

RATING FACTOR 1.B.: INTERPRETATION/DIAGNOSIS, ENSURE ACCURACY

1. Examiner comment on 303 form p. 8 of 32, related to Scenario 3, Event 5

A. FACTUAL SEQUENCE OF EVENTS

-During the simulator scenario, at time 11:30:49, event 5 was initiated with a trip of the running EHC pump.

-The trip of the EHC pump caused alarm ALB33-B07, 480V SWGR 1NB02 TROUBLE, to annunciate.

-At time 11:31:57, Carla directed the [REDACTED], as Reactor Operator (RO), to dispatch a field operator to investigate the condition.

-As Senior Reactor Operator (SRO), Carla directed the BOP operator (not an applicant, a surrogate) to reference the ARP for alarm ALB20-D05 HYD FLUID LO PRESS. Note that this alarm never annunciated during this event.

-In accordance with the ARP actions for ALB20-D05, Carla directed the BOP operator to manually start the standby EHC pump. This pump was started at time 11:32:20, approximately 1 minute and 31 seconds after the initial trip of the running EHC pump.

-Carla did not solicit EHC pressure values or trends before directing the standby pump to be manually started.

-Annunciator ALB20-D05 did not actually annunciate during the event, because the standby pump was manually started before EHC pressure lowered to the setpoint of 1500 psig. Of note, the auto-start of the standby EHC pump is set at 1400 psig. If EHC pressure were to continue to lower to 1100 psig, an automatic turbine trip signal would be generated. For this event, the lowering EHC pressure was only due to the pump trip and not a leak or rupture in the EHC system.

-At time 11:34:17, Carla called Clearance and Tagging (C&T) to direct them to investigate a potential failure of the auto-start feature on the standby EHC pump.

During post-scenario follow-up questions, the examiner asked Carla “did the standby [EHC] pump automatically start?” Carla responded no, that it had not. The examiner then asked Carla “should it [the standby EHC pump] have automatically started?” Carla responded yes, the standby pump should have started. Note that in accordance with Scenario 3 ES-D-2 p. 21, it was verified by the NRC team during prep week that ALB20-D05 would annunciate “after several minutes.”

## B. EXAMINER EVALUATION AND COMMENTS

Based upon these observations, the examiner determined that the applicant had mis-diagnosed that the standby EHC pump had failed to automatically start. The principal element in this mis-diagnosis was that the applicant did not obtain any EHC pressure values or trends before ordering the standby pump to be manually started. In accordance with this assessment, the examiner determined that the correct rating factor to place this deficiency was 1.b., which states: “Did the applicant ensure the collection of CORRECT, ACCURATE, and COMPLETE information and reference material on which to base diagnoses?”

Along with the evaluation of this root cause deficiency, the examiner recognized that there were also weaknesses relating to Competency 5, Direct Shift Operations, which were also displayed during this particular event. Furthermore, there are also weaknesses related to rating factor 4.b., in that Carla passed incorrect information to C&T regarding plant status. Finally, there is another weakness relating to rating factor 1.a., in that Carla failed to recognize that the failure of the annunciator to alarm meant that the standby pump had not received an automatic start signal; furthermore, there was nothing preventing her from moving closer to the EHC pressure gage to better recognize the plant status upon which to base her diagnosis.

In Carla’s request for appeal, during her description of this event, she states that she directed the appropriate actions to be taken. This is correct; the examiner did not dispute that correct actions were taken. The reason she was downgraded for diagnosis is that the [correct] actions that she directed were based on an erroneous diagnosis. Furthermore, Carla states that the distance from the SRO position to the EHC meter on the BOP panels prevented her from precisely determining an exact EHC pressure from the gage. However, she had an opportunity to either walk over to the gage to get a closer reading; or she could have directed the BOP operator to report EHC pressure values and trends. Moreover, because the ALB20-D05 alarm had not actually annunciated, this was an additional verification to her that EHC pressures had not actually dropped below 1500 psig.

2. Examiner comment on 303 form p. 10 of 32, related to Scenario 3, Event 7

A. FACTUAL SEQUENCE OF EVENTS

-During the simulator scenario, at time 12:00:52, event 7 was initiