August 24, 1998

Florida Power Corporation
ATTN: Mr. Bruce J. Hickle, Acting Director
Nuclear Operations Training
8200 West Venable Street
Crystal River, FL 34429

SUBJECT: MEETING SUMMARY AND PUBLIC MEETING ANNOUNCEMENT - JULY 1998 NRC REGION II EXAMINATION WORKSHOP AND NOVEMBER 1998 TRAINING MANAGERS' CONFERENCE - CRYSTAL RIVER NUCLEAR PLANT

Dear Mr. Hickle:

Region II facilitated a workshop on Operator Licensing Examination Techniques on July 15, 1998, conducted at the Richard B. Russell Building. The workshop attendees included representatives from all Region II facilities. It is our opinion that the workshop was beneficial and provided an excellent opportunity for open discussion on the operating test portion of the operator licensing examination process.

During the workshop, we covered a preliminary response to concerns expressed at the January 1998 workshop and a synopsis was promised, but due to the status of the program, cannot be provided. The slides used for our discussions are enclosed.

Also, I would like to extend an invitation to you, and to members of your operations and training staff, to attend this year's Training Managers' Conference to be held on November 5, 1998. Our goal for the meeting is to provide an open forum for discussion of operator licensing issues. The site for this year's conference will be in the Richard B. Russell Building Auditorium on Spring Street in downtown Atlanta. As of this date, the agenda is open. We encourage you to submit, via telephone, a list of topics that you would like to have discussed.

Additionally, we would appreciate an update of the home addresses of your licensed operators. Please send them in an envelope marked "To Be Opened by Addressee Only" to either Ms. Beverly Michael or myself. If you have any questions or need additional information, please contact Bev at (404) 562-4640 or me at (404) 562-4638.

Sincerely,

(Original signed by T.A. Peebles)

Thomas A. Peebles, Chief
Operator Licensing and Human
Performance Branch
Division of Reactor Safety

Docket No.: 50-302
License No.: DPR-72

Enclosures: As Stated

cc w/encls:
J. P. Cowan, Vice President, Nuclear Operations
Crystal River Nuclear Plant

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B. Michael, DRS

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OPERATING TEST WORKSHOP
Richard B. Russell Auditorium
July 15, 1998

8:00 Opening Remarks (Johns Jaudon)

8:20 Standard JPM format (SSNTA)

8:40 JPM critical tasks (Hopper & Meller)
What constitutes a critical task?

The importance of measurable criteria?
* Good examples
* Bad examples

Discrimination (it has to be failable!)
* Good examples
* Bad examples

9:30 JPM Questions (Baldwin)
Direct look up. As defined in ES-602. Attachment 1, B.2.e (p.15)
* examples
* "fixes" to those examples

Use of Open and Closed Reference items as defined in ES-301, D.1.l (p.9) which states: "closed reference items may be used to evaluate the immediate actions for emergency and other procedures, certain automatic actions, operating characteristics, interlocks, and set points..."
* examples
* "fixes" to those examples

10:30 Administrative JPMs (Steiner)

11:00 Scheduling (Steiner)
* ways to optimize the material developed
* simulator bottle necks
* control room JPMs
* reasonable daily work loads
* candidate stress
* exam delays

11:30 Lunch

1:00 Exam predictability and exam security (Payne)

1:30 Simulator scenario development (Payne & Hopper)
* scheduling and crew makeup
* evaluation tool
* malfunctions in relation to major event
* level of detail

3:30 Questions and Answers

4:30 Closing

REGION II WORKSHOP - OPERATING TEST
JULY 15, 1998
Richard B. Russell Building Strom Auditorium

David Lane	Examiner - Sonalysts
Larry Kelley	Training Advisor - OHN/Pickering
John Brewer	Manager - Authorization Training - Ontario Hydro Nuclear

Carolina Power and Light Company

Tom Hackler	Requal Training - Brunswick
Curtis Dunsmore	Initial Training - Brunswick
Tony Pearson	Initial Training - Lead - Brunswick
Terry Toler	Instructor - Harris
Rick Garner	Sperviisor - Ops Training - Harris
Dwayne Coffey	LOCT Supervisor - Robinson
Dave Neal	OIT Lead - Robinson
Scott Poteat	Support Lead - Robinson

Duke Energy Corporation - Catawba, McGuire, and Oconee

David Re	Training Instructor
Charles Sawyer	Senior Tech Spec
James Presten	Instructor
Brent Moore	Instructor
Bill Caudill	Nuclear Instructor
E. T. Beedle	Instructor - Catawba
Reggie Kimray	Nuclear Instructor - Catawba
John Supte	Operations - Catawba
Rob Billings	Instructor - McGuire
Steve Helms	Instructor - McGuire
Robby Pope	Supervissor - Mcguire
Rick Robinson	Ops Training Coordinator - Oconee
Robin Lane	Training Instructor - Oconee
J. R. Steely	Training Instructor - Oconee
David Covar	Nuclear Instructor - Oconee
Randall Yarbrough	Nuclear Instructor - O[illegible]e
Bobby Ayers	Ops Instructor - Oco[illegible]e

Florida Power Corporation

Ivan Wilson	Ops Manager
Jack Springer	Supervisor - Training - Crystal River
Johnie Smith	Ops Training Supervisor - Crystal River

Florida Power and Light Company

Dave Brown	Initial Training - St. Lucie
Tim Bolander	Simulator and Exams - St. Lucie
Mike Croteau	Instructor - Training - Turkey Point
Rich Bretton	LOCT Supervisor - Training - Turkey Point

South Carolina Electric and Gas Company

Jim Callicott	Senior Instructor
Perry Ramicone	Instructor - V. C. Summer

Southern Nuclear Operating Company, Inc. (SNC)

Tom Blindauer	Senior Plant Instructor - Simulator - Farley
Bill Oldfield	Training - Farley
Steve Be	Training - Hatch
Ken Drawdy	Training Instructor - Vogtle
Thad N. Thompson	Ops Training Instructor - Vogtle
Perry Tucker	Ops Training Instructor - Vogtle
Michael Henry	Nuclear Instructor - Vogtle
Leon Ray	Ops Training Supervisor - Vogtle
Fred Howard	Ops Reg Instructor - Vogtle
Perry Vannier	Initial Training - Vogtle
Charlton Sal	Requal Training - Vogtle
Steve Dyer	Requal Training - Vogtle

Tennessee Valley Authority

Phillip H. Case	Simulator Instructor - NC Training
Denny Campbell	Ops Instructor -Browns Ferry
Marvin Meer	Ops Instructor - Browns Ferry
Jim Kearney	Ops Instructor - Sequoyah
Dave Davidson	Ops Instructor - Sequoyah
Steve Taylor	Ops Instructor - Sequoyah
Ricky C. King	Senior Ops Instructor - Sequoyah
Ed Keyser	Simulator Instructor - Sequoyah
Tom Wallace	Supervisor - Watts Bar
Terry L. Newman	Ops Instructor - Watts Bar
Jack Cox	Training Manager - Watts Bar
John Roden	Ops Training Manager - Watts Bar
Randy Evans	HLT Lead - Watts Bar

Virginia Electric and Power and Power Company

Walt Shura	Supervisor - Training - North Anna
Steve Crawford	Senior Instructor (Nuclear) - North Anna
Ken Grove	Senior Instructor - Surry
Ray Simmons	Senior Instructor - Surry

EXAM REVIEW GUIDELINES

I. TECHNICAL ACCURACY

- Is there more than one correct answer?
- Is the given answer correct?
- Adequate data in the stem?
- Is data in the stem consistent and plausible?

II. PSYCHOMETRICS: The process of applying sound qualitative processes to menta' measurements.

PSYCHOMETRIC FLAWS THAT COULD DIMINISH THE VALIDITY OF THE EXAMINATION!		
FLAW	GUIDANCE	APPENDIX B REFERENCE
1. Low level of knowledge	Question should be written to reflect the level of knowledge most appropriate for a specific K/A. When there is a choice, try to write the question to reflect the higher level. *SEE LEVEL OF KNOWLEDGE BELOW	App. B 1.d
2. Low operational validity	Does the question test the *intent* of the K/A? Could someone do the job safely and effectively without being able to answer the question?	App. B 1.a/b/e 2.k
3. Low discriminatory validity	Will a less than competent candidate miss the item? Can a person understand the principle being tested and still miss the item? *SEE LEVEL OF DIFFICULTY BELOW.	App. B 1.d 2.g
4. Implausible Distractors	Can a distractor be eliminated with out understanding the concept being tested?	App. B 2.b/f/h/m
5. Confusing or ambiguous language	State the question as concisely as possible but provide all necessary information.	App. B 1.c
6. Confusing negatives	Avoid negative stems.	App.B 2.e
7. Collection of true/false	Each item should focus on one K/A item determined by the stem.	App.B 1.f 2.c
8. backwards logic	Examine on a topic in a way that is consistent with how the K/A should be remembered and used.	App.B 1.h

LEVEL OF DIFFICULTY

Establish a level of difficulty that will enable an applicant who is *capable of safely operating the plant* to complete and review the examination within four hours and achieve a grade of 80 percent or greater. [ES-401 p.4]

Since item difficulty can usually be decreased or increased by revision, the examination author need not be overly preoccupied with difficulty when writing the items. The author should focus on achieving a valid measure of the concept he is attempting to evaluate. [Appendix B, p. 6]

LEVEL OF KNOWLEDGE

Level 1: FUNDAMENTAL KNOWLEDGE
The recall or recognition of discrete bits of information.

- knowledge of terminology
- definitions
- set points
- other specific facts

Level 2: COMPREHENSION
Involves the metal process of understanding the material through relating it to its own parts or some other material.

- describing or recognizing relationships
- recognizing how systems interact
- consequences or implications of events

Level 3: ANALYSIS, SYNTHESIS OR APPLICATION
Involves assembling, sorting or integrating information to predict an event or outcome. Requires mentally using the knowledge and its meaning to solve problems.

NUREG-1021, APPENDIX B, GUIDANCE

1. Generic Principles

a. Ensure that the concept being measured has a direct, important relation ship to the ability to perform the job.

b. Make sure that the question matches the intent of the K/A.

c. State the question unambiguously and precisely.

d. Write the question at the highest level of knowledge reflected in the testing objective.

e. Avoid questions that are unnecessarily difficult or irrelevant.

f. Limit the question to one concept or topic, unless a synthesis of concepts is being tested.

g. Avoid copying text directly forma training or other reference material.

h. Avoid backward logic questions.

