INITIAL SUBMITTAL

SURRY RETAKE EXAM
50-280, 281/2001-301
APRIL 2, 2001 (WRITTEN) &
APRIL 16-17, 2001 (ADMIN)

INITIAL SUBMITTAL JPMS

ADMINISTRATIVE JPMs/QUESTIONS
SIMULATOR JPMs,
IN-PLANT JPMs, AND
INITIAL ADMIN TOPICS OUTLINE
(ES-301-1),
CONTROL ROOM SYSTEMS &
FACILITY WALK-THROUGH OUTLINE
(ES-301-2)

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

JPM A.1-1
SROU/SROI

Determine Boration requirements for a load reduction with rod motion.

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Determine boration requirements for a 50% load reduction with 28 steps of rod motion.

References:

1-DRP-003, "Curve Book", Rev. 53

Validation Time: 20 min. **Time Critical:** No

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Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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Tools/Equipment/Procedures Needed:

1-DRP-003, "Curve Book", Rev. 53
Calculator

Evaluators Note:

Asterisked items compose the critical steps of the task. Each graph and table must be correctly interpreted to eliminate the possibility of multiple errors leading to a correct final answer.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit-1 is stable at 100% power.

RCS temperature is stable at 573°F.

Current boron concentration is 602 ppm as measured two hours ago. No borations or dilutions have occurred since that time.

Core age is 9998 MWD/MTU.

"D" Bank rod height is currently 224 steps.

'A' BAST is lined up to unit 1 and has a concentration of 7.8%.

INITIATING CUES:

You are requested to determine the amount of boration or dilution required for a decrease from 100% to 50% power. Reactor Engineering has established a target rod height of 196 steps at 50% power. Discount the affects of xenon during the transient.

STEP 1: Obtain a copy of the appropriate procedure from the evaluator. STANDARD: Operator obtains a copy of 1-DRP-003, "Curve Book." COMMENTS:	___ SAT ___ UNSAT
*STEP 2: Trainee determines the Power Defect at 100% power. STANDARD: Operator locates "Power Defect" curve (Att. 31) in 1-DRP-003 and determines the power defect to be –2215 pcm (Band of –2200 pcm to -2250 pcm allowed) at 100% power and 602 ppm boron. COMMENTS:	___ SAT ___ UNSAT
*STEP 3: Trainee determines the power defect at 50% power. STANDARD: Operator locates "Power Defect" curve (Att. 31) in 1-DRP-003 and determines the power defect to be –1140 pcm (Band of -1150 pcm to –1125 pcm allowed) at 50% power and 602 ppm boron. COMMENTS:	___ SAT ___ UNSAT
*STEP 4: Determine change in power defect from 100% power to 50% power. STANDARD: Operator determines difference between values as a net positive reactivity addition of 1075 pcm (Allowed band of 1125 pcm to 1050 pcm) COMMENTS:	___ SAT ___ UNSAT

*STEP 5: Determine the rod worth between 224 and 196 steps. STANDARD: Operator locates "At Power Integral Worth Table For Control Banks C and D in Overlap" table (Att. 29) in 1-DRP-003 and determines worth at 224 steps is .4 pcm and the value at 196 steps is 114.4 pcm. Calculates the difference as 114 pcm negative reactivity added to the core. COMMENTS:	___ SAT ___ UNSAT
*STEP 6: Determine Reactivity Change of power defect and rods combined. STANDARD: Operator determines power defect is positive reactivity addition, rods are negative reactivity addition. Calculates boron must compensate for 1075 pcm (+50/-25 pcm) –114 pcm. Total value should be 961 (+50/-25 pcm [1011-936 pcm]) COMMENTS:	___ SAT ___ UNSAT
*STEP 7: Determine the boron coefficient for current unit conditions STANDARD: Operator locates "Boron Coefficient vs. Burnup" curve (Att. 27) in 1-DRP-003 and determines the boron coefficient is between –7.17 (100% value) and –7.325 pcm/ppm (50% value). **Examiner Note:** -7.25 will be used as an approximation of the average during the ramp (Developer assumption). The candidate should pick a value based on a stated assumption. COMMENTS:	___ SAT ___ UNSAT
*STEP 8: Determine the required ppm boron change for the given reactivity change. STANDARD: Operator divides the power defect and rod reactivity effects (961 pcm +50/-25 pcm) by the boron coefficient (-7.25 pcm/ppm +/- 0.075 pcm/ppm) and determines the required ppm boron change is 133 ppm +8/- 6 ppm (Allowable band is 128 ppm to 141 ppm) COMMENTS:	___ SAT ___ UNSAT

*STEP 9: Determine the required RCS boration to go from 602 ppm boron to 735 ppm (+/- 5 ppm). STANDARD: This task can be completed by either of the following methods: 1) Operator locates "Boron Addition – Coolant Hot" (Att. 10) and determines based on plant conditions [BAST concentration 7.8% - a close approximation for nomograph, RCS boron currently 602 ppm with a 133 ppm (+8/- 5 ppm) boration to be performed] the required gallons of boric acid as 540 gallons +60/-40 gallons (allowed band of 500 gallons to 600 gallons) -OR- 2) Operator locates "Gallons of Boric Acid Needed to Increase RCS by 1 ppm" (Att. 23), top table for RCS conditions of 2235 psig and 550°F and determines the required boron gallons per 1 ppm increase in the RCS is 4.0 to 4.1 gallons/ppm (BAST concentration is 7.8%). The trainee should then multiply this value with the required boration of 133 ppm (+8/- 5 ppm) to determine the required RCS boration of 539 gallons (allowable band of 512 gallons to 578 gallons). **Evaluator's Note:** If candidate elects to use the nomograph, a followup question should be asked to assess capability to get a more accurate estimate (nomograph assumes a 7.0% by weight vs. the given value of 7.8%. COMMENTS:	___ SAT ___ UNSAT
STEP 10: Done STANDARD: Operator reports results as ~540 gallons (allowable band of 500 to 600 gallons if nomograph used or 512 to 578 gallons if table used) COMMENTS: ** END OF TASK **	___ SAT ___ UNSAT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit-1 is stable at 100% power.

RCS temperature is stable at 573°F

Current boron concentration is 602 ppm as measured two hours ago. No borations or dilutions have occurred since that time.

Core age is 9998 MWD/MTU.

"D" Bank rod height is currently 224 steps.

'A' BAST is lined up to unit 1 and has a concentration of 7.8%.

INITIATING CUES:

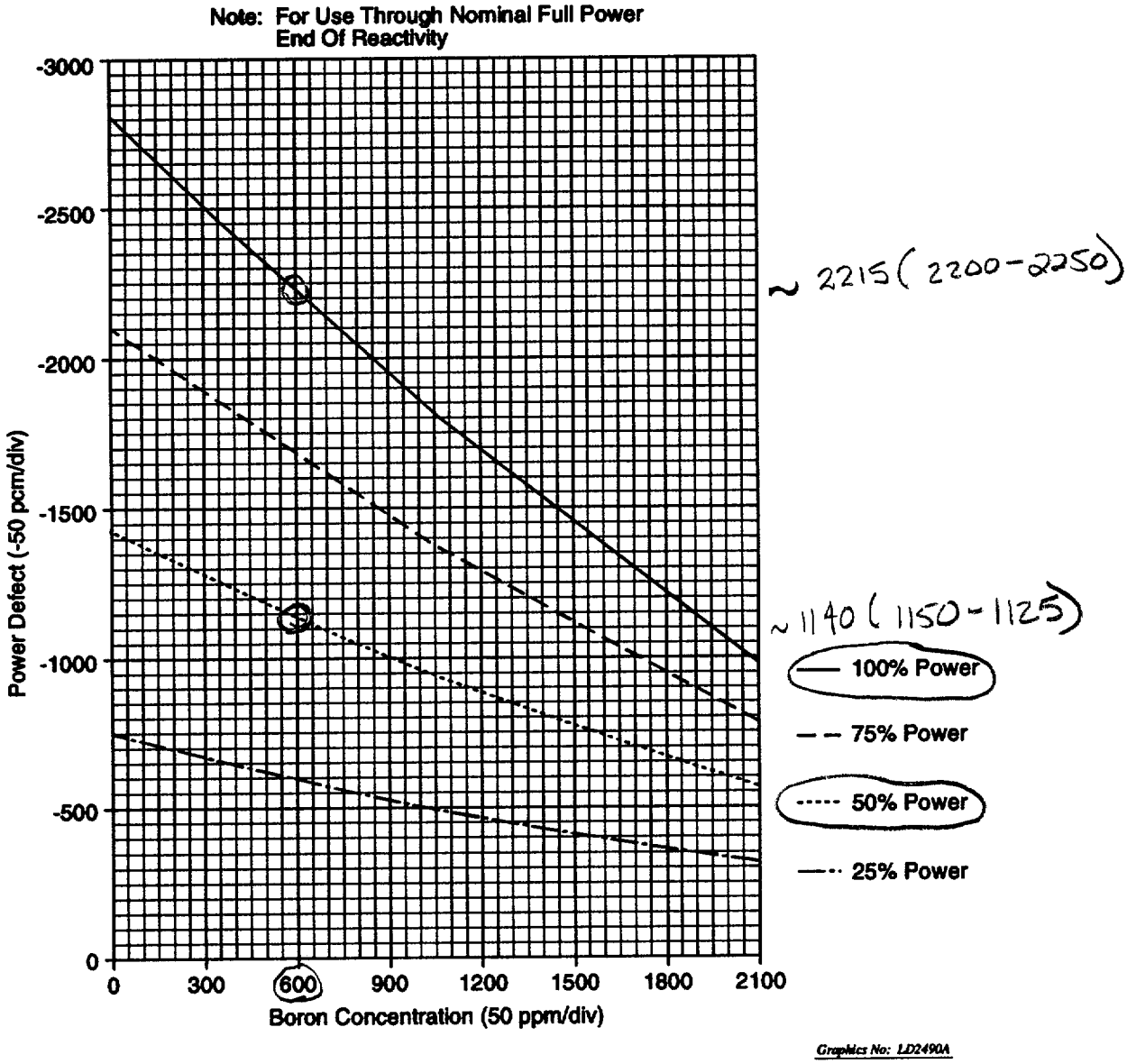
You are requested to determine the amount of boration or dilution required for a decrease from 100% to 50% power. Reactor Engineering has established a target rod height of 196 steps at 50% power. Discount the affects of xenon during the transient.

ATTACHMENT 31

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17

POWER DEFECT



ATTACHMENT 29

(Page 1 of 7)

SURRY UNIT 1 - CYCLE 17

AT-POWER INTEGRAL ROD WORTH TABLE FOR CONTROL BANKS C AND D IN OVERLAP

NOTE: Worth at Nominal HFP Conditions

		CYCLE BURNUP RANGE (MWD/MTU)				
D-BANK POS STEPS	C-BANK POS STEPS	8000.1 TO 10000.0	10000.1 TO 12000.0	12000.1 TO 14000.0	14000.1 TO 15900.0	15900.1 TO 17300.0
226	226	0.0	0.0	0.0	0.0	0.0
224	226	0.4	0.5	0.5	0.6	0.6
222	226	2.7	3.1	3.4	3.8	4.2
220	226	6.4	7.4	8.1	9.1	10.0
218	226	11.0	12.6	13.8	15.4	16.9
216	226	17.1	19.4	21.4	24.0	26.3
214	226	24.0	27.2	30.2	33.7	36.8
212	226	31.5	35.6	39.6	44.2	48.1
210	226	39.7	44.8	49.8	55.4	60.3
208	226	48.8	54.9	61.1	67.8	73.6
206	226	58.5	65.6	72.9	80.7	87.5
204	226	68.5	76.6	85.1	94.0	101.7
202	226	79.3	88.2	97.8	107.8	116.4
200	226	90.7	100.2	110.9	121.9	131.5
198	226	102.4	112.5	124.3	136.4	146.8
196	226	114.4	125.0	137.8	150.9	162.3
194	226	126.4	137.6	151.5	165.6	177.9
192	226	138.8	150.4	165.3	180.4	193.5
190	226	151.2	163.4	179.3	195.3	209.1

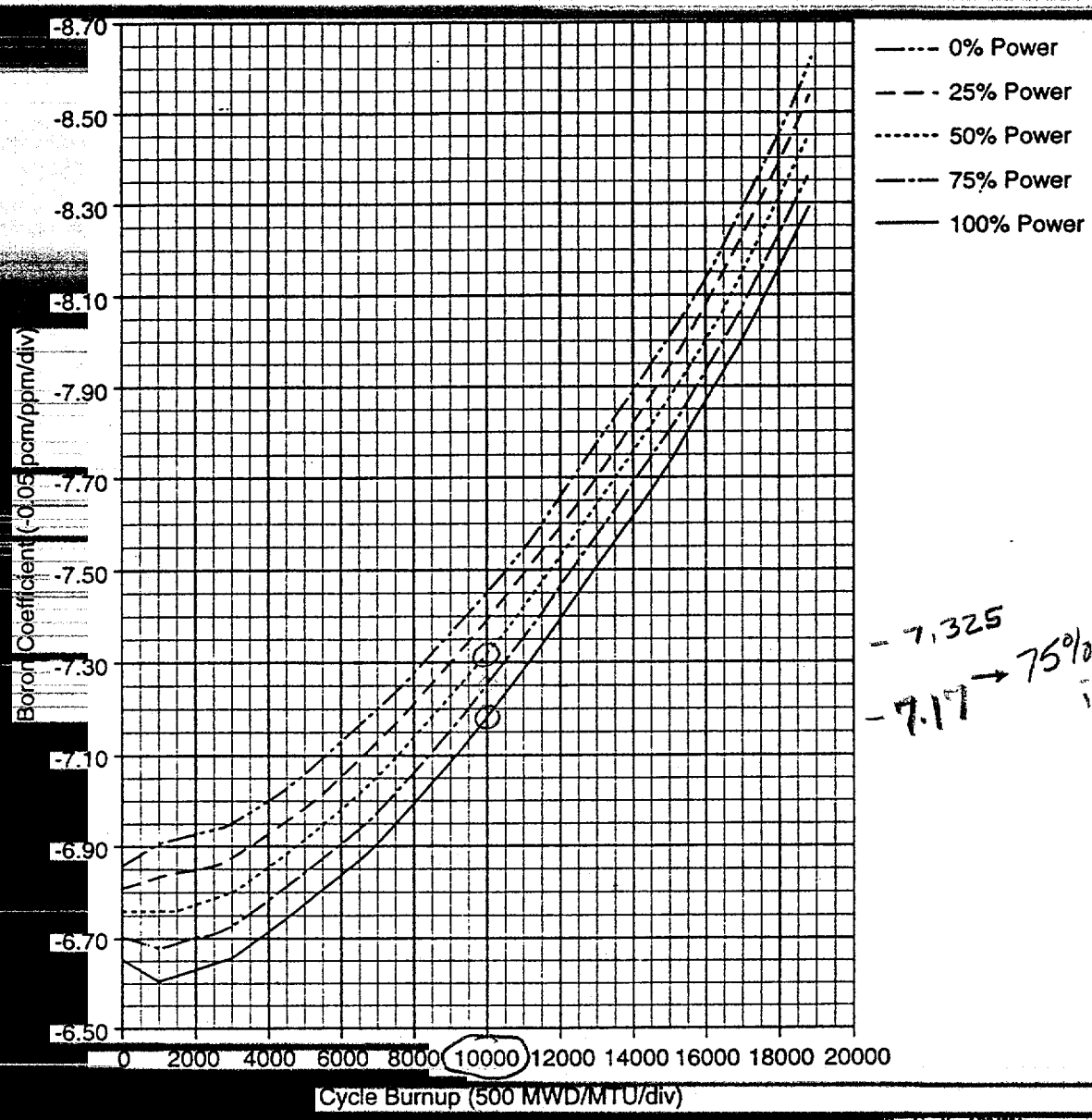
114.4 - .4
= 114

ATTACHMENT 27

(Page 1 of 1)

