FINAL SUBMITTAL

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

FINAL AS-GIVEN JPMs FOR EACH

WALK-THROUGH TEST

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/- 6 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/- 6 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.

SURRY POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

JPM A.1-2
SROU/SROI

Evaluate Critical Safety Function Status Trees

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 Heat Sink. *(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

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
ADMINISTRATIVE
Topic A.2

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.

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.

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.

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

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Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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SURRY
POWER
STATION
ADMINISTRATIVE
Topic A.3

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 22 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 110 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

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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 = 1894 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. (.15)**

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. (.15)

Operator #3: Can be assigned the task. The Operator is qualified on the Watchstation and their quarterly dose is below the administrative limit. (.15)

Operator #4: Can be assigned the task. The Operator is qualified on the Watchstation and their quarterly dose is below the administrative limit. (.15)

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)

SURRY
POWER
STATION
ADMINISTRATIVE
Topic A.3

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 22 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.

SURRY
POWER
STATION
ADMINISTRATIVE
Topic A.3

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 = 1894 mrem
- Operator #3: Qualification Level = Step 6; Quarterly Dose = 1556 mrem
- Operator #4: Qualification Level = Step 7; Quarterly Dose = 1478 mrem

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

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Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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SURRY
POWER
STATION
ADMINISTRATIVE
Topic A.4

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 and when the time requirements start to perform the following actions?

a. Event classification from the time the event occurs
b. Notification of the NRC
c. Notification of the State Emergency Operating Center (EOC)
d. Notification of surrounding 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.

SURRY
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ADMINISTRATIVE
Topic A.4

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 and when the time requirements start to perform the following actions?

a. Event classification from the time the event occurs
b. Notification of the NRC
c. Notification of the State Emergency Operating Center (EOC)
d. Notification of surrounding localities.
e. Completion of Personnel Accountability
f. Activation of the Emergency Response Data System (ERDS)

SURRY
POWER
STATION
ADMINISTRATIVE
Topic A.4

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.

Facility: **RNP**		Date of Exam: **26-Mar-01**						Exam Level:				**RO**	
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1 Emergency & Abnormal Plant Evolutions	1	2	2	3				3	3			3	16
	2	2	2	4				3	4			2	17
	3	1	0	1				0	0			1	3
	Tier Totals	5	4	8				6	7			6	36
2 Plant Systems	1	2	2	2	2	2	2	2	3	2	2	2	23
	2	1	2	2	2	2	2	1	2	2	2	2	20
	3	1	1	1	2	0	1	1	0	1	0	0	8
	Tier Totals	4	5	5	6	4	5	4	5	5	4	4	51
3 Generic Knowledge and Abilities		Cat 1			Cat 2			Cat 3			Cat 4		
		4			3			2			4		13

Notes:

1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. Actual point totals must match those specified in the table.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6. * The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.
8. Shaded K/As on the following pages indicate that the related questions appear ONLY on the RO examination.

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1							Form ES-401-4
	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1			3				Tech-Spec limits for rod mismatch	3.6	1
000015/17 RCP Malfunctions / 4				20			RCP malfunctions: Bearing temperature	2.7	1
W/E09&E10 Natural Circ. / 4			1				(Nat Circ) Facility operating characteristics	3.3	1
000024 Emergency Boration / 1				5			Performance of letdown system during emergency boration	3.1	1
000026 Loss of Component Cooling Water / 8				5			CCWS radiation alarm	3.1	1
000027 Pressurizer Pressure Control System Malfunction / 3		3					Pressurizer Pressure controllers and positioners	2.6	1
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / 4	2						(Uncont Depress all SGs) Emergency operating procedures	3.5	1
W/E08 RCS Overcooling - PTS / 4			3				(PTS) Desired operating results during emergency situations	3.7	1
000051 Loss of Condenser Vacuum / 4					2		Conditions requiring reactor and/or turbine trip	3.9	1
000055 Station Blackout / 6						2.4.1	EOP entry conditions (Station Blackout)	4.3	1
000057 Loss of Vital AC Elec. Inst. Bus / 6					20		Interlocks to restore normal equipment operation	3.6	1
000062 Loss of Nuclear Service Water / 4						2.4.24	Loss of cooling water procedures (SW)	3.3	1
000067 Plant Fire On-site / 9					4		Fire's extent of potential damage to equipment	3.1	1
000068 Control Room Evac. / 8						2.4.11	Abnormal condition procedures (Cont Room Evac)	3.4	1
000069 (W/E14) Loss of CTMT Integrity / 5	2						(High Cont Press) Emergency operating procedures	3.2	1
000074 (W/E06&E07) Inad. Core Cooling / 4		2					(Core Cooling) Facility's heat removal and operation	3.8	1
000076 High Reactor Coolant Activity / 9									
K/A Category Totals:	2	2	3	3	3	3	Group Point Total:		16