2. Other Construction Guidelines

a. Use four answers.

b. Do not use "none of the above" or "all of the above".

c. Do not present a collection of true-false statements.

d. Define the question, task or problem in the stem.

e. Avoid using negatively stated stems when possible.

f. Provided sufficient counter balance in questions with multi-part answers.

g. Include common misconceptions as Distractors.

h. Make all answer options homogeneous and highly plausible.

I. If the answers have a logical sequence, put them in order.

j. Avoid overlapping answer options.

k. Do not include trivial distractors with more important distractors.

l. Vary the location of the correct answer.

m. Avoid specific determiners that give clues as to the correct answer.

(1) distractors that do not follow grammatically from the stem.

(2) options that can be judged correct or incorrect without reading the stem.

(3) equivalent and /or synonymous options which rule out both options.

(4) an option which includes another option.

(5) implausible distractors.

(6) a correct answer which is longer that the distractors.

(7) qualifiers in the correct answer unless they are used in distractors. (e.g. probably, ordinarily)

(8) words such as "never" , "always" which suggest a wrong answer.

(9) a correct option that differs from the distractors in favorableness, style, or terminology.

III. BEANS

BEANS ..... BEANS ..... BEANS		
BEAN	LIMIT	REFERENCE
Knowledge level questions	< 50	ES-401 p.4
SRO / RO overlap	≤ 75	ES-401 p.5
Questions from training class quizzes OR last two NRC exams.	≤ 25	ES-401 p.5
Questions from licensee audit exam (same author for audit exam)	≤ 0	ES-401 p.5
Questions from licensee audit exam (independent author for audit exam)	≤ 5	ES-401 p.5
Questions from licensee bank	≤ 50	ES-401 p.5
New questions at comprehension or analysis	≥ 10	ES-401 p.5

JPM CRITICAL TASKS AND MEASURABLE CRITERIA

G. HOPPER
L. MELLEN

3. Develop Performance Criteria

The JPM should have meaningful performance requirements that will provide a legitimate basis for evaluating the examinee's ability to safely operate the system or the plant. Artificially subdividing existing tasks to generate new ones may dilute the value of the JPMs to a point where they become meaningless.

The JPM shall identify specific *performance standards*, or check points, that will permit the examiner to evaluate successful progress toward completing the task in accordance with the procedural references. Detailed control and indication nomenclature and criteria (e.g., switch positions and meter readings) should be identified whenever possible, even if these criteria are not specified in the procedural step. The JPM should also note any *important observations* that should be made by the examinee while performing the task.

The JPM must clearly identify the *task standard*; i.e., the predetermined outcome (qualitative and/or quantitative) against which task performance will be measured. Every procedural step that the examinee must perform correctly (i.e., accurately, in the proper sequence, and at the proper time) in order to accomplish the task standard shall be identified as a *critical step* and shall have an associated performance standard.

If there are any specific procedural restrictions on the sequence in which the steps are performed they shall be clearly noted in the JPM.

Measurable Performance Indicators

A measurable performance indicator consists of **positive actions** that an observer can objectively identify **taken by an individual(/crew)**.

Examples:

Actions taken in the EOPs such as in response to an ATWS.

Control manipulations such as a manual reactor trip or the start of an ECCS pump.

Verbal reports or notification of abnormal parameters or conditions.

Non-measurable Performance Indicators:

Verification that an expected response has occurred:

1)Verification and/or ensure steps which require no action.

Passive observations such as monitoring the performance of a system.

DEFINED TASK STANDARDS

Task standards should include objective requirements with allowable tolerances agreed upon by the facility and the NRC.

The acceptance criteria must be able to discriminate/identify poor performance !

Bad Examples:

"If pressure falls below 1400 psi, start pump ..., " is a performance measure that is not objective. The operator performing this task could conceivably start the pump when pressure reaches 0 psi and still not violate the performance measure stated in the procedure, even though the facility licensee expects the operator to start the pump sooner. The NRC and facility licensee should agree in writing that the limits for each CS or CT are acceptable before the examination begins. For the example given above, adding an

acceptable pressure tolerance (e.g., within 200 psi) would clarify the standard of performance that is expected.

"Immediately borate the RCS if below rod insertion limits": There is no definition of immediate in this situation. Anywhere form one to ten minutes might be argued as acceptable.

Proper Cueing

External stimulus should prompt an operator to respond by taking certain actions. The indications of a system or a component malfunction (including passive failures)by meters and alarms **must be accurate and include all expected indications.**

JOB PERFORMANCE MEASURE

Provide this page to the Candidate

Initial conditions:

A Station Blackout has occurred on Unit 2. Unit 1 is in a LOOP with both Emergency Diesel Generators in service. The NPS and ANPS have determined the need to crosstie electrical power from the 1A EDG to the 2A3 4.16 KV switchgear via the SBO AB Bus Crosstie.

Initiating Cue:

The ANPS has directed you to accomplish the Unit to Unit crosstie to the 2A3 4.16 KV Bus by performing 2-EOP-99, Table 7 and then 2-EOP-99, App. V within 10 minutes.

JOB PERFORMANCE MEASURE

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

1. (C) Element/Step <u>OPEN</u> and <u>GREEN FLAG</u> the following startup transformer breakers:

   A. Standard: S.U. Transformer 2A (2-30102)

   Cue: GREEN LIGHT ON, FLAG GREEN

   B. Standard: S.U. Transformer 2B (2-30202)

   Cue: GREEN LIGHT ON, FLAG GREEN

   C. Standard: S.U. Transformer 2A (2-20102)

   Cue: GREEN LIGHT ON, FLAG GREEN

   D. Standard: S.U. Transformer 2B (2-20302)

   Cue: GREEN LIGHT ON, FLAG GREEN

2. (C) Element/Step Ensure the following breakers are <u>GREEN FLAGGED</u> and <u>OPEN</u>:

   A. Standard: Aux Transformer 2A (2-30101) (2W87)

   Cue: GREEN LIGHT ON, FLAG GREEN

   Standard: Aux Transformer 2B (2-30201) (2W85)

   Cue: GREEN LIGHT ON, FLAG GREEN

Comments:_____

_____

2. (Cont'd) B. Standard: Aux Transformer 2A (2-20101) (1W86)

Cue: GREEN LIGHT ON, FLAG GREEN

Standard: Aux Transformer 2B (2-20301) (1W84)

Cue: GREEN LIGHT ON, FLAG GREEN

C. Element/Step Tie breakers between normal and emergency 4160V buses:

Standard: 4.16 KV Bus Tie 2A2-2A3 (2-20109)

Cue: GREEN LIGHT ON, FLAG GREEN

Standard: 4.16 KV Bus Tie 2A3-2A2 (2-20209

Cue: GREEN LIGHT ON, FLAG GREEN

Standard: 4.16 KV Bus Tie 2B2-2B3 (2-20309)

Cue: GREEN LIGHT ON, FLAG GREEN

Standard: 4.16 KV Bus Tie 2B3-2B2 (2-20411)

Cue: GREEN LIGHT ON, FLAG GREEN

D. Element/Step 4.16 KV Bus 2AB Tie breakers

Standard: Feed to 4.16 KV Bus 2AB (2-20208)

Cue: GREEN LIGHT ON, FLAG GREEN

Standard: Incoming feeder from 4.16 KV bus 2A3 (2-20505)

Cue: GREEN LIGHT ON, FLAG GREEN

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

2.D. (Cont'd)		Standard:	Incoming feeder from 4.16 KV bus 2B3 (2-20504)
		Cue:	GREEN LIGHT ON, FLAG GREEN
		Standard:	Feed to 4.16 KV Bus 2AB (2-20409)
		Cue:	GREEN LIGHT ON, FLAG GREEN
3.	(C) Element/Step		OPEN the following 4.16 KV feeder breakers to the station service transformers:
	A.	Standard:	Station Service Transformer 2A1 (2-20110)
		Cue:	GREEN LIGHT ON
	B.	Standard:	Station Service Transformer 2A5 (2-20210)
		Cue:	GREEN LIGHT ON
	C.	Standard:	Station Service Transformer 2A2 (2-20213)
		Cue:	GREEN LIGHT ON
	D.	Standard:	Station Service Transformer 2B1 (2-20310)
		Cue:	GREEN LIGHT ON
	E.	Standard:	Station Service Transformer 2B2/2B5 (2-20402)
		Cue:	GREEN LIGHT ON

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

4. (C) Element/Step OPEN and GREEN FLAG the following 480V feeder breakers from the station service transformers:

A. Standard: 480V Bus 2A1 Feeder (2-40103)

Cue: GREEN LIGHT ON, FLAG GREEN

B. Standard: 480V Bus 2A5 Feeder (2-40361)

Cue: GREEN LIGHT ON, FLAG GREEN

C. Standard: 480V Bus 2A2 Feeder (2-40219)

Cue: GREEN LIGHT ON, FLAG GREEN

D. Standard: 480V Bus 2B1 Feeder (2-40419)

Cue: GREEN LIGHT ON, FLAG GREEN

E. Standard: 480V Bus 2B5 Feeder (2-40653)

Cue: GREEN LIGHT ON, FLAG GREEN

F. Standard: 480V Bus 2B2 Feeder (2-40503)

Cue: GREEN LIGHT ON, FLAG GREEN

SAT UNSAT

Comments: _____

_____

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

5. (C) Element/Step OPEN the following 480V bus tie breakers

A. Standard: 480V Bus Tie 2A2-2AB (2-40220)

Cue: GREEN LIGHT ON

B. Standard: 480V Bus Tie 2AB-2A2 (2-40702)

Cue: GREEN LIGHT ON

C. Standard: 480V Bus Tie 2AB-2B2 (2-4[illegible]06)

Cue: GREEN LIGHT ON

D. Standard: 480V Bus Tie 2B2-2AB (2-40504)

Cue: GREEN LIGHT ON

SAT UNSAT

Comments:_____

_____

6. (C) Element/Step Establish communications with Unit 1

Standard: ESTABLISH COMMUNICATIONS with Unit 1 via Gai-Tronics or plant radio (if available).

Cue: **COMMUNICATIONS ARE ESTABLISHED**

7. Element/Step PLACE the following pump switches in the PULL TO LOCK position:

(C) A. Standard: 2A ICW Pump

Cue: **SWITCH IN PULL TO LOCK**

B. Standard: 2B ICW Pump

Cue: **SWITCH IN PULL TO LOCK**

(C) Standard: 2C ICW Pump

Cue: **SWITCH IN PULL TO LOCK**

(C) D. Standard: 2A CCW Pump

Cue: **SWITCH IN PULL TO LOCK**

E. Standard: 2B CCW Pump

Cue: **SWITCH IN PULL TO LOCK**

(C) Standard: 2C CCW Pump

Cue: **SWITCH IN PULL TO LOCK**

SAT UNSAT

Comments: _____

_____

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

8. (C) Element/Step Verify the EDG output breaker on the selected 4.16 KV bus is open

Standard: VERIFY the EDG output breaker on the selected 4.16 KV bus (2-20211) is OPEN

Cue: GREEN LIGHT IS ON. REPORT UNIT 1 IS READY TO CROSSTIE AB 4.16 KV BUSES.