SURRY UNIT 1 - CYCLE 17

BORON COEFFICIENT VS. BURNUP



-7.325

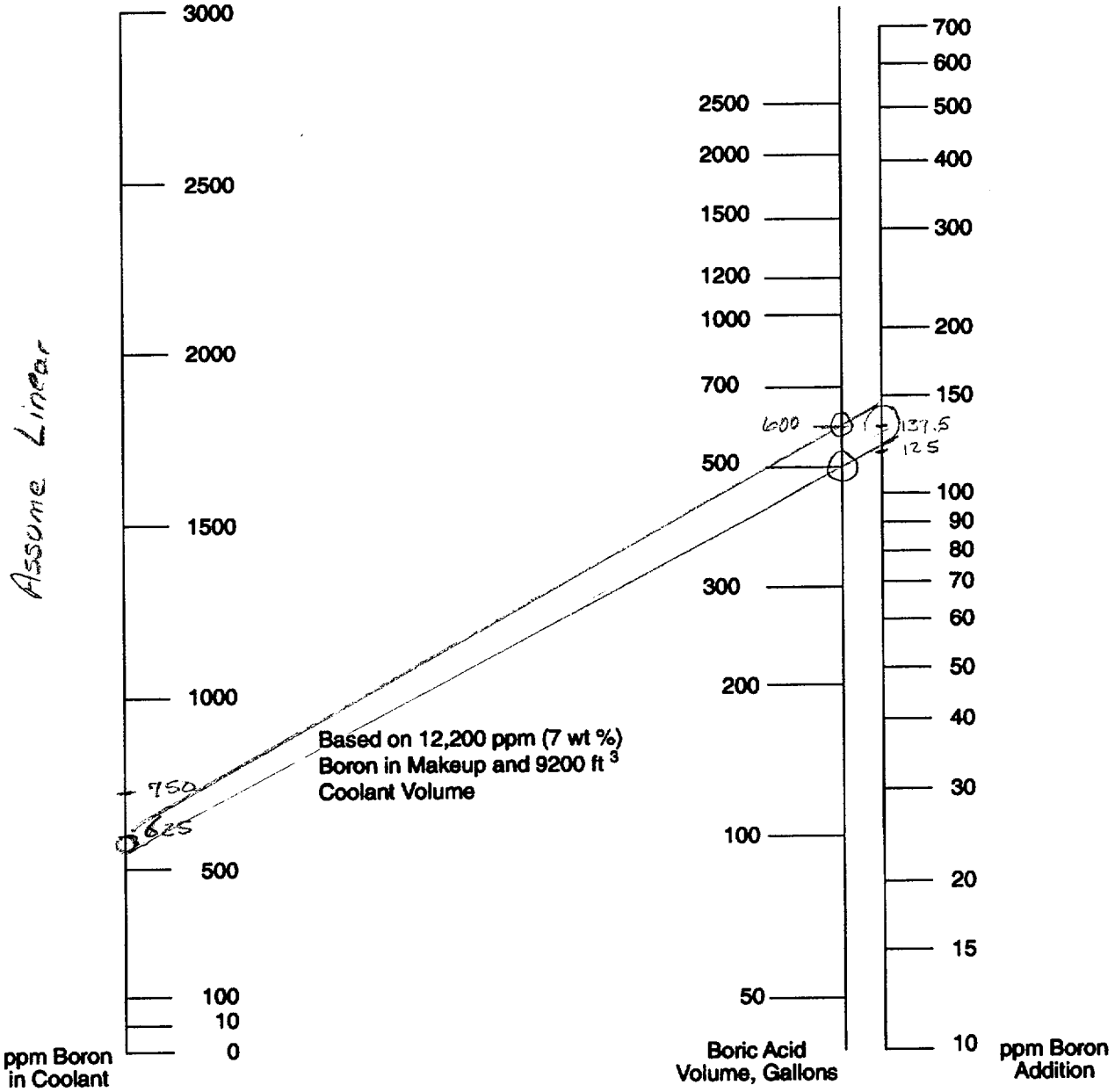
-7.17 → 75% value is 7.25

Graphics No: D32488A

ATTACHMENT 10

(Page 1 of 1)

BORON ADDITION - COOLANT HOT



BORON ADDITION RATE - COOLANT HOT (~ 580°F)
FIGURE S-3.1-3

Graphics No: KM1104B

ATTACHMENT 23

(Page 1 of 2)

GALLONS OF BORIC ACID NEEDED TO INCREASE RCS BY 1 PPM

(2235 PSIG, 550 F, RCS VOLUME=9200 CUBIC FEET)

CURRENT RCS PPM	BAST 7.0	BAST 7.3	BAST 7.5	BAST 7.8	BAST 8.0	BAST 8.2	BAST 8.5
0	4.3	4.1	4.0	3.9	3.8	3.7	3.5
250	4.4	4.2	4.1	3.9	3.8	3.7	3.6
500	4.5	4.3	4.2	4.0	3.9	3.8	3.7
750	4.6	4.4	4.3	4.1	4.0	3.9	3.7
1000	4.7	4.5	4.3	4.2	4.1	3.9	3.8
1250	4.8	4.6	4.4	4.2	4.1	4.0	3.9
1500	4.9	4.7	4.5	4.3	4.2	4.1	3.9
1750	5.0	4.8	4.6	4.4	4.3	4.2	4.0
2000	5.1	4.9	4.7	4.5	4.4	4.3	4.1
2250	5.3	5.0	4.8	4.6	4.5	4.4	4.2

~4.05

(450 PSIG, 350 F, RCS VOLUME=9200 CUBIC FEET)

CURRENT RCS PPM	BAST 7.0	BAST 7.3	BAST 7.5	BAST 7.8	BAST 8.0	BAST 8.2	BAST 8.5
0	5.1	4.9	4.8	4.6	4.5	4.4	4.2
250	5.2	5.0	4.9	4.7	4.6	4.4	4.3
500	5.3	5.1	5.0	4.8	4.6	4.5	4.4
750	5.4	5.2	5.1	4.9	4.7	4.6	4.4
1000	5.6	5.3	5.2	4.9	4.8	4.7	4.5
1250	5.7	5.4	5.3	5.0	4.9	4.8	4.6
1500	5.8	5.6	5.4	5.2	5.0	4.9	4.7
1750	6.0	5.7	5.5	5.3	5.1	5.0	4.8
2000	6.1	5.8	5.6	5.4	5.2	5.1	4.9
2250	6.3	5.9	5.8	5.5	5.3	5.2	5.0

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

JPM A.1-2
SROU/SROI

Evaluate Critical Safety Function Status Trees

Rev. 0

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Evaluate Critical Sfety Function Status Trees.

References:

Critical Safety Function Status Trees (F-1 through F-6)

Validation Time: 15 min. **Time Critical:** No

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Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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Tools/Equipment/Procedures Needed:

Critical Safety Function Status Trees (F-1 through F-6)

Simulator Setup:

- Recall 100% IC, trip the reactor and stabalize at HSD.
- Implement a Steam break in Containment (MMS0302, 100%, 1 Second T.D.)
- Degrade the Terry Turbine, MFW1101, 100% degradation, and trip one Motor Driven AFW Pump, MFW0702.
- Fail Startup rate meters (3) 5% high, meter overrides NI35D, NI36D, STRTUP_RATE_DPM, and fail both intermediate range meters high, MNI0501/0502).
- Verify AFW less than 450 gpm and at least one SG level between 11% and 22%.

Evaluators Note:

Asterisked items compose the critical steps of the task.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

- I am the Shift Supervisor. A large steam break occurred while performing ES-0.1.
- The team is transitioning to E-0 step 1.
- The Simulator will be left in freeze during performance of the assessment, you are not required or permitted to manipulate controls to change unit conditions.

INITIATING CUES:

- **I need you to assess ALL CSFSTs and record, on the supplied Operator Directions Handout, the terminus (Red/Orange/Yellow/Green) for each function.**
- **Notify me if a required transition is identified.**
- **When you finish the actions necessary to accomplish this, please inform me.**

*STEP 1: Assess the Status of the Subcriticality Status Tree. STANDARD: (a) Reads Note on Subcriticality tree (F-1). (b) Identifies adverse numers apply (Containment pressure >20 psia). (c) Identifies Gammametrics WR power level (NI-NFI-1270B1 and 190B1) less than 5% (10^{-1}). (d) Identifies Gammametrics WR power level (NI-NFI-1270B1 and 190B1) stable and/or decreasing. (e) Identifies Gammametrics SR power level (NI-NFI-1270A1 and 190A1) are off-scale high. (f) Identifies adverse numers apply (Containment pressure >20 psia). *(g) Records Green terminus for subcriticality. EVALUATORS CUE: If asked, WR power level is slowly decreasing (Cue can be given using a pen on the meter). COMMENTS:	___ SAT ___ UNSAT
*STEP 2: Assess the Status of the Core cooling Status Tree. STANDARD: (a) Identifies core Exit Thermocouples are less than 1200°F. (b) Identifies adverse numbers apply. (c) Identifies RCS subcooling is greater than 85 °F (105 °F). *(d) Records green terminus for Core Cooling. COMMENTS:	___ SAT ___ UNSAT

*STEP 3: Assess the Status of the Heat Sink Status Tree. STANDARD: (a) Identifies Adverse Numbers apply. (b) Identifies narrow range level in all Steam Generators is less than 22% (All off-scale low). (c) Identifies Total Feedwater flow is less than 450 gpm. (375-400). *(d) Records Red terminus for Integrity. *(e) Reports a transition to FR-H.1 is required. EVALUATORS CUE: Notify the candidate that the team will transition to FR-H.1, Direct the candidate to continue assessing the status of the remaining status trees. COMMENTS:	___ SAT ___ UNSAT
*STEP 4: Assess the Status of the Integrity Status Tree. STANDARD: (a) Identifies no loop TC decrease of greater than 100°F in the last 60 minutes. ("B" loop has decreased approximately 80°F) (b) Identifies all RCS cold leg temperatures are greater than 350 °F (lowest is approximately 470°F). *(c) Records green terminus for Integrity. COMMENTS:	___ SAT ___ UNSAT
*STEP 5: Assess the Status of the Containment Status Tree. STANDARD: (a) Identifies containment pressure less than 60 psia. (b) Identifies containment pressure greater than 23 psia (approximately 24 psia). *(c) Records orange terminus for Containment status tree. COMMENTS:	___ SAT ___ UNSAT

*STEP 6: Assess the Status of the Inventory Status Tree. STANDARD: (a) Identifies pressurizer level less than 88%. (b) Identifies pressurizer level less than 15% (approximately 10%). *(c) Records yellow terminus for Inventory status. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Report to Shift Supervisor (Evaluator). STANDARD: Verbal status report made of task completion. COMMENTS: ** END OF TASK **	___ SAT ___ UNSAT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- I am the Shift Supervisor. A large steam break occurred while performing ES-0.1.
- The team is transitioning to E-0 step 1.
- The Simulator will be left in freeze during performance of the assessment, you are not required or permitted to manipulate controls to change unit conditions.

INITIATING CUES:

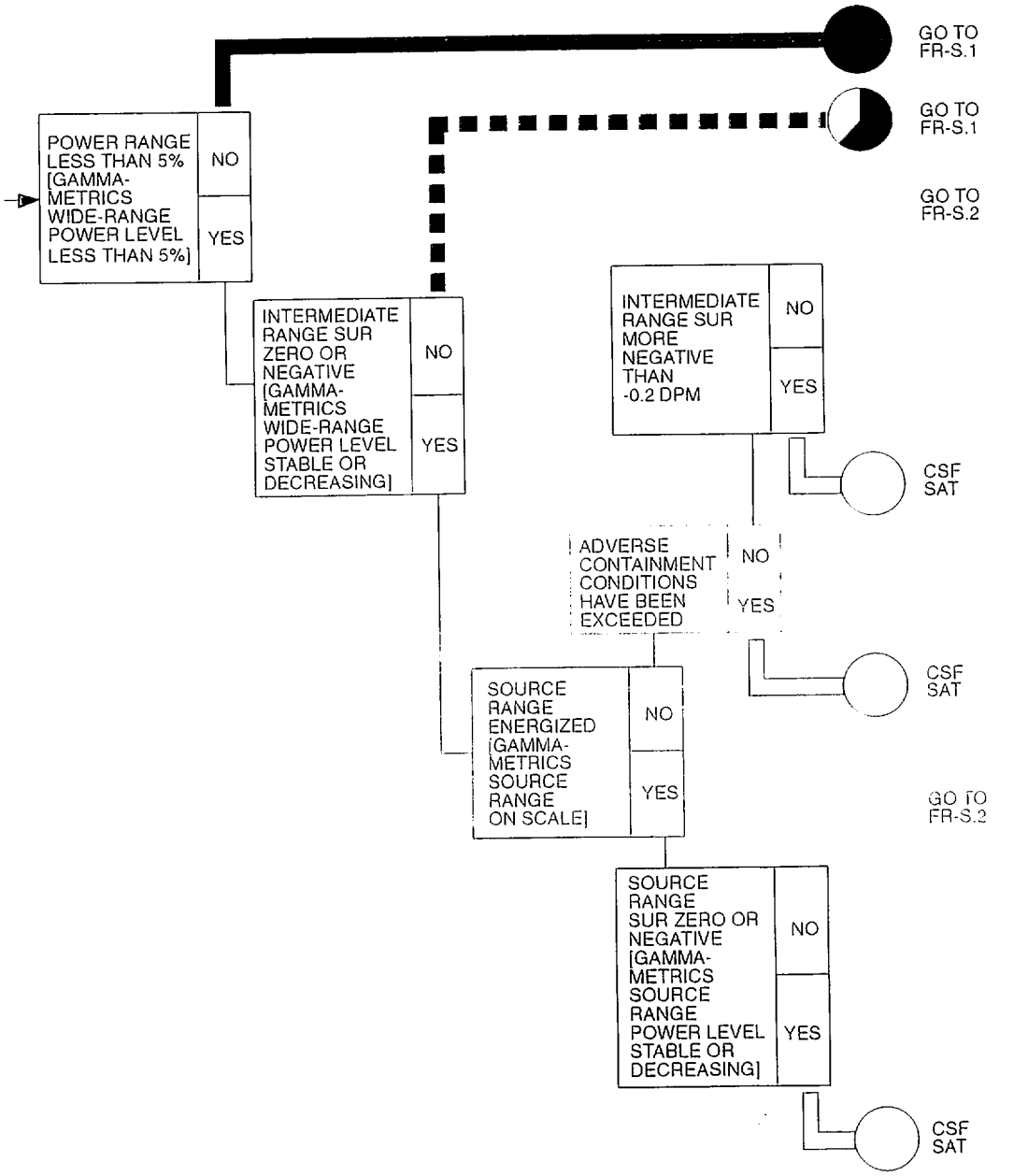
- **I need you to assess ALL CSFSTs and record, on the supplied Operator Directions Handout, the terminus (Red/Orange/Yellow/Green) for each function.**
- **Notify me if a required transition is identified.**
- **When you finish the actions necessary to accomplish this, please inform me.**

Assessment

Subcriticality				
	RED	ORANGE	YELLOW	GREEN
Core Cooling				
	RED	ORANGE	YELLOW	GREEN
Heat Sink				
	RED	ORANGE	YELLOW	GREEN
Integrity				
	RED	ORANGE	YELLOW	GREEN
Containment				
	RED	ORANGE	YELLOW	GREEN
Inventory				
	RED	ORANGE	YELLOW	GREEN

Number:	Title:	Revision:
F-1	SUBCRITICALITY	2

NOTE: IF adverse Containment conditions have been exceeded, THEN the Gamma-Metrics Excore Neutron Monitor system (Source and Wide Ranges) should be used to monitor neutron flux for the duration of the event.

