[redacted]

ENCLOSURE 5

Substantive Comments

Note: There were two substantive comments made by applicants following the written examination, with explanations concerning why the comments were accepted.

September 2010 Written examination comments.

The following substantive comments are being submitted for consideration during the grading of the Licensing exam that was administered at the Sequoyah Nuclear Station on September 29, 2010.

The first comment is submitted by candidate [redacted]

Question #41, Which ONE of the following ice condenser temperatures is within the optimal range in accordance with 0-SO-61-1, "Ice Condenser Cooling," and one of the potential adverse affects of being outside this range?

A. 19°F; excessive concrete expansion

B. 19°F; operation outside technical specification limit

C. 27°F; excessive concrete expansion

D. 27°F; operation outside technical specification limit

Comment; The question has two parts, (1) the optimal temperature range and (2) one of the potential adverse affects of being outside this range.

Since the optimal temperature range is 18°F to 20°F, then either A or B has the correct temperature, however, since the candidate wasn't sure how far outside the optimal temperature limit they could be, then they assumed that once temperature was greater than 27°F, you would be outside the technical specification limit and that would have an adverse affect on operation, since the plant would be in an LCO and may have to shutdown. Also from 1-SO-OPS-000-002.0, "Daily Shift Log," 3.0 Precautions and Limitations, C. "The Ice condenser may be operated at a temperature outside the optimum range, provided technical specifications limits are maintained, in accordance with Engineering recommendations to support system maintenance or planned outages." Thus the plant could operate outside the optimal limit as long as the technical specification limit was not exceeded. Based on this criterion, this would make "B" also a correct answer.

Site Recommendation:

It was intended that the adverse affects of operating outside the optimal range was physical in nature, testing the candidates knowledge of the potential adverse affects of not maintaining the ice condenser temperature within established optimal limit, (as indentified in the distractor analysis the Final safety Analysis Report (FSAR) 6.5.7.2 identifies 19°F to be the optimal temperature range to minimize the condition of concrete expansion, floor heaving and frost buildup.) However, since the adverse affect asked for in the question was not limited to a physical condition or a physical affect, then it would be reasonable that an adverse administrative affect (operating outside the technical specification limit, thus rending the ice condenser bed inoperable) could also be assumed. This would make both "A" and "B" correct. Since either an adverse affect could be interpreted as physical or administrative, Sequoyah station concludes that both "A" and "B" are considered as correct answers.

Additionally the following comment was submitted by (applicant [redacted]

#95. Given the following:

Unit-1 outage schedule logic changes for a planned 28-day refueling outage are being reviewed by an SRO to determine if they are safety significant in accordance with SPP-7.2, "Outage Management," Appendix E, "Outage Schedule Logic Change Control."

In accordance with Appendix E, which ONE of the following proposed logic changes would meet the criteria for a Safety Significant change?

A. Reschedule the Unit-1 loop #2 MSIV seat inspection from the core empty mid-loop period to the time period during core reload while SG secondary manways are removed for inspection.

B. Increase the cavity level from 711 feet to 712 feet elevation to minimize dose while unlatching control rods.

C. Add a 48 hour activity to perform preventative maintenance on the turbine driven auxiliary feedwater pump before entry into Mode 4.

D. Change the window for a contract diver to enter the CCW pump intake bay from the end of the outage (before starting CCW pumps) to the beginning of the outage (after securing CCW pumps.)

Comment: Since the Condenser Circulating Water system (CCW) intake bay is common to both units, diving operations could affect both units. As per SPP-7.2, Appendix E, (provided as a reference) the SRO is to evaluate if the activity would meet any of the listed criteria. Item 15 asks if the activity will affect the non-outage unit and if so then that item would be considered a safety significant change and would require additional evaluation. Since diving could affect the non-outage unit then "D" is a correct answer.

Response: After evaluating the question and choices against the criteria of SPP-7.2, Appendix E, and industry OE associated with diving operations, it is plausible that an SRO could reasonably conclude that a diving operation, in the vicinity of the CCW pumps, could (and would) have an impact on the operation of the non-outage unit. Thus per the direction of SPP-7.2, Appendix E, which was provided to the SRO candidates evaluating the events, we agree with the comment and consider "A" and "D" as correct answers.

3.0 **PRECAUTIONS AND LIMITATIONS** (Continued)

B. Trapping cold glycol solution between two isolated valves must be avoided. When isolating a component, close one valve only, until fluid warms up to ambient, or open a vent between the two closed valves.