9. (C) Element/Step Close in the Unit 2 SBO breaker

Standard: CLOSE IN the Unit 2 SBO breaker 2-20501.

Cue: RED LIGHT ON

10. (C) Element/Step Request the Unit 1 control room to close the Unit 1 SBO breaker

Standard: REQUEST the Unit 1 control room to close the Unit 1 SBO breaker 1-20501.

Cue: UNIT 1 ACKNOWLEDGES REQUEST.

END Element/Step TERMINATION

Standard: Student requests Unit 1 to close the Unit 1 SBO crosstie breaker.

Comments:_____

_____

Bad example of critical - 1

JOB PERFORMANCE MEASURE

(C) Indicates a Critical Step **PERFORMANCE CHECKLIST**

1. Element/Step: Review the EOOS log and determine if channel RM-26-18 (PAG-203) has been declared out of service.

   Standard: Verifies RM-26-18 is not out of service.

   Cue: **RM-26-18 IS NOT OUT OF SERVICE**

2. Element/Step: Check the Met Tower for operability

   Standard: Verifies Met Tower chart recorder working properly..

   Cue: **MET TOWER CHART RECORDER TRACKING PROPERLY.**

3. Element/Step: Verify gas release permit properly filled out and authorized, enter release permit number and tank to be released on procedure.

   Standard: Verifies permit filled out properly and authorized, enters release permit number (98-007) and 2C GDT on procedure.

   Cue: **98-007 AND 2C GDT ENTERED ON PROCEDURE**

All will be done one time 1.1.5

4. (C) Element/Step: Verify the following valve alignment:

V6745	Closed
V06142	Open
V7071	Open
V7070	Open
V7072	Locked Closed
V6742	Locked Closed

   Standard: Verify all above listed valves in proper positions

   Cue: **V6745 FULLY CLOCKWISE**
   V06142 FULLY COUNTERCLOCKWISE
   V7071 FULLY COUNTERCLOCKWISE
   V7070 FULLY COUNTERCLOCKWISE
   V7072 FULLY CLOCKWISE WITH LOCK ATTACHED
   V6742 FULLY CLOCKWISE WITH LOCK ATTACHED

SAT UNSAT

Comments: _____

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

4. Element/Step Check closed FCV-25-9, "Continuous Containment/Hydrogen Purge Control Valve Filter Inlet."

Standard: At the NON-SAFETY VENTILATION HVAC PANEL: VERIFY CLOSED FCV-25-9

Cue: 0%, GREEN LIGHT ON, RED LIGHT OFF

SAT UNSAT

Comments: _____

5. (C) Element/Step Throttle FCV-25-28, "Continuous Containment/Hydrogen Purge Control Valve Bypass" to approximately 10% OPEN position.

Standard: At the NON-SAFETY VENTILATION HVAC PANEL: POSITION FCV-25-28 to the open position UNTIL the valve position indicates 10% OPEN

Cue: 10%, BOTH RED & GREEN LIGHTS ON

SAT UNSAT

Comments: _____

6. ~~(C)~~ Element/Step Start HVE-6B, "Shield Building Exhaust Fan."

Standard: At the B TRAIN EMERGENCY VENTILATION HVAC PANEL: POSITION HVE-6B control switch to START

Cue: RED LIGHT ON, GREEN LIGHT OFF

SAT UNSAT

Comments: _____

C. The system/equipment status reflects the overall intent of what the JPM required upon completion.

D. Correctly perform all critical steps.

All steps where procedural guidance exists may be considered critical. Performance of Off-Normal Operating Procedure immediate actions will be from memory.

During the course of the JPM, there may be some tasks you will have to perform that will require you to implement contingency actions in order to complete them. Even in these cases, you are expected to make decisions and take actions based on the indications available and in accordance with the facility's procedural guidance.

Initiating Cue(s):

The ANPS has directed you to respond to the abnormal alarm IAW 1-0120035.

References:

ONP 1-0120035, Rev 18

- During the performance of the task I will tell you which steps to simulate or discuss.
- Verbalize each step before you do it. **This gives you a chance to self-check and use STOP during the performance of each task element.**
- Verify the position or condition of equipment or components by pointing to the instrumentation and providing a brief explanation of how the indication is used for verification.
- I will provide you with the appropriate cues for steps which are simulated or discussed.
- You may use any approved reference materials normally available in the execution of this Job Performance Measure, including logs.
- Do you understand these directions?
- If you have any questions, ask them now, and I will answer them.
- During the test I cannot answer questions.
- When you complete all steps correctly, you will pass this job performance measure.
- **Begin the task now.**

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST

1. Element/Step: Verify pressurizer spray, proportional and backup heaters are operating properly in automatic.

   Standard: OBSERVE any of the following Pressurizer pressure indications on RTGB 103 and/or RTGB 106 to DETERMINE improper automatic response:

   PR-1100 PIC-1100X PIC-1100Y

   PI-1102A PI-1102B PI-1102C PI-1102D
   PIA-1102ALL PIA-1102BLL PIA-1102CLL PIA-1102DLL

   Observe the proportional heater control and indication for P-1 and P-2

   Observe the B/U heater control and indication for banks B-1 through B-6

   Observe the spray valve controller HIC-1100

NOTE TO EXAMINER: The CUEs should provide sufficient information to diagnose the failure of the selected pressure channel LOW. It should be recognized that Pressurizer pressure is actually increasing. All of the indicators listed may not be used by the operator when diagnosing this problem. The student may refer to Appendix "A" for expected automatic responses.

Cue: For PR-1100, PIC-1100X, PIC-1100Y :
SELECTED CHANNEL - DOWNSCALE LOW, NONSELECTED CHANNEL IS =2300 PSIA AND SLOWLY INCREASING

For other PI instruments:
INDICATED PRESSURE IS =2300 PSIA AND SLOWLY INCREASING

For Pressurizer heaters:
SWITCHES IN AUTO, HEATERS LIGHTS INDICATE ON

For Pressurizer spray controller HIC-1100:
INDICATES NO OUTPUT

SAT UNSAT

Comments: _____

_____

(C) Indicates a Critical Step PERFORMANCE CHECKLIST

2. (C) Element/Step If the selected pressure channel has failed, Then shift to the operable pressure channel.

Standard: At RTGB 103: POSITION HS-1100 to the alternate pressure control channel

Cue: ALTERNATE CHANNEL SELECTED. PROPORTIONAL HEATER OUTPUT REDUCING, SPRAY VALVE OUTPUT RISING, PZR PRESSURE RETURNING TO NORMAL.

NOTE - The ANPS directs that the rest of the ONP be carried out.

SAT UNSAT

Comments: _____

_____

3. Element/Step Verify SE-02-03 and SE-02-04 "Auxiliary Spray Valves", are closed

Standard: At RTGB 103: DETERMINE keyswitches and indicating lights for SE-02-03 and SE-02-04 to be CLOSED

Cue: SE-02-03, SE-02-04 GREEN LIGHTS ON AND RED LIGHTS OFF

SAT UNSAT

Comments: _____

_____

4. Element/Step Verify power operated relief valves are closed.

Standard: At RTGB 103:: DETERMINE position indicating lights for both power operated relief valves CLOSED

Cue: PORV-1402, PORV-1404 GREEN LIGHTS ON AND RED LIGHTS OFF

SAT UNSAT

Comments: _____

_____

5. Element/Step: Ensure that PORVs V1402 and V1404 hand switches are in the proper position for existing plant conditions.

Standard: At RTGB 103: DETERMINE PORVs hand switches are in NORMAL

Cue: **PORVs HAND SWITCHES IN NORMAL**

SAT UNSAT

Comments: _____

_____

6. Element/Step: Verify pressure anomaly is NOT caused by a large rate of change of Tavg.

Standard: At RTGB 103: OBSERVE any of the following indications and DETERMINE that Tavg is fairly stable:

TR-1111X/1121X, TI-1102A, TR-1115/1125, TI-1102B, TIA-1111X, TI-1102C, TIA-1121X, TI-1102D, TIC-1111Y, TIC-1121Y

Cue: **Tavg HAS BEEN STABLE THROUGHOUT THE EVOLUTION**

SAT UNSAT

Comments: _____

_____

END Element/Step: TERMINATION

Standard: **The pressurizer pressure control system is responding properly to control pressure at 2250 psia.**

OPERATING TEST WORKSHOP

RUSSELL BUILDING

JPM QUESTIONS

RICK BALDWIN

JULY 15, 1998

ES-301, D1(l)

States:

The prescripted questions for Categories A and B may include a combination of open- and closed-reference items. **Open-reference** items that require applicants to **apply** their **knowledge** of the plant to postulated normal, abnormal, and emergency situations are **preferred**. **Closed-reference** items **may be used** to evaluate the immediate actions of emergency and other procedures, certain automatic actions, operating characteristics, interlocks, set points as appropriate to the facility. **Minimize** the use of **closed-reference** questions that rely solely on **memory**, and ***avoid*** the use of open-reference **questions whose answer can simply be looked up if the applicant can find the correct document**.

Refer to Section B.6 of **Appendix C** for more **guidance** regarding the development and use of open reference questions for the walk-through test.

Appendix C:

States:

6. Develop Pre-scripted Follow-up Questions

If the JPM will be used during an initial licensing examination, it shall include a sufficient number of prescripted questions (with answers and references) to evaluate the examinee's understanding of two knowledge and/or ability (K/A) statements related to the system or task. More than one question may be required to effectively evaluate some K/A statements.

The most appropriate format for this application is the **short-answer** question, which requires the examinee to **compose a response** rather than select from among a set of alternative responses, as is the case with multiple-choice, matching, and true/false questions. Keep the following guidelines, in addition to the generic item construction principles in Appendix

B, in mind when preparing the questions:

a. Provide **clear**, explicit directions /guidelines for answering the question so that the examinee understands **what constitutes a fully correct response.**

   Choose words carefully to ensure that the stipulations and requirements of the question are appropriately conveyed. Words such as "evaluate," "outline," and "explain," can invite a lot of detail that is not necessarily relevant.

b. Make sure that the **answer key response matches (and is limited to) the requirements posed in the question.** When appropriate, indicate the amount of partial credit to be granted for an incomplete answer.