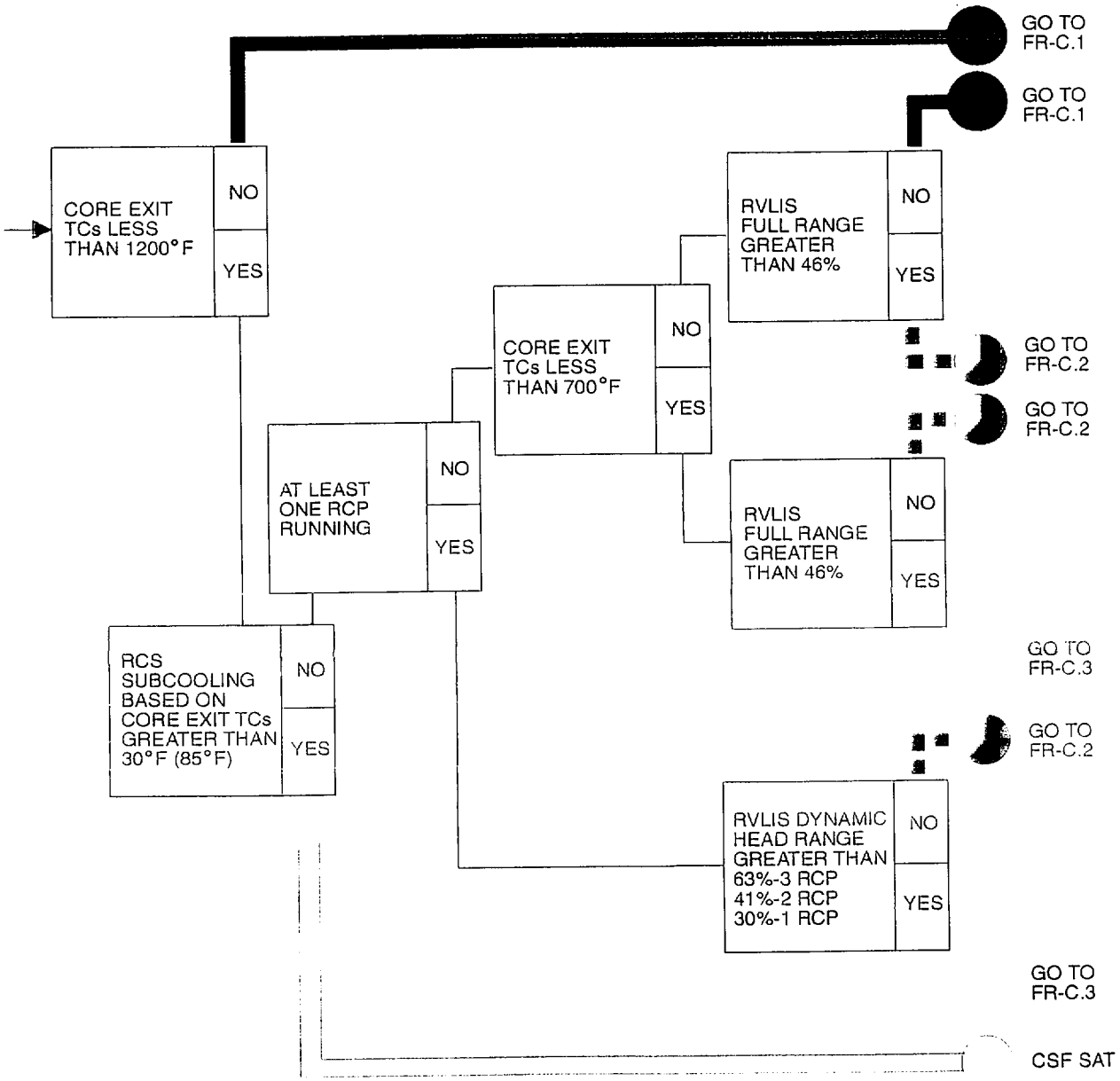


Drawing No. CB379B

SNSOC CHAIRMAN

DATE

Number:	Title:	Revision:
F-2	CORE COOLING	Rev-1A



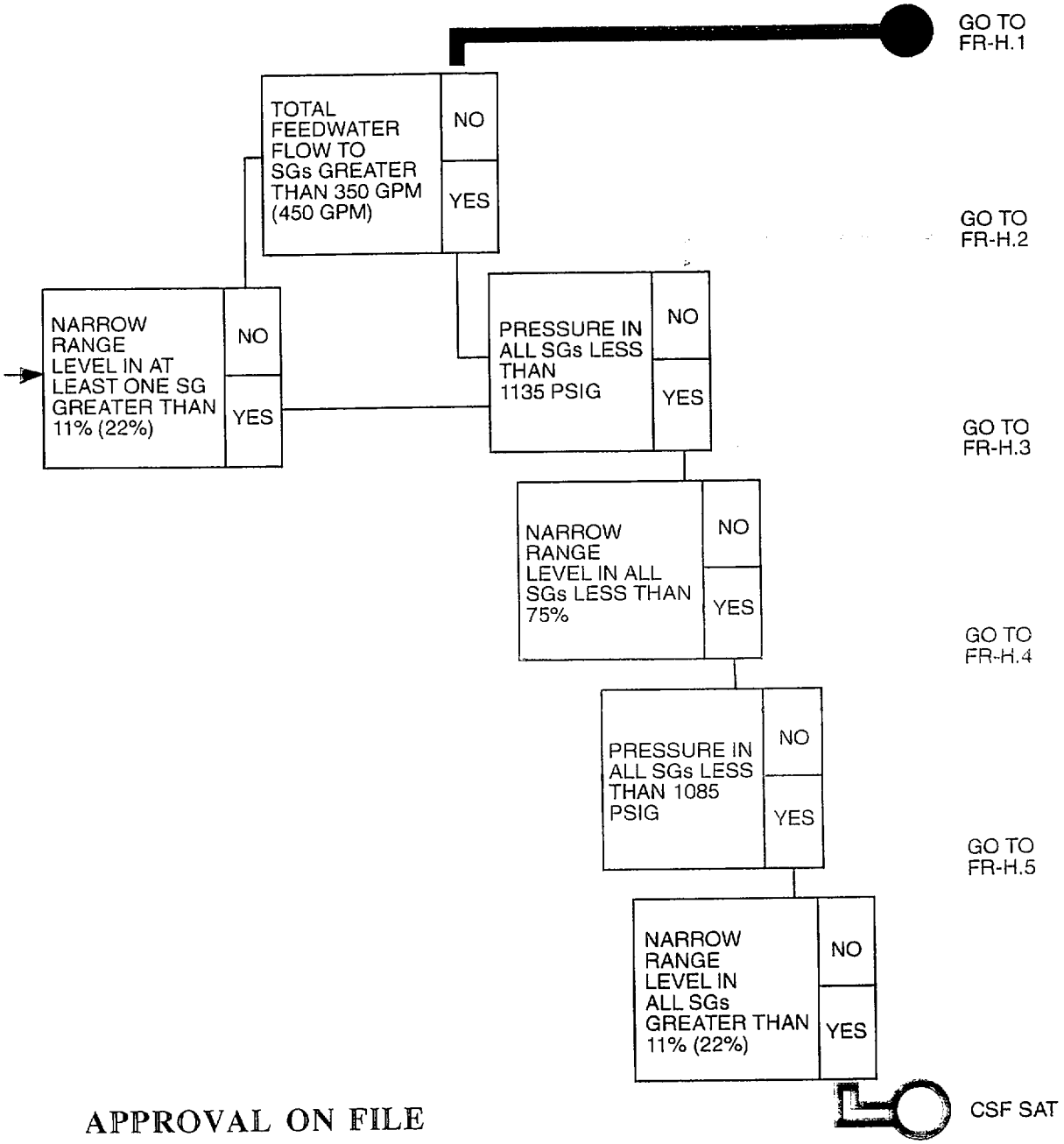
APPROVAL ON FILE

SNSOC CHAIRMAN

DATE

Drawing No. CB:180

Number:	Title:	Revision:
F-3	HEAT SINK	4



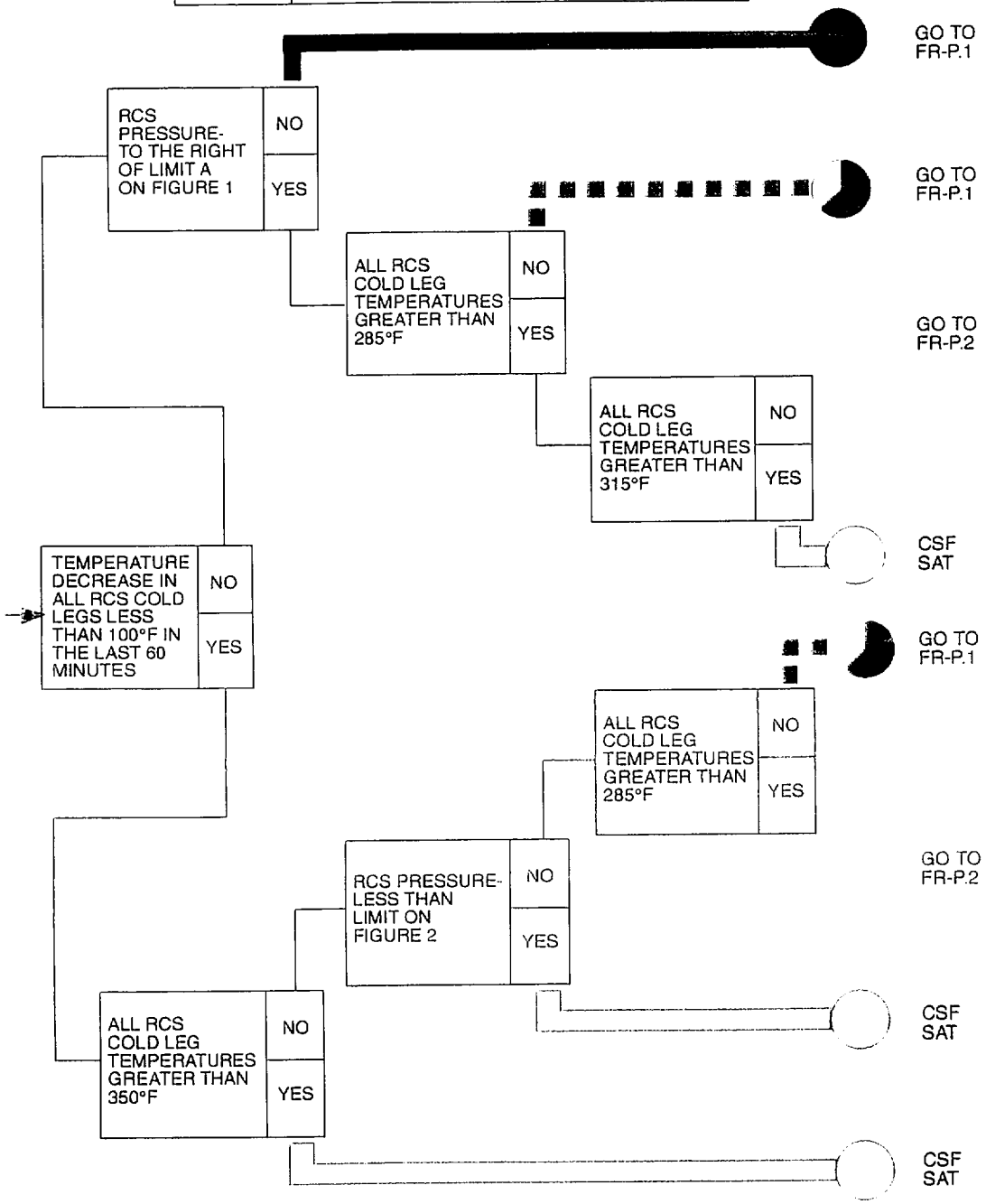
APPROVAL ON FILE

SNSOC CHAIRMAN

DATE

Graphics No. CB381

Number:	Title:	Revision:
F-4	INTEGRITY	2



APPROVAL ON FILE

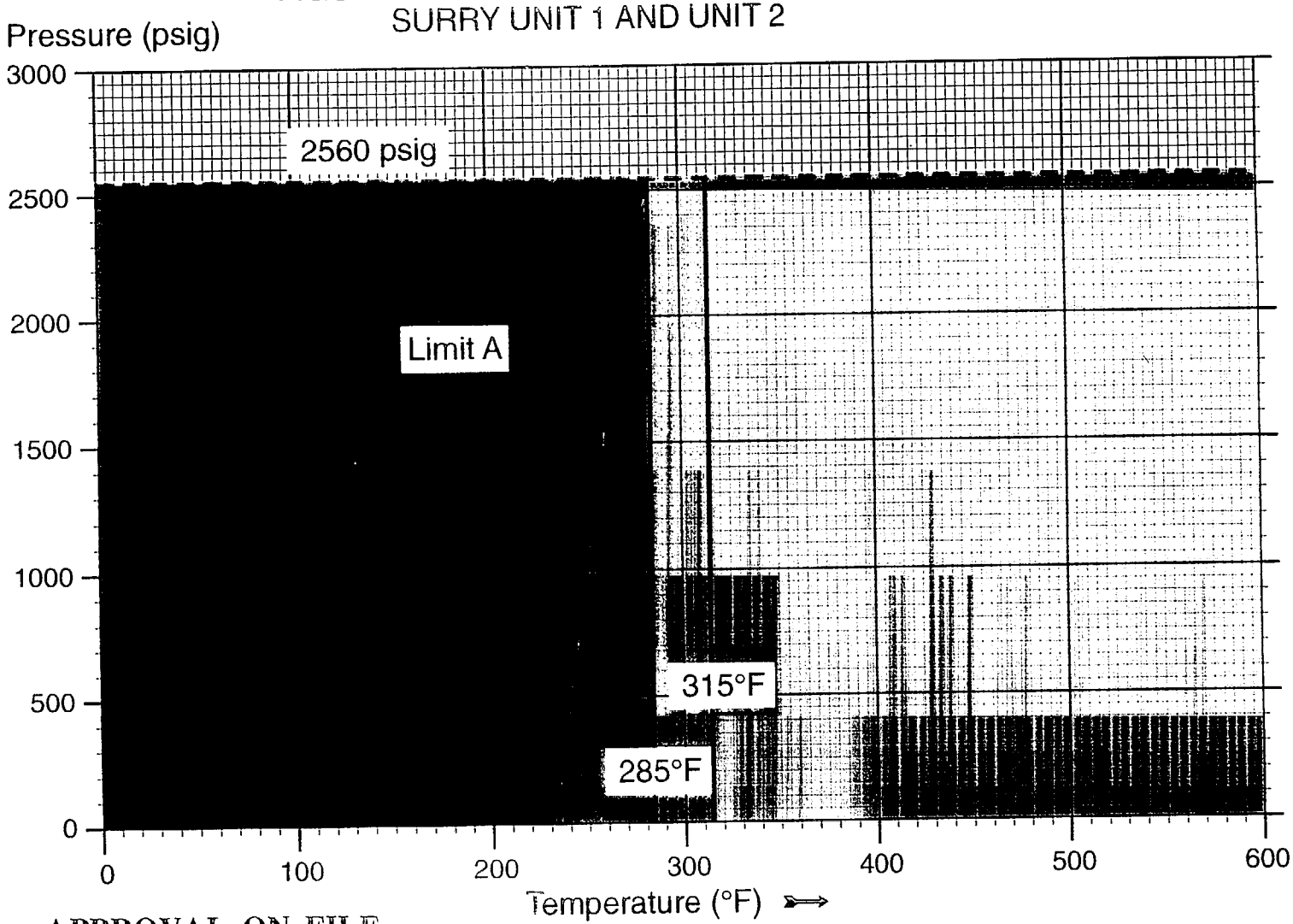
SNSOC CHAIRMAN

DATE

Graphics No. CB383

Number:	Title:	Revision:
F-4	INTEGRITY	2

FIGURE 1 - OPERATIONAL LIMITS CURVE
SURRY UNIT 1 AND UNIT 2



APPROVAL ON FILE

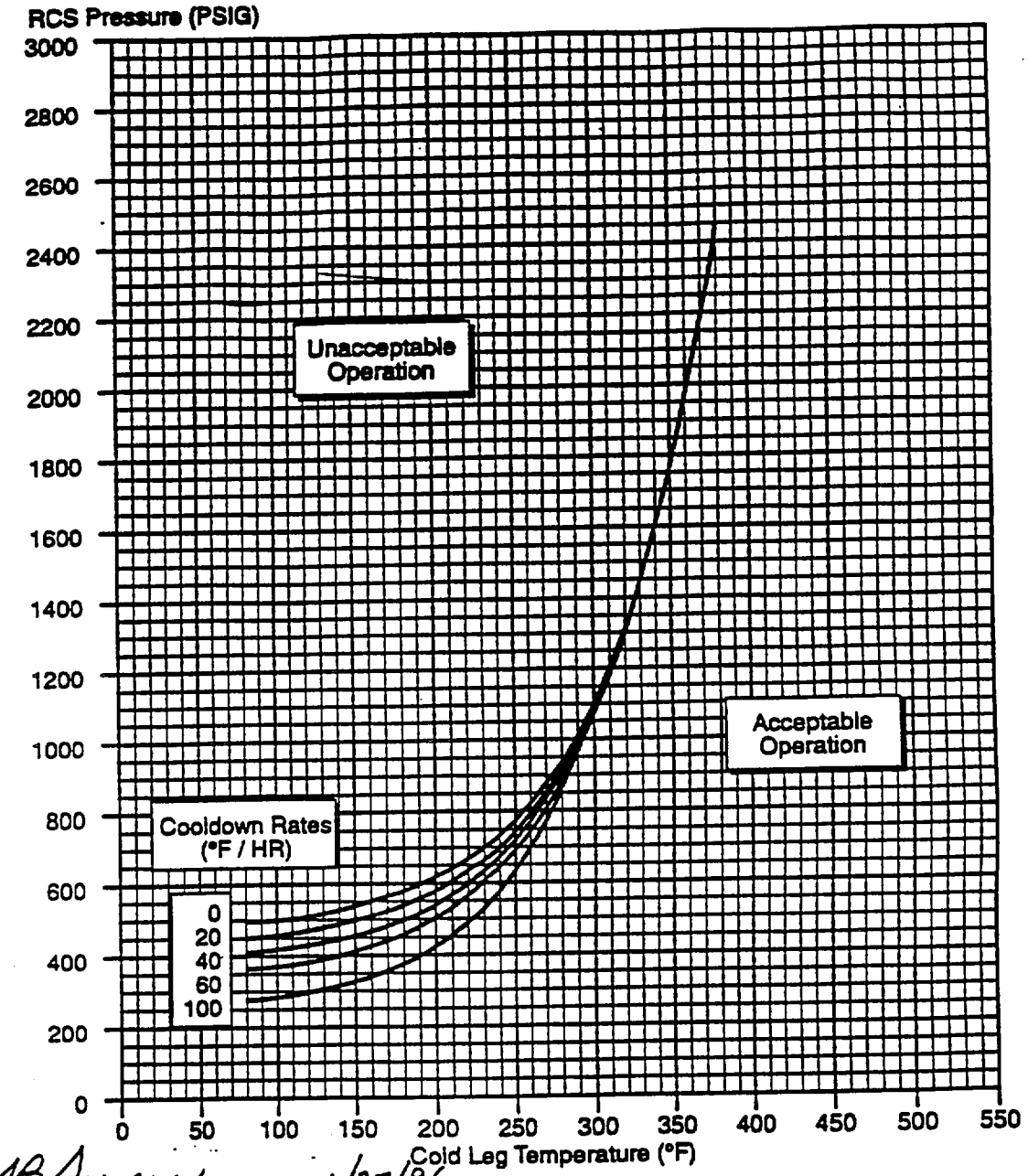
SNSOC Chairman

Date

Drawing No: WT316

Number:	Title:	Revision:
F-4	INTEGRITY	2

Figure 2
RCS COOLDOWN RESTRICTIONS

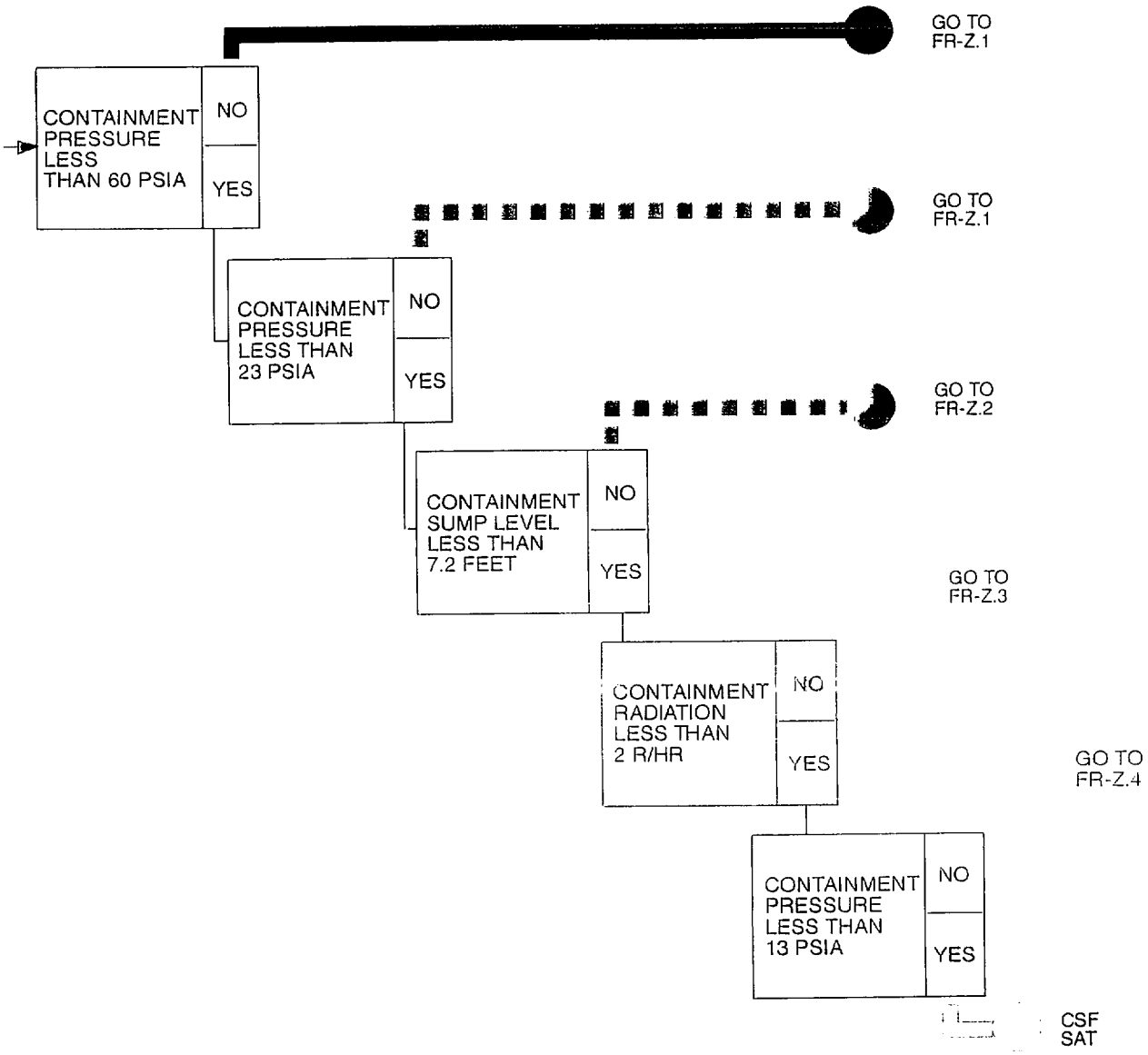


JB Sowers
SNSOC Chairman

1/25/96
Date

Graphics No. CE1388

Number:	Title:	Revision:
F-5	CONTAINMENT	Rev-1A



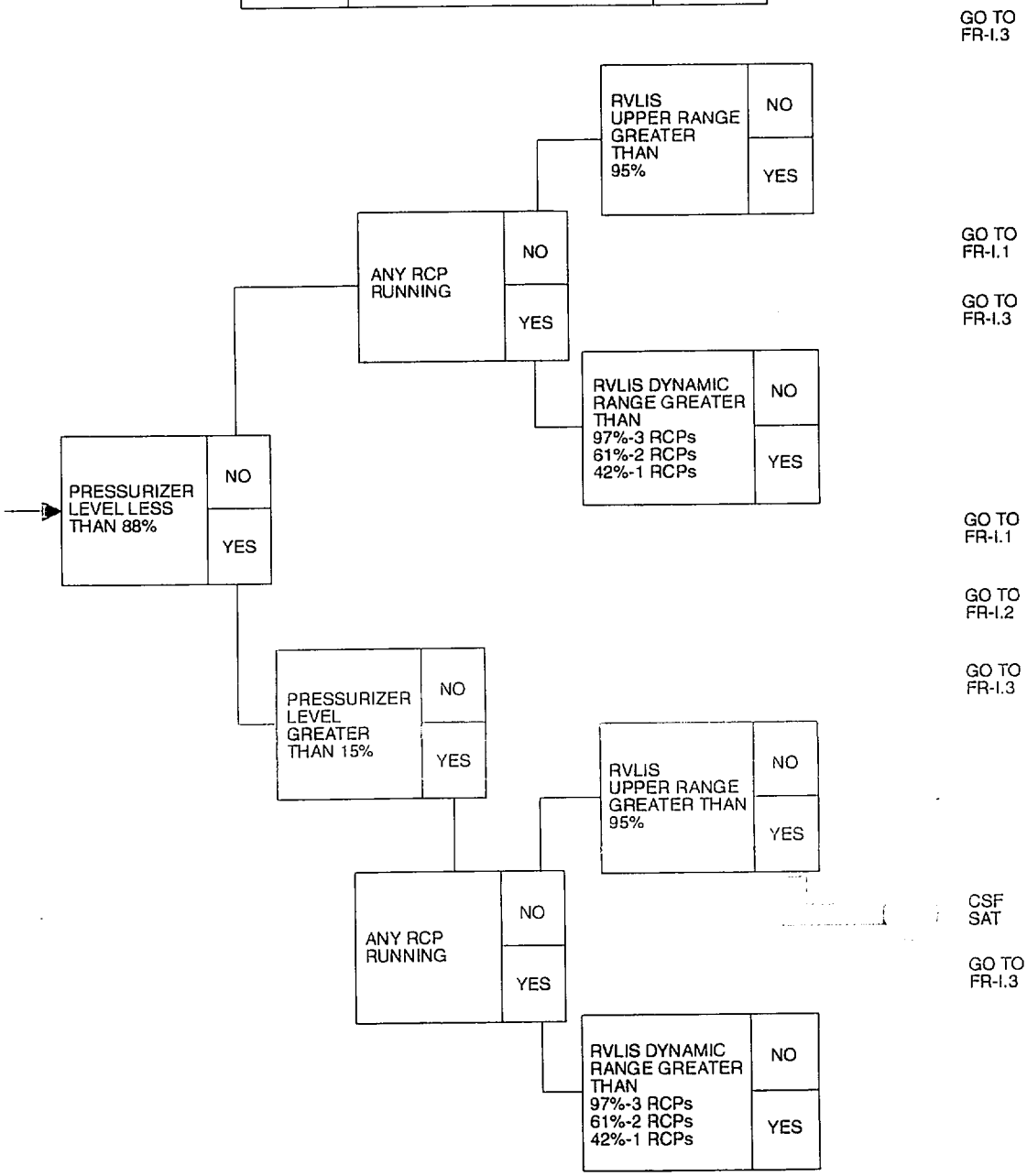
Drawing No. CB382

APPROVAL ON FILE

SNSOC CHAIRMAN

DATE

Number:	Title:	Revision:
F-6	INVENTORY	2



APPROVAL ON FILE

SNSOC CHAIRMAN

DATE

Drawing No. CB384

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

JPM A.2
SROU/SROI

Determine Estimated Critical Position Using a 1/M Plot.

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Predict the estimated critical rod position utilizng a 1/M plot.

References:

1-OP-RX-006, "Withdrawal of the Control Banks to Critical Conditions", Rev. 9

Validation Time: 15 min. **Time Critical:** No

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Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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Tools/Equipment/Procedures Needed:

1-OP-RX-006, "Withdrawal of the Control Banks to Critical Conditions," Rev. 9
Calculator

Evaluators Note:

Asterisked items compose the critical steps of the task.

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit-1 is in the process of a reactor startup.

"C" bank control rods have been withdrawn to 98 steps.

1-OP-RX-006, "Withdrawal of the Control Banks to Critical Conditions" has been completed to step 5.3.3.

"D" Bank rod height is currently 60 steps. Source range counts on N-31 and N-32 are 2000 counts.

30 Minutes ago, with "C" Bank at 98 steps, source range counts on N-31 and N-32 were 610.

15 Minutes ago, with "C" Bank at 143 steps, source range counts on N-31 and N-32 were 1200 counts.

