Control Board Operations

Results: Control Board Operations

Competency		weight	scores		grades	total	comment page No
Control Board Operations						1.99	
	a. Locate and manipulate	0.34	1		0.34		pg 18, 19. 20
	b. Understanding	0.33	3		0.99		
	c. Manual Control	0.33	2		0.66		pg 21

3a. Locate and Manipulate
Comment on page 18

Examiner's Comments

CROSS REFERENCE:

3.a: Control Board Operations – Locate & Manipulate

SCENARIO/EVENT:

Scenario 7, Event 1: Raise Power in Accordance With 12004-C, Power Operation (Mode 1)

EXPECTED ACTION/RESPONSE:

The applicant, as Reactor Operator (RO), was expected to make the required reactivity adjustments to maintain Tave within 2°F of Tref during a power ascension from 29%.

APPLICANT ACTION/RESPONSE:

Prior to commencing the power ascension, the Senior Reactor Operator (SRO) directed the applicant to maintain Tave within 2°F of Tref. However, the applicant allowed Tave to drop approximately 2.3 °F below Tref after the power ascension was suspended. Tave trended downward for approximately 40 minutes before reaching the maximum deviation of 2.3 °F, at which time the applicant withdrew control rods and brought Tave back within the directed control band. After the scenario, the applicant was asked to state the Tave/Tref control band provided by the SRO. The applicant stated 2 °F. The applicant was also asked to state the maximum difference between Tave and Tref prior to the reactor trip. The applicant stated 2.3 °F. The applicant was downgraded in this competency because her reactivity manipulations were not timely enough to maintain the control band provided by the SRO.

The applicant made three non-critical errors in this rating factor; therefore, a score of "1" was assigned.

LACK OF ABILITY/KNOWLEDGE:

The applicant demonstrated a weakness in her ability to make timely reactivity changes to maintain Tave within 2 °F of Tref as directed by the SRO.

POTENTIAL CONSEQUENCES:

The potential consequences of not maintaining parameters within control bands directed by the SRO could result in alarms and unnecessary operator actions that could distract the operator.

K/A (SRO IMPORTANCE RATING): 001A4.03 (3.7)

10CFR55.45(a)(3): Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.

Applicant Response

In response to, 3a. Control Board Operation – Locate and Manipulate (comment on page 18)

APPLICANT ACTION/RESPONSE:

SRO directed the applicant to maintain T_{avg} within 2°F of T_{ref} for power ascension. Comment written by examiner states that the applicant allowed T_{avg} to drop approximately 2.3° F below T_{ref} after power ascension was suspended. The comment also stated that there was a downward trend for approximately 40 minutes before being corrected.

The description of the event does not identify that the applicant attempted on **two** occasions to adjust the deviation prior to reaching 2.3°F. Each time the applicant requested to withdraw control rods and was granted permission, a failure occurred (Malfunction was requested by the NRC Examiners) causing the SRO to suspend the rod withdrawal (Note; the timing of each failure is directed completely by the NRC lead examiner(*) with the concurrence of the other examiners and they are in direct communication with the simulator operator, if the intent was to remove grading points in this case a reasonable amount of time must be given to control RCS temperature and certainly giving direction to insert the next failure to prevent this control would not be appropriate). The first attempt was interrupted by the failure of the NSCW fan tripping and the second attempt to adjust the deviation was interrupted by a failure of a Pressurizer pressure channel (this failure resulted in the crew exiting Unit Operating Procedure and entering 18001 section C to address the condition. Each time the SRO identified that the failure would be addressed **first and once addressed the rod withdrawal would commence** (Note; below that NMP-OS-001 states all reactivity manipulations must be first approved by the SRO). It is also important to note that the applicant continued to update the SRO on the status of the temperature deviation. Once the failure was evaluated according to the Annunicator Response Procedure, Technical Specifications and Abnormal Operating Procedures the applicant was granted permission to adjust the deviation. The applicant at no time give any indication that she did not know the operating limits and how to properly make the required adjustment and would have performed the correct actions if given adequate time to respond as is required per the NRC testing guidelines in Appendix D.

NMP-OS-001

Station Standard (Procedure included in the frozen references sent to the NRC Examiners)

The SS will approve each reactivity manipulation.

(*) As stated below in APPENDIX D , NRC "SIMULATOR TESTING GUIDELINES"

(1) A well-crafted scenario should flow from event to event, giving the operators sufficient time in each event to analyze what had happen, evaluate the consequences of their action (or inaction), and assign a priority to the event given the existing plant conditions.