C. Raw cooling water header pressure should normally be maintained greater than 40 psig to glycol chiller packages. If available, the standby RCW booster pump should be started in accordance with 0-SO-24-1 as necessary to maintain system pressure.

If NO RCW booster pump can be started, 0-SO-24-1 provides guidance on raising RCW header pressure to allow short-term operation of a few glycol chiller packages while restoring a RCW booster pump.

D. During cooldown, the differential temperature between the glycol supply temperature and the averaged measured floor surface temperature (Appendix G), should not exceed 20°F.

E. In order to minimize sublimation, frost buildup, and ice condenser door binding problems, the Ice Condenser temp should be maintained within the optimum range of 18°F to 20°F. **[C.1]**

F. If glycol flow is left on the shutdown chiller unit, the bypass valve around the temperature control valve in the cooling water flow path must be left open at all times to prevent freezing.

G. The following apply to the AHUs:

1. Heat tracing on the AHU defrost drains must be maintained continuously while plenum temperature is below freezing. If power is lost to both heating circuits for any length of time, the drain pipes must be inspected for signs of damage due to freezing.

2. If isolation of an AHU is necessary, use the odd numbered isolation valves if possible. Even numbered return valves are used for flow balance, and they should be returned to their previous position if closure is necessary.

3. When removing an AHU from service for maintenance, open circuit breaker CB #1, so it will not unnecessarily add its defrost heat to the ice condenser during the normal defrost cycle.

4. Do not operate any AHU that is not completely assembled. When air bypasses the coils due to the front or side panels being removed, it is adding warmer air to the wall panels. All sheetmetal panels must be installed on the front and sides of the AHUs. Open CB #1, unless all sheetmetal panels are installed.

3/4.6.5 ICE CONDENSER

ICE BED

LIMITING CONDITION FOR OPERATION

3.6.5.1. The ice bed shall be OPERABLE with:

a. The stored ice having a boron concentration of ≥ 1800 ppm and ≤ 2500 ppm boron as sodium tetraborate and a pH of 9.0 to 9.5,

b. Flow channels through the ice condenser,

c. A maximum ice bed temperature of less than or equal 27°F,

d. A total ice weight of at least 2,225,880 pounds at a 95% level of confidence, and

e. 1944 ice baskets.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the ice bed inoperable, restore the ice bed to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1 The ice condenser shall be determined OPERABLE:

a. At least once per 12 hours by verifying that the maximum ice bed temperature is less than or equal to 27°F.

b. At least once per 18 months by verifying, by visual inspection, accumulation of ice on structural members comprising flow channels through the ice bed is ≤ 15 percent blockage of the total flow area for each safety analysis section.

Appendix E
(Page 1 of 2)

Outage Schedule Logic Change Control

Subsequent to the Independent Outage Safety Review (IOSR) or issuance of Rev. C if an IOSR was not performed, all significant outage schedule changes which involve the modification of logic relation between outage activities will be controlled by the following process.

A. The proposed schedule change is documented on the Outage Schedule Logic Change Form (OSLCF) SPP-7.2-2, Attachment 1 of this procedure.

An OSLCF is initiated by the responsible individual each time a logic change to the outage schedule is required. The initiator must complete items A through D of the OSLCF.

B. A licensed SRO reviews the requested logic change documented on the OSLCF and evaluates whether the change to the outage schedule should be approved and proceed. This review by a SRO is to ensure safety - significant changes receive a review consistent with the initial independent outage safety review of the outage schedule. The SRO should consider the criteria below when determining if the change should be approved: If the answer to any of these questions is yes, the reviewer should ensure appropriate actions are taken to minimize the safety risk resulting from incorporating the logic change prior to approval. If the logic change requires a major system window change, or could present a challenge to the defense in depth strategy with safety significance, the Unit Outage Manager will be consulted to convene an Independent Outage Safety Review team to provide additional expert opinions on whether the change should be approved. The plant manager, or designee, will approve a schedule change, deemed safety significant via the following questions.

SRO review questions for consideration:

1. Perturb the stability of RHR parameters (flow, pressure, temperature, etc.) and other operational parameters (operating pump amperes, etc.)?

2. Alter plant configurations that would result in RCS temperature below the minimum value used to analyze reactor shutdown margin?