INITIATING CUES:

Given a copy of 1-OP-RX-006, you are requested to predict the "D" bank critical rod height.

STEP 1: Obtains a Copy of the Appropriate Procedure from the Evaluator. STANDARD: 1-OP-RX-006, "Withdrawal of the Control Banks to Critical Conditions" COMMENTS:	___ SAT ___ UNSAT
STEP 2: Determines Attachment 2 is Required to Predict Criticality. STANDARD: Candidate locates "Inverse Count Rate Ratio (ICCR) Plot" (Att. 2) of 1-OP-RX-006. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Reviews Source Range Counts to be Used for the ICRR. STANDARD: Determines ICCR will be performed with only Source range. **EVALUATORS NOTE: No Intermediate range indication is currently present.** COMMENTS:	___ SAT ___ UNSAT

*STEP 4: Fills in Time/Steps/Power Level/1/M table. STANDARD: (a) Fills in the three different times. (b) Fills in 98/143/188 for the first three "C" steps blocks. (c) Fills in 0/15/60 for the first three "D" step blocks. (d) Fills in 610/1200/2000 for the first three SR blocks. (e) Leaves IR power levels blank. (f) Enters 1 for first 1/m block. *(g) Calculates 2nd 1/m as 610/1200 and enters .51 in the second 1/M block. *(h) Calculates 3rd 1/M as 610/2000 and enters .31 in the second 1/M block. **Evaluators NOTE: If asked Intermediate range indication is not on scale.** COMMENTS:	___ SAT ___ UNSAT
*STEP 5: Plots Points on the ICCR Plot. STANDARD: *(a) Places point on intersection of "C" 98 steps (x axis) and 1.0 (y axis). *(b) Places point on intersection of "C" 143 steps (x axis) and .51 (y axis). *(c) Places point on intersection of "C" 188 steps (x axis) and .31 (y axis). *(d) Draws a line starting at the point plotted in step b. through the point plotted in step c. and extending through the x axis. **Examiner Note:** The candidate will likely also draw a line through the points determined in steps a. and b. This would be expected as the evolution progressed in real time (This JPM assumes a snapshot later in the startup evolution). COMMENTS:	___ SAT ___ UNSAT
*STEP 6: Predicts "D" Bank Critical Rod Height. STANDARD: Predicts "D" bank critical rod height at approximately 127 steps. The line should clearly intersect the x axis between the increments of 120 and 135. COMMENTS: ** END OF TASK **	___ SAT ___ UNSAT

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit-1 is in the process of a reactor startup.

"C" bank control rods have been withdrawn to 98 steps.