   For questions requiring computation, **specify the degree of precision expected.** Try to make the answer turn out to be whole numbers.

c. Avoid giving away part or all of the answer by the way the question is worded. For example:

> "If the letdown line became obstructed, could boration of the plant be accomplished shortly after a reactor trip to put the plant in cold shutdown? If so, how?"

A test-wise examinee can realize that the answer has to be yes, or else the second part of the question would have read something like "If not, why not?"

d. Avoid what could be considered "trick" questions in which the answer key does not precisely match the question. For example, asking "How [do] the SI termination criteria change following a SI reinitiation?" implies that the termination criteria will change, when in actuality they do not.

e. **Avoid direct look-up questions that only require the examinee to recall where to find the answer to the question.**

The operational orientation required of questions on the walk-through test and the examinee's access to reference documents, argue against the use of questions that test for recall and memorization. **Any questions that do not require any analysis, synthesis, or application of information by the examinee should be answerable without the aid of reference materials.** Refer to ES-602, Attachment 1, for a more detailed discussion of direct look-up questions.

Form ES-602-1, "NRC Checklist for Open-Reference Test Items," contains a list of questions that can be used to evaluate the suitability of the follow-up questions planned for the walk-through portion of the operating test. Although the checklist was developed for use in

evaluating requalification written examinations, most of the criteria (i.e., all except 9, 10, 11, and the K/A rating on item 7) are generically applicable and could be used as a basis for revising or rejecting proposed walk-through questions.

Test Item Level

____ 1. Does each test item have a documented link to important licensee tasks, K/As, and/or facility learning objectives?

____ 2. Is each question operationally oriented (i.e., is there a correlation between job demands and test demands)?

____ 3. Is the question at least at the comprehension-level of knowledge?

____ 4. Is the context of the questions realistic and free of window dressing and backwards logic?

____ 5. Does the item require an appropriate use of references (i.e., use of analysis skills or synthesis of information either to discern what procedures were applicable or to consult the procedures to obtain the answer)?

____ 6. ***Is the question a "direct look-up" question, or does one question on the examination compromise another? A "direct look-up question" is defined as a question that immediately directs an licensee to a particular reference where the answer is readily available.***

____ 7. Does the question possess a high K/A importance factor (3 or greater) for the job position?

____ 8. Does the question discriminate a competent licensee from one who is not?

____ 9. Is the question appropriate for the written examination and the multiple choice format?

____ 10. Do questions in Section A take advantage of the simulator control room setting?

____ 11. Does any question have the potential of being a "double-jeopardy" question?

____ 12. Is the question clear, precise, and easy to read and understand?

____ 13. Is there only one correct answer to the question?

____ 14. Does the question pose situations and problems other than those presented during training?

____ 15. Does the question have a reasonable estimated response time?

CONCLUSIONS

① Open-reference questions whose answer can simply be looked up if the applicant can find the correct document are ***NOT*** acceptable.

② Analysis, Synthesis, Comprehension questions should be used to avoid direct look-up problems.

③ On all questions where the expected responses are multipart, we will notify the candidate of the number of known correct answers and the number needed for full credit.

④ Examiners **will** ask non-prescripted follow up questions, as necessary, to clarify or confirm the candidate's understanding of prescripted questions or pre-planned tasks. The followup questions should be to further explore the lack of candidate knowledge in the specific area in question

⑤ Assign point values to each answer that has multiple parts, to ensure examiner grading consistency.

⑥ Identify on the candidate's sheet the status of reference material usage.

⑦ There is proposal to impose an allowance of only 30% closed-reference questions of either Category A or B.

DIRECT LOOK QUESTIONS

WITH ACCEPTABLE

CORRECTIONS

RO Admin. A.1 (Fuel Handling), Question 1
2.1.23 3.9/4.0

QUESTION:
Given the following plant conditions:

- Reactor shutdown for refueling outage
  - Unit offline: 1/1/97 12:01 AM
  - Entered Mode 3: 1/1/97 2:10 AM
  - Entered Mode 4: 1/1/97 6:17 AM
  - Entered Mode 5: 1/1/97 11:45 PM

What is the earliest date/time core offload can commence?

ANSWER:
1/5/97 6:10 AM
100 hours after shutdown

REFERENCE:
GP-010, "Refueling", step 5.3.1

INIT

5.2.28 IF needed for SFP water clarity, THEN place the SFP skimmer in service IAW OP-910. ____

5.3 Fuel Assembly and Core Component Movement

NOTE: A case evaluation has been performed IAW PLP-037 for each major evolution in this section. The case determination is defined prior to each applicable evolution.

5.3.1 Check that the Reactor has been subcritical for at least 100 hours AND record hours subcritical. (TRMS 3.12) _____hrs ____

5.3.2 Verify EST-001 is complete. ____ ENG

NOTE: The following equipment tests need to be completed prior to moving fuel.

5.3.3 Verify the following equipment necessary to support fuel off-load has been tested IAW EST-030 AND mark the equipment that is not needed to support fuel off-load N/A.

- Fuel Transfer System (Section 8.6.2) ____ ENG
- Manipulator Crane (Section 8.6.3) ____ ENG
- CV RCC Change Fixture (Section 8.6.4) ____ ENG
- New Fuel Handling Equipment (Section 8.4) ____ ENG
- NFB New Fuel Lift (Section 8.5.1) ____ ENG
- SFP New Fuel Monorail (Section 8.5.2) ____ ENG
- SFP Bridge Crane (Section 8.5.3) ____ ENG
- SFP New Fuel Elevator (Section 8.5.4) ____ ENG

3.12 DECAY TIME

TRMS 3.12 (CTS 3.8.1.h) Movement of fuel within the core shall not be initiated prior to 100 hours after shutdown.

APPLICABILITY: MODE 6.

COMPENSATORY MEASURES

CONDITION	REQUIRED COMPENSATORY MEASURE	COMPLETION TIME
A. Requirements of TRMS not met.	A.1 Suspend movement of fuel within the core.	Immediately

TEST REQUIREMENTS

TEST	FREQUENCY
None.	NA

B 3.12 DECAY TIME

BASES

The restriction of not moving fuel in the reactor for a period of 100 hours after shutdown reduces the consequences of a fuel handling accident by providing for decay of short-lived fission products and the reduction of fission gas inventory in any potentially failed fuel. Fuel handling accidents in containment and the Spent Fuel Building have been evaluated by postulating that the failure of all fuel rods in one assembly occurs 100 hours after shutdown.

RO Admin. A.1 (Fuel Handling), Question 1
2.1.23 3.9/4.0

REFERENCE ALLOWED

QUESTION:
Given the following plant conditions:

- Reactor shutdown for refueling outage
  - Unit offline: 1/1/98 12:01 AM
  - Entered Mode 2: 1/1/98 12:38 AM
  - Entered Mode 3: 1/1/98 2:10 AM
  - Entered Mode 4: 1/1/98 6:17 AM
  - Entered Mode 5: 1/1/98 11:45 PM

What is the earliest date/time core offload can commence?

ANSWER:
1/5/98 6:10 AM
(100 hours after shutdown)

REFERENCE:
GP-010, "Refueling", step 5.3.1
PLP-100 (Technical Requirements Manual), section 3.12

RO JPM CR-019, Question 2
006 K1.03 4.2/4.3

QUESTION:
Given the plant conditions:

- Mode 1, 100% power
- Accumulator levels / pressure
  - "A" 68% 600 psig
  - "B" 70% 630 psig
  - "C" 70% 645 psig

Annunciator APP-002-B4 "SI ACCUM A HI/LO PRESS" illuminated

Describe the basis for NOT being allowed to raise the pressure in the "A" Accumulator and lower the pressure in the "C" Accumulator by simultaneously opening the vent valves for the two accumulators.

ANSWER:
Simultaneously opening the accumulator vent valves would connect the two accumulator gas spaces. If a large break LOCA were to occur on either of the loops ("A" or "C") both accumulators would depressurize invalidating the LOCA analysis.
(Not required for credit: Accumulator design capacity is based on one accumulator spilling to the containment floor through the break, the other two accumulators fill the core to the mid-plane.)

REFERENCE:
FSAR section 6.3.2.2.6
OP 202, step 4.20
APP-002-B4 "SI ACCUM A HI/LO PRESS"

3. Finally the second low level alarm on the RWST sounds. At this time, the operator performs the switchover operation.

The changeover from injection to recirculation is effected by the operator in the Control Room via a series of manual switching operations according to written procedures. Valves SI-856A and B are manually closed at the valves.

Remotely operated valves for the injection phase of the SIS (Figures 6.3.1-1 and 6.3.1-2) which are under manual control, (this is, valves which normally are in their ready position and do not receive a SI signal) have their positions indicated on a common portion of the control board. At any time during operation, when one of these valves is not in the ready position for injection, it is shown visually on the board. Table 6.3.2-1 is a listing of the instrumentation readouts on the control board which the operator can monitor during recirculation. In addition, an audible annunciation alerts the operator to the condition.

6.3.2.2.5.1 Location of the major components required for recirculation. The RHR pumps are located in the RHR pump pit (Elevation 203 ft 0 in.) which is below the basement floor of the Auxiliary Building (Elevation 226 ft 0 in). The RHR pump pit is located between the Containment Building and the Auxiliary Building. The residual heat exchangers are located on the first floor of the Auxiliary Building.

The high head SI pumps, component cooling pumps and component cooling heat exchangers are located in the Auxiliary Building (Elevation 226 ft 0 in).

The service water pumps are located in the intake structure, and the redundant piping to the component cooling heat exchangers is run underground.

6.3.2.2.6 Accumulators. The accumulators are pressure vessels filled with borated water and pressurized with nitrogen gas. During normal plant operation, each accumulator is isolated from the RCS by two check valves in series.

Should the RCS pressure fall below the accumulator pressure, the check valves open and borated water is forced into the RCS. Mechanical operation of the swing-disc check valves is the only action required to open the injection path from the accumulators to the core via the cold leg.

The accumulators are passive engineered safety features (ESF) because the gas forces injection; no external source of power or signal transmission is needed to obtain fast-acting, high-flow capability when the need arises. One accumulator is attached to each of the cold legs of the RCS.

The design capacity of the accumulators is based on the assumption that flow from one of the accumulators spills onto the containment floor through the ruptured loop. The flow from the remaining accumulators provides sufficient water to fill the volume outside of the core barrel below the nozzles, the bottom plenum, and one-half the core.