(2) Each event description should include when it is to be initiated (e.g. BY SIGNAL OF THE LEAD EXAMINER/EVALUATOR, timeline, or plant parameter). Discussion with the simulator operators during the NRC exam revealed that option number one above was utilized BY SIGNAL OF THE LEAD EXAMINER / EVALUATOR in each of the scenarios. In addition, the pace at which malfunctions are entered can adversely affect the way an operator or crew responds. Too short a time between malfunctions may mask the effects of a particular malfunction and divert the operator's attention. This cuts short the observers ability to evaluate the operators response to the earlier malfunction and may be prejudicial to a fair evaluation.

ABILITY/KNOWLEDGE

Applicant understood requirements to maintain 2 F t_{avg}/t_{ref} deviation. However applicant could not make adjustment with additional failures in progress as this would result in the SRO addressing simultaneous conditions that could lead to a potential human performance error. In addition positive Rx manipulations are not permitted without the permission of the SS or the use of a peer check.

POTENTIAL CONSEQUENCES

There were no consequences associated with the deviation because the SRO was updated on the status of the parameter and the crew did not receive a T_{avg}-T_{ref} Deviation alarm (setpoint was at 3F).

Supporting Documentation

6.3.3 As a minimum, the Specific Reactivity Management Practices contained in Attachment 2 will be followed.

6.3.4 Except when a Reactivity Management SRO is stationed per 6.4 of this procedure, the SS shall maintain direct supervisory oversight of reactivity manipulations. The SS will approve each reactivity manipulation, with the exceptions of transient conditions described in step 6.3.8 or when a Reactivity Management SRO is stationed per 6.4.

6.3.5 A reactivity brief shall take place at the beginning of each shift in modes 1 and 2. The reactivity brief should include expected reactivity manipulations during the shift needed to maintain current plant conditions or in the case of planned startups, shutdowns or power maneuvers the brief should include a discussion of reactivity changes that would be required to execute these power changes. In addition to this, the reactivity brief should include a discussion of pertinent current core reactivity parameters and any planned work activities that could potentially affect reactivity. The reactivity briefing sheet or OATC turnover sheet shall contain a list of degraded or out of service reactivity manipulation equipment.

6.3.6 When power reduction is necessary, only steam flow adjustments will be effective in reducing and maintaining reactor power below limits. While control rod insertion may appear to provide some immediate relief from high power conditions, the effects are temporary without reducing total steam flow and will only reduce nuclear instrument accuracy due to the resultant cooldown. Turbine load adjustments must be made to reduce and control reactor power, with control rods used primarily to maintain Tave on program during the power reduction. (PWR Only)

6.3.7 Peer checks will be used for reactivity changes, with the exception of conditions described in step 6.3.8.

6.3.8 During some plant operations, one or more of the various indications of reactor power may not be accurate. Therefore, control room operators should always monitor all indications of reactor power and maintain it within licensed limits.

6.3.9 Transient Conditions

6.3.9.1 During transient conditions that require a rapid reduction in reactor power, operators may take actions to insert negative reactivity that are outside the amounts discussed in the reactivity brief and without SS concurrence. Peer checking reactivity manipulations under these conditions is preferred but not required if there are no other licensed operators available during the manipulation. The SS shall be briefed as soon as possible on the amount of negative reactivity added (number of steps of rod insertion, amount of boron added (PWR Only), Recirculation Pump speed adjustments (BWR Only), etc.

6.3.9.2 The control room team shall not immediately dilute or withdraw control rods in an attempt to restore RCS Tavg/Tref deviations caused by a secondary plant transient. Attempts to immediately restore RCS Tavg/Tref deviations caused by a secondary plant transient can be aggravated by withdrawing control rods or reducing boron concentration with reactor power rising. . For the PWRs, once turbine load has been stabilized and RCS Tavg has been restored to within 3 degrees of Tref, positive reactivity can be added by withdrawing control rods.

6.3.9.3 The control room team shall not immediately withdraw control rods or raise Recirculation Flow in an attempt to restore reactor power or turbine throttle pressure caused by a secondary plant transient. Attempts to immediately restore reactor power or turbine throttle pressure caused by a secondary plant transient can be aggravated by withdrawing control rods or raising Recirculation Flow when reactor power is rising (BWR only).

6.3.9.4 During transients, independent methods of determining reactor power shall be used and correlated to validate accuracy. Following the transient condition, the SS and shift NPOs will evaluate the reactivity control status, discuss a recovery plan, and if possible consult other resources to determine an appropriate course of action. The recovery plan should include expected communication updates on reactivity conditions and reactor power/temperature management.

6.3.9.5 If at any time the reactor becomes sub critical unintentionally, as indicated by a -1/3 dpm startup rate or - 78 second period, the reactor should be shutdown. (Reference SOER 07-01, Recommendation 1)

6.3.10 Control Rod Movement

6.3.10.1 With the exception of transient conditions described above, rod manipulations shall be peer checked. The peer check should include a verbal confirmation of rod movement direction.

6.3.10.2 For plant Hatch, control rod movement will be in accordance with Hatch procedure 34GO-OPS-065-0.

6.3.10.3 For Farley and Vogtle:

When withdrawing control rods in MODE 1, the OATC shall stop rod withdrawal at least every three steps and check for expected response on NI's, DRPI, and reactor coolant temperature (i.e. pull and wait). This requirement may be suspended during evolutions that have adequate procedural direction and oversight during the withdrawal of the control rods (i.e. recovery of a dropped rod, rod control surveillances). It should be noted that many of the fuel-damaging events in the industry have resulted from misoperation of control rods. Careful monitoring of the rod control system is essential.

Peer check for rod manipulations should confirm placement of hand on rod motion switch in a manner that allows physical confirmation of intended direction of rod motion.

6.4 Reactivity Management SRO

6.4.1 During a plant start-up, at approximately 2% power, an additional active licensed SRO shall be dedicated to provide direct and intrusive oversight of reactivity manipulations allowing the SS to maintain the overall perspective of unit operation. A reactivity management SRO may also be stationed at the request of the Shift Supervisor during power maneuvers involving frequent reactivity manipulations.

Pg. 18 response:

During the scenario Charlissa (RO) kept me (SRO) informed of the TAVE/TREF Deviation and recommended several times to withdraw control rods beginning at a deviation of 1.7F. During those times there were failures present that I decided to prioritize over withdrawing control rods to maintain Tave in the established band. My responsibilities as Shift Supervisor require ensuring that there are no transients going on during reactivity manipulations and mitigating those transients prior to reactivity manipulations being performed, with the exception of maintaining Thermal Power within the licensed limit. Charlissa (RO) was not allowed to make any positive reactivity manipulation without approval from me (SS), and met station expectations through keeping me informed of the deviation and its trend while recommending withdrawing control rods.

NMP-OS-001 (Reactivity Management Program):

> 6.3.4: Except when a Reactivity Management SRO is stationed per 6.4 of this procedure, the SS shall maintain direct supervisory oversight of reactivity manipulations. The SS will approve each reactivity manipulation, with the exceptions of transient conditions described in step 6.3.8 or when a Reactivity Management SRO is stationed per 6.4.

3a. Locate and Manipulate
Comment on page 20

Examiner's Comments

CROSS REFERENCE:

3.a: Control Board Operations – Locate & Manipulate

SCENARIO/EVENT:

Scenario 7, Event 6: RWST Sludge Mixing Line Pipe Break with Failure to Automatically Isolate

EXPECTED ACTION/RESPONSE:

The applicant, as Reactor Operator (RO), was expected to know the location of the RWST sludge mixing isolation valves' (1-LT-0991 & 1-LT-0990) handswitches, which were located on the control room back panel QPCP. As a result, the applicant was expected to assist the crew in locating and closing the sludge mixing isolation valves in a timely manner following annunciation of ALB06-E04, RWST LO LEVEL. The applicant was the RO, therefore, it was not expected that she leave her control boards to close the valves. However, it was expected that she recommend to the crew that those valves were located in the control room (and also modeled in the simulator) and that the automatic actions for those valves to close on low RWST level needed to be ensured.

APPLICANT ACTION/RESPONSE:

After receipt of ALB06-E04, the applicant did not recommend to the crew that they needed to ensure that the sludge mixing isolation valves, were closed. During this event the Unit Operator (UO) stated to the applicant that the sludge mixing valves should have closed on low RWST level, but the applicant did not recommend that the crew ensure that those control room handswitches be checked closed. The entire crew, including the applicant, allowed the RWST leak to continue for approximately 19 minutes when the only action required to isolate the leak was closing the control room handswitches for the sludge mixing isolation valves, which should have been verified closed as part of performing the alarm response procedure associated with ALB06-E04.

The applicant made three non-critical errors in this rating factor; therefore, a score of "1" was assigned.

LACK OF ABILITY/KNOWLEDGE:

The applicant demonstrated a weakness in locating the sludge mixing isolation valves' handswitches.

POTENTIAL CONSEQUENCES:

The potential consequences of not closing sludge mixing isolation valves was a reduction in RWST inventory available to cool the core following a safety injection, including a potential inability to achieve cold leg recirculation due to the depletion of RWST inventory.

K/A (SRO IMPORTANCE RATING): 006K4.24 (3.0)

10CFR55.45(a)(3): Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.