3. Reduce the reactor cavity or reactor vessel inventory?

4. Reduce the spent fuel pit inventory or challenge SF Cooling redundancy?

5. Reduce the availability of systems or support systems required to provide reactor vessel makeup water consistent with the decay heat generation load?

6. Minimize the availability of low pressure injection?

7. Reduce the availability of alternate sources of reactor vessel makeup water consistent with the decay heat generation rate?

8. Increase the probability of jeopardizing installed temporary equipment that could reduce safety system availability?

9. Isolate of the operable boration flow path?

Appendix E
(Page 2 of 2)

Outage Schedule Logic Change Control

10. Cause leakage of water into the RCS or spent fuel pit which would dilute the boron concentration to a value below the minimum required?

11. Affect bus outages or switchyard outages?

12. Reduce the availability of onsite or offsite electrical power supplies or support systems?

13. Increase the probability of fuel or other core component mishandling or damage?

14. Reduce the ability to isolate containment when required?

15. Affect the non-outage unit?

After reviewing the above questions, the SRO signs the OSLCF for approval if warranted. If the SRO rejects the change, the OSLCF is returned to the originator with an explanation of why it was rejected for enhancement or cancellation as appropriate.

C. Following SRO approval of an OSLCF, the Outage Manager reviews the OSLCF for completeness and determines if additional reviews are required. This determination is based on the following criteria:

1. Logic changes for work activities within a system window which change the sequence of scheduled work and do not pose a potential challenge to the defense in depth strategy can be approved by the Outage Manager.

2. Logic changes which move a work activity scheduled in Modes 5 or 6 (PWR only) to the empty reactor vessel period can be approved by the Outage Manager.

3. Logic changes for work activities on the equipment and systems affecting system operations require review and concurrence by the Operations Management representative in the OCC, in addition to the original SRO's approval. As an example: IF the logic change moves the activity out of its scheduled work window OR has the potential to challenge the station's defense in depth strategy, Operations management concurrence in OCC is required, as well as Outage Manager and Plant Manager, or outage shift designees.

4. Logic changes for work activities on equipment and systems not identified above can be approved by the Outage Manager.

D. Following approval of the OSLCF, the Outage Manager directs changing the outage schedule in accordance with the OSLCF. Approved OSLCFs are retained by the Outage Manager. OSLCFs that are not approved are returned to the originator for cancellation or further processing.

E. Copies of approved OSLCFs should be distributed to the Outage Manager and to other outage participants that will be affected by the change as deemed necessary.

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

November 15, 2010

ES-501

Mr. Richard S. Baldwin
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Avenue, NE, Suite1200
Atlanta, Georgia 30303-1257

Sequoyah Nuclear Plant, Units 1 and 2
Facility Operating License Nos. DPR-77 and DPR-79
NRC Docket Nos. 50-327 and 50-328

Subject: **Reactor Operator and Senior Reactor Operator Initial Examinations - 05000327/2010302 and 05000328/2010302**

Reference: NRC letter to TVA, "Reactor Operator and Senior Reactor Operator Initial Examinations - 05000327/2010302 and 05000328/2010302," dated October 6, 2010

In accordance with Examination Standard (ES) 501, "Initial Post-Examination Activities," of NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," substantive comments related to the examination were provided in the referenced letter. The purpose of this letter is to provide supplemental information to the substantive comments submitted in the referenced letter. The enclosure provides the supplemental information as discussed with Craig Kontz of your staff on November 5, 2010.

There are no commitments contained in this submittal. Should you require additional information regarding this matter, please contact Michael Buckner at (423) 843-4208 or contact Beth A. Wetzel at (423) 843-7170.

NOV 16 2010

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

November 15, 2010

ES-501

Mr. Richard S. Baldwin
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Avenue, NE, Suite1200
Atlanta, Georgia 30303-1257

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Sincerely,

Christopher R. Church
Site Vice-President
Sequoyah Nuclear Plant

Enclosure: Reactor Operator and Senior Reactor Operator Initial Examinations
Supplemental Substantive Comments (ES-402)

BAW:NRT:SKD
Enclosure

ENCLOSURE

SEQUOYAH NUCLEAR PLANT
UNITS 1 AND 2

Reactor Operator and Senior Reactor Operator Initial Examinations
Supplemental Substantive Comments (ES-402)

The following provides supplemental information to the NRC post examination questions.

