be conservative if calculated at a higher than actual flowrate.
- Purge system is in Full Flow operation when the desired flow path includes, both Purge Exhaust flow paths and both Purge Exhaust fans.
- Purge system is in Half Flow operation when any single flow path is selected to include 1 Purge Exhaust flow path and 1 Purge Exhaust fan.

SECTION 2.0 - OPERATIONS

UNIT 1 CONTAINMENT PURGE:

- ☒ Full PURGE rate (12,000 cfm) in MODE 5, 6, or DEFUELED only.
- ☐ Upper Containment Supply/Lower Containment Exhaust. (10,000 cfm)
- ☐ Upper Containment Supply/Lower Containment Exhaust with airlocks closed. (3,500 cfm)
- ☐ Upper Containment only. (6,000 cfm)
- ☐ Lower Containment only. (6,000 cfm)
- ☐ Instrument Room only. (1,000 cfm)

T Kaspar
Supervisor/Manager

STANDARD (**CS**)**:** Operator identifies incorrect release method has been selected. Full PURGE rate is not allowed as plant is in Mode 3 from conditions given in brief
SAT: ☐ UNSAT: ☐

FORWARD TO RADIATION PROTECTION

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4021-028-005	Rev. 38	Page 51 of 57
Operation Of The Containment Purge System			
Data Sheet 1	Containment Purge Release Permit		Pages: 50 - 53

SECTION 3.0 - APPROVAL

Verify release compliance with PMP-6010-OSD-001 (Off-Site Dose Calculation Manual) Section 3.2.4, as per 12-THP-6020-CHM-308, Effluent Batch Releases.

This release is approved provided the following conditions exist:

- At least one Unit 1 Auxiliary Building Exhaust Fan is operating during the entire release.
- Less than 24 hours have elapsed from the time approval of PURGE is granted, to commencement of PURGE.

1) The PURGE is in compliance with the ODCM and is approved.
2) Supporting release permit calculation paperwork is attached.

J. Sodium	Chemistry	8/4/20 0500 Date/Time
C. Gamma	RP	8/4/20 0510 Date/Time
J. Fall	Environmental	8/4/20 0525 Date/Time

This PURGE is NOT APPROVED for the following reason:

	Chemistry	Date/Time
	RP	Date/Time
	Environmental	Date/Time

SM/WCC-SRO Authorization to begin Containment PURGE (release dose rates values are within ODCM limits; must commence within 24 hours of obtaining RP approval)

SM/WCC-SRO	Date/Time

IF NOT APPROVED above, **THEN** approval of Plant Manager is REQUIRED for release.

Plant Manager	Date/Time

STANDARD (**CS):** Operator identifies > 24 hours has elapsed since Chem, RP, and ENV approved the Purge release.
SAT: ☐ UNSAT: ☐

STANDARD (**CS):** Operator identifies Purge cannot be authorized due to incorrect Purge method and <24 hour time requirement has expired.
SAT: ☐ UNSAT: ☐

TERMINATION CUE: JPM is complete when examinee states Purge is not authorized.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4021-028-005	Rev. 38	Page 52 of 57
Operation Of The Containment Purge System			
Data Sheet 1	Containment Purge Release Permit		Pages: 50 - 53

SECTION 4.0 - RADIATION PROTECTION

NOTE: If the release setpoints for 1-VRS-1505/1-VRS-1525 are less than the original setpoints, the setpoints for 1-VRS-1505, 1-VRS-1525 and 1-VFR-1510 do not have to be changed.

1-VRS-1505 Setpoints:

Original setpoints: Alert: _____µCi/CC High: _____µCi/CC
Release setpoints: Alert: _____µCi/CC High: _____µCi/CC

1-VRS-1525 Setpoints:

Original setpoints: Alert: _____µCi/CC High: _____µCi/CC
Release setpoints: Alert: _____µCi/CC High: _____µCi/CC

1-VFR-1510 Setpoints:

Original setpoints: Low Flow: _____cfm High Flow: _____cfm

1-VFR-1510 setpoint is based on assumed release flowrate calculated as follows:

_____cfm + _____cfm = _____cfm
Source Flow Rate [Purge fan(s) flowrate from section 2.0] | Unit Vent Flow Rate (Initial 1-VFR-1510 flowrate) | Release flowrate

