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December 12, 2006
GO2-06-155

Stephen Garchow
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
INITIAL LICENSE WRITTEN AND OPERATING EXAMINATION DOCUMENTATION

Dear Mr. Garchow:

The Initial License Written and Operating Examination were given at Columbia Generating Station the weeks of November 27 and December 4, 2006. The required Written Examination Performance Analysis including justification for changes to the exam is attached. Also included are all Examination Security Agreements, ES-201-3.

If you require additional information, please contact MK Cantrell, Manager, Operations Training, at (509) 377-8622.

Respectfully,

D.K. Atkinson

DK Atkinson
Vice President, Nuclear Generation
Mail Drop PE08

Attachment: Written Exam Performance Analysis

cc: w/o attachments
NRC Resident Inspector - 988C
RN Sherman - BPA – 1399

2006 ILC Written Exam Analysis was performed on questions that at least half of the candidates missed. The results of the review are as follows:

RO Exam – Question #15 – A post exam review of this question with the candidates was performed. No program deficiency exists. All candidates have the requisite knowledge involved in this question. Columbia has submitted comments on this question and believes the question to be faulty.

RO Exam – Question #16 - A post exam review of this question with the candidates was performed. No program deficiency exists. Candidates that missed this question determined that without more information, such as power history and SRM position, the question had no correct answer. Additionally, Columbia's procedures do not allow the reactor to be shutdown in the manner stated in the question.

RO Exam – Question #29 - A post exam review of this question with the candidates was performed. No program deficiency exists. All candidates have the requisite knowledge involved in this question.

RO Exam – Question #35 - A post exam review of this question with the candidates was performed. No program deficiency exists. All candidates have the requisite knowledge involved in this question. Columbia has submitted comments on this question as needing dual credit.

ILC WRITTEN EXAM REVIEW

Based on a review of the exam, several questions are candidates for challenge as follows:

Question 10
Question 15
Question 35
Question 46
Question 59

Question #10

References

1. PPM 5.0.10, Flowchart Training Manual
2. SD000127, System Description, Primary Containment, Volume 8, Chapter 1
3. Final Safety Analysis Report, Chapter 6

The indicated correct answer is "C , Condensation of steam from the SRV downcomers cannot be assured."

The term *SRV* Downcomers is confusing. The SRV tailpipe heat quencher is uncovered at 17'. Using the term SRV with downcomer may lead a candidate to believe that the heat quencher is the object being discussed and it would not actually be uncovered by the 18' 6" discussed in the question.

Main Steam System Description and Objective 5528.i, uses the term Quencher for the component that condenses the steam, not SRV downcomer. PPM 5.0.10 uses downcomer, not SRV downcomer.

Recommendations: Discard Question (no correct answer)

Question #15

References

1. SD000174, System Description, High Pressure Core Spray, Volume 7, Chapter 2.
2. SD000127, System Description, Reactor Core Isolation Cooling, Volume 7, Chapter 6.
3. Final Safety Analysis Report, Chapter 6

This question required the student to recognize that the RCIC turbine will lower the enthalpy of the steam that is being directed to the suppression pool, thus reducing the overall decay heat transferred to the wetwell. Since the MSIVs are closed, the decay heat is being removed by cycling the SRVs (directing the steam to the suppression pool). Although the RCIC turbine does remove some enthalpy from this stream, an additional cooling effect results from the HPCS minimum flow line. Insufficient data exists to support either A or B as a correct answer as both impact the amount of energy in the suppression pool over time. The lack of data makes the answer subjective to the assumptions made.

With the RPV level at +30 inches and stable and the HPCS suction from the CST (not injecting), the HPCS pump minimum flow valve would be open providing flow from the CST to the wetwell. This minimum flow (relatively cool water with some HPCS pump heat added) would provide significant dilution cooling to the wetwell during the time the HPCS pump is not injecting. The initial conditions stated the wetwell temperature was 106F. The nominal CST temperature is 70F.