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2						Form ES-401-4	
	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1					3		Actions taken if automatic functions have not taken place	4.5	1
000003 Dropped Control Rod / 1						2.4.4	Entry-level for abnormal operating procedures (Dropped Rod)	4.0	1
000007 Reactor Trip - Stabilization - Recovery / 1			1				Actions contained in EOP for reactor trip	4.0	1
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3 (PSA)						2.4.9	EOP terms and definitions (LBLOCA)	3.1	1
W/E04 LOCA Outside Containment / 3									
W/E03 LOCA Cooldown/Depress. / 4 (PSA)				2			(LOCA CD/Depress) Operating behavior characteristics	3.7	1
W/E11 Loss of Emergency Coolant Recirc. / 4 (PSA)		2					Facility's heat removal systems and proper operation	3.9	1
W/E01 & E02 Rediagnosis & SI Termination / 3			2				(SI Termination) EOP implementation	3.3	1
000022 Loss of Reactor Coolant Makeup / 2									
000025 Loss of RHR System / 4	1						Implications of loss of RHRS during all modes	3.9	1
000029 Anticipated Transient w/o Scram / 1					1		ATWS: Reactor nuclear instrumentation	4.4	1
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7					11		Loss of compensating voltage	3.1	1
000037 Steam Generator Tube Leak / 3				11			SG Tube Leak: PZR level indicator	3.4	1
000038 Steam Generator Tube Rupture / 3				30			SGTR: SI and containment isolation	4.0	1
000054 Loss of Main Feedwater / 4 (PSA)	1						MFW line break depressurizes S/G (similar to steam break)	4.1	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 (PSA)					2		(Loss of Heat Sink) Adherence to procedures	3.7	1
000058 Loss of DC Power / 6			1				Use of dc control power by D/Gs	3.4	1
000059 Accidental Liquid RadWaste Rel. / 9		2					Radioactive-gas monitors	2.7	1
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7			2				Guidance contained in alarm response for ARM system	3.4	1
W/E16 High Containment Radiation / 9									
K/A Category Totals:	2	2	4	3	4	2	Group Point Total:		17

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3							Form ES-401-4	
	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2	1						PZR reference leak abnormalities	2.8	1
000036 Fuel Handling Accident / 8						2.2.28	Fuel movement procedures (Fuel Handling Accident)	2.6	1
000056 Loss of Off-site Power / 6									
000065 Loss of Instrument Air / 8									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5			1				(Cont Flooding) Coolant chemistry and effects	2.7	1
K/A Category Totals:	1	0	1	0	0	1	Group Point Total:		3