Applicant Response

In response to, 3 a. Control Board Operations – Locate and Manipulate (comment on page 20)

APPLICANT ACTION/RESPONSE

Applicant acknowledged ALB06-E04 (RWST Lo level), and was directed by the SRO to monitor Reactivity while the UO responded per the annunicator response procedure. (Note; that assigning the OATC to monitor reactivity while the remainder of the operating crew are distracted by other plant conditions is of the highest importance, this is not just an empty statement but is intended to establish responsibilities during crew responses). If it is expected by the NRC examiner that OATC is to be burdened with the additional responsibility of considering and recommending actions to the crew related to the problem or failure you would weaken this focus on core reactivity and thereby render this assigned task useless. In addition, in the past the station has been complemented by INPO and the NRC on this approach to transient response. The applicant to the extent possible did assist the UO and SRO by monitoring trends and updated the SRO on the status. Prior to the UO and SRO determining that the sludge mixing valves were open the applicant did ask if there were any manual valves that could be manipulated downstream if the air operated valves were isolated and leaking by. In addition, the examiner's written report states that the UO directed a communication to the applicant that the sludge mixing valves should have closed on low RWST level, this is in error and supported by the other candidates because this information was reported to the SRO, NOT the applicant (why would this communication be directed to the OATC, this is not logical).

The SRO and UO were aware that the sludge mixing valves did not isolate and that they were located on the QPCP. Other crews **where all the candidates passed** had issues with determining the location of the hand switches to close the valves, but this was not the case for our crew. The SRO and UO were looking for the correct procedure guidance to isolate the sludge mixing valves (activities performed directly by procedure guidance as opposed to knowledge based actions are always recommended and encouraged by the station, if this is not considered an appropriate approach to the safe operation of the station the NRC should maybe make some change recommendations). Isolating the sludge mixing valves per the SOP would protect plant equipment to ensure the pumps associated with the sludge mixing were properly stopped.

LACK OF ABILITY/KNOWLEDGE

The applicant could not recommend to the crew to isolate the sludge mixing valves because they were already aware. The applicant ensured that she notified the SRO on the status of the RWST so that the SRO could assess the level of urgency in finding the correct procedure. The grading criteria utilized, is not listed as an expected action or behavior on the Required Operator Actions on Form ES-D-2 (See supporting documents). In addition it is unrealistic to identify that the applicant made an error because she did not make a recommendation to the crew. If all crew members were heavily involved in diagnosing and response to the failure, no one would be adequately monitoring reactivity.

Supporting Documentation

Pg. 20 response:

When ALB06-E04 was received, Charlissa (RO) silenced and announced the alarm. I (SS) directed Charlissa to continue to monitor reactivity and directed [redacted] to pull the ARP for the alarm and investigate actions to be taken. [redacted] informed me, by name, not Charlissa of the automatic action that did not take place. There was never any confusion as to where the hand switches were located by either [redacted] or me. I made a conscious decision to isolate the sludge mixing system by use of the SOP 13105-1 Step 4.2.7.3. This decision was based on not isolating the system with the pump running. The delay of 19 minutes was incurred while reviewing the P&ID for the RWST and finding the correct procedure and step to isolate the sludge mixing system. My expectation for Charlissa was for her to monitor reactivity and critical parameters of the reactor. Charlissa getting involved with troubleshooting and diagnosis would have taken away from the duties I directed her to do.

[redacted]

Pg. 20 response:

[redacted] directed me to pull the ARP for ALB06-E04 while Charlissa (RO) was directed to monitor reactivity. After reviewing the ARP, I informed [redacted] that the automatic action of the valves going shut should have occurred. I waited on direction from [redacted] to shut the valves. There was no confusion on where the valves were located. [redacted] discussed with me procedural guidance for shutting the valves and directed me to find the SOP for removing the sludge mixing system from service. I agreed with this action so that challenging the automatic action of the pump tripping would not be challenged; not challenging automatic actions of systems is an expectation of both Operations and Operations Training being reinforced throughout license training.

[redacted]

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose RWST level is actually lowering on all channels. Symptoms / alarms: ALB06-E04 RWST LO LEVEL Indications: • RWST level lowering on LI-0990, 0991, 0992, and 0993 to less than 95%..
	OATC	**ALB06-E04 actions.** **PROBABLE CAUSE** 1. Filling of Accumulators. 2. Adding water to the Spent Fuel Pool. 3. Safety Injection (SI) actuation. 4. System leakage.
	UO	**AUTOMATIC ACTIONS** RWST Sludge Mixing Isolation Valves 1-HV-10957 (Train B, 1-LT-0991) an 1-HV-10958 (Train A, 1-LT-0990) close. **Note to examiner:** These valves are located on the QPCP and will NOT close for this event. The UO will have to manually close the valves to isolate the leak.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.