1-OP-RX-006, "Withdrawal of the Control Banks to Critical Conditions" has been completed to step 5.3.3.

"D" Bank rod height is currently 60 steps. Source range counts on N-31 and N-32 are 2000 counts.

30 Minutes ago, with "C" Bank at 98 steps, source range counts on N-31 and N-32 were 610.

15 Minutes ago, with "C" Bank at 143 steps, source range counts on N-31 and N-32 were 1200 counts.

INITIATING CUES:

Given a copy of 1-OP-RX-006, you are requested to predict the "D" bank critical rod height.

To be marked up through 5.3.2

VIRGINIA POWER

SURRY POWER STATION

PROCEDURE NO: 1-OP-RX-006	
REVISION NO: 9	
PROCEDURE TYPE: OPERATING PROCEDURE	UNIT NO: 1
PROCEDURE TITLE: WITHDRAWAL OF THE CONTROL BANKS TO CRITICAL CONDITIONS	EFFECTIVE DATE: ON FILE
	EXPIRATION DATE: (Temporary Procedures Only) N/A

REVISION SUMMARY:

Revised Procedure to change 229 to 226 on Attachment 1 and Attachment 2 IAW EN FB 00-0045.

Revised to add Step 5.1.3 IAW OCI 99-059 to verify Suspended Solids are less than or equal to 350 ppb.

UNIT ONE

Infrequently Conducted or Complex Test or Evolution (ICCE)
Requires Senior Operations Manager
or
Operations Manager on Call

Reactivity Management

PROCEDURE WRITER: J. Redler / G. R. Gwynn	VALIDATOR: R. Mushenheim / W. H. Moore
APPROVAL: APPROVAL ON FILE	DATE:

PROCEDURE USED: ☐ Entirely ☐ Partially **Note:** If used partially, note reason in remarks.

PROBLEMS ENCOUNTERED: ☐ Yes ☐ No **Note:** If yes, note problems in remarks.

REMARKS: _____

SHIFT SUPERVISOR (SIGNATURE):	DATE:

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1.0 PURPOSE

1.1 To provide instructions for the manual withdrawal of Control Banks A, B, C, and D in overlap.

1.2 To establish criticality by the withdrawal of Control Banks C and D in overlap to the estimated critical rod position calculated in 1-OP-RX-004, The Calculation of Estimated Critical Conditions.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR Section 3.3.1, Reactivity Control Aspects of The Reactor

2.1.2 UFSAR Section 3.3.2.7, Summary of Control Rod Requirements

2.2 Technical Specifications Surry Power Station Units 1 and 2

2.2.1 Technical Specifications, Section 3.7, Nuclear Instrumentation Requirements

2.2.2 Technical Specifications, Figure 3.8.1, Allowable CTMT Air Partial Pressure

2.2.3 Technical Specifications, Section 3.12.A.3.a, Rod Withdrawal Sequence

2.2.4 Technical Specifications, Section 3.12.A.3.b, Rod Bank Overlap

2.2.5 Technical Specifications, Section 3.1.E.1, Minimum Temperature for Criticality

2.2.6 Technical Specifications, Section 3.12.A.4, Criticality Below MIL

2.3 Technical References

2.3.1 1-OP-RX-004, The Calculation of Estimated Critical Conditions

2.3.2 1-GOP-1.4, Unit Startup, HSD to 2% Reactor Power

2.3.3 0-NSP-RX-001, Chi-Squared Test

2.3.4 VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions

2.3.5 DCP 94-007, Removal of Turbine Runback on Dropped Rod

2.3.6 VPAP-1410, Reactivity Management

2.4 Commitment Documents

2.4.1 CTS 1489, Implement performance of a statistical analysis to assure reliability of the source range nuclear instrumentation before establishing criticality

2.4.2 INPO (SOER 88-02), Premature Criticality Events During Reactor Startup

2.4.3 CTS 1667, Revise Criticality procedure to include a precautionary requirement that a boron sample be taken approximately one hour prior to going critical and a backup sample at least 10 minutes from the initial sample to confirm the results

2.4.4 CTS 1669, Revise Criticality procedure to address the situation where the reactor appears to be going critical below the MIL

2.4.5 Station Deviation S-98-1315, Mismatch of Group Step Counters during withdrawal of the Shutdown Banks

2.4.6 Station Deviation S-98-1372

Init	Verif		
		3.0	**INITIAL CONDITIONS**
_____		3.1	1-GOP-1.4, Unit Startup, HSD to 2% Reactor Power, is complete to Subsection 5.4.
_____		3.2	1-OP-RX-004, The Calculation of Estimated Critical Conditions, has been performed. **(Reference 2.4.2)**
_____		3.3	Two Source Range Channels, two Intermediate Range Channels, and four Power Range Channels are in service. If criticality is being established after fuel load, then the reactivity computer will be attached to N-44 with N-44 placed in trip. (The reactivity computer will be replacing the fourth power range channel when criticality is being established after fuel load.)
_____		3.4	0-NSP-RX-001, Chi-Squared Test, has been performed for the source range detectors following a refueling outage. This procedure is a statistical analysis to assure the reliability of the source range nuclear instrumentation before criticality is established. **(Reference 2.4.1)**
_____		3.5	The count rate is audible. **(Reference 2.4.2)**
_____		3.6	At least two CRDM Fans are in service.
_____		3.7	The Shift Supervisor has authorized withdrawal of the control rods.
_____		3.8	The Reactor Coolant System temperature is greater than or equal to 530°F.
_____		3.9	The manual rod speed pots in Rack 29 have been set for 48 steps per minute such that SI-1-408, ROD SPEED, will indicate 48 SPM.
I&C			

4.0 PRECAUTIONS AND LIMITATIONS

4.1 The ICRR (Inverse Count Rate Ratio) plot in Attachment 1 will be used for the initial approach to criticality, starting at zero steps on BANK A and terminating at 98 steps on BANK C. **(Reference 2.4.2)**

4.2 The ICRR plot in Attachment 2 will be used for the final approach to criticality, starting at 98 steps on BANK C.

4.3 The CRO that reviewed and signed 1-OP-RX-004 should be the CRO doing the Startup. **(Reference 2.4.2)**

4.4 Activities, such as shift turnover and surveillance testing that could distract the operator during the Startup will not be allowed. **(Reference 2.4.2)**

4.5 Criticality must be anticipated any time the control rods are being withdrawn. The Reactor should be Critical after approximately five count rate doublings.

4.6 The MIL (Minimum Insertion Limit) must **not be violated**. If the MIL is violated during the performance of this procedure, the Reactor **must be tripped** and **emergency borated** the required amount. **(Reference 2.4.4)**

4.7 The Estimated Critical Position (ECP) must be within ± 500 pcm of the actual control rod position established for criticality. This is an Administrative Limit that must be maintained whenever criticality is being established by pulling control rods.

4.8 The following Inverse Count Rate Ratio (ICRR) Plot precautions for Attachment 2 must be strictly followed.

- Criticality must be anticipated any time the control rods are being withdrawn.
- Rod withdrawal increments between successive data points should not be more than 45 steps. If the Inverse Count Rate Ratio Plot in Attachment 2 predicts a critical rod height within the next 45 steps, then the control rods should **not** be withdrawn more than 45 steps or beyond a 1 dpm start-up rate.
- After each increment of rod withdrawal, wait at least two minutes and wait until the count rate has steadied out. (This will allow time for subcritical multiplication to take place before the count rate is recorded.)

4.9 To provide the most accurate ECP calculations a boron sample should be taken approximately one hour prior to going critical and a backup sample at least 10 minutes from the initial sample to confirm the results. **(Reference 2.4.3)**

4.10 Two operator controlled positive reactivity additions (e.g. dilution and rod withdrawal), excluding the effects of Xenon transients, must not be made during the approach to criticality.

4.11 The Shift Supervisor shall ensure that unexplained or abnormal reactivity changes or neutron flux distributions are investigated immediately and if necessary direct a unit shutdown or trip to terminate the problem. The Shift Supervisor or Unit SRO shall promptly notify the STA and the Reactor Engineer to investigate the situation.

4.12 If the Group Step Counters are found to be out of sequence during the withdrawal of the Control Banks, rod withdrawal must be stopped. The Shift Supervisor, I&C, and the Reactor Engineer must be notified. The mismatch should be evaluated and I&C may correct the mismatch depending on existing core conditions. The Reactor Trip Breakers may be opened as necessary to terminate the problem. **(Reference 2.4.5)**

4.13 To provide the most accurate boron sample, at least 15 minutes should elapse following a dilution before sampling. This will allow time for adequate mixing to occur and a representative sample can be obtained. **(Reference 2.4.6)**

5.0 INSTRUCTIONS

5.1 Pre-Rod Withdrawal Data

* *

CAUTION: If the count rate doubles during the dilution process, stop the dilution and evaluate the shutdown margin calculations.

* *

_____ 5.1.1 Commence a Dilution or Boration of the RCS to the critical boron concentration as determined by 1-OP-RX-004, The Calculation of Estimated Critical Conditions.

_____ 5.1.2 Record the following information using either NI-1-31 or NI-1-32 for both the Start and End of the Dilution/Boration. The same NI should be used for both the Start and End of the Dilution/Boration.

		Count Rate	NI-1-31 or NI-1-32
_____	Start of Dilution/Boration	_____	_____
_____	End of Dilution/Boration	_____	_____

_____ 5.1.3 Verify that suspended solids are less than or equal to 350 ppb. Record below.

Suspended Solids _______________ ppb

_____ 5.1.4 Have Chemistry obtain or verify two critical boron concentration samples from the same sample line at least 10 minutes apart. The two samples shall be within 10 ppm of each other. (The first sample shall be taken approximately one hour prior to the beginning of the pull to criticality.) **(Reference 2.4.3)**

_____ 5.1.5 Record the SOURCE RNG FLUX counts for BANK A at 000 steps.

NI-1-31B _____ cps NI-1-32B _____ cps

_____ 5.1.6 Using the NEUT FLUX REC - PEN 1 SEL SWITCH, put the highest reading SOURCE RNG FLUX signal on NEUT FLUX REC NR-1-45.

_____ 5.1.7 Using the NEUT FLUX REC - PEN 2 SEL SWITCH, put the highest reading INT RNG signal on NEUT FLUX REC NR-1-45.

_____ 5.1.8 Verify NEUT FLUX REC NR-1-45 chart speed switch in HI.

5.1.9 Turn the HIGH FLUX AT SHUTDOWN switch from NORMAL to BLOCK.

_____ a. Source Range NI-1-31

_____ b. Source Range NI-1-32

_____ 5.1.10 Acknowledge Annunciator 1G-F2, NIS SOURCE RGE HI FLUX SHDN ALARM BLKD.

_____ 5.1.11 Verify annunciator 1G-H1, NIS DROPPED ROD FLUX DECREASE > 5% PER 2 SEC is NOT LIT.

5.1.12 Verify that both of the following indicators are NOT LIT on the NI Drawer.

_____ • DROPPED ROD

_____ • CHANNEL IN TEST

NOTE: The SOURCE RNG FLUX instrument with the higher counts should be used for the ICRR plot.

_____ 5.1.13 Record the base counts (C_0) for the first data point below and in Step 1.0 of Attachment 1.

C_0 _____cps

_____ 5.1.14 Record the first doubling (C_1) below, in Step 5.2.8, and in Step 2.0 of Attachment 1.

C_1= 2 x _____cps = _____cps (This is the second data point.)
C_0 (Step 5.1.13)

_____ 5.1.15 Record the second doubling (C_2) below, in Step 5.2.13, and in Step 3.0 of Attachment 1.

C_2= 4 x _____ cps = _____ cps (This is the third data point.)
C_0 (Step 5.1.13)

Performed by:

Signature	Initial	Print	Date

5.2 Rod Withdrawal and Associated Verifications

______ 5.2.1 Verify that the Shift Supervisor (who is the designated Test Coordinator) or his designee has reviewed the Detailed Pre-Test Pre-Job Briefing Checklist and Responsibilities in Attachment 4 (page 4 of 6) and conducted a Detailed Pre-Test Briefing with all the personnel designated as part of the Test Team IAW VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions.

______ 5.2.2 Verify that the Senior Operations Manager or Operations Manager on Call has reviewed the Management Expectations Briefing Checklist in Attachment 4 (page 3 of 6) and briefed the Operations Department and test personnel on management expectations IAW VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions.

______ 5.2.3 Verify that the STA and a Reactor Engineer are present in the MCR.

______ 5.2.4 Make the following announcement on the GAI-TRONICS system:
Unit 1 Reactor Startup Commencing; Unit 1 Reactor Startup Commencing.

* *

CAUTION: During rod withdrawal, if it appears that the reactor will go critical below the MIL (Minimum Insertion Limit), the rod withdrawal must be stopped, the Reactor Trip Breakers must be opened, and 1-OP-RX-004 must be re-evaluated. (Reference 2.2.6, T.S. 3.12.A.4)

CAUTION: If the 1-OP-RX-004 re-evaluation cannot determine the reason that the reactor appears to be going critical below the MIL, then the RCS must be borated to Hot Shutdown. (Reference 2.2.6)

* *

NOTE: The count rate may double one time but should **NOT** double two times before BANK C is at **50** steps.

______ 5.2.5 Verify or put the ROD CONT MODE SEL switch in MAN.

_____ 5.2.6 Immediately before rod withdrawal, check that CONT BANK A, B, C, and D DEMAND POSTN counters and the BANK OVERLAP counter indicate 000.

* *

CAUTION: Rod withdrawal must be momentarily stopped in order to verify Bank Overlap at 015 steps for Control Banks A, B, and C. Rod withdrawal may immediately continue, after the Bank Overlap verification in Step 5.2.7.h has been completed for a respective Control Bank. Also, rod withdrawal must be stopped for count rate stability, before a count rate doubling is declared.

CAUTION: If the Group Step Counters are found to be out of sequence during the withdrawal of the Control Banks, rod withdrawal must be stopped. The Shift Supervisor, I&C, and the Reactor Engineer must be notified. The mismatch should be evaluated and I&C may correct the mismatch depending on existing core conditions. The Reactor Trip Breakers may be opened as necessary to terminate the problem. **(Reference 2.4.5)**

* *

_____ 5.2.7 Withdraw the CONT BANKs and verify the following conditions. IF a count rate doubling is declared before CONT BANK C is at 015 steps, THEN enter N/A for Substep 5.2.7.h.3 AND GO TO Steps 5.2.8 and 5.2.9 to continue.

_____ a. The ROD DIRECTION OUT light is LIT.

_____ b. ROD SPEED SI-1-408 indicates 48 SPM.

_____ c. GP 1 AND GP 2 DEMAND POSTN counters alternately step.

_____ d. The BANK ANALOG POSTN indicators are increasing.

_____ e. The SOURCE RNG SUR indication is active and less than 1 DPM.

_____ f. The SOURCE RNG FLUX levels are increasing.

_____ g. The traces on NR-1-45, NEUT FLUX REC, are increasing.

h. The Bank Overlap at 015 steps for Control Banks A, B, and C corresponds to the following bank overlap indications during control bank withdrawal.

_____ 1. BANK OVERLAP is 015 steps for CONT BANK A at 015 steps.

_____ 2. BANK OVERLAP is 143 steps for CONT BANK B at 015 steps.

_____ 3. BANK OVERLAP is 271 steps for CONT BANK C at 015 steps.

* *

CAUTION: The SOURCE RNG FLUX counts must be stable before a count rate doubling is declared.

* *

_____ 5.2.8 Continue rod withdrawal until the SOURCE RNG FLUX counts **double** OR until BANK C reaches 98 Steps. Enter N/A in the C_1 cps blank below if **doubling** did not occur.

C_1= _____ cps,
(This is the second data point on Attachment 1.)

_____ 5.2.9 Record the actual rod position at which the SOURCE RNG FLUX counts **doubled** in Step 5.2.8. Enter N/A if **doubling** did not occur.