16. A case evaluation has been performed for each section of this procedure IAW PLP-037. The case determination and any associated additional requirements are defined at the beginning of each section.

17. The Dedicated Operator utilized for filling SI Accumulators shall be any active licensed individual other than the Reactor Operator on watch, and shall remain at the RTGB until the filling evolution is complete.

18. If any SI Accumulator level increases greater than 10% (70 gal) due to inleakage when the RCS pressure is >1000 psig, then the affected accumulator shall be sampled within the next 6 hours. (ITS SR 3.5.1.4)

19. When drawing an oil sample from an SI Pump, remove the Control Power Fuses. Reinstall the Control Power Fuses when sampling has been completed AND the oil reservoir has been refilled to the normal level. During the interval with fuses removed, the SI Pump is inoperable.

20. Do NOT open more than one SI Accumulator Vent valve at a time when the SI Accumulators are required to be operable to prevent invalidating the LOCA Analysis. (Westinghouse Memo CPL-96-210)

21. Operation with RWST level greater than the high level setpoint should be avoided to prevent water level at the Spring Line of the RWST.

RO JPM CR-019, Question 2
006 K1.03 4.2/4.3

REFERENCE ALLOWED

QUESTION:
Given the plant conditions:

- Mode 1, 100% power
- Accumulator levels / pressure
  - "A" 68% 600 psig
  - "B" 70% 630 psig
  - "C" 70% 645 psig

Annunciator APP-002-B4 "SI ACCUM A HI/LO PRESS" illuminated

QUESTION A:
Determine which accumulator parameter(s) are outside the normal operating band.

ANSWER A:
"A" Accumulator pressure is low (normal band = 614 to 646 psig)

REFERENCE ALLOWED

QUESTION B:
Can this evolution be performed and describe the basis for your response.

ANSWER B:
No, not allowed. Simultaneously opening the accumulator vent valves would connect the two accumulator gas spaces. If a large break LOCA were to occur on either of the loops ("A" or "C") both accumulators would depressurize invalidating the LOCA analysis. (Not required for credit: Accumulator design capacity is based on one accumulator spilling to the containment floor through the break, the other two accumulators fill the core to the mid-plane.)

REFERENCE:
FSAR section 6.3.2.2.6
OP 202, step 4.20
APP-002-B4 "SI ACCUM A HI/LO PRESS"

RO JPM CR-025, Question 1

005 K4.07 3.2/3.5

QUESTION:

Given the following plant conditions:

- RCS cooldown is in progress
- Plant is in Mode 4
- RCS T_{avg} is 348°F
- RCS pressure
  - PT-402 = 468 psig
  - PT-403 = 470 psig
  - PT-404 = 472 psig

What must be done to open MOV-750/751 to place RHR in service?

ANSWER:

- Reduce RCS pressure (sensed by PT-403) to less than 465 psig
- Verify SI-862A/B "RWST TO RHR" and SI-863A/B "RHR LOOP RECIRC" closed with breakers closed and control power switches in "NORMAL"

REFERENCE:

OP-201, "Residual Heat Removal System",

System Description: Residual Heat Removal System

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Reactor Coolant System temperature and pressure shall be less than 350°F and 375 psig before the Residual Heat Removal System is put in service, and the RHR system will be removed from service before RCS pressure and temperature are raised above these values.

4.2 To prevent boiling the CCW liquid contained in an RHR HX, CCW flow should not be isolated to an RHR HX when the temperature of the RHR System is greater than 200°F. (CR 95-00565)

4.3 Neither RHR-750 nor RHR-751 will open unless the following conditions are satisfied:

- The breakers for SI-862A and B are closed.
- The breakers for SI-863A and B are closed.
- The control power switches for SI-862A and B are in NORMAL.
- The control power switches for SI-863A and B are in NORMAL.
- Valves SI-862A and B are closed.
- Valves SI-863A and B are closed.
- RCS pressure is less than 465 psig.

4.4 SI-862A & B, and SI-863A & B are interlocked so they cannot be opened unless the RHR loop pressure is less than 210 psig.

4.5 When the Residual Heat Removal System is providing Core Cooling AND seal injection flow is desired to maintain a positive ΔP across the Thermal Barrier of the Reactor Coolant Pumps, letdown flow through HCV-142 and PCV-145 should be maintained to provide makeup to the VCT.

4.6 When RHR-757C or RHR-757D is closed, 3,350 gpm flow, indicated on FI-605, with one RHR pump running or 6,700 gpm flow with two RHR pumps running shall not be exceeded, except as allowed/required by approved test procedures for which flowrates on FI-605 may be as high as 3800 gpm for one pump or 7600 gpm for two pumps.

RO JPM CR-025, Question 1

005 K4.07 3.2/3.5

REFERENCE ALLOWED

QUESTION:

Given the following plant conditions:

- RCS cooldown is in progress
- Plant is in Mode 4
- RCS T_{avg} is 348°F
- RCS pressure
  - PT-402 = 461 psig
  - PT-403 = 470 psig
  - PT-404 = 472 psig

What conditions must be satisfied to open MOV-750/751 to place RHR in service?

ANSWER:

- [.5] Reduce RCS pressure (sensed by PT-403) to less than 465 psig
- [.5] Verify SI-862A/B "RWST TO RHR" and SI-863A/B "RHR LOOP RECIRC" closed with breakers closed and control power switches in "NORMAL"

REFERENCE:

OP-201, "Residual Heat Removal System", step 4.3

System Description: SD-003, Residual Heat Removal System

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.	C.1 Be in MODE 3 with T_{avg} < 500°F.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/$\bar{E}$ μCi/gm.	7 days
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the gross specific activity of the reactor coolant at least once every 7 days. The analysis shall consist of a qualitative measurement of the total radioactivity of the primary coolant in units of μCi/gm. While basically a quantitative measure of radionuclides with half lives longer than 15 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in gross specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance is applicable in MODES 1 and 2, and in MODE 3 with T_{avg} at least 500°F. The 7 day Frequency considers the unlikelihood of a gross fuel failure during the time.

SR 3.4.16.2

This Surveillance is performed in MODE 1 only to ensure iodine remains within limit during normal operation and following fast power changes when fuel failure is more apt to occur. The 14 day Frequency is adequate to trend changes in the iodine activity level, considering gross activity is monitored every 7 days. The Frequency, between 2 and 6 hours after a power change $\geq$ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following fuel failure; samples at other times would provide inaccurate results.

SR 3.4.16.3

A radiochemical analysis for $\bar{E}$ determination is required every 184 days (6 months) with the plant operating in MODE 1 equilibrium conditions. The $\bar{E}$ determination directly relates to the LCO and is required to verify plant operation within the specified gross activity LCO limit. The analysis for $\bar{E}$ is a measurement of the average energies per disintegration for isotopes with half lives longer than

(continued)

SRO(I) Admin. A.1, (Plant Chemistry), Question 1
2.1.14 - 2.5/3.3

REFERENCE ALLOWED

QUESTION:
Given the following plant conditions:

- The plant is at 100% power, equilibrium Xenon, all systems aligned for normal operation (Jan 15, 1998, 12:01 AM)
- Chemistry personnel report they have completed obtaining RCS and Pressurizer liquid samples (9:00 AM)
- A runback due to a dropped rod occurred at 9:15 AM
- Recovery actions are in progress

QUESTION A:
What are the chemistry sampling requirements for this plant condition?

ANSWER A:
[.5] Between 2 and 6 hours following a reactor power change of $\geq$ 15% in 1 hour (in Mode 1), RCS Dose Equivalent I-131 shall be verified $\leq$ 1.0 micro-curies / gram. (Between 11:15 AM and 3:15 PM)

NO REFERENCE ALLOWED

QUESTION B:
What is the basis for the time frame after the power change?

ANSWER:
[.5] Ensure Iodine remains within limit following fast power changes when fuel failure is more apt to occur. 2 to 6 hours following a power change of $\geq$ 15% in a 1 hour period is established because this is when the Iodine level in the RCS would peak due to fuel failure.

REFERENCE:
OMM-001-13, "Plant Chemistry", section 5.2
ITS, SR 3.4.16.2

SRO(I) Admin. A.1, (Plant Chemistry), Question 1

2.1.14 - 2.5/3.3

QUESTION:

Given the following plant conditions:

- The plant is at 100% power, equilibrium Xenon, all systems aligned for normal operation (Jan 15, 1998, 12:01 AM)
- Chemistry personnel report they have completed obtaining RCS and Pressurizer liquid samples (9:00 AM)
- A runback due to a dropped rod occurred at 9:15 AM
- The plant is now stable at ~68%
- Recovery actions are in progress

What are the chemistry sampling requirements and basis for this plant condition?

ANSWER:

Between 2 and 6 hours following a reactor power change of $\geq$ 15% in 1 hour (in Mode 1), RCS Dose Equivalent I-131 shall be verified $\leq$ 1.0 micro-curies / gram. (Between 11:15 AM and 3:15 PM)

Ensure Iodine remains within limit following fast power changes when fuel failure is more apt to occur. 2 to 6 hours following a power change of $\geq$ 15% in a 1 hour period is established because this is when the Iodine level in the RCS would peak due to fuel failure.

REFERENCE:

Plant Chemistry", section 5.2

SR 3.4.16.2

POOR QUESTIONS

KA: 062AA1.01
Importance: 3.4/3.8
Reference allowed (FSAR)

Question: What is the limiting factor on the amount of current that can be passed from Unit 1 to Unit 2 through the SBO crosstie?

Expected Response: The electrical cable between the two units is the limiting factor.

KA: 033000K303
Importance: 3.0/3.3
Reference allowed

Question: What is the response of the Spent Fuel Pool Cooling System [KF], and why, regarding temperature and level following a Blackout?

[NOTE: Assume NO operator action is taken]

Expected Response: Spent Fuel Pool level and temperature will increase due to decay heat of the spent fuel assemblies.

Conduct of Operation (SRO 1)
Fire Brigade

KA: 194001K116 3.5/4.2
Lesson Plan: EAP-SEP
Reference: Fire Plan, (E-Plan) RP/1000/29 Fire Brigade Response, NSD 112, Fire Brigade Organization, Training, and Responsibilities
Task: 2610000, 3710001
Source: NEW PRA 3-18-97

4. As the Operations Shift Supervisor serving as the Fire Brigade Leader during an actual fire or fire drill, you have several responsibilities. Describe the normal duties as the Fire Brigade Leader at the fire scene?

ANSWER:

1- Serve as the Fire Brigade Commander and direct the Fire Brigade during the event.

2- Obtain support as needed such as Security, Radiation Protection, Chemistry, Offsite Fire Department and Hazmat.