With RPV level at +30 inches and stable and the RCIC suction from the CST (not injecting), the RCIC system would be in standby (RCIC-V-45 closed) with no steam flow and no min flow to the wetwell.

Maintaining these injection lineups for "several hours" would result in one of the following:
Intermittant HPCS pump injection with near continuous minimum flow from the CST to the wetwell (HPCS minflow opens at 1300 gpm) - OR -
Intermittant RCIC injection momentarily using steam to drive its turbine, but the turbine secured for the duration until needed for additional injection.

Since no specific data exists identifying the impact on wetwell temperature due to running RCIC vs the HPCS minimum flow impact, the student is forced to make an educated guess as to the impact on the wetwell. The question does ask for the LEAST amount of heat added, but the operator would use wetwell temperature rise as an indication of the heat and no existing data support RCIC or HPCS min flow as the correct data.

Recommendations: Discard Question (no correct answer)

Question #35

References

1. Plant Drawing, EWD-46E-107
2. Plant Drawing, EWD-58E-004

Dual credit should be given for both 'A' and 'D'. Answer 'D' is correct. Distractor 'A' is also correct.

This discussion will evaluate SW-P-1B. SW-P-1A response is identical.

After the loss of all off-site power, SM-8 loses power. Reference drawing 46E107. when SM-8 reaches its primary UV setting, E-RLY-27/8/1 and E-RLY-27/8/2 (Zone E9) deenergize causing their 4-3 contacts to close (Zone D8 and Legend note 5). These contacts closing energize E-RLY-27XX/8 causing contact M1-R1 (drawing 58E06) to open.
Reference drawing 58E004.
Once E-RLY-27XX/8 opens its M1-R1 contact, the downstream relay SW-RLY-62/P1B is deenergized.

Upon restoration of power by DG-2, E-RLY-27/8/1 and E-RLY-27/8/2 energize and open contacts 4-3 (Drawing 46E107). This deenergizes E-RLY-27XX/8 causing contact M1-R1 to close. The other flow paths (Zone G/9 and G/10) would not be available as RCIC, RHR-B, and RHR-B would not be running.

Once M1-R1 closes, (E-RLY-5/DG2 is closed with DG-2 running), then SW-RLY-62/P1B energizes and times out 20 seconds before closing its associated 1-5 contact. The pump only needs SW-RLY-V/2B2 contact 2-3 (SW-V-2B closed) to allow the SW-P-1B breaker to close.

Note both of these conditions are required to exist for the SW-P-1B breaker to close. For the breaker to close the discharge valve must be closed AND the 20 second time delay relay must time out.

Based on this, distractor 'A' is also correct.

Recommendations: Two Correct Answers, A and D.

Question #46

References

1. Plant Procedure SOP-AR-START, section 5.3
2. SD000181, Air Removal System (AR), Volume 2, Chapter 6

The intent of this question deals with an interlock associated with the pressure control valve. The system is operated such that this interlock can never come into effect. (See attached pages of SOP-AR-START). When MS-PCV-16A is placed in AUTO, the valve will not move. The local controller is in manual with the valve shut. After placing the switch in AUTO, the local controller is then manually positioned to open the valve. When pressure is at 210 psig, the local controller is then placed in automatic.

If the student assumes the procedural steps have been completed IAW SOP-AR-START, then two correct answers exist. First, the valve is capable of opening once upstream steam supply pressure is GT 120 psig. Answer 'D' is correct as written. Second, the MS-PCV-16A is set to maintain 210 psig. This valve would be OPEN if downstream pressure was LT 50 psig as the pressure controller would be attempting to maintain 210 psig. Distractor 'A' is also correct.

Recommendations: Two Correct Answers, 'A' and 'D'.

Question #59

References

1. NUREG 1123, K/A Catalog 295038

This question is beyond the scope for RO knowledge. Interpretation of QEDPS data is not a Reactor Operator task or is QEDPS training required for ROs. The KA is for the Reactor Operators to determine the source of a release given the indications available to the Reactor Operator, such as annunciators, ARMs, and effluent monitors.

Recommendations: Discard Question (not required RO knowledge)