NRC Question 1

Simulator Job Performance Measure (JPM) G - Need new evaluation criteria and basis for evaluating the applicants use of Abnormal Operating Procedure (AOP) - M.04 Appendix E with centrifugal charging pump (CCP) and volume control tank (VCT) for establishing make-up. The issues of capacity (flow rate and overall available volume) need to be addressed as an alternative for residual heat removal (RHR) from the refueling water storage tank (RWST).

TVA Response 1

This JPM was developed as an alternate path JPM such that when the candidates determined that the Appendix A criteria for establishing flow from the RWST through the CCPs in Step 1 could not be established, the candidate would then move on to Step 2 and establish makeup flow from the RWST through an alternate path using the RHR pumps. After reviewing the step sequence and the use of check boxes as each step is performed, it would be reasonable and logical that a candidate would go back to Step 5 of the AOP after not being able to open the suction valves from the RWST to the CCPs and conclude that the next step should be the guidance in Step 5 response not obtained (RNO) column that directs the candidate to perform Appendix E of AOP-M.04. This is not the direction given to the candidate in the JPM initiating cues, (which was "to establish makeup to the refueling cavity from the RWST as soon as possible") however; the direction to perform Appendix E does have a logical flow path.

Although making up to the refueling cavity using a CCP taking suction from the VCT does reduce the rate of makeup to that of VCT makeup flow (~120 gpm given the plant conditions for the JPM) vs potential makeup from injection by using a CCP taking suction from the RWST (~ 400 gpm) or RHR pumps (~3000 gpm), the rate of makeup flow was not a critical task of the JPM. Since the candidates did not know what the leak rate was, they would not know if Appendix A or Appendix E flow path was adequate until after determining if refueling cavity level was recovering or not. Determining a change in refueling cavity level to indicate how effective the makeup is in recovering level was not part of the JPM, only establishing makeup flow.

The site would evaluate the candidate as satisfactory if they assumed that makeup flow from the RWST could not be established when the CCP suction valves would not open using Appendix A and then applied the Step 5 RNO column direction of implementing Appendix E.

A revised copy of JPM G, with the alternate method of makeup to the refueling cavity using Appendix E is attached.

NRC Question 2

Administrative JPM A.1.A – Overtime Restrictions – TVA Standard Programs and Processes (SPP) - 1.5, Section 3.2.1.A.5, requires "At least a 34 hour break in any 9 calendar day period."

a. How is this requirement applied / implemented at the station?
b. How should this requirement have been applied / evaluated for the schedule given in the JPM?

TVA Response 2(a)

The actual application at the station is by using a "Personnel Qualification and Scheduling" software program in the Shift Operations Management System (eSOMS). This program has the criteria identified in NPG-SPP-03.21, Fatigue Management and Work Hour Limits. This is the official program used to track worker hours (actual and projected) to ensure the site is complying with the requirements of Title 10 Code of Federal Regulations (CFR) Part 26, Fitness for Duty Programs.

The application of Section 3.2.1.A.5 of "At least a 34 hour break in any 9 calendar day period" is actually a 216-hour period. The computer program evaluates the 34-hour break based on the start of work following a break of at least 34 continuous hours. Therefore, the computer program would evaluate the 216 hours since the end of the last break of at least 34 continuous hours for another break of at least 34 continuous hours in length.

TVA Response 2(b)

Normally any hours scheduled to be worked (or planned to be worked) are processed using eSOMS to determine if any of the established criteria from Section 3.2.1 would be violated.

The JPM as administered had the candidates do a manual calculation of a work schedule based on the hours presented. During development and validation it was determined that two critical tasks (work hour violations) were present. It was not identified that a violation of Item 3.2.1.A.5 (a 34 hr break in any 9 calendar day period) had been committed. The work hours given in the JPM were processed through the eSOMS software and the computer program did identify the two predetermined work hour violations, (one on May 30, 2010, for a violation of greater than 26 hours in 48 hour period and one on June 4, 2010, for a violation of greater than 72 hours in a 7 day period); however, it did not identify a violation of Item 3.2.1.A.5.

The procedure requires evaluating any 9 calendar days and it would appear that a violation of the 34 hour break in any 9 day requirement may occur on June 7, 2010. However, because of evaluating the 34 hour break in 9-day period at the end of the workday or start of the next work day, not during a non-workday, there is a greater than 34 hour break for the work hours listed in the JPM. If a candidate determined that a potential violation did occur for this instance it would be a conservative call and would actually need to be verified through the use of the official tracking tool (eSOMS). This would not constitute a failure by the candidate, only an item which would need further evaluation.