(3- Ensure all fire protection equipment is restore to full capability immediately following the event).

(4- Complete the Fire Emergency Report and forward the report to the EP (Emergency Planning) Section).

KA: 062000A401 (3.3/3.1)
Lesson Plan: EL EPD Objective R8 page 25
Reference: OMP
Task: 002630001
Source: Bank EL 96 (JPM CRO 08) RO

QUESTION:
Describe the safety and personnel requirements for manual operation of switchyard disconnects.

ANSWER:
Rubber safety gloves and safety glasses must be worn.
At least two people in the crew performing the task, one of which is a supervisor.
Nomex suits should be worn by the breaker operator.

Conduct of Operations (SRO 1)
Self Checking/STAR

KA: 194001K101 (3.6/3.7)
Lesson Plan: ADM-OMP
Reference: OMP 1-22, Job Assignments
Task: 3610052
Source: PRA 3-6-97 NEW

1. As an SRO (Shift Supervisor) you have the responsibility of performing Pre-Job Briefs with other operators on your shift, you make the decision of the level of detail and information within the Pre-job Brief.

   What are several guidelines that you will use to determine the amount of detail of the Pre-Job Brief presentation and describe the "STAR" component of the Pre-Job Brief?

ANSWER:

(2 of 5)

1) Complexity of the task
   Consequences of the task
   Importance of the task
   Frequency of the task
   Unfamiliarly of the task to the performer

2) "STAR" is a self checking method (that operators use to reduce the potential of errors).
   ("S" - Stop)
   ("T" - Think)
   ("A" - Act)
   ("R" - Review)

ACCEPTABLE QUESTIONS

Importance: 2.6/3.0
Reference: Steam Tables

Question: The RCS is at 2250 psia, Quench tank pressure is 3.5psig. If a small leak developed in the seat of Code Safety V 1201, what temperature would you expect to see on TIA-1107?

Expected Response: 230 degrees

Question #1.
KA: 001K5.02
Importance: *2.9/3.4*
Reference: Unit 2 Plant Physics Curves

Question: Unit 2 has 6,000 EFPH on the core and experiences a dropped rod resulting in the NI power level changes from 100% to 93%, what is the approximate worth of the dropped rod?
Expected Response: Approximately 75 to 100 pcm.
Question # 2.
KA: 001K5.28
Importance: ***3.5/3.8***
Reference: **Unit 2 Plant Physics Curves**
Question: In order to withdraw the same CEA without changing the power level or temperature of the RCS, how much would RCS boron concentration have to be changed?(PPM)

****If Question 1 is missed:** Assuming the worth of a dropped CEA was 100 pcm, how much would boron concentration have to be changed to withdraw the rod without changing power level or temperature?

Expected Response: approximately 12 PPM (Boron worth for the present conditions is 8.38pcm/ppm)

"HLC EXAM DEVELOPMENT EXAM BANK" TEST ITEM DATA SHEET

I. CROSS-REFERENCE DATA

RECORD NUMBER: 1427
LESSON 1: LOR-SIM-JP-019-A05
STYLE: Short Essay/Other
REVISION: 3
ENTERED BY:
MODIFIED BY:
DATE LAST USED:
(approved by:

TYPE: General Use
LESSON 1 OBJECTIVES: 01
POINT VALUE: 1.00
TIME TO COMPLETE: 4 Minutes
DATE ENTERED: 10/10/94
DATE MODIFIED: 04/27/98

ASSOCIATED TASKS:
No Tasks are currently referenced to this question.

ASSOCIATED K/A's:
206000 A1.01 ROI: 4.3 SROI: 4.4
Ability to predict and/or monitor changes in parameters associated with operating HIGH PRESSURE COOLANT INJECTION SYSTEM REACTOR WATER LEVEL: BWR-2,3,4 controls

REFERENCES: 2 APP A-01 3-1 /R21

II. QUESTION:

HPCI started on high drywell pressure, but tripped on high RPV level.

Explain how HPCI responds as level lowers from the high level trip to Lo Level 3.

Additionally, if you wanted to restart HPCI at 120", what actions would be required to perform that action?

III. ANSWER:

As level lowers, HPCI will not restart until level reaches LL-2 (105"). HPCI will then reset its trips and start and inject with no operator action. HPCI will continue to run as level lowers to LL-3.

To restart HPCI prior to reaching LL-2, depress the high water level trip reset pushbutton, the drywell signal will then restart HPCI and cause it to inject.

QUESTION 3 POINT VALUE: 1.00

Using the attached diagram, explain how it is possible to reset a scram with the mode switch in SHUTDOWN.

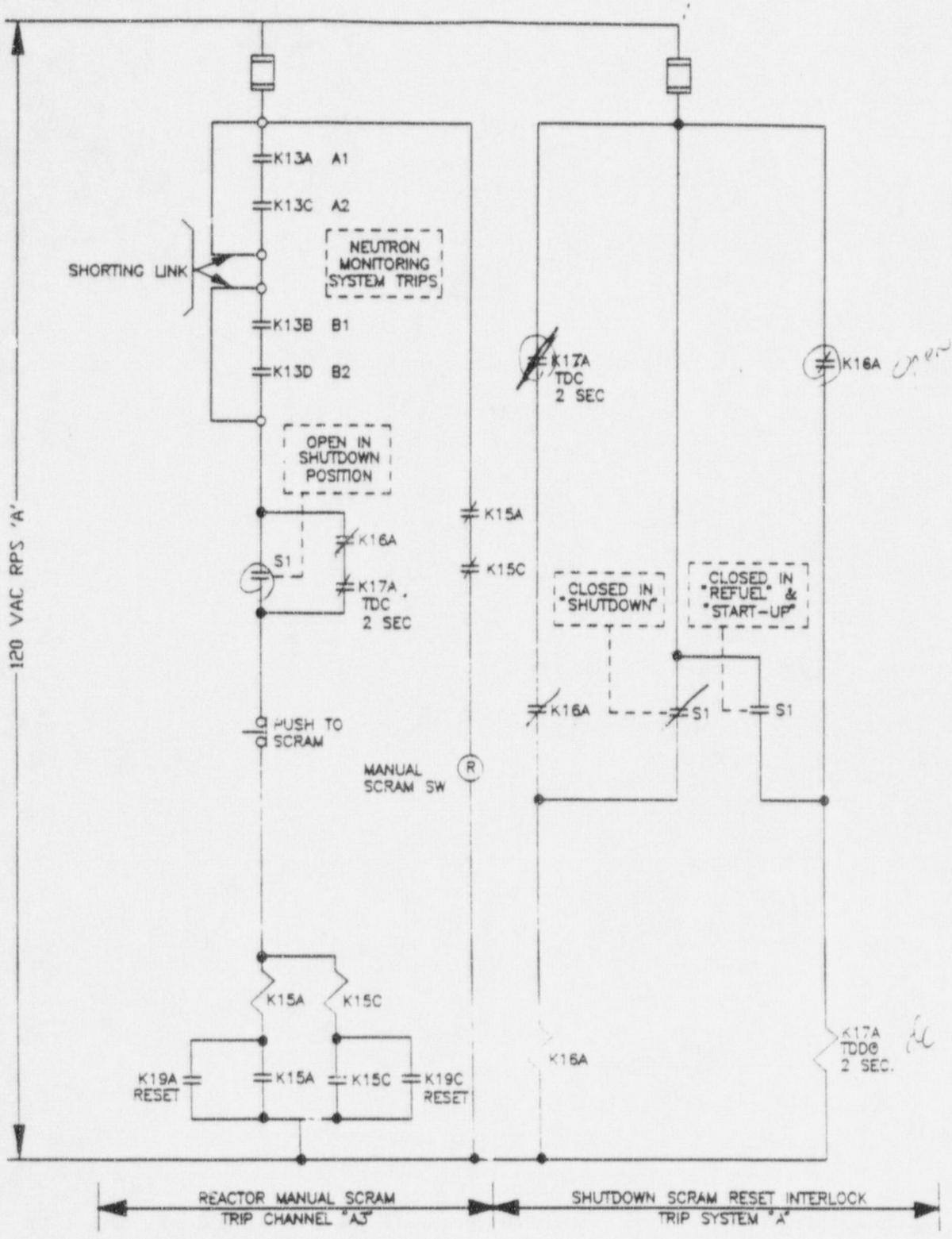


Figure 03-21 - Shutdown Scram Reset Interlock

Provide this page to the Candidate

Health Physics has performed a survey of the Unit 2 Charging Pump rooms and hallway. Given a survey map, determine how each room and hallway should be posted.

HPS-207
CHARGING PUMPS
ELEVATION -0.5 FT.

DATE _____

TIME _____

MONITOR _____

SMEARS (dpm/100cm²)	
1	<1K
2	<1K
3	<1K
4	>1K
5	>1K
6	<1K
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Remarks _____

Reviewed _____

S2 OPS

DATE _____ SYS _____ HP _____

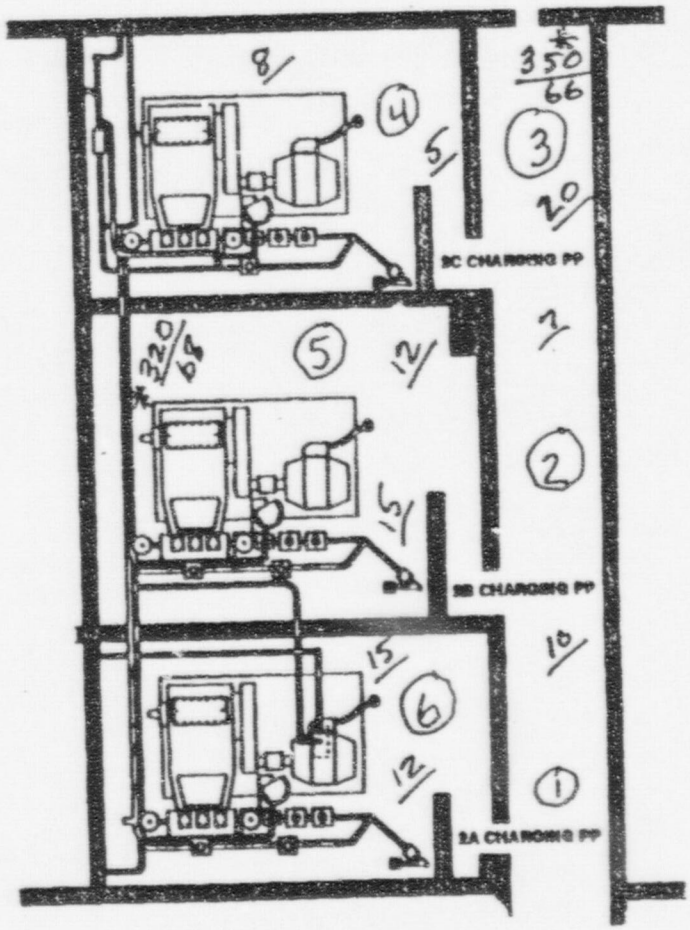
DOC1 HPS 207 COMP _____

DOCN _____ ITM _____

AREA POSTINGS (KEY)			
Contaminated Area	(C)	Radiation Area	(R)
High Rad. Area	(H)	RWP for Entry	(E)
Rad. Material Area	(M)	Gate Locked	(L)
Airborne Activity	(A)	No TLD Required	(N)
Exclusion Area	(X)	Hot Particles	(P)

ALL READINGS IN MRAD/HR UNLESS OTHERWISE NOTED

INST	#	CAL DUE	BKG dpm	MDA dpm



(TAP/2301205-F4-R5)

Figure 4
2301205, Rev. 7
FOR TRAINING USE ONLY

JPM SCHEDULING

PAUL STEINER

JPM SCHEDULING CONSIDERATIONS

- Amount of material to be generated:
  - Licensee Cost.
  - Licensee Manpower.
  - Examiner Review Time.
  - Validation Time on Simulator During Prep-Week.