High Limit Flow Rate (Release Setpoint) = (Release flowrate) X 1.1

High Limit Flow Rate (Release Setpoint) = _____cfm

_____ _____ _____
Environmental Date Time

_____ _____ _____
Radiation Protection Date Time

1-VRS-1505 alarm setpoint verified returned to original value **OR** ENV determined value, as applicable:
1-VRS-1525 alarm setpoint verified returned to original value **OR** ENV determined value, as applicable:
1-VFR-1510 alarm setpoint verified returned to original value **OR** ENV determined value, as applicable:

_____ _____ _____
Environmental Date Time

_____ _____ _____
Radiation Protection Date Time

NO ACTIONS CONTAINED ON THIS PAGE

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Continuous	1-OHP-4021-028-005	Rev. 37	Page 53 of 57
Operation Of The Containment Purge System			
Data Sheet 1	Containment Purge Release Permit		Pages: 50 - 53

SECTION 5.0 - OPERATIONS

Unit 1 Containment was PURGED to atmosphere at:
_____ cfm
1-VFR-315 or 1-VFR-1510 (Circle Instrument Used)

Data Sheet No. 2 information recorded if applicable:

- From Time: _____ Date:___/___/___
- To Time:_____ Date:___/___/___
- Purge Time hrs and Minutes _____
- Cumulative Total Time _____

Operations: _____
Signature

NO ACTIONS CONTAINED ON THIS PAGE

Task Briefing

The Unit was shut down yesterday due to an RCS leak. RCS cooldown is in progress with RCS temperature currently at 425 F.

The SM has requested you to review and approve the Containment Purge Release Permit to begin purging containment to allow containment entry for leak location identification.

AMERICAN ELECTRIC POWER

COOK NUCLEAR PLANT TRAINING CENTER

Bridgman, Michigan

OPERATIONS JPM

TRAINING PROGRAM TITLE	Initial License Training	**TIME:**	20 Minutes
NUMBER AND TITLE:	2020NRC-A4-SRO Determine if PAR required and determine PAR	**REVISION:**	0

TIME CRITICAL JPM

Examinee's Name: _____

Evaluator's Name: _____

Date Performed: _____

Result (Circle One): SAT / UNSAT

Number of Attempts: _____

Time to Complete: _____

Comments: _____
_____
_____

REFERENCES/NRC KA/TASKS

Procedures:

PMP-2080-EPP-101	EMERGENCY CLASSIFICATION
PMP-2080-EPP-100	EMERGENCY RESPONSE

NRC KA

KA 2.4.44	Knowledge of emergency plan protective action recommendations.
SRO Importance	4.4

Task Number: EPP0120703 Develop a Protective Action Recommendation

TRAINING AIDS/TOOLS/EQUIPMENT

None

HANDOUTS

Task Briefing sheet
Task briefing
PMP-2080-EPP-100, Emergency Response, Attachment 1 Protective Action Recommendations
PMP-2080-EPP-101, Emergency Plan Classification, Attachment 1
EP Binder with full PMP-2080-EPP-100, Emergency Response procedure

ATTACHMENTS

None

EVALUATION SETTINGS

Classroom

EVALUATION METHOD:	PERFORM: ☒	SIMULATE: ☐

SIMULATOR/LAB SETUP

None

EVALUATOR INSTRUCTIONS

1. Brief the operator (May be performed by giving out Task Briefing Sheet)
2. Announce start of the JPM
3. Perform evolution
4. At completion of evolution, announce the JPM is complete.
5. Document evaluation performance.

TASK BRIEFING

You are the Shift Manager and had declared a Site area Emergency 20 minutes ago based on Security Hazard HS1 - HS1 HOSTILE ACTION within the plant PROTECTED AREA based on a report from Security.

You have just upgraded the Emergency level to General Emergency as the hostile forces have detonated explosives on all four U1 4KV Emergency buses. The upgrade was due to Loss of Emergency AC Power - SG1 Prolonged loss of all offsite and all onsite AC power to emergency buses.

You are to determine if a PAR is required and if so what the PAR determination is.

This is a Time Critical JPM.

GENERAL STANDARDS/PRECAUTIONS

Determine PAR is required and recommends PAR IAW EPP-100 attachment 1.

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Reference	PMP-2080-EPP-100	Rev. 40	Page 14 of 60
Emergency Response			
Attachment 1	Protective Action Recommendations		Pages: 14 - 17

NOTE: The Shift Manager (SM) should utilize a recent dose assessment completed within the last 15 minutes when developing or determining any PAR.