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 1											Form ES-401-4		
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive						1						CRDS reset system, rod control annunciator	2.9	3
							6					Operating CRDS controls: Reactor power	4.1	
			1									Effect of loss/malfunction of CRDS on CVCS	2.9	
003 Reactor Coolant Pump											2.1.32	Limits and precautions (RCP)	3.4	2
								5				Effects of VCT pressure on RCP seal leakoff flows	2.5	
004 Chemical and Volume Control										4		Calculation of boron concentration changes	3.2	3
		3										Power supplies to charging pumps	3.3	
							11					CVCS controls: Letdown and charging flows	3.0	
013 Engineered Safety Features Actuation								2				Consequences of excess steam demand	4.3	3
										3		Operate/monitor: ESFAS initiation	4.5	
		1										Power supplies to ESFAS/safeguards equipment	3.6	
015 Nuclear Instrumentation					4							Factors affecting accuracy of calorimetrics	2.6	2
						4						NIS: Bistables and logic circuits	3.1	
017 In-core Temperature Monitor				1								Input to subcooling monitors	3.4	1
022 Containment Cooling									1			Initiation of safeguards mode of operation	4.1	2
			2									Effect of loss of CCS on cont instruments	3.0	
056 Condensate	3											Relationships between Condensate and MFW	2.6	1
059 Main Feedwater				19								Automatic feedwater isolation	3.2	1
061 Auxiliary/Emergency Feedwater (PSA)									3			AFW S/G level control on automatic start	3.9	2
	7											AFW: Emergency water source	3.6	
068 Liquid Radwaste											2.3.11	Radiation releases (Liquid Radwaste)	2.7	1
071 Waste Gas Disposal								5				WGDS: Power failure to ARM and PRM	2.5	1
072 Area Radiation Monitoring					2							Radiation intensity changes with source distance	2.5	1
K/A Category Totals:	2	2	2	2	2	2	2	3	2	2	2	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2												Form ES-401-4	
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant					10							Relationship between reactor power and RCS diff temp	3.6	1
006 Emergency Core Cooling									6			Automatic operation of valve lineups	3.9	1
010 Pressurizer Pressure Control											2.1.33	Entry-level conditions for tech specs (Pressurizer Pressure)	3.4	1
011 Pressurizer Level Control						4						Effect on operation of PZR level controllers	3.1	1
012 Reactor Protection						4						RPS: Bypass-block circuits	2.9	2
		1										Power supplies to RPS channels, components	3.3	
014 Rod Position Indication								4				Consequences of misaligned rod	3.4	1
016 Non-nuclear Instrumentation			1									Effect of loss of NNIS on RCS	3.4	1
026 Containment Spray							1					CSS controls: Containment pressure	3.9	1
029 Containment Purge				1								Automatic purge isolation	3.2	1
033 Spent Fuel Pool Cooling			3									Effect of loss on spent fuel temperature	3.0	1
035 Steam Generator				1								S/GS feature(s) providing for S/G level control	3.6	1
039 Main and Reheat Steam					8							Effect of steam removal on reactivity	3.6	1
062 AC Electrical Distribution		1										Power supplies to major system loads	3.3	1
063 DC Electrical Distribution											2.1.32	System limits and precautions (DC Electrical)	3.4	1
064 Emergency Diesel Generator										2		Adjustment of exciter voltage	3.3	1
073 Process Radiation Monitoring										1		Operate/monitor: Effluent release	3.9	1
075 Circulating Water								2				Consequences of loss of CW pumps	2.5	1
079 Station Air	1											Relationship between SAS and IAS	3.0	1
086 Fire Protection									1			Starting mechanisms of fire water pumps	2.9	1
K/A Category Totals:	1	2	2	2	2	2	1	2	2	2	2	Group Point Total:		20

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 3											Form ES-401-4	
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal			1									Effect of loss of RHRS on RCS	3.9	1
007 Pressurizer Relief/Quench Tank									1			Components which discharge to the PRT	2.7	1
008 Component Cooling Water				2								CCWS: Operation of surge tank	2.9	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control							2					HRPS controls: Containment pressure	3.4	1
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control						3						SDS: Controller and positioners	2.7	1
045 Main Turbine Generator	18											Relationships between MT/G system and RPS	3.6	1
076 Service Water		1										Power supplies to service water	2.7	1
078 Instrument Air														
103 Containment				6								Containment isolation system	3.1	1
K/A Category Totals:	1	1	1	2	0	1	1	0	1	0	0	Group Point Total:		8

Plant-Specific Priorities

System/Topic	Recommended Replacement for …	Reason	Points
Plant-Specific Priority Total: (limit 10)			

Facility: **RNP**	Date of Exam: **26-Mar-01**		Exam Level: **RO**	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Conduct of operations requirements	3.7	1
	2.1.3	Shift turnover practices	3.0	1
	2.1.29	Conduct and verify valve lineups	3.4	1
	2.1.18	Make accurate, clear and concise logs, records, status boards, and reports	2.9	1
	Total			4
Equipment Control	2.2.11	Process for controlling temporary changes	2.5	1
	2.2.13	Tagging and clearance procedures	3.6	1
	2.2.26	Refueling administrative requirements	2.5	1
	Total			3
Radiation Control	2.3.2	Facility ALARA program	2.5	1
	2.3.1	10 CFR:20 and related facility radiation control requirements	2.6	1
	Total			2
Emergency Procedures/ Plan	2.4.22	Prioritizing safety functions during emergency operations	3.0	1
	2.4.26	Facility protection requirements including fire brigade	2.9	1
	2.4.43	Emergency communications systems and techniques	2.8	1
	2.4.45	Interpret significance of each annunciator or alarm	3.3	1
	Total			4
Tier 3 Point Total				13