Time	Position	Applicant's Action or Behavior
	OATC UO	**ALB06-E04 actions continued.** **INTIAL OPERATOR ACTIONS** NONE
	UO	**SUBSEQUENT OPERATOR ACTIONS** 1. IF in Modes 1, 2, 3, or 4, and SI is not in progress, stop any operation that could be removing water from the RWST. 2. IF a system leak is indicated, dispatch personnel to locate and isolate the leak. **Note to examiner.** The UO closing either HV-10957 or HV-10958 will isolate the leak for this event. 3. Restore RWST level to normal per 13701-1, "Boric Acid System". 4. Refer to Technical Specification LCO 3.5.4 and TR 13.1.7. **COMPENSATORY OPERATOR ACTIONS** NONE
	SS	

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.

Time	Position	Applicant's Action or Behavior
	SS	3.5.4 Refueling Water Storage Tank (RWST). LCO 3.5.4 The RWST shall be OPERABLE. APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more sludge mixing pump isolation valves inoperable.	B.1 Restore the valve(s) to OPERABLE status.	24 hours
D. RWST inoperable for reasons other than Condition A or B.	D.1 Restore RWST to OPERABLE status.	1 hour
E. Required Action and associated Completion Time of Condition A or D not met.	E.1 Be in MODe 3. AND E.2 Be in MODE 5	6 hours 36 hours.

Note to examiner: Closing the RWST sludge mixing isolations HV-10957 and HV-10958 satisfies Condition B.

Op-Test No.: 2012-301 **Scenario No.:** 7

Event No.: 6

Event Description: The RWST will develop a leak resulting in lowering RWST level below the Tech Spec limit. After receipt of a QMCB annunciators, the UO will find the RWST Sludge Mixing Isolation Valves have failed to automatically close. The UO will close the valves on the QPCP and the leak will be terminated.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Action or Behavior</th></tr>
<tr><td></td><td>SS</td><td>TR 13.1.7 Borated Water Sources – Operating.

TR 13.1.7 The following borated water source(s) shall be OPERABLE as required by TR-13.1.3:

a. Boric acid storage tank.

b. The refueling water storage tank (RWST).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS
<table>
<tr><th>CONDITION</th><th>REQUIRED ACTION</th><th>COMPLETION TIME</th></tr>
<tr><td>D. RWST inoperable.</td><td>D.1 Enter applicable Conditions of RWST Technical Specification 3.5.4.</td><td>Immediately.</td></tr>
</table></td></tr>
<tr><td></td><td></td><td>END OF EVENT 6, proceed to EVENT 7, the main event.</td></tr>
</table>

3c. Manual Control

Comment on page 21

Examiner's Comments

CROSS REFERENCE:

3.c: Control Board Operations – Manual Control

SCENARIO/EVENT:

Scenario 7, Event 3: Loss of Cooling to Letdown Heat Exchanger (TE-0130 Failed Low)

EXPECTED ACTION/RESPONSE:

The applicant, as Reactor Operator (RO), was expected to diagnose the failure of TE-0130, Letdown Heat Exchanger Outlet Temperature, and manually control TV-0130 using controller 1TIC-130, LETDOWN HX OUTLET TEMP.

APPLICANT ACTION/RESPONSE:

When TE-0130 failed low, the applicant acknowledged the associated alarms (ALB07-F04 & ALB07-B04), but did not take any actions to manually control letdown temperature, and also did not recommend to the Senior Reactor Operator (SRO) that she could manually control letdown temperature. Approximately seven minutes after the first alarm annunciated, the applicant made the statement, "The only thing we can do is call C&T [Clearance & Tagging] to get the TE fixed." Approximately one minute later, the SRO directed the applicant to take manual control of 1TIC-130 and monitor the VCT outlet temperature. When the applicant began manipulating 1TIC-130, she initially pressed the up arrow, and the SRO immediately informed her that the controller raises and lowers temperature and that the arrows are not indicative of opening and closing the valve. After the incorrect manipulation and specific direction from the SRO, the applicant gained control of letdown temperature. After the scenario, the applicant was asked to explain her response to the malfunction. She stated that she initially pressed the up pushbutton, and then corrected her actions and pushed the down pushbutton.

The applicant had seven minutes to understand that the automatic function of controlling letdown temperature could be accomplished manually. Instead of making this recommendation to the SRO, she stated that the only option was to call C&T to get the TE repaired. Furthermore, she demonstrated a weakness in taking manual control of an automatic function by her incorrect manipulation of 1TIC-130. The applicant was downgraded in this competency due to not demonstrating the ability to manually control an automatic function.