1 **IF** a General Emergency is currently classified **OR** current conditions exist that would require the classification of a General Emergency, **THEN** develop a PAR using this attachment.

NOTE: Dose assessment results may be necessary to determine if conditions for RG1.1, RG1.2 OR RG1.3 General Emergency EAL have been met for initial PAR.

1.1 **IF** this is the initial PAR (concurrent with the GE classification), **THEN** utilize the Initial PAR flowchart.

1.2 **IF** this is any PAR determination after the initial PAR determination, **THEN** utilize the Follow-Up PAR flowchart.

- New PARs may be necessary based on changes in wind direction.
- New PARs shall be developed if dose assessment indicates new Protective Action Areas meet EPA Protective Action Guidelines of 1 Rem TEDE or 5 Rem Thyroid CDE.

2 Determine a PAR

☐None					
Recommend the following protective actions, implement the State of Michigan Potassium Iodide (KI) plan, and all other areas monitor and prepare.					
Evacuation of Area(s)	☐1	☐2	☐3	☐4	☐5
In-Place Shelter of Area(s)	☐1	☐2	☐3	☐4	☐5
Clear Lake Area(s)	☐6			☐7	
PARs based on Dose Calculations	☐Yes	☐No			
PARs beyond 10 Miles	☐Yes	☐No			

Time:_____ INIT:_____ (Shift Manager)

EVALUATOR NOTE: A General Emergency requires a Protective Action Recommendation (PAR) to be made to the state.

Start Time:_____.

STANDARD (**CS**)**:** Candidate determines PAR is required.
SAT: ☐ UNSAT: ☐

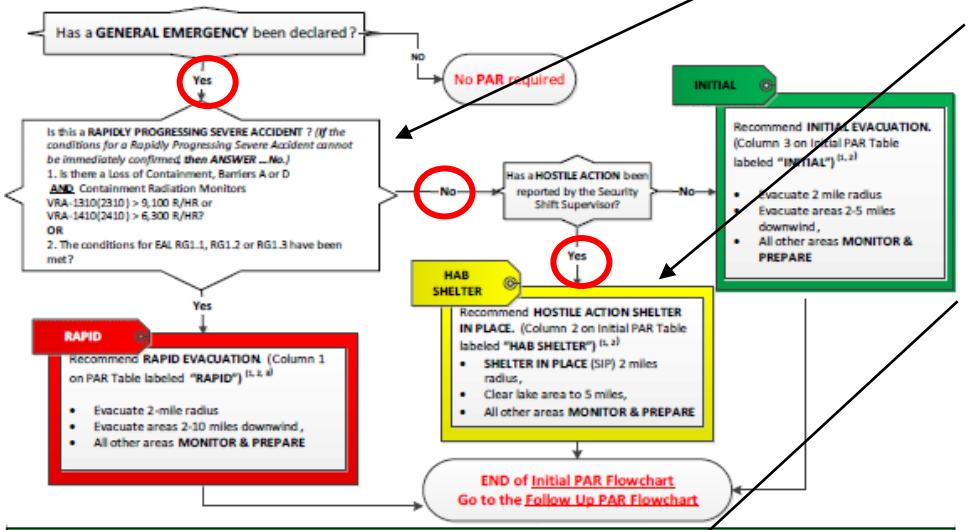
STANDARD**:** Candidate proceeds to Initial PAR flowchart.
SAT: ☐ UNSAT: ☐

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Reference	PMP-2080-EPP-100	Rev. 40	Page 15 of 60
Emergency Response			
Attachment 1	Protective Action Recommendations		Pages: 14 - 17

3 Direct notifications per Attachment 8, Notification of Off-Site Agencies.

Initial - Protective Action Recommendations



INITIAL PAR TABLE

Wind Direction (from)	RAPID	HAB	INITIAL
168.75 to 213.75	Area 1, 2, 4, and clear lake areas 6 & 7	Area 1 and clear lake Area 6	Area 1, 2 and clear lake area 6
213.75 to 236.25	Area 1, 2, 3, 4 and clear lake areas 6 & 7		Area 1, 2, 3, and clear lake area 6
236.25 to 303.75	Area 1, 2, 3, 4, 5 and clear lake areas 6		Area 1, 2, 3 and clear lake area 6
303.75 to 348.75	Area 1, 3, 5 and clear lake area 6		Area 1, 3 and clear lake area 6
348.75 to 56.25	Area 1, 3, 5 and clear lake areas 6 & 7		Area 1, 3 and clear lake area 6
56.25 to 168.75	Area 1, and clear lake areas 6 & 7		Area 1 and clear lake area 6

Notes: 1. Lake areas are "cleared" for either evacuation or sheltering.
2. Area 6 is the lake area at 0 to 5 mile radius; Area 7 is the lake area 5 to 10 mile radius.
3. IF Impediments exist as determined by the Offsite Response Organizations, the ORO may shelter in place.

