

2009 Wolf Creek NRC Written Exam Review of \geq 50% Missed Questions

Question 44:

This question involved being able to diagnose a pressurizer steam space LOCA. Three out of six candidates picked answer "B" instead of "D". Answer "B" was that the event was a Small Break LOCA. Answer "D" was a stuck open PORV. Both conditions can result in increased containment pressure with a rising pressurizer level. If the steam tables are used to determine subcooling, the RCS is saturated based on given conditions. If the event were due to a small break LOCA, the core gets filled before the pressurizer and saturated conditions are not expected.

One candidate asked a question during the exam as to PRT conditions. No response was provided, as this information would clearly differentiate between the two answers. This is a Three Mile Island question, and is covered in training to be able to make this assessment without PRT information using the added features from NUREG-737 retrofits to existing plants (post-accident monitoring). During the post-exam debrief, this candidate said that the lack of PRT information caused them to choose answer "B". Of course, at this point the PRT would have ruptured, so giving a zero pressure could have been leading to the wrong answer as well, unless PRT temperature was given.

This will be covered during the exam review. Validation showed only 2 out of 10 picking answers "A" and "B". Training Needs Analysis TNA 2009-1240-0 was created: "Based on ILO written exam analysis, candidates showed weakness in differentiating between a small break LOCA refill and a steam space LOCA. The differentiation was based on RCS conditions. For steam space leak, the RCS will be in saturated conditions (steam bubble in RCS), for a small break LOCA it will not. This training can be provided as a simulator lab and Lesson plan LO1610722 should be IMPACTed".

Question #68

This question involves the manner in which MODE 1 is administratively declared in the GEN 00-003 and 005 procedures. Three candidates picked answer "A" instead of "C". Answer "A" has the determination based on one NI channel at or above 5%; however answer "C" is based on the procedural requirement for two channels to meet this condition. This is adequately captured in the procedures. The lesson plans are correct as well. No comments were received on this question. If candidates were actually performing the procedure, this would not be an issue. No training need was identified other than covering this during the exam review. Validation had two picking "D" and two picking "A" out of ten.

Question #72

This question involves the diagnosis and response time for a fire that affects the pressurizer PORV's. All candidates got the diagnosis portion correctly; however

three candidates chose 10 minutes (answer "D") instead of 3 minutes (answer "C"). Two candidates had post-exam debrief feedback. One stated that he wished that he had reviewed the latest changes to OFN KC-016, being aware that there were recent changes. Another candidate stated that he thought it was 5 minutes and that it did not have a correct answer.

The action time has changed while the candidates were in training. As with many plants, Wolf Creek is in the process of making changes to fire protection procedures based on new analysis information. On 5 Mar 2009, OFN KC-016 revision 21 was issued which changed the time from 5 minutes to 3 minutes. OFN training for this class occurred in 2008, so they would not have been trained on this change. In addition to exam review, they will receive this as part of the normal catch-up post-license training to bring them up to speed on changes that have occurred since they entered class. This is not a knowledge weakness; just confusion over a procedure that was revised while the class was ongoing. During validation one picked answer "D" out of ten, but the original question was replaced based on NRC feedback.

Question #76:

This question deals with RCS temperature response due to a LOOP and natural circulation. The candidates also had to be aware of that the reactor coolant pumps are restarted in EMG ES-02 if offsite power is available. In this case, T_{hot} decreases and T_{cold} rises, making "B" the correct answer. Two candidates picked answer "A", which indicated that the RCP's would not be restarted. One candidate picked answer "C" which had T_{hot} rising and RCP's not restarted. The only widespread knowledge issue appears to be that EMG ES-02 will allow restart of the RCP's. This is a procedurally driven action and will not be an issue in the plant. On validation, only two out of seven missed the question. This will be covered during the exam review.

As a side note, this question was further validated by the actual plant on 19 Aug 09. The plant experienced a LOOP and subsequent restoration of offsite power. T_{hot} decreased, T_{cold} rose, and the RCP's were restarted in EMG ES-02. Therefore, no global issue exists.