The applicant made one non-critical error in this rating factor; therefore, a score of "2" was assigned.

LACK OF ABILITY/KNOWLEDGE:

The applicant demonstrated a weakness in her ability to take manual control of an automatic function. Specifically, this was demonstrated by the applicant not taking manual control of letdown temperature or recommending manual control for approximately seven minutes before the SRO finally directed manual control. Furthermore, she demonstrated a weakness in ability to take manual control of an automatic function by incorrectly manipulating 1TIC-130 until being corrected by the SRO.

POTENTIAL CONSEQUENCES:

The potential consequences of not correctly controlling letdown temperature include a challenge to the interlock that protects the demineralizers from high temperatures as well as reactivity effects resulting from letdown temperature changes.

K/A (SRO IMPORTANCE RATING): 006K4.24 (3.0)

10CFR55.45(a)(3): Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.

Applicant Response

In response to, 3c. Control Board Operation – Locate and Manipulate (comment on page 21)

APPLICANT ACTION/ RESPONSE

The examiner writes that when TE – 130 failed low, that the applicant acknowledged the associated alarms but did not take any actions to take manual control of letdown temperature and also did not recommend to the SRO that she could manually control letdown temperature The event description does not identify that the applicant acknowledged the alarms and was immediately told to go back to the C panel and monitor reactivity (Note; that in previous NRC administered exams circumstances are established to make the applicant respond to the condition if this is the intent (example, have the UO performing actions on the back panels), the NRC examiners could have easily controlled this situation by a simply direction of "WE WOULD LIKE FOR YOU TO RESPOND TO THIS FAILURE WHILE THE UO ASSUMES THE REACTIVITY RESPONSIBILITY", not giving this type of cue or direction could be interpreted by the candidate that the NRC desires that the UO is to perform this function as part of the simulator testing plan .

When the UO was directed to address the alarm and respond to the failure (with no disagreement from the NRC exam team) all the NRC grading and point reduction related to the OATC response would appear not to be appropriate. At that time the applicant was not assigned to diagnose or respond to the failure. The applicant assisted the crew and identified to the SRO that TIC-130 was closed. In determining that the Temperature Element had failed low, the applicants' statement was to notify the SRO that there was no associated AOP entry with the failure and that it could only be fixed by contacting C&T (implying that the actual repair of the component would require maintenance, note to contact C&T and request a work order, condition report, and notify operations management of the problem should have been consistently observed by the NRC testing team). The SRO directed the applicant to open the valve (TI-130) and the applicant did push the up arrow first. The error had no negative impact and was quickly corrected when the down arrow was pressed and the temperature was controlled and monitored for the duration of the scenario. Initial thought was to open the valve but the TIC-130, located in the Control Room is not a direct indication of valve position. It is representative of controlling the temperature by using the up arrow to raise temperature and the down arrow to lower temperature.

After the scenario the examiner did ask questions about the incorrect manipulation, and the applicant explained in detail how the valve works. Applicant identified that the controller is used to control temperature and that you must understand what direction the valve, TI-130, moves based on the how temperature is controlled. If the up arrow is pressed then you are trying to raise temperature, then the valve (TI-130) would close (TI-130 controls the amount of cooling water that goes through the letdown heat exchanger). Because the TE-130 failed the controller thought that temperature lowered and closed the valve to decrease the amount of cooling water that went through the heat exchanger to try to raise temperature. This was all explained to the examiner.

Initially the controller was operated in the wrong direction and there was no impact because the valve was already in the closed position. In addition I would like for the review team to evaluate the categorization of this comments. If the evaluator's main comments was that "the valve was initially operated in the wrong direction". Then would it be more appropriate that this be placed under "Locate and Manipulate" versus "Manual Control". This is a similar description to what was described in comment # 19 in which the PORV was operated in the wrong direction (see supporting documents for a copy of the comment). The applicant did manually control the parameter once the valve was open. The applicant trended the program and notified the SRO when the parameter was back in specification.

When reviewing consider the following:

1. The applicant was assigned to monitor Reactivity , UO was designated to diagnose the failure
2. The applicant is the crew member that identified the failure to the SRO
3. Once the valve was turned back over to the applicant, she controlled the parameter until back in spec.
4. Was this comment categorized correctly
5. The valve was already closed, so there were no consequences

Supporting Documentation

CROSS REFERENCE:

3.a: Control Board Operations – Locate & Manipulate

SCENARIO/EVENT:

Scenario 7, Event 5: Pressurizer (PRZR) Pressure Transmitter (PT-456) Failed High causing PORV to Open, PORV Block Valve Failed to Automatically Close

EXPECTED ACTION/RESPONSE:

The applicant, as Reactor Operator (RO), was expected to diagnose a failure of PT-456, and correctly perform the immediate operator actions of procedure 18001-C, "Systems Instrumentation Malfunction," Section C, which included:

- closing pressurizer spray valves
- closing the affected PORV, and
- operating heaters as necessary to restore pressure.

The applicant was expected to complete these Immediate Operator Actions without requiring assistance from other crew members.

APPLICANT ACTION/RESPONSE:

The applicant correctly diagnosed that PT-456 failed high and immediately closed the pressurizer spray valves. However, she did not immediately close the affected PORV, or its associated PORV Block Valve, and PRZR pressure continued to lower. Approximately 30 seconds after initiation of the failure, the Senior Reactor Operator loudly directed, "Shut that valve!" The applicant then closed the PORV to halt the pressure decrease. After the scenario, the applicant was asked to explain her response to the PT-456 failure. The applicant stated that she had initially manipulated the PORV switch in the wrong direction. The applicant was downgraded in this competency because she did not manipulate the PORV handswitch in an accurate manner.

The applicant made three non-critical errors in this rating factor; therefore, a score of "1" was assigned.

LACK OF ABILITY/KNOWLEDGE:

The applicant demonstrated a weakness in her ability to accurately operate the PORV handswitch.

POTENTIAL CONSEQUENCES:

The potential consequences of not closing either the PORV or its associated block valve include an unnecessary reactor trip due to the vapor space loss of coolant accident through the open PORV.

K/A (SRO IMPORTANCE RATING): 010A2.03 (4.2)

10CFR55.45(a)(3): Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.

Pg. 21 response:

Charlissa (RO) was the first to recognize that TE-0130 was the failed component. I directed [redacted] to pull and investigate the appropriate ARPs. The statement Charlissa made about contacting C&T was to reinforce the fact that there was no AOP entry to be made (for loss of letdown). This statement was not stand-alone and was taken out of context for the situation. When operating TIC-130 there was no consequential action in pressing the up arrow and the crew immediately self corrected as is the expectation of Operations Training and Operations for the control room team.

[redacted]

Op-Test No.: 2012-301 **Scenario No.: 7**

Event No.: 3

Event Description: TE-0130 fails low, this controls ACCW cooling to the Letdown Heat Exchanger. With TE-0130 failed low, TV-0130 will throttle shut raising the actual Letdown Heat Exchanger temperature. The OATC will have to manually control TV-0130 to control ACCW flow to the Letdown Heat Exchanger.

Time	Position	Applicant's Action or Behavior
	OATC	Diagnose TE-0130 has failed low. Symptoms / alarms: ALB07-F04 LTDN HX HI TEMP DEMIN DIVERT ALB07-B04 (VOLUME CONTROL TANK OUTLET TEMP HI (delayed, or may not come in) Indications: • TE-0130 reading down scale low. • TE-0130 red UP arrow – LIT. (indicates attempting to raise letdown temperature). • Amber light on 1HS-129 LETDOWN TO DEMIN / VCT – LIT.
	OATC	**ALB07-F04 response actions:** **AUTOMATIC ACTIONS:** Letdown flow is diverted away from the Mixed Bed Demineralizers directly to the Reactor Coolant Filter.
	OATC	**INITIAL OPERATOR ACTIONS** 1. Check letdown temperature on 1-TI-0130 on the QMCB. **(failed)** 2. IF necessary, initiate 18007-C, "Chemical Volume Control System Malfunction". **(not necessary, letdown is not lost)** 3. Check for ACCW normal operation. **(TV-0130 not normal)**

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Time	Position	Applicant's Action or Behavior
	OATC	**SUBSEQUENT OPERATOR ACTION** 1. Attempt to balance charging and letdown flow. 2. WHEN letdown temperature is restored, return 1-TV-0129 to the DEMIN position. 3. IF instrument or equipment failure has occurred, initiate maintenance as required. **COMPENSATORY OPERATOR ACTIONS** NONE **Note to examiner:** The OATC can control cooling flow to the VCT using TV-0130. For 120 gpm letdown flow, this is normally set to 51% (note dry erase board on SS throne). It is expected the OATC will take manual control of TV-0130 to control cooling flow. **End of 17007-F04 actions.**
	OATC	**ALB07-B04 actions (LTDN HX HI TEMP DEMIN DIVERT)** **PROBABLE CAUSE** 1. Low Auxiliary Component Cooling Water (ACCW) flow through the Letdown Heat Exchanger. 2. Low ACCW flow through the Excess Letdown Heat Exchanger or Seal Water Heat Exchanger if aligned to the Volume Control Tank (VCT).

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Time	Position	Applicant's Action or Behavior
	OATC	**AUTOMATIC ACTIONS** NONE **INITIAL OPERATOR ACTIONS** Check normal operation of ACCW and, if necessary, initiate 18022-C, "Loss of Auxiliary Component Cooling Water".
	OATC	**SUBSEQUENT OPERATOR ACTIONS** NOTE Seal water injection flow to the Reactor Coolant Pumps (RCPs) should be maintained less than 130°F. 1. Monitor VCT outlet temperature using 1-TI-0116 on the QMCB. 2. Check letdown flow using 1-FI-0132 and temperature using 1-TI-0130 on the QMCB. 3. Adjust the charging or letdown flow if necessary to reduce the letdown temperature. 4. Return to normal operation as soon as possible per 13006-1, "CVCS Startup and Normal Operation." 5. IF equipment failure is indicated, initiate maintenance as required. **COMPENSATORY OPERATOR ACTIONS** NONE – **End of 17007-B04 actions.**

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Time	Position	Applicant's Action or Behavior
	SS	**AOP-18022-C, LOSS OF AUXILIARY COMPONENT COOLING WATER symptoms and steps.** Symptoms / alarms: • High temperature on any heat exchanger serviced by ACCW. **Note to examiner:** The SS may look at 18022-C due to the reference from ALB07-B04 if received.
	OATC	NOTES • ACCW pumps are removed from the 4.16KV Class 1E buses following simultaneous loss of offsite power and safety injection. • ACCW flow to the Seal Water Heat Exchanger is not required if RCS temperature is less than 150°F and Seal Water Heat Exchanger Return Temperature remains less than 135°F.

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Event No.: 3

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Time	Position	Applicant's Action or Behavior
	OATC	1. Check ACCW pumps – AT LEAST ONE RUNNING. (YES) 2. Check ACCW SPLY HDR PRESS PI-1977 – GREATER THAN 135 PSIG. (YES) 3. Check if ACCW flow exists through the letdown heat exchanger. **(YES)** • TV-0130 OPEN. • ALB07-D03 LTDN HX OUT HI TEMP – EXTINGUISHED.
	OATC UO	4. Initiate the Continuous Actions Page.
	OATC	5. Check ACCW Surge Tank Level (IPC L2700) – GREATER THAN 20% AND STABLE OR RISING. **(YES)**

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Time	Position	Applicant's Action or Behavior
	OATC	6. Check if RCPs should be stopped: a. Check the following RCP parameters (using plant computer): • Motor bearing (upper or lower radial or thrust) – GREATER THAN 195°F. • Motor stator winding – GREATER THAN 311°F. • Seal water inlet – GREATER THAN 230°F. • Loss of ACCW – GREATER THAN 10 MINUTES. **Note to examiner:** All parameters listed are met, the RCPs do NOT require stopping. a. Perform the following. 1) IF any parameter limit is exceeded, THEN perform step 6.b. 2) Go to Step 7.

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Time	Position	Applicant's Action or Behavior
	OATC	7. Check RCP thermal barrier outlet valves – OPEN. **(YES)** • HV-19051 ACCW RCP-1 THERMAL BARRIER RTN VLV • HV-19053 ACCW RCP-2 THERMAL BARRIER RTN VLV • HV-19055 ACCW RCP-3 THERMAL BARRIER RTN VLV • HV-19057 ACCW RCP-4 THERMAL BARRIER RTN VLV • HV-2041 ACCW RCPS THERMAL BARRIER RTN VLV **Note to examiner:** All the above listed valves are open as required.
	OATC	8. Check ACCW heat exchangers outlet temperature (IPC T2701) - LESS THAN 120°F. **(YES)**
	OATC	9. Check ACCW containment isolation valves – OPEN. **(YES)** • HV-1979 ACCW SPLY HDR ORC ISO VLV • HV-1978 ACCW SPLY HDR IRC ISOL VLV • HV-1974 ACCW RTN HDR IRC ISO VLV • HV-1975 ACCW RTN HDR ORC ISO VLV **Note to examiner:** All the above listed valves are open as required.

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Time	Position	Applicant's Action or Behavior
	OATC	10. Check if ACCW is restored to service. a. Components cooled by ACCW – TERMPERATURES RETURNING TO NORMAL. **(YES)** b. Restore charging and letdown using 13006, CHEMICAL AND VOLUME CONTROL SYSTEM. **(N/A)**
	SS	c. Return to procedure and step in effect.
		END OF EVENT 3, proceed to EVENT 4.