STANDARD (**CS**): Candidate determines this is NOT Rapidly Progressing and a HOSTILE ACTION is occurring.
SAT: ☐ UNSAT: ☐

STANDARD (**CS**): Candidate determines PAR using Initial PAR flowchart. Candidate determines Shelter in Place for Area 1 and clearing lake area 6 is required.
SAT: ☐ UNSAT: ☐

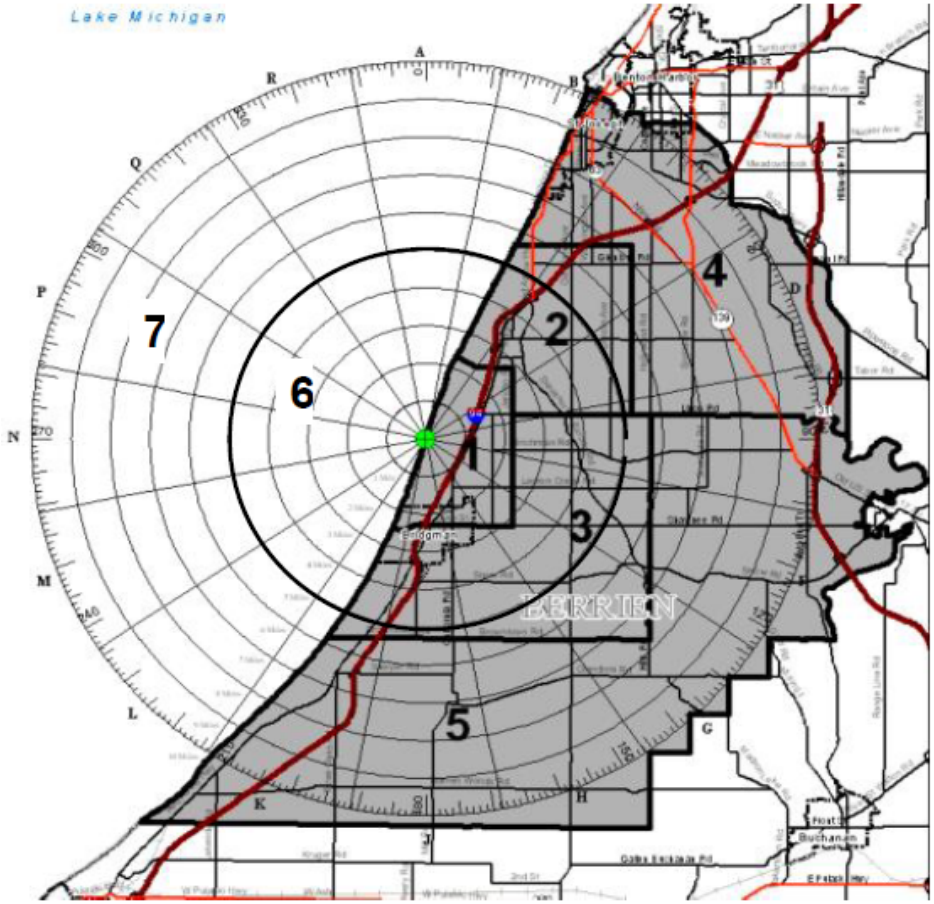
STANDARD (**CS**): Uses HAB column to determine areas affected and fills in information on step 2.
SAT: ☐ UNSAT: ☐

Termination Cue: JPM is complete when examinee provides recommended PAR.

Completion Time _____ (</= 12 minutes)

EXPECTED ACTIONS	CUES/STANDARDS ("**CS**" Indicates Critical Standard)

Reference	PMP-2080-EPP-100	Rev. 40	Page 17 of 60
Emergency Response			
Attachment 1	Protective Action Recommendations		Pages: 14 - 17



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