SEQUOYAH NUCLEAR PLANT
September 2010 NRC Exam

SIM G (RO\SRO)

Initiate Makeup to the Refueling Cavity
(rev. 1)

RO/SRO

JOB PERFORMANCE MEASURE

Task: Initiate Makeup to the Refueling Cavity

Task #: 3210110401 **(RO)**

Task Standard: Makeup to the refueling cavity via the RHR Pumps is initiated per AOP-M.04.(preferred method)
Makeup to the refueling cavity via the CCPs and VCT is initiated per AOP-M.04. (alternate)

Time Critical Task: **YES:** **NO:** **X**

K/A Reference/Ratings: 036AA2.02 (3.4/4.1) 004A4.08 (3.8/3.4)
036AK3.03 (3.7/4.1)

Method of Testing:

Simulated Performance: _____ **Actual Performance:** **X**

Evaluation Method:

Simulator **X** **In-Plant** _____ **Classroom** _____

Main Control Room _____ **Mock-up** _____

Performer: _____
Trainee Name

Evaluator: _____ / _____ _____
Name / Signature DATE

Performance Rating: **SAT:** _____ **UNSAT:** _____

Validation Time: **15 minutes** **Total Time:** _____

Performance Time: **Start Time:** _____ **Finish Time:** _____

COMMENTS

_____

_____

_____

SPECIAL INSTRUCTIONS TO EVALUATOR:

1. Critical steps are identified in step SAT/UNSAT column by bold print 'Critical Step'.
2. Any UNSAT requires comments
3. Initialize the simulator to IC-114 and complete the following setup.
4. **Override # AN:OVRDN_584** to **ON**, to bring in alarm for SPENT FUEL PIT LEVEL.
5. **Override ZAOLI68320, ZAOLI68321, ZAOLI68335A, ZAOLI68339A at 50** to simulate PZR at refueling level.
6. **Override ZAOPI6866A, ZAOPI6869, ZAOPI6862 at 35** to simulate refuel flood up pressure.
7. **Override AN:OVRDN_1695 to OFF** to keep midloop high level alarm from alarming.
8. **Override (FCV-62-135 & 136, CCP Suction from VCT, CLOSED. (ZLOHS62135A_Green f:ON, ZLOHS62136A_Green f:ON, ZDIHS62135A f:0 (close), ZDIHS62136A f:0 (close)**
9. Insure operator performs the following required actions for **SELF-CHECKING**;
   a. Identifies the correct unit, train, component, etc.
   b. Reviews the intended action and expected response.
   c. Compares the actual response to the expected response.
10. Add Caution Order tag to FCV-63-1 per 0-GO-13 App. O. (jumpers placed to remove seal in)

Tools/Equipment/Procedures Needed:

AOP-M.04, Section 2.0, 2.1, and Appendix A & B

REFERENCES:

1.	AOP-M.04, Sect 2.1 & Appendix A	Refueling Malfunctions	Rev No. 9
2.	AOP-M.04, Sect 2.1 & Appendix E	Refueling Malfunctions	Rev No. 9

Task Number	Task Title	Cont TRN
3210110401 (**RO**)	Initiate Makeup to the Refueling Cavity	

==========

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. All steps shall be performed for this task. When you complete the task successfully, the objective for this job performance measure will be satisfied. 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:

1. **Unit 1 is in mode 6 performing refueling operations. Approximately 1/2 of the core has been off-loaded at this time.**
2. **There is one fuel assembly in transit to the spent fuel pit from the core. It is presently in the upender cart in transient to the spent fuel pit.**
3. **The refueling SRO in the reactor building has just informed you that there is an obvious drop in reactor cavity level.**
4. **A dedicated operator that has been assigned to monitor vessel level instruments, informs you that there is a decreasing trend in Reactor cavity level indicators.**

INITIATING CUES:

1. **The refueling SRO reports a confirmed reactor cavity seal failure is occurring.**
2. **Alarm on panel 1-M-6D (D3) "SPENT FUEL PIT LEVEL HIGH-LOW" has just actuated.**
3. **The refueling SRO has requested makeup to the refueling cavity from the RWST as soon as possible**
4. **The US directs you to perform AOP-M.04, Refueling Malfunctions (single performer method).**
5. **Inform the refueling SRO (and Unit SRO) as soon as makeup is initiated.**