Rod Position A/_____ B/_____ C/_____ D/_____ steps

_____ 5.2.10 WHEN the SHUTDN AND CONT ROD CONT SWITCH is released, THEN check that the ROD DIRECTION OUT light is NOT LIT and rods stop.

_____ 5.2.11 Check that the SOURCE RNG FLUX and INT RNG FLUX levels are **NOT** increasing.

_____ 5.2.12 IF **doubling** did not occur in Step 5.2.8, THEN close out Attachment 1, AND enter N/A for the remaining steps in this subsection, AND GO TO Subsection 5.3. Otherwise, enter N/A for this step.

NOTE: The projected third data point (C_2= second doubling) is the rod position corresponding to the line drawn through C_0 and C_1 and extended to the intersection of the horizontal 0.25 1/M line on Attachment 1.

_____ 5.2.13 Project the third data point (C_2= second doubling) on Attachment 1, and record the Projected Rod Position which corresponds to the projected third data point below.

Rod Position A/_____ B/_____ C/_____ D/_____ steps

C_2= _____ cps,
(This is the third data point on Attachment 1.)

_____ 5.2.14 IF the projected third data point (second doubling) is greater than 50 steps on BANK C, THEN perform the following. Otherwise, enter N/A for this step and GO TO Step 5.2.15.

_____ a. Continue with the rod withdrawal to 98 steps on BANK C.

_____ b. IF a count rate doubling was declared before CONT BANK C was at 015 steps, THEN verify BANK OVERLAP is 271 steps for CONT BANK C at 015 steps. Otherwise, enter N/A for this substep.

_____ c. Check that the SOURCE RNG FLUX and INT RNG FLUX levels are **NOT** increasing after rod withdrawal is stopped.

_____ d. Close out Attachment 1.

_____ e. Enter N/A for Steps 5.2.15 and 5.2.16.

_____ 5.2.15 IF the projected third data point (second doubling) is less than 50 steps on BANK C, THEN open the reactor trip breakers AND perform another ECP calculation IAW 1-OP-RX-004.

_____ 5.2.16 Close out 1-OP-RX-006 by entering N/A in the steps that were not performed, and obtain a new official copy of 1-OP-RX-006 to repeat the withdrawal of the Control Banks.

Performed by:

Signature	Initial	Print	Date

5.3 The Pull to Criticality Using Banks C and D

NOTE: The estimated critical rod bank position required for the pull to criticality is recorded in 1-OP-RX-004, Section 5.6, for core conditions where Xenon is in equilibrium or changing less than 100 pcm. Where Xenon concentrations are changing equal to or greater than 100 pcm, the estimated critical rod bank positions are recorded in 1-OP-RX-004, Section 5.6.

_____ 5.3.1 IF the pull to criticality in Step 5.3.2 is delayed so that critical conditions can NOT be achieved at the designated estimated times for criticality recorded in 1-OP-RX-004, Section 5.6 (Summary of Estimated Critical Conditions With Xenon Changing), THEN enter N/A for Steps 5.3.2 through 5.3.5 AND GO TO Step 5.3.6 and record the reason for the delay in the pull to criticality. IF Xenon Concentration is NOT changing by 100 pcm or more OR there is no delay in the pull to criticality, THEN enter N/A for this step.

* *

CAUTION: If during the performance of Step 5.3.2, criticality is expected to occur below the Minimum Insertion Limit (MIL) (Bank D at 23 steps) or is expected to go outside the ECP Admin. Limits (± 500 pcm), the Reactor Trip Breakers must be opened, and 1-OP-RX-004, The Calculation of Estimated Critical Conditions, must be re-evaluated.

CAUTION: If the Inverse Count Rate Ratio Plot in Att 2 predicts a critical rod height within the next 45 steps, then the control rods should **not** be withdrawn more than 45 steps or beyond a 1 dpm start-up rate.

* *

_____ 5.3.2 Pull Control Banks C and D in overlap to the estimated critical rod bank position in increments of **not** more than 45 steps and concurrently perform the following:

_____ a. Plot the ICRR delineated in Attachment 2 for each increment of rod withdrawal.

_____ b. Wait at least two minutes and wait until the count rate has steadied out after each increment of rod withdrawal. (This will allow time for subcritical multiplication to take place before the count rate is recorded.)

_____ c. Verify that BANK OVERLAP indicates 399 steps when Control Bank D indicates 015 steps.

_____ d. Adjust the AUDIO MULTIPLIER in decades, as required, during the count rate increase.

_____ e. Check that PERM STATUS LIGHT B3, P-6 NIS INT RGE > 10^{-10} AMPS, is LIT.

_____ f. Verify that the SOURCE and INT RNG FLUX channels have at least ONE decade overlap.

g. Before exceeding 10^5 cps, depress the following pushbuttons:

_____ 1. I/N 33A, SOURCE RNG TRIP-BLOCK TR A

_____ 2. I/N 33B, SOURCE RNG TRIP-BLOCK TR B

_____ h. Verify that PERM STATUS LIGHT A-1, NIS SOURCE RNG RX TRIP BLOCKED is LIT.

NOTE: Annunciator 1G-A3, NIS SOURCE RNG LOSS OF DET VOLT, will clear to the Black Board condition, when acknowledged.

_____ i. Acknowledge Annunciator 1G-A3, NIS SOURCE RNG LOSS OF DET VOLT, and verify the annunciator clears to the Black Board condition.

_____ j. Monitor the second INT RNG FLUX channel on NR-1-45, using NEUT FLUX REC - PEN 1 SEL SWITCH.

_____ 5.3.3 IF criticality was established above the MIL and within the Admin. Limits, THEN GO TO Step 5.3.4 AND enter N/A for Steps 5.3.6 and 5.3.7. Otherwise, GO TO Step 5.3.6 AND enter N/A for Steps 5.3.4 and 5.3.5.

_____ 5.3.4 AFTER criticality is achieved, THEN perform the following.

_____ a. Notify the Shift Supervisor.

_____ b. Establish a SUR not greater than 1 DPM.

_____ c. Stabilize Reactor Power at approximately 10^{-8} amps (between 5×10^{-9} and 5×10^{-8} amps).

_____ d. Complete the Summary of Actual Critical Conditions in Attachment 3, and in Attachment 3 of 1-OP-RX-004, The Calculation of Estimated Critical Conditions.

_____ 5.3.5 Return to 1-GOP-1.4, Unit Startup, HSD to 2% Reactor Power, Subsection 5.4, Reactor Power Increase to 2%.

_____ 5.3.6 IF the reason for the missed criticality can be determined, THEN open the reactor trip breakers, record the reason for the missed criticality below, AND repeat this procedure and 1-OP-RX-004. Enter N/A for Step 5.3.7. IF the reason for the missed criticality can NOT be determined, THEN enter N/A for this step AND GO TO Step 5.3.7.

Reason for Missed Criticality:

_____

_____

_____

_____

_____

_____

_____

_____ 5.3.7 IF the reason for the missed criticality can NOT be determined, THEN open the reactor trip breakers AND borate to Hot Shutdown. Notify the Reactor Engineer or the Nuclear Analysis and Fuel (NA & F) Department, and initiate a Deviation Report. Record the name of the NA & F or Reactor Engineer person contacted and the DR No. below.

NA & F or Reactor Engineer
Contacted _____

DR No. _____

Performed by:

Signature	Initial	Print	Date

ATTACHMENT 1

(Page 1 of 1)

INVERSE COUNT RATE RATIO PLOT (CONTROL BANKS A, B, AND C)

* *

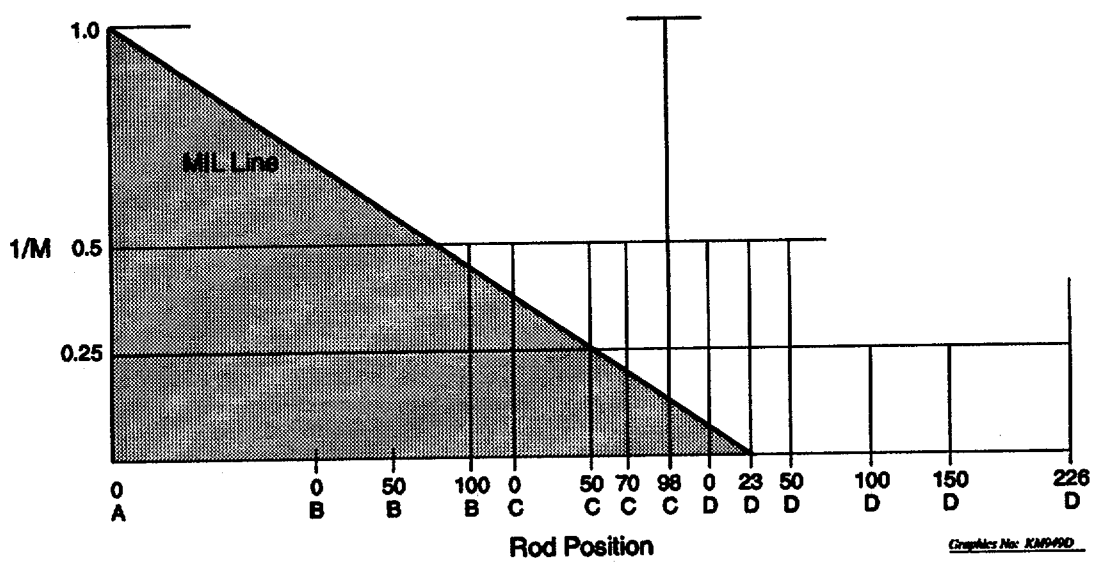
CAUTION: During rod withdrawal, if the second data point falls below the MIL Line, the rod withdrawal must be stopped, the Reactor Trip Breakers must be opened, and 1-OP-RX-004 must be reevaluated.

* *

_____ 1.0 (C_0) = __________ cps (first data point) CONT BANK A at 000 steps

_____ 2.0 $C_1 = 2 \times (C_0)$ = __________ cps (second data point)

_____ 3.0 $C_2 = 4 \times (C_0)$ = __________ cps (third data point)



INVERSE COUNT RATE RATIO PLOT

Performed by: ____________________ ________ ____________________ ________
Signature Initial Print Date

____________________ ________ ____________________ ________
Signature Initial Print Date

ATTACHMENT 3

(Page 1 of 1)

SUMMARY OF ACTUAL CRITICAL CONDITIONS

1.0 **Summary of Actual Critical Conditions**

_____ 1.1 Date and Time of Criticality: _____

_____ 1.2 Control Rod Position: C/_____, D/_____ Steps

_____ 1.3 Average RCS Temperature: _____°F

_____ 1.4 Critical Boron Concentration: _____ ppm

Performed by: _____ _____ _____ _____
Signature Initial Print Date

_____ _____ _____ _____
Signature Initial Print Date

ATTACHMENT 4

(Page 1 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

PERFORMANCE AND REVIEW OF PERSONNEL RESPONSIBILITIES

1. **Senior Operations Manager or Operations Manager on Call** -- Provide oversight and control of Infrequently Conducted or Complex Tests or Evolutions as defined in VPAP-0108.

   A. Before the start of Step 5.2.4 (where control bank rod withdrawal for Criticality is commenced) a Senior Operations Manager or Operations Manager on Call will be assigned to exercise continuous responsibility for the oversight of the test. This individual shall:

      1. Have primary responsibility for ensuring that tests or evolutions are conducted in a manner that maximizes the margin of safety of the Unit.

      2. Oversee the test/evolution to ensure the Station is operated safely without becoming involved in the details.

      3. Be familiar with the test/evolution to the extent of knowing the general sequence, objectives, reactor safety considerations, portions of the test/evolution most susceptible to difficulty, and criteria for terminating the test/evolution.

      4. Attend at least one pre-test (pre-job) briefing.

      5. Have authority to direct termination and slow the pace of the test/evolution, including directing a reactor trip as needed for safe operation of the Unit.

      6. Exercise authority through the Shift Supervisor without relieving the Shift Supervisor's responsibility for safe Station operation.

      7. Remain at the Station during critical portions of the test/evolution, in a location where oversight and responsibility can be exercised effectively.

      8. Participate in turnovers, if required, due to the duration of a test/evolution.

ATTACHMENT 4

(Page 2 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

PERFORMANCE AND REVIEW OF PERSONNEL RESPONSIBILITIES

9. Maintain two-way communication capability with the Shift Supervisor during critical portions of the test/evolution.

B. Prior to the start of Step 5.2.4 (where control bank rod withdrawal for Criticality is commenced) the Senior Operations Manager or Operations Manager on Call shall brief Operations Department and test/support personnel on management expectations, using Page 3 of this Attachment.

2. **Test Coordinator** -- The qualified Test Coordinator shall be responsible for coordinating the efforts of individuals performing a particular test and assuring the test is completed in a timely manner. The Test Co-ordinator shall conduct pre-test and turnover briefings using Page 4 of this Attachment.

3. **System Engineer** -- The engineer who has been designated to become knowledgeable in all aspects of the system and can be appointed as the Test Coordinator by the System Engineering Supervisor.

4. **Test Lead** -- A person who is knowledgeable in all aspects of the procedure/test to be performed. A Test Lead will be appointed and will assume the Test Coordinator role for those procedures/tests which do not have an appointed Test Coordinator.

5. **Shift Supervisor**--The Senior Reactor Operator (SRO) in direct charge of unit operations on shift, and the Station Management representative during backshifts, weekends, and holidays.

6. **System Engineering Supervisor** -- The supervising engineer who will ultimately review and approve the performance of the systems/components being tested in this test procedure, if applicable.

7. **Shift Technical Advisor (STA)** -- On-shift engineering advisor who must remain informed of testing that may affect plant conditions.

ATTACHMENT 4

(Page 3 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

The following items were covered during the Management Expectations briefing: (Check all that apply)

- ☐ The need to exercise caution and conservatism during the test, particularly when uncertainties are encountered.
- ☐ Emphasis on maintaining the highest margins of safety to place proper perspective on any sense of urgency that may otherwise prevail.
- ☐ Assigned responsibilities for the activity and any deviation from the normal shift duties and accountabilities.
- ☐ The need for proper communication.
- ☐ Lessons learned from pertinent in-house and industry operating experience to assist Operations Department and test personnel in internalizing the lessons.
- ☐ The need to stop the ICCE when unexpected conditions arise or unexpected behavior is experienced.
- ☐ Strict compliance with procedure details.
- ☐ Criteria for terminating the ICCE.