- The current trend is a shift towards a single JPM set, administer piece by piece, with all applicants receiving the same piece each day.

- Considerations with this technique:
  - Availability of both Simulator and Booth Operators for two shifts.
  - Sequestering.
  - Candidate Stress.
  - Examiner Stress. (No laughing please!)

Current Problems

- JPMs are lasting 30 minutes to 1 hour.
  - Longer is not better.
  - Take the time it takes a staff instructor to perform the task, with questions, and double it.
- The last three examinations have run past 10:00 pm and were scheduled to end at 6:00 pm.
- Applicants are arriving at 7:00 am and are not being examined until 7:00 pm.
- No margin for error or simulator failure.

OPERATING EXAMINATION

ADMINISTRATIVE TOPICS

JPMs vs QUESTIONS

Paul Steiner

ES-301 Specific Instructions for Category A

- Although Admin topics may be examined separately, it is preferable, whenever possible, to link, associate, or integrate them with tasks and events conducted during Categories B and C

- Using a single Admin JPM is generally preferred, however, two prescripted questions may be used.

- If the applicant has a "U" in only one Admin topic, the examiner may fail the applicant in Category A depending on the importance of the identified deficiency.

  - Topics in the administrative portion of the NRC initial examination are weighted the highest of all examination areas, and are thus the most likely to result in a failing grade.

  - A single knowledge weakness/ or applicant error can result in an initial examination failure.

Common Single Failure Points:

- Clearance Error.
- Reactivity Balance Error.

- The key is a balance between questions and JPM's.

- All JPMs will result in a long Admin exam, with a high potential to fail a candidate for a single error.

- All questions usually results in a weak Admin exam.

Examples of Good Admin JPMs

- Shutdown Margin Calculation.
- Approval of a Clearance Order.
- ECP Calculation.
- Manual Leak Rate Calculation.
- Risk Matrix Utilization.
- Off-Site Dose Projection.
- Review a Survey Map and Demonstrate Knowledge of Radiological Hazards in a Work Zone.
- Evaluate the Applicants Scenarios for Emergency Plan Application and Make Protective Action Recommendations.

  - *The key to success with these types of tasks is solid and thorough validation.*

  - *If the task is not clear, and well defined, the applicants <u>will</u> become confused.*

  - *If the task is too long, it will begin to loose its evaluating ability.*

Examples of Poor Admin JPMs

- Check out a key from the key locker.
- Make a log entry.
- Frisk out an item.
  - Do you want an applicant to fail for touching the surface?
- Make a call-in for emergent work while reading from a procedure.
- Perform a pre-job brief.
  - These are items of Low Discriminatory Validity, and if performed poorly can result in severe grading.

Other Difficulties With Admin

- SRO applicants should be evaluated at greater depth on Admin topics.
  - There must be a difference between the RO and SRO Admin examinations.
- Control Room Software not available on the simulator or applicants don't have the proper password.
- The question does not solicit the answer.
  - Put validators in the mind set of applicant.
- Assigning point values to multiple answer questions.
  - The limit is 80%. If there are four answers, the applicant must get *all* four correct.
- Don't require applicants to catch integrity issues, or misspelled words when approving clearances or valve line-ups.
- Direct look-ups are prohibited!

EXAMINATION SECURITY
AND
EXAMINATION PREDICTABILITY

C. PAYNE

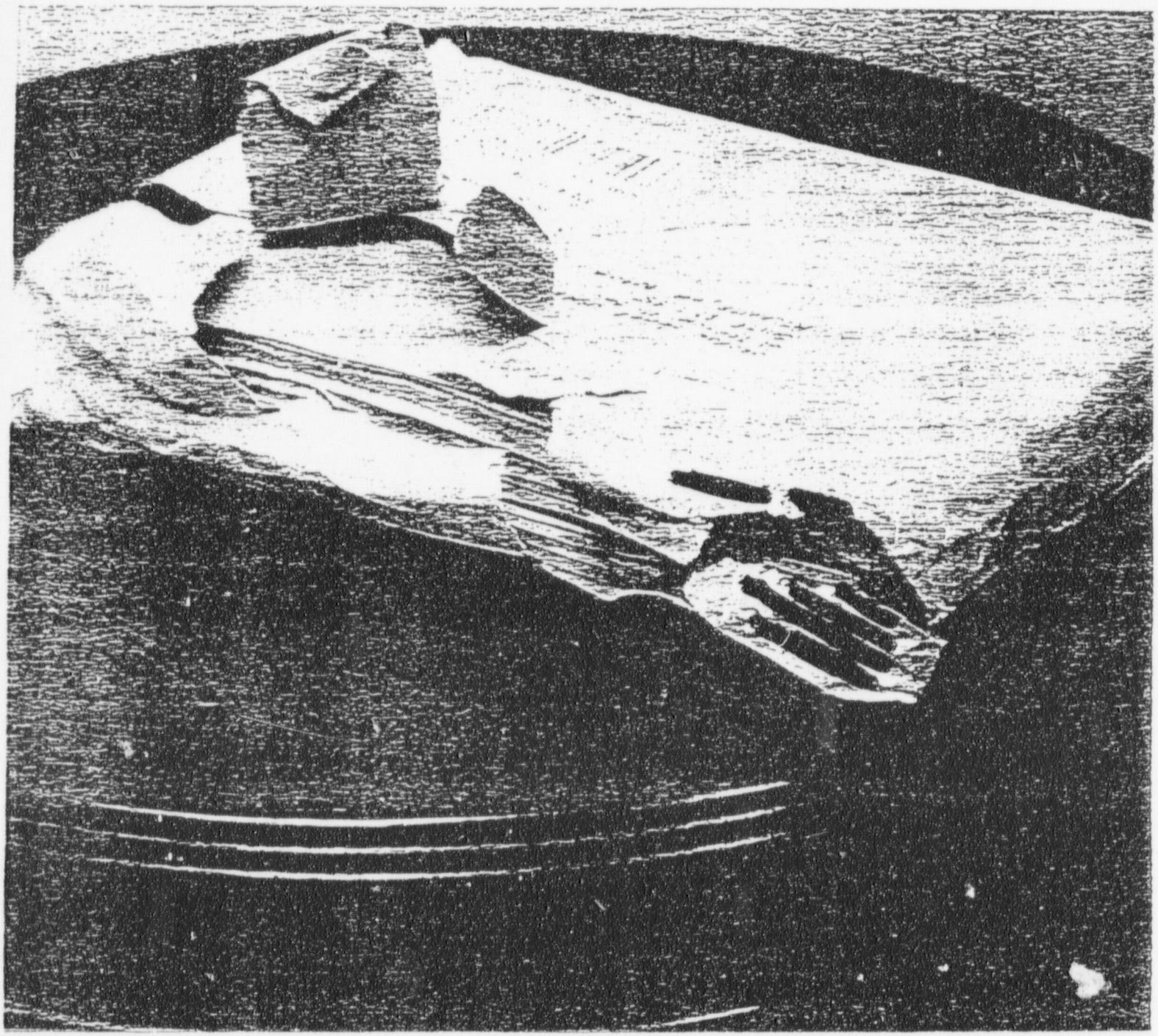
EXAMINATION SECURITY

- PER 10 CFR 55.49 - "APPLICANTS, LICENSEES, AND FACILITY LICENSEES SHALL NOT ENGAGE IN ANY ACTIVITY THAT COMPROMISES THE INTEGRITY OF ANY APPLICATION, TEST, OR EXAMINATION BY THIS PART"

- RULE IMPLEMENTED IN NUREG-1021
  - ES-201 - C.1 & C.2 & C.3 (RESPONSIBILITIES)
  - ES-201 - D.2 (PERSONNEL RESTRICTIONS)
  - ES-201 - ATTACHMENT 1 (PHYSICAL SECURITY & EXAM BANK LIMITATIONS)
  - ES-201 - FORM ES-201-3 (SECURITY AGREEMENT)
  - ES-205 - GFES EXAM ADMINISTRATION
  - ES-402 - C.1 (RESPONSIBILITIES)
  - ES-402 - E.3 (POST-EXAM REVIEWS)
  - ES-501 - POST-EXAM DOCUMENTATION
  - APPENDIX D, SECTION F (SIMULATOR SECURITY CONSIDERATIONS)

EXAMPLES

- INSTRUCTOR SIGNED SECURITY AGREEMENT AND DISCUSSED EXAM CONTENT WITH EXAMINEES
- REVEALING OF WHAT IS NOT ON THE EXAM (APPLICANTS SHOULD NOT BE ABLE TO PREDICT OR NARROW THE POSSIBLE SCOPE OR CONTENT OF EXAM BASED ON YOUR TEST DEVELOPMENT PRACTICES)
- BIAS OF SCOPE, CONTENT, OR LEVEL OF DIFFICULTY OF AN EXAM TO ENHANCE CHANCES OF CANDIDATES PASSING TEST
- LOSS OF CONTROL OF EXAM MATERIAL (NOT LOCKED UP WHEN LEAVE OFFICE, PARTS OF EXAM LEFT IN COPIER, PARTS OF EXAM LEFT IN SIMULATOR BOOTH AFTER VALIDATION)
- INSTRUCTOR ON SECURITY AGREEMENT INTERACTS WITH SRO(U) CANDIDATE DURING REQUAL (TAUGHT CLASS, EVALUATED SIM. SCENARIOS, SAT ON AUDIT BOARD)
- WRITE EXAM TO SAME FORMAT EVERY TIME SO IT BECOMES PREDICTABLE
- CHANGING K/A NUMBERS ON OLD QUESTIONS IN ORDER TO FIT NEW SAMPLE PLAN
- PERSONNEL NOT ON SECURITY AGREEMENT IGNORE WARNING SIGNS AND WALK IN ON EXAM DEVELOPMENT ACTIVITIES
- DRAFT EXAM MATERIAL NOT PROPERLY PACKAGED WHEN SENT TO NRC AND WAS DELIVERED OPEN