Question #78:

This question deals with Technical Specification requirements for DC sources, DC buses, and procedural actions required for the loss of a battery charger. In the case of loss of a battery charger, the bus remains energized by the battery and the inoperability is associated with the DC source, not the bus. The correct action is to declare the source inoperable and align a swing charger using the SYS NK-131 procedure. OFN NK-020 would only be used if the bus is deenergized or the voltage is near 105V. All candidates missed this question. Two chose answer "A", which declares the source inoperable, but uses the OFN NK-020 procedure, which is for responding to a dead bus. One candidate picked answer "B" which has no inoperability and uses OFN NK-020 to restore. One

candidate picked answer "D" which has no inoperability, but uses the correct procedure to restore. One candidate commented that he was down to answers "A" and "C" since he knew that the DC source was inoperable, but did not know which procedure to use. He knew that ALR 00-025 could send you to OFN NK-020, but was unsure if it also sent you to the SYS.

Only one of seven missed this question on validation by picking answer "B". However, removal of a battery charger for maintenance is a frequent occurrence in the plant. TNA 2009-1241-0 was created: "During the 2009 NRC written exam evaluation, a weakness in handling the loss of a Class 1E battery charger was observed. There are two parts to this issue both dealing with the fact that in this case, the bus is still energized by the battery. The first concerns TS operability. DC source TS 3.8.4 requires both a battery, charger and float voltage $\geq 128.4V$. DC bus specification TS 3.8.9 only requires the battery and sufficient voltage to operate equipment. This voltage is 105V, which is the point at which the battery is discharged and must be isolated from the bus. The second concerns the procedural flowpath to deal with this situation. The ALR sends you to SYS NK-131 if the bus is still energized, but to OFN NK-020 if the bus is dead. OFN NK-020 will kick you out if the bus is still energized. Overall, TS bases and procedures are clear. However, training should occur on what constitutes an energized bus. We should also mention the need to isolate batteries if voltage gets down to 105VDC. EMG C-0 and OFN NB-034 require battery monitoring, but do not give a setpoint. Cell reversal can occur if batteries are discharged too far. Procedure comments will also be entered." Two procedure comments were generated to place minimum voltage numbers in EMG C-0 and OFN NB-034.

Question #87

This question deals with a PORV failure during EMG performance. The EMG in affect is EMG E-3 for SGTR. The question requires the candidate to identify the concern and the next procedure to go to. The correct response is to enter EMG C-31 to allow recovery while minimizing cycling of ECCS components due to subcooling requirements. Two candidates picked answer "B", which is to go to EMG C-32. However EMG C-32 cannot be entered directly from EMG E-3, only from EMG C-31. The concern was correct, however the procedural flowpath was not. One candidate picked answer "C" which has the correct procedure, but the incorrect concern. Rupture of the PRT may occur, but this leakage is captured in containment. A steam generator tube rupture has the potential of discharging RCS coolant to the environment, which is the overriding concern. In any case, this is not the EMG basis for transition to EMG C-31. No comments were received during debrief.

The high miss portion is based on procedure flowpath. Validation had 4 out of 7 missing this question as well, all picking "B". These contingency procedures are for a beyond design basis event. The probability of actual use is small. If these procedures were actually implemented, the correct flowpath will occur. No additional training needs were identified other than the exam review.

Question #91

This question involves an earthquake that causes the failure of the main dam. This places the operators in two sections of OFN SG-003 at the same time. A key in the stem indicates that the equipment inspection is complete and there is no damage in the plant to eliminate any power hold criteria from the earthquake section. With lake level near the suctions of the circulating water and service water pumps, the operator will need to reduce power before the condenser is lost. The operators will also have to start Essential service water to provide cooling to safety-related equipment. Two candidates picked answer "A", which indicated to maintain power until plant equipment is checked. This was likely due to not utilizing all of the information in the stem, namely that the plant inspection is complete or that lake level at 1080 indicates a failure of the main dam. No comments were received at the post-exam debrief. This question will be covered during the exam review. During validation, two out of seven picked answer "C".

Question #98:

This question involves the procedural requirements for processing an On-The-Spot-Change (OTSC) to an in-progress procedure. One part concerned the requirement that only one OTSC is allowed at a time. The second part was that two personnel must approve, one of which being a senior reactor operator. Two candidates picked answer "B", which only had one approver as a senior reactor operator. They did not miss the part that an SRO was required to approve it, which is the most important part. OTSC changes are performed using form APF 15C-004-04, which has separate signatures for each. Should they receive one in the plant, the two-signature requirement will be apparent. No additional training is required, other than the exam review. During validation, two picked answer D and one picked answer "B" out of seven. However, this question was significantly modified several times between validations, so these numbers are not relevant.