Briefing completed by _____ Date _____ Time _____

Senior Operations Manager or
Operations Manager on Call

ATTACHMENT 2

(Page 1 of 1)

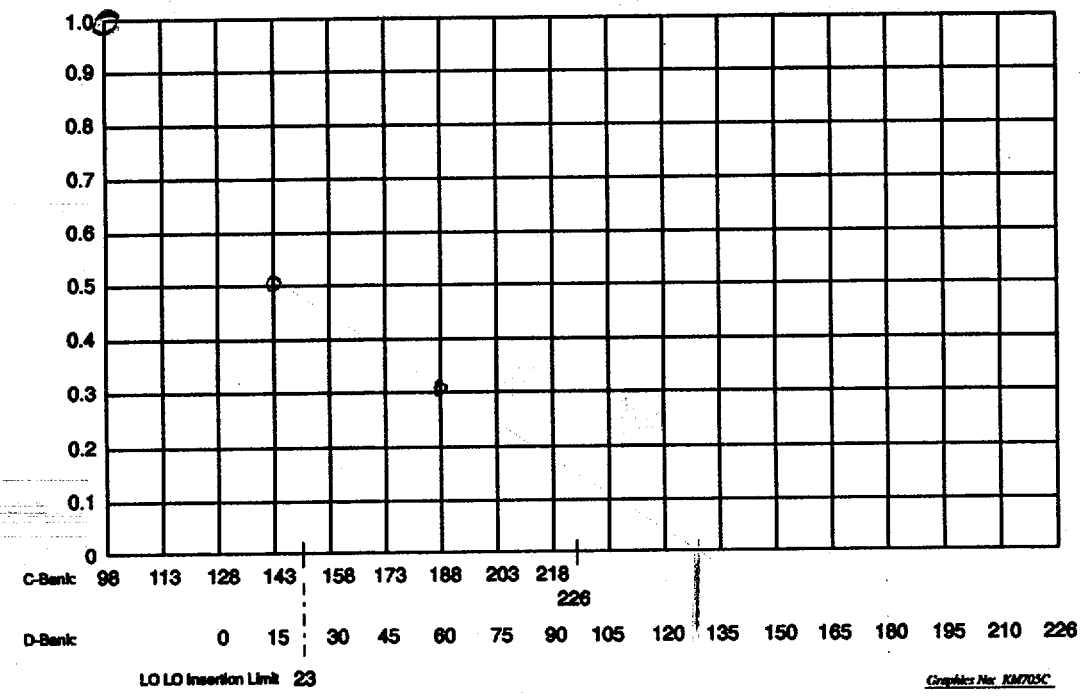
INVERSE COUNT RATE RATIO PLOT (PULL TO CRITICALITY)

Start Up No. _____
Ch: SR _____
IR _____

ECP: Bank _____ at _____ Steps
-500 PCM _____ Steps
+500 PCM _____ Steps

ACP: Bank _____ at _____ Steps
CB _____

Time	Steps		Power Level		1/M	Time	Steps		Power Level		1/M
	C	D	SR	IR			C	D	SR	IR	



INVERSE COUNT RATE RATIO PLOT

Performed by: _____ _____ _____ _____
Signature Initial Print Date

ATTACHMENT 4

(Page 4 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

The following items were covered during the pre-test (pre-job) briefing: (Check all that apply)

- ☐ Test/evolution objectives.
- ☐ Station and test/operating organization.
- ☐ The specific position or person primarily responsible for the test/evolution.
- ☐ Duties and responsibilities of individual personnel on the team. Ensure that each participant understands their individual and team responsibilities.
- ☐ Establish the lines of communication steering the test/evolution.
- ☐ Personnel special certifications and qualifications required.
- ☐ Discussion of the initial conditions of the test/evolution, including station and system status.
- ☐ Anticipated Unit performance.
- ☐ Termination guidance for specific portions of the test/evolution and contingency plans for unexpected occurrences.
- ☐ Risks associated with the test/evolution.
- ☐ Discussion of interactions that may cause a Unit transient.
- ☐ Discussion of any significant safety and radiological hazards.
- ☐ Review of procedure precautions and limitations.
- ☐ Review of procedure instructions and acceptance criteria.
- ☐ Ensure that personnel have read and understand the necessary work procedures and are aware of specific hold points.
- ☐ Discussion of Administratively approved process for deviating from the procedure, if it becomes necessary.
- ☐ Discussion of the scheduled activities, schedule restraints, and the impact of other work in the area.
- ☐ Discussion of the specific job and any departmental administrative controls required, such as RWPs, Tagouts, Flame Permits, or Fire Watches.
- ☐ Identification of materials required for the activity and their availability, including parts and tools.
- ☐ Discussion of barriers and Good Practices/Operating Experience noted from previous similar tests/evolutions.
- ☐ Discussion of the work area conditions, including any additional services required such as service air, ventilation, or lighting.
- ☐ Discussion of the expected level of housekeeping, including cleanliness requirements, foreign material exclusion, and post-test/post-evolution cleanup.
- ☐ Discussion of the need for a post-test/post-evolution review and what will be required of each participant to close out the test/evolution.
- ☐ Discussion of the need to process DRs as soon as possible after discovery.
- ☐ Define the final expected condition of the Station.

Briefing completed by _____ Date _____ Time _____
Test Coordinator/Test Lead

ATTACHMENT 4

(Page 5 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

DATE _____ TIME _____

PRE-TEST (PRE-JOB) BRIEFING MEETING ATTENDEES

	POSITION	PERSON	SIGNATURE
1.	Test Coordinator/Test Lead		
2.	Senior Operations Manager or Operations Manager on Call		
3.	System Engineer		
4.	Shift Supervisor		
5.	STA		
6.	Operator		
7.	Operator		
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

ATTACHMENT 4

(Page 6 of 6)

PRE-TEST BRIEFING CHECKLIST AND RESPONSIBILITIES

PRE-TEST (PRE-JOB) BRIEFING MEETING ATTENDEES

	POSITION	PERSON	SIGNATURE
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE QUESTIONS

A.3
SROU/SROI

RWP.

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
QUESTIONS

Task:

Determine the applicability of a RWP for a specific job and determine which personnel may be assigned the task based on personal qualifications and dose limitations.

References:

VPAP-2101 (allowed)
RWP 01-1-0003 (provided)
Radiological Survey Map and Record for G-11 (provided)
Alara Component Locator Map (provided)

Validation Time: 15 Minutes **Time Critical:** No

==========

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

_____

_____

QUESTION # 1

REFERENCE ALLOWED: __X__ / ____
yes no

Question: Assume the following Initial Conditions:

- 1-BR-E-10A (Gas Stripper Steam Heaters) is to be tagged out and drained due to a suspected tube leak.
- This task has historically taken one Operator approximately 40 minutes to complete.
- All valves that will be manipulated or tagged are located in the immediate vicinity of the heat exchangers.

Here are copies of RWP 01-1-0003, the Radiological Survey Map and Record for the area, and an ALARA Component Locator Map for the area. You are to determine if this task can be performed under RWP 01-1-0003 and provide justification for your answer.

Answer: **No. The projected dose for the job of 200 mrem will exceed the 100 mrem limit referenced in step 6.1 of the Worker Instructions section of the RWP. (.4)**

Evaluator's Cue: **If candidate states that the RWP DAD dose rate alarms and limit alarms. State HP will revise the DAD alarms if all other RWP requirements are met.**

CANDIDATE'S RESPONSE

_____

_____

_____

_____

_____

_____

Time: **15 min.**

K/A: GEN-2.3.4 (2.5/3.1)

References:

VPAP-2101 (allowed)
RWP 01-1-0003 (provided)
Radiological Survey Map and Record for G-11 (provided)
Alara Component Locator Map (provided)

QUESTION # 2

REFERENCE ALLOWED: __x__ / _____
yes no

Question: Assuming that the tagout and draining of 1-BR-E-10A will proceed, assess each individual operator to determine which could be assigned this task. Explain the basis for your decision on each individual.

- Operator #1: Qualification Level = Step 4; Quarterly Dose = 1447 mrem
- Operator #2: Qualification Level = Stepped Out; Quarterly Dose = 1824 mrem
- Operator #3: Qualification Level = Step 6; Quarterly Dose = 1556 mrem
- Operator #4: Qualification Level = Step 7; Quarterly Dose = 1478 mrem

Answer: **Operator #1: Cannot be assigned the task. The Operator is not qualified on that Watchstation. The Operator must have a qualification level of Step 6 or greater in order to perform tasks in the Auxiliary Building. (.2)**

Operator #2: Cannot be assigned the task. The Operator is excluded from the RCA due to being within 200 mrem of the Quarterly Administrative Dose Limit. VPAP 2001, Section 6.3.4, specifies that a worker who has a dose limit within 200 mrem of an administrative dose limit will be denied RCA access unless specifically authorized by the Supervisor Exposure Control and Instrumentation. (.2)

Operator #3: Can be assigned the task. The Operator is qualified on the Watchstation and their quarterly dose is below the administrative limit. (.2)

Operator #4: Can be assigned the task. The Operator is qualified on the Watchstation and their quarterly dose is below the administrative limit. (.2)

Examiner's Cue: **If asked, none of the Operators have been granted a dose limit extension for this quarter or been given permission to exceed any administrative limits.**

CANDIDATE'S RESPONSE

Time: **15 min.**

K/A: GEN-2.3.4 (2.5/3.1)

References:

VPAP-2101 (available)
RWP 01-1-0003 (provided)
Radiological Survey Map and Record for G-11 (provided)
Alara Component Locator Map (provided)

QUESTION # 1

CANDIDATE COPY

REFERENCE ALLOWED: __x__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: **Question:** Assume the following Initial Conditions:

- 1-BR-E-10A (Gas Stripper Steam Heaters) is to be tagged out and drained due to a suspected tube leak.
- This task has historically taken one Operator approximately 40 minutes to complete.
- All valves that will be manipulated or tagged are located in the immediate vicinity of the heat exchangers.

Here are copies of RWP 01-1-0003, the Radiological Survey Map and Record for the area, and an ALARA Component Locator Map for the area. You are to determine if this task can be performed under RWP 01-1-0003 and provide justification for your answer.

QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: __x__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Assuming that the tagout and draining of 1-BR-E-10A will proceed, assess each individual operator to determine which could be assigned this task. Explain the basis for your decision on each individual.

- Operator #1: Qualification Level = Step 4; Quarterly Dose = 1447 mrem
- Operator #2: Qualification Level = Stepped Out; Quarterly Dose = 1824 mrem
- Operator #3: Qualification Level = Step 6; Quarterly Dose = 1556 mrem
- Operator #4: Qualification Level = Step 7; Quarterly Dose = 1478 mrem

POWER STATION

RADIATION WORK PERMIT 01-1-0003

VALID FROM 01/01/2001 TO 12/31/2001 **RWP 01-1-0003** **REV. NO 0**

DAD DOSE RATE ALARM : 60 mRem/Hr	**PROJECTED EXPOSURE : 2197 mRem**
DAD DOSE LIMIT ALARM : 10 mRem	**ALARA EVALUATION # :**

JOB LOCATION : Owner Controlled Area excluding Containments

JOB DESCRIPTION : Operations Routine Support.

THE MAXIMUM POSTED AREA THAT CAN BE ENTERED ON THE RWP IS:
Locked High Radiation Area.

RADIOLOGICAL CONDITIONS :

GENERAL AREA RADIATION LEVELS (mRem/Hr) : See current RCA surveys.

CONTACT/HOT SPOT RADIATION LEVELS (mRem/Hr) : See current RCA surveys.

CONTAMINATION LEVELS (dpm/100cm2) : See current RCA surveys.

AIRBORNE RADIOACTIVITY (DAC) : < .30

REQUIRED JOB COVERAGE : Advanced Radiation Worker

1.0 If ARW coverage cannot be obtained routine Health Physics coverage applies.
2.0 Continuous Health Physics Coverage is required for the following:
  2.1 Entry into Locked High Radiation Areas without self-closing gates.
  2.2 Entry into a posted "Hot Particle Area" with contamination levels greater than 1,000,000 dpm/100cm^2.

DOSIMETRY REQUIREMENTS : TLD DAD/SRD

1.0 DAD alarms may be revised, by the Health Physics Shift Supervisor, up to 1,000 mRem/hr on an as needed basis.

PROTECTIVE CLOTHING REQUIREMENTS :

HEAD AND BODY FEET HANDS

1.0 Refer to the Radiological Conditions Legend for minimum protective clothing requirements in posted contaminated areas.
2.0 Additional Protective Clothing required for a Hot Particle Area (HPA):
  2.1 Hood, Coveralls, Gloves, and Shoe Covers. Use Cuff Sealers over gloves and secure leg cuffs with tape.

Prepared by :	C. Logan	Date : 12/11/2000	Approved By :		Date : 12/11/00
Revised by :		Date :	Approved By :		Date :
Terminated by :		Date :	Approved By :		Date :

JOB LOCATION

RADIATION WORK PERMIT 01-1-0003

2.2 For interfacing with individuals or equipment at HPA step off pad, an extra pair of gloves and a face shield is required.

3.0 Protective Clothing requirements may be modified by the HPSS.

RESPIRATORY REQUIREMENTS :

MINIMUM TRAINING REQUIRED TO USE THIS RWP : BRWII

WORKER INSTRUCTIONS :

1.0 If your DAD dose alarms (on and off alternating tone) immediately leave the area and report to Health Physics-Operations. (HP-Ops)
If your DAD dose rate alarms (continuous tone) leave the area causing the alarm, if the alarm continues report to HP-Ops.
2.0 Notify HP-Ops, if radiological conditions occur which are not anticipated (i.e. Radioactive liquid spills, Air Monitor alarm, Radiation Monitor alarm, etc.).
3.0 Notify HP-Ops prior to entering the RCA daily, prior to starting work.
4.0 Work performed in support of special RWP activities should be performed under the specific RWP for that task.
5.0 Ensure any water encountered during the job is properly contained and removed per HP-Ops instructions.
6.0 This RWP shall not be used if:
  6.1 The total estimated exposure for the task is > 100 mRem.
  6.2 Tasks to be performed could cause a significant change in the radiological conditions.
7.0 Overhead areas require HP-Ops notification prior to entry.
8.0 Notify HP-Ops prior to entry into any area posted "Neutron Dose Calculations Required for Entry."
9.0 Hot Particle Area Exit Instructions (including those interfacing with workers/equipment in HPA) :
  9.1 Workers with exposed skin shall be monitored by HP-Ops every two hours (unless specified by the HPSS) while in the HPA.
  9.2 Workers exiting the HPA shall proceed directly to the PDA for whole body monitoring, OR
  9.3 Workers that will remain in the RCA will be monitored upon exiting the HPA. Monitoring shall consist of a whole body scan.
  9.4 Do not remove any items from a posted "Hot Particle Area" until authorized by HP-Ops.

HEALTH PHYSICS INSTRUCTIONS :

1.0 Neutron Dose determination is required for all entries into areas posted "Neutron Dose Calculations Required for Entry". Calculate each worker's neutron dose utilizing the "Neutron and Noble Gas Dose Calculation Record".
2.0 Hot Particle Area (HPA) monitoring requirements:
  2.1 Workers exiting the HPA will be monitored consisting of a whole body scan within 1/2 inch using:
    2.1.1 RM-14 (with an HP-210 and background less than 22,000 cpm);
    OR
    2.1.2 RO-2 (open window and background less than 2.0 mRem/hr);
    AND
    2.1.3 Worker release criteria: a net reading of less than 36,000 cpm or less than 4.0 mRem/hr at 1/2 inch.