CONSEQUENCES

- NUREG-1600, "GENERAL STATEMENT OF POLICY AND PROCEDURES FOR NRC ENFORCEMENT ACTIONS" APPLIES
- IF HAVE INDICATION OF COMPROMISE, ACTION WILL BE TAKEN TO ENSURE AND RESTORE THE INTEGRITY AND SECURITY OF PROCESS. INCLUDES:
  - NOT GIVING EXAM
  - MAKING ADDITIONAL CHANGES TO EXAM
  - VOIDING EXAM RESULTS IF EXAM ALREADY GIVEN
  - REEVALUATING LICENSING DECISIONS PER 55.61(b)
  - POSSIBLY IMPOSING ENFORCEMENT ACTIONS INCLUDING:
    - CIVIL PENALTIES
    - ORDERS
    - IMPLEMENTATION OF DELIBERATE MISCONDUCT RULE (10 CFR 50.5)

EXAM PREDICTABILITY

- APPLICANTS SHOULD NOT BE ABLE TO PREDICT OR NARROW THE POSSIBLE SCOPE OR CONTENT OF EXAM BASED ON YOUR TEST DEVELOPMENT PRACTICES

- EXAM DEVELOPMENT TECHNIQUES OR RULES SHOULD NOT BE DISCUSSED WITH THE CANDIDATES (e.g., 25% OF WRITTEN WILL BE OFF THE MOST RECENT EXAM)

- EXAM METHODOLGY SHOULD BE VARIED FROM EXAM TO EXAM (e.g., SECTION A.4 SHOULD NOT ALWAYS BE "CLASSIFY THE SCENARIO" FOR SRO's)

- EXAM DEVELOPMENT CRITERIA LIMITATIONS SHOULD NOT ALWAYS BE THE BASIS OF THE EXAM CONTENT (e.g., NO OVERLAP WITH THE AUDIT TEST SHOULD NOT BE A RULE STRICTLY FOLLOWED WITH NO EXCEPTION) IF DONE CANDIDATES CAN EXCLUDE EVERY THING FROM THEIR AUDIT AS NOT BEING ON THEIR TEST WHICH NARROWS THE SCOPE.

- ALLOW AUDIT AND LICENSE EXAMS TO DEVELOP INDEPENDENTLY AND IDENTIFY TO THE CHIEF EXAMINER THOSE AREAS THAT OVERLAP WITH A PROPOSED RESOLUTION, IF NEEDED.

- AREAS TO WATCH:
  - NO OVERLAP FROM AUDIT EXAM
  - 25% FROM THE LAST TWO NRC EXAMS
  - 50% FUNDAMENTAL KNOWLEDGE
  - NO TEST ITEM REPEATS FROM DAY TO DAY
  - WRITTEN EXAM ANSWERS FAVOR a,b,c, OR d
  - ALL JPMs DONE ONLY ON A SPECIFIC UNIT

SIMULATOR SCENARIO DEVELOPMENT

C. PAYNE
G. HOPPER

CRITICAL TASKS

What constitutes a critical task?

The requalification examination uses critical tasks (CTs) for evaluating crew performance on tasks that have safety significance to the plant or the public. **The CTs are objective measures for determining whether an individual's or a crew's performance is satisfactory or unsatisfactory.** Although CTs are not directly used to evaluate operator performance on the initial licensing examinations, the concept of **focusing on those tasks that have a significant impact on the safety of the plant or the public remains valid** and should be taken into consideration when evaluating the competence of initial license applicants.

The Importance Of Safety Significance and Measurable Criteria

In reviewing each proposed CT, assess the task to ensure that it is essential to safety. **A task is essential to safety if the improper performance or omission of this task by an operator will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant.**

If an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance or the performance necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

Examples of CTs involving essential safety actions include those for which operation or correct **performance prevents**--

- **degradation** of any barrier to fission product release.
- **degraded** emergency core cooling system (ECCS) or emergency power capacity.
- a **violation** of a safety limit.
- a **violation** of the facility license condition.
- incorrect reactivity control (such as failure to initiate emergency boration or standby liquid control, or manually insert control rods).
- a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to:

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.

- recognize a failure or an incorrect automatic actuation of an ESF system or component.

- take one or more actions that would prevent a challenge to plant safety.

- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation).

Facility: Scenario No.: 1 Op-Test No.: 1

Objectives: To evaluate the students ability to implement ONOPs for loss of a vital 480V load center, an off-normal Pressurizer pressure and Letdown condition, and failure of a Steam Generator level transmitter; to perform a normal power reduction; and to execute EOPs for a Steam Generator Tube Rupture combined with an Excess Steam Demand (EOP-15)

Initial Conditions: Unit 2 is at 100% power, MOL.

Turnover: Unit 2 is at 100% power MOL. the 2B Charging pump is out of service for packing replacement, expected back in four hours. The 2A Heater Drain Pump has a unisolable oil leak requiring the pump to be taken out of service. Shift instructions is to reduce power to 92% and remove the 2A Heater Drain Pump from service.

Additional failures: 2A Containment Spray Pump fails to start on CSAS

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP R-RO	Power reduction from 100% to 92%
2		I-RO	PIC-1100X (PZR pressure transmitter) drifts ~~high~~ low
3		C-BOP,	2AB Load Center deenergizes (Loss of charging)
4		C-RO	2B CCW Pump trips
5		I-BOP	FIC-9011, 2A Steam Generator flow transmitter fails low.
6		M-BOP M-RO	2A Steam Generator tube rupture (250 GPM), 2A main steam line break inside containment on reactor trip.
		C	2A containment spray pump fails to start

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Scenario No.: 1a Op-Test No.: 1

Objectives: To evaluate the students ability to implement ONOPs for loss of a vital 480V load center, an off-normal Pressurizer pressure and Letdown condition, and failure of a Steam Generator steam flow transmitter; to perform a normal power reduction; and to execute EOPs for a Steam Generator Tube Rupture combined with a Main Feedwater line break inside containment (EOP-15)

Initial Conditions: Unit 2 is at 100% power, MOL.

Turnover: Unit 2 is at 100% power MOL. The 2A Charging pump is out of service for a lube oil PM, expected back in three hours. The 2B Main Feedwater Pump has a unisolable discharge flange leak requiring the pump to be taken out of service. 2A Main Steam Line Radiation Monitor is out of service, not expected back this shift. 2-HVS-1A containment cooler is out of service. Chemistry reports a 15 GPD tube leak on the 2B S/G. Management has decided to continue power operations due to the system load. Shift instructions are to reduce power to 45% and remove the 2B Main Feedwater Pump from service. Thunderstorms have been reported to be approaching the St. Lucie County area

Additional failures: A train CSAS fails to actuate and FCV071A fails to fully open
2B Containment Spray pump develops a sheared shaft on start.
2A Main Feedwater pump fails to trip on low suction pressure
2A Main Feedwater isolation valves fail to close on MSIS

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP R-RO	Power reduction from 100% to 45%
2		I-RO	PIC-1100X (PZR pressure setpoint) drifts high
3		C-RO	2AB Load Center deenergizes, 2B Charging pump trips
4		N-BOP	Realignment of charging and letdown
5		C-BOP	2B CCW Pump trips
~~6~~		~~I-BOP~~	~~FR-8011, 2A S/G steam flow transmitter fails high~~
7		M-BOP M-RO	2A Steam Generator tube rupture (250 GPM), 2A main feed line break inside containment on reactor trip
		C	A train CSAS fails to actuate
		C	2A Main Feed Isolation valves fail to close on MSIS (MFIV failure, continues to feed containment)
		C	FCV 071A fails to fully open

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility:	Date of Exam:	Scenario Numbers: / /	Operating Test No.:

	QUALITATIVE ATTRIBUTES	Initials		
		a	b	c
1.	The scenarios have clearly stated objectives in the scenario summaries.			
2.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.			
3.	The scenarios consist mostly of related events.			
4.	Each event description consists of • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point (if applicable)			
5.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.			
6.	The events are valid with regard to physics and thermodynamics.			
7.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
8.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.			
9.	The simulator modeling is not altered.			
10.	The scenarios have been validated.			
11.	Every operator will be evaluated using at least one new scenario. All other scenarios have been modified in accordance with Section D.4 of ES-301.			
12.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
13.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form along with the simulator scenarios).			
14.	The level of difficulty is appropriate to support licensing decisions for each crew position.			

	TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO)	Actual Attributes	—	—	—
1.	Total malfunctions (5-8)	/ /			
2.	Malfunctions after EOP entry (1-2)	/ /			
3.	Abnormal events (2-4)	/ /			
4.	Major transients (1-2)	/ /			
5.	EOPs entered/requiring substantive actions (1-2)	/ /			
6.	EOP contingencies requiring substantive actions (0-2)	/ /			
7.	Critical tasks (2-3)	/ /			

OPERATING TEST NO.:

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	4
RO	Reactivity	1				
	Normal	1				
	Instrument	2				
	Component	2				
	Major	1				
As RO	Reactivity	1				
	Normal	0				
	Instrument	1				
	Component	1				
	Major	1				
SRO-I						
As SRO	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				
SRO-U	Reactivity	0				
	Normal	1				
	Instrument	1				
	Component	1				
	Major	1				

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
(2) Reactivity manipulations must be significant as defined in Appendix D.

Author: _____
Chief Examiner: _____

Competencies	Applicant #1 RO/SRO-I/SRO-U				Applicant #2 RO/SRO-I/SRO-U				Applicant #3 RO/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms												
Diagnose Events and Conditions												
Understand Plant and System Response												
Comply With and Use Procedures (1)												
Operate Control Boards (2)												
Communicate and Interact With the Crew												
Demonstrate Supervisory Ability (3)												
Comply With and Use Tech. Specs. (3)												

Notes:

(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter the event numbers that test the competency for each scenario in the set.

Author: _____

Chief Examiner: _____