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
NOTE: If operator responds using AR-M6-D window D-3. AUO is dispatched to the SFP to investigate the alarm. Operator determines that AOP-M.04 is the appropriate procedure.	
STEP 1: Obtain the appropriate procedure. STANDARD: Operator obtains a copy of AOP-M.04. COMMENTS:	___ SAT ___ UNSAT Start Time____
STEP 2: 1. EVALUATE the following Tech Specs for applicability: ▪ 3.9.8.2, RHR - Low Water Level ▪ 3.9.10, Rx Vessel Water Level ▪ 3.9.11, Refueling Operations - Spent Fuel Pit Water Level ***Cue:*** ***The US will evaluate the Tech Specs for applicability*** STANDARD: Operator notifies US of the need to evaluate these three Tech Spec items. COMMENTS:	___ SAT ___ UNSAT
STEP 3: 2. EVALUATE EPIP-1, Emergency Plan Initiating Conditions Matrix. ***Cue:*** ***The SM will evaluate the Emergency Plan*** STANDARD: Operator notifies US/SM of the need to evaluate the Emergency Plan. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 4: 3. Diagnose conditions to determine appropriate section, of AOP-M.04, to perform. STANDARD: Based on plant indications and initial conditions, determines that section 2.1 must be performed and proceeds to page 4. COMMENTS:	___ SAT ___ UNSAT
Caution 1: Loss of Spent Fuel Pit or Refueling Cavity level and subsequent loss of shielding may result in extremely high dose rates in Containment and Spent Fuel Pit areas.	
Caution 2: If the reactor cavity water level drops to flange elevation with upender in vertical position, the top 0.25 inch of upender will extend above surface of water.	
Note: Fuel Handling SRO, personnel required to place fuel in safe location, and Radcon personnel remain (if possible) until required actions are completed.	
STEP 5: 2.1.1 **ANNOUNCE** to all non-essential personnel to evacuate Containment and AB el. 734 Refuel Floor. ***Cue:*** ***The SM would like you to make that announcement.*** STANDARD: Operator makes this announcement. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 6: 2.1.2 **ENSURE** the following personnel notified that seal failure has occurred: • Control Room • RADCON - to monitor refueling area and Aux Bldg as required • Fuel Handling Supervisor ***Cue: The SM will ensure all control room personnel and the Fuel Handling Supervisor are aware of the event and that RADCON begins monitoring CNMT and the Aux Bldg.*** STANDARD: Operator ensures these people are notified. COMMENTS:	___ SAT ___ UNSAT
Caution: Failure to maintain RWST level greater than 5% may cause CCPs or RHR pumps to lose suction.	
STEP 7: 2.1.3 **MAINTAIN** Refueling Cavity level as necessary: a. INITIATE makeup from RWST using Appendix A, "Filling Refueling Cavity from RWST." b. ***Cue: US directs makeup from RWST using CCP*** STANDARD: Operator obtains a copy of Appendix A Section A of AOP-M.04. COMMENTS:	___ SAT ___ UNSAT
NOTE:The following are from Appendix A, Filling Refueling Cavity From RWST, Section A of AOP-M.04.	
STEP 8: A.1.a. **VERIFY** RWST level greater than 8%. STANDARD: Operator verifies RWST level greater than 8% using one or more of the RWST level indicators located on M-6. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 9: A.1.b. **ENSURE** the following charging valves OPEN: FCV-62-90 STANDARD: Operator verifies FCV-62-90 open by observing 1-HS-62-90A RED light LIT. COMMENTS:	___ SAT ___ UNSAT
STEP 10: A.1.b. **ENSURE** the following charging valves OPEN: FCV-62-91 STANDARD: Operator verifies FCV-62-91 open by observing 1-HS-62-91A RED light LIT COMMENTS:	___ SAT ___ UNSAT
STEP 11: A.1.b. **ENSURE** the following charging valves OPEN: FCV-62-85 OR FCV-62-86 STANDARD: Operator verifies FCV-62-85 or 86 is open by observing 1-HS-62-85A or 1-HS-62-86A RED light LIT. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 12: A.1. c **OPEN** the following valves: FCV-62-135 and 136, CCP suction from RWST. STANDARD: Operator pushes HSs (1-HS-62-135A and 1-HS-62-136A) IN and turns to the OPEN position and determines that neither valve opens Green lights remain LIT for FCVs-62-135 and 136. ***Cue:*** **If required, acknowledge and ask for recommended path to complete task.** This step is critical to attempt a supply to the refueling cavity makeup flowpath and then for the UO to determine the valve failure so the alternate path may be utilized. COMMENTS:	___ SAT ___ UNSAT **Critical Step**
Evaluator Note: The candidate should recommend using the alternate method of filling Reactor Cavity by performing step 2 of Appendix A, **OR** the candidate may determine that response was not obtained due to suction valves not opening, flow from RWST is not available and returns to AOP step 5, RNO column. **(If candidate returns to step 5, RNO to perform Appendix E, then go to JPM step 20)**	
STEP 13: Operator reports to US that neither CCP suction from the RWST will open. ***Cue:*** ***After operator reports not being able to open CCP suction valves, report as the US that you will contact Maintenance Shift Supervisor to investigate the cause of the valve failure.*** STANDARD: Operator determines that step 2 of Appendix A is appropriate action to take or returns to step 5 RNO column for next action. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
NOTE: The following are from Appendix A, Section A, Step 2 of AOP-M.04.	
STEP 14: A.2. **IF** initiating makeup from RWST using RHR Pump suction, **THEN PERFORM** the following: a. VERIFY RWST level greater than 8%. STANDARD: Operator verifies RWST level greater than 8% using one or more of the RWST level indicators located on M-6. COMMENTS:	___ SAT ___ UNSAT
STEP 15: A.2. **IF** initiating makeup from RWST using RHR Pump suction, **THEN PERFORM** the following: b. OPEN FCV-63-1, RWST supply. STANDARD: Operator uses HS-63-1A and opens FCV-63-1, Observes Red light ON, Green light OFF. This step is critical to provide a makeup flowpath from the RWST to the refueling cavity. COMMENTS:	___ SAT ___ UNSAT **Critical Step**

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 16: A.2. **IF** initiating makeup from RWST using RHR Pump suction, **THEN PERFORM** the following: c. CLOSE one the following valves: * FCV-74-1, RHR suction from Hot Leg No.4 or * FCV-74-2, RHR suction from Hot Leg No. 4. STANDARD: Operator uses HS-74-1A and CLOSES FCV-74-1, Observes Red light OFF, Green light ON. OR Operator uses HS-74-2A and CLOSES FCV-74-2, Observes Red light OFF, Green light ON This step is critical to isolate the normal RHR suction flowpath and to swap over to the RWST suction flowpath. COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 18: A.2.d VERIFY flow to RCS. STANDARD: Operator verifies flow into the RCS by observing flow on 1-FI-63-91B or 1-FI-63-92B. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 19: Inform the US of flow from RWST to RCS/Refueling Cavity. STANDARD: Operator informs US and/or SM that flow has been established from RWST to Spent Fuel Pit. ***Cue:*** ***After operator reports that flow has been established, State "This completes the JPM."*** COMMENTS:	___ SAT ___ UNSAT Stop Time____
Evaluator Note: If candidate went back to Step 5 RNO start evaluation here	
STEP 20: 2.1.5.a RNO: **IF** RWST NOT available, **THEN PERFORM** the following: 1) **INITIATE** makeup using normal charging with CCP suction aligned to VCT **USING** App. E, Refueling Cavity Makeup Using Normal Charging. STANDARD: Operator transitions to App E to initiate makeup using normal charging. COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
NOTE: The following steps are from Appendix E, of AOP-M.04.	
STEP 21: App E 1. **ENSURE** FCV-62-81, Letdown Back Pressure Control Valve CLOSED. STANDARD: Operator places Manual/Auto toggle switch to Manual on controller 1-HIC-62-81A and then moves toggle to the right until valve position indicator is fully CLOSED (indicator needle stops moving to the right) This is a critical step to stop letting down water from RHR system to conserve RCS inventory. COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 22: 2. **ENSURE** FCV-62-83, RHR Letdown CLOSED. STANDARD: Operator turns setpoint dial fully clockwise and observes position indicator goes fully to CLOSE (left) position . COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 23: 3. **ENSURE** one of the following valves OPEN: FCV-62-85, Charging FCV to Loop 1 **OR** FCV-62-86, Charging FCV to Loop 4 STANDARD: Operator verifies FCV-62-86 is Open by observing switch for FCV-62-86 in the Open position and Red light On. COMMENTS:	___ SAT ___ UNSAT
STEP 24: 4. **ENSURE** the following valves OPEN: FCV-62-90, Charging isolation FCV-62-91, Charging isolation STANDARD: Operator verifies FCV-62-90 and FCV-62-91 are Open by observing switch for each valve in A-Auto position and Red light On, Green light off for each valve. COMMENTS:	___ SAT ___ UNSAT
Evaluator Note: The VCT makeup rate will be limited to ~ 120 gpm for normal auto makeup, if charging is increased above this value then VCT makeup will be required.	

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 25: 5. **ENSURE** VCT makeup initiated as necessary to maintain VCT level above 20%: STANDARD: Operator verifies VCT level above 20% and notes the need to monitor level to ensure normal makeup initiates as necessary. COMMENTS:	___ SAT ___ UNSAT
STEP 26: 6. **ENSURE** the following valves OPEN: FCV-62-132, CCP Suction from VCT FCV-62-133, CCP Suction from VCT STANDARD: Operator verifies that FCV-62-132 and FCV-62-133 are OPEN by observing control switches in A-Auto position and Red light ON, Green light Off COMMENTS:	___ SAT ___ UNSAT

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 27: 7. **ENSURE** the following valves CLOSED: FCV-62-135, CCP Suction from RWST FCV-62-136, CCP Suction from RWST STANDARD: Operator verifies that FCV-62-135 and FCV-62-136 are CLOSED by observing control switch indications Green light ON, Red light Off. **Evaluator Note:** valves are failed closed per the previous JPM malfunction COMMENTS:	___ SAT ___ UNSAT
STEP 28: 8. **ENSURE** CCP running. STANDARD: Operator verifies that 1B-B CCP running by observing control switch in A-Auto position and Red light ON, Green light Off, and normal running amps, discharge pressure, for plant conditions. COMMENTS:	___ SAT ___ UNSAT
Evauator Note: If candidate establishes greater than 120 gpm charging flow to the RCS in the next step, normal makeup flow will not be able to maintain VCT level greater than 20% and they will eventually lose this source of makeup water if VCT level cannot be maintained.	

Job Performance Checklist

STEP/STANDARD	SAT/UNSAT
STEP 29: 9. **ADJUST** FCV-62-89 and FCV-62-93 to establish desired flow to RCS. STANDARD: Operator adjusts charging flow by positioning control dial (turning dial counter clockwise) on 1-HC-82-93A to open FCV-62-93 to establish ~120 gpm flow to the RCS. This step is critical to ensure that makeup flow is being provided to the RCS to attempt to makeup for inventory loss due to the Reactor Cavity Seal. COMMENTS:	___ SAT ___ UNSAT **Critical Step**
STEP 30: Inform the US of flow from VCT to RCS/Refueling Cavity. STANDARD: Operator informs US and/or SM that flow has been established from VCT to RCS/Refueling Cavity. ***Cue:*** ***After operator reports that flow has been established, State "This completes the JPM."*** COMMENTS:	___ SAT ___ UNSAT Stop Time____

End Of JPM

READ TO OPERATOR

DIRECTIONS TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. All steps shall be performed for this task. When you complete the task successfully, the objective for this job performance measure will be satisfied. 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:

1. Unit 1 is in mode 6 performing refueling operations. Approximately 1/2 of the core has been off-loaded at this time.
2. There is one fuel assembly in transit to the spent fuel pit from the core. It is presently in the upender cart in transient to the spent fuel pit.
3. The refueling SRO in the reactor building has just informed you that there is an obvious drop in reactor cavity level.
4. A dedicated operator that has been assigned to monitor vessel level instruments, informs you that there is a decreasing trend in Reactor cavity level indicators.

INITIATING CUES:

1. The refueling SRO reports a confirmed reactor cavity seal failure is occurring.
2. Alarm on panel 1-M-6D (D3) "SPENT FUEL PIT LEVEL HIGH-LOW" has just actuated.
3. The refueling SRO has requested makeup to the refueling cavity from the RWST as soon as possible
4. The US directs you to perform AOP-M.04, Refueling Malfunctions (single performer method).
5. Inform the refueling SRO (and Unit SRO) as soon as makeup is initiated.