Location: [illegible] PDT, Tool Stripper & Liquid Waste Tank Room (G-[illegible])

PURPOSE: ☒ Routine ☐ Non-Routine ☐ RWP Prep., for RWP No.# _____

TYPE: ☒ Gamma ☐ Beta ☐ Neutron ☐ Smear, GA ☒ Smear, LA ☐ Smear, HP ☐ Air Sample

REACTOR POWER	
Unit 1	Unit 2
100%	100%

Instrument Model	Serial #
TELE 6112B	11728
RSO-50E	189
RM-14	8003

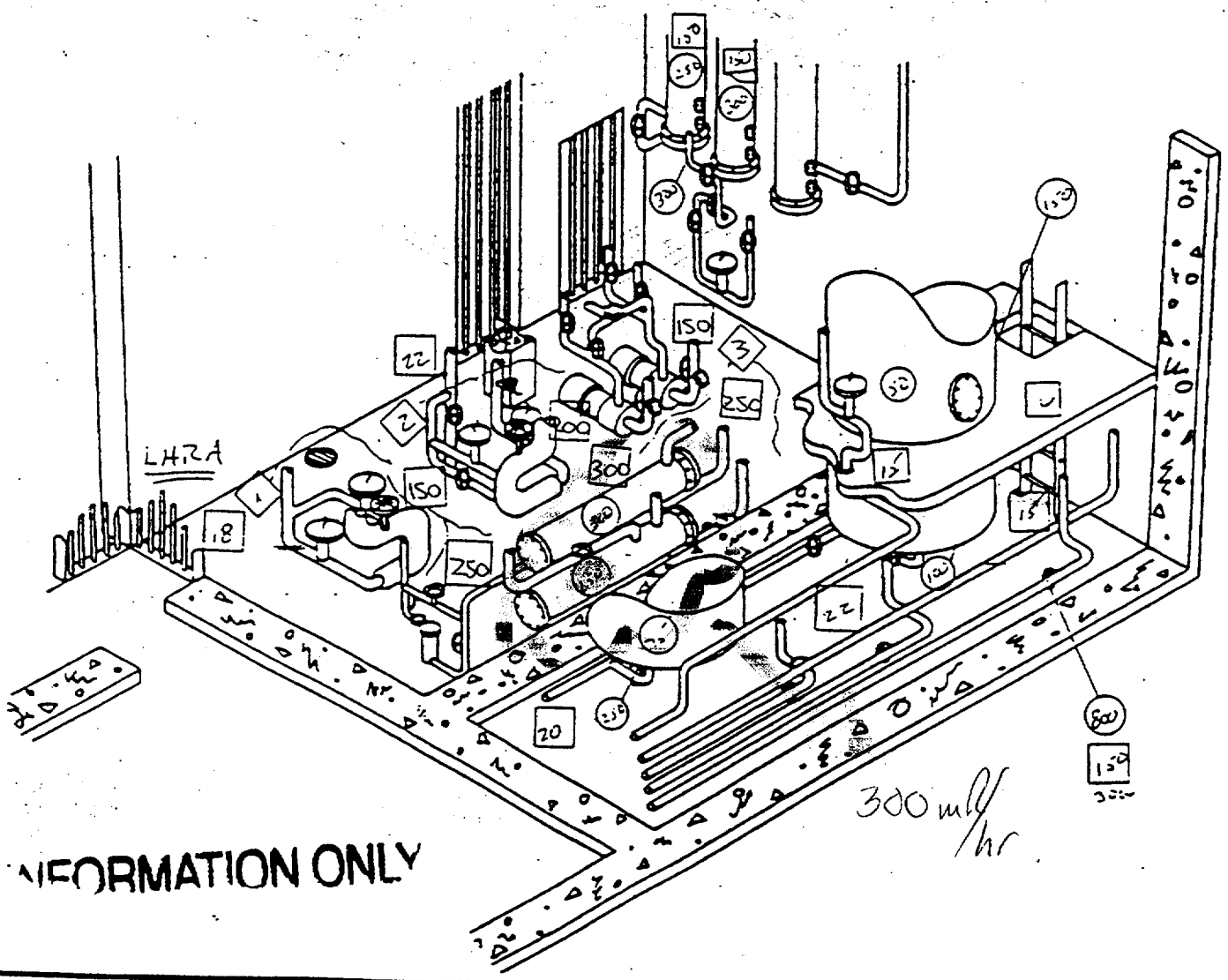
☐ All GA smears < 1000 DPM/100cm² except as noted on map or smear worksheet.
☐ All GA smears < 1000 DPM/100cm²
☒ All LA smears < 1000 DPM/ft²
☐ All HP smears < 1 HP/smear
☐ Air particulate + I_2 < 0.1 DAC
☐ _____

☐ All GA smears in DPM/100cm²
☐ All HP smears in HPs/smear
☒ All Gamma readings in mrem/hr.
☐ All Neutron readings in mrem/hr.
☐ All Beta readings in mrad/hr.

Comments: QUARTERLY SURVEY

Survey RWP: 01-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name/Signature)	Date
4	HP TECH #1	HP TECH #2	YESTERDAY



INFORMATION ONLY

LDWA - Low Dose Waiting Area
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area

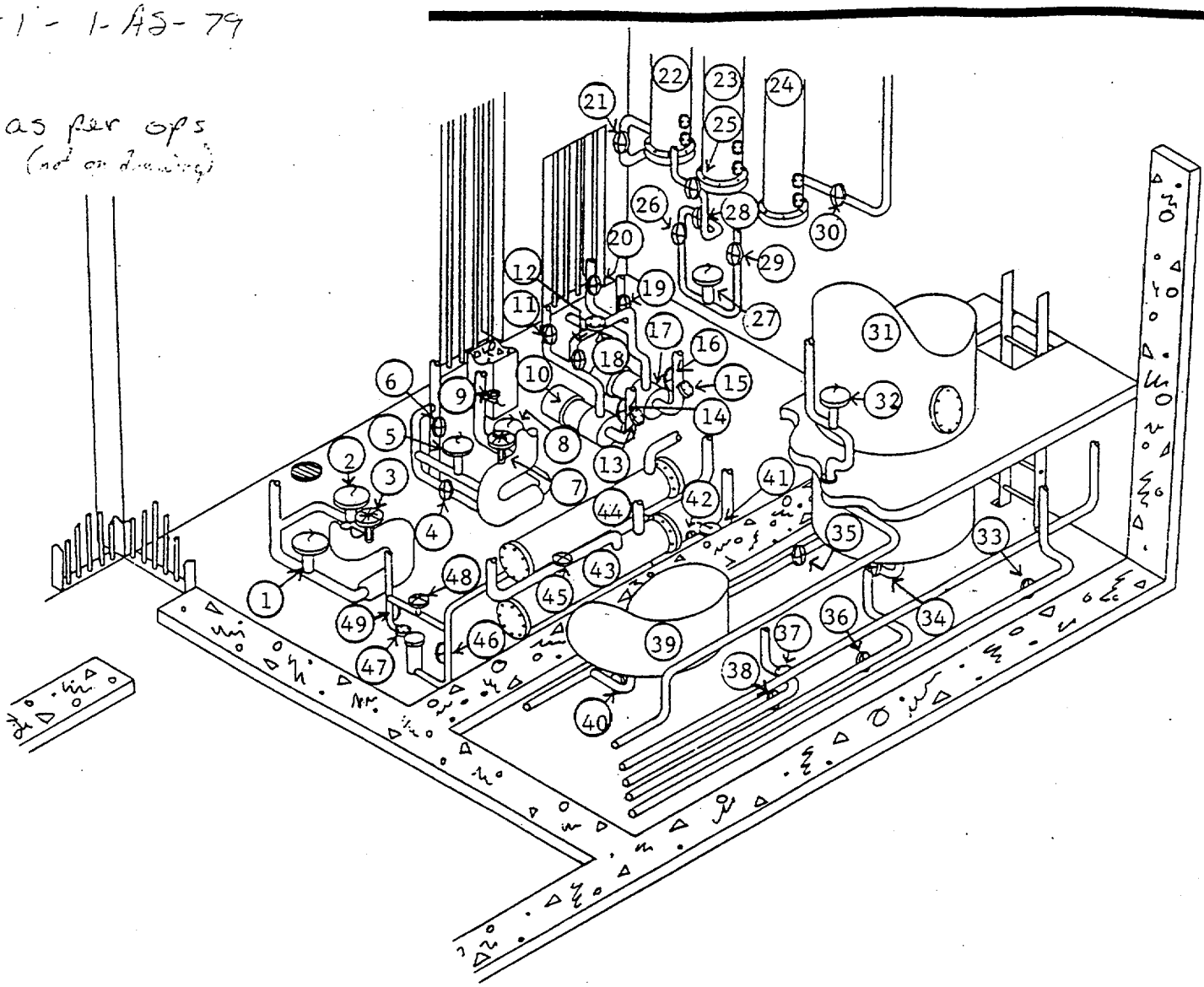
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material(s)

CAM - Continuous Air Monitor
(F) - Frisking Station
RCAB - Radiological Control Area Boundary
NDCR - Neutron Dose Calculation Required

☐ Gen. Area; ○ Contact; △ GA Smear; ◇ LA Smear; △* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~LOCK~~ Barrier

#1 - 1-AS-79

as per ops
(not on drawing)



PDT, GAS STRIPPER & LW TK. ROOM
G-11, 2' ELEV.

1. 1-BR-TCV-103B
2. 1-AV-PCV-150B
3. 1-AS-77
4. 1-AS-174
5. 1-AV-PCV-150A
6. 1-AS-176
7. 1-AS-179
8. 1-BR-TCV-103A
9. 1-AS-80
10. 1-BR-P-7A
11. 1-BR-8
12. 1-BR-7
13. 1-BR-S-7A
14. 1-BR-3
15. 1-BR-S-7B
16. 1-BR-4
17. 1-BR-P-7B
18. 1-BR-10
19. 1-BR-26
20. 1-BR-25
21. 1-BR-39
22. 1-BR-E-6A
23. 1-BR-E-6B
24. 1-BR-E-6C
25. 1-BR-15
26. 1-BR-11
27. 1-BR-PCV-131
28. 1-BR-12
29. 1-BR-13
30. 1-BR-47
31. 1-LW-TK-2B
32. 1-LW-HCV-109A
33. 1-LW-345
34. 1-LW-32
35. 1-LW-31
36. 1-LW-47
37. NOT LABELED
38. NOT LABELED
39. 1-LW-TK-2A
40. 1-LW-29
41. 1-BR-16
42. 1-BR-305
43. 1-BR-E-10A
44. 1-BR-E-10B
45. 1-AS-102
46. 1-AS-105
47. 1-AS-107
48. 1-AS-106
49. 1-AS-108

VALVES NOT SHOWN

1-CC-497	1-CC-498
1-CC-499	1-CC-500
1-CC-501	1-CC-502
1-CC-503	1-CC-504
1-CC-505	1-CC-506
1-CC-507	1-CC-508
1-CC-509	1-CC-510
1-AS-104	1-AS-176
1-AS-177	1-AS-180
1-LW-46	1-LW-40
1-LW-HCV-109B	

ALARA COMPONENT LOCATOR MAP

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE QUESTIONS

A.4
SROU/SROI

Classify an Event IAW EPIP-1.01.

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
QUESTIONS

Task:

Classify an event IAW EPIP-1.01.

References:

EPIP-1.01, EMERGENCY ACTION LEVEL TABLE

Validation Time: 25 Minutes **Time Critical:** No

==========

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

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_____

QUESTION # 1

REFERENCE ALLOWED: ___X___ / _____
yes no

Question: Given the the following conditions determine the highest applicable EPIP classification, if any:

- 1-SV-1551A, "A" Pressurizer Safety valve has failed open.
- RCS pressure is currently stable at 1400 psig.
- RCS subcooling indicates 15°F
- Pressurizer level indicates 47%.
- 1-CH-RM-118, Letdown Radiation monitor indicates, 2.3×10^2cpm
- 1-RM-RMS-161, Outside Containement Radiation Monitor indicates 13 mr/hr
- Containment pressure is 18.3 psia and increasing.
- All systems have responded as designed.

Answer: **TAB B-1, Site Area Emergency (4.0)**

Other applicable Tabs:
A-4, NOUE
B-2, Alert
B-3, NOUE

CANDIDATE'S RESPONSE

_____

_____

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_____

_____

_____

Time: 15 min.

K/A: GEN-2.4.41 (2.3/4.1)

References:

EPIP-1.01

QUESTION # 2

REFERENCE ALLOWED: ___X___ / _____
yes no

Question: Given the fact an EAL (Emergency Action Level) TAB for a Site Area Emergency has been exceeded, state the time requirements to perform the following actions?

a. Event classification from the time the event occurs.

The following time requirements are from the time of actual declaration of the event

b. Notification of the NRC.
c. Notification of the State Emergency Operating Center (EOC)
d. Notification of surroundinng localities.
e. Completion of Personnel Accountability
f. Activation of the Emergency Response Data System (ERDS)

Answer:
a. 15 Minutes (1.0)
b. Immediately, not to exceed 1 hour (1.0)
c. 15 Minutes (1.0)
d. 15 Minutes (1.0)
e. 30 Minutes (1.0)
f. As soon as possible, not to exceed 1 hour. (1.0)

Evaluator's Note: Only references available in the control room or simulator are available for use.

CANDIDATE'S RESPONSE

_____

_____

_____

_____

_____

Time: 10 Minutes.

K/A: GEN-2.4.42 (2.3/4.0)

References:

EPIP Series Available in the Simulator or Control Room.

QUESTION # 2
CANDIDATE COPY

REFERENCE ALLOWED: ___X___ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the fact an EAL (Emergency Action Level) TAB for a Site Area Emergency has been exceeded, state the time requirements to perform the following actions?

a. Event classification from the time the event occurs.

The following time requirements are from the time of actual declaration of the event

b. Notification of the NRC.
c. Notification of the State Emergency Operating Center (EOC)
d. Notification of surroundinng localities.
e. Completion of Personnel Accountability
f. Activation of the Emergency Response Data System (ERDS)

QUESTION # 1
CANDIDATE COPY

REFERENCE ALLOWED: __X__ / _____
yes no

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF ANSWER)

Question: Given the the following conditions, determine the highest applicable EPIP classification, if any:

- 1-SV-1551A, "A" Pressurizer Safety valve has failed open.
- RCS pressure is currently stable at 1400 psig.
- RCS subcooling indicates 15°F
- Pressurizer level indicates 47%.
- 1-CH-RM-118, Letdown Radiation monitor indicates, 2.3×10^2cpm
- 1-RM-RMS-161, Outside Containement Radiation Monitor indicates 13 mr/hr
- Containment pressure is 18.3 psia and increasing.
- All systems have responded as designed.

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. Loss of cooling function needed for Cold Shutdown and Refueling Condition CSD & RSD	• Secondary System cooling capability - UNAVAILABLE AND • Loss of any of the following systems: • Service Water • Component Cooling • Residual Heat Removal AND • RCS temperature GREATER THAN 140° F	ALERT
4. Failure of a safety or relief valve to close after pressure reduction ALL CONDITIONS	• RCS • RCS pressure - LESS THAN 2000 psig OR Overpressure Mitigation System - ENABLED AND • Any indication after lift or actuation that Pressurizer Safety or PORV - REMAINS OPEN AND • Flow - NON-ISOLABLE • MAIN STEAM Excessive flow through Steam Generator Safety or PORV as indicated by rapid RCS cooldown rate - GREATER THAN 50° F per hour	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. RCS leak rate exceeds makeup capacity ABOVE CSD CONDITION	• Primary system leak (LOCA) - IN PROGRESS AND • Safety Injection - REQUIRED AND • RCS subcooling based on Core Exit Thermocouples - LESS THAN 30° F OR RCS inventory cannot be maintained based on pressurizer level or RVLIS indication	SITE AREA EMERGENCY
2. RCS leak rate limit - EXCEEDED ABOVE CSD CONDITION	• Primary system leak determined to be - GREATER THAN 50 gpm AND • Pressurizer level can be - RESTORED AND MAINTAINED	ALERT
3. Leak rate requiring plant shutdown IAW T.S. ABOVE CSD CONDITION	Intentional reduction in power, load, or temperature IAW T.S. 3.1.C leakage limit Action Statement - HAS COMMENCED	NOTIFICATION OF UNUSUAL EVENT

Have one of the trainees role play the Station Emergency Manager. Have him follow EPIP-1.01, Emergency Manager Controlling Procedure, assuming classification of each type has occurred. Go through EPIP 1.02 through 1.05 in this manner. Answer trainee questions as the EPIPs are presented and emphasize the following.

1. EPIP 1.01 Emergency Manager Controlling Procedure

   a. Declaration of the highest emergency class for which an EAL is exceeded shall be made.

   b. It is the NRC's position that 15 minutes is an appropriate time for classification of an event once indications are available to the MCR that an EAL has been exceeded.

   c. As plant status changes during an emergency, reclassify using EAL Tables.

   d. If basis for EAL no longer exists when discovered and no other reasons exist for an emergency declaration, the EPIPs are not implemented. A VPAP-2802 one-hour, non-emergency report for classification without declaration is made for this condition

2. EPIP 1.02 Response to Notification of Unusual Event

   User - Station Emergency Manager

   b. Initial notification of an emergency must be made within 15 minutes following declaration of the emergency with follow-up reports to state and local governments approximately every 60 minutes or when changes in emergency conditions indicate an increasing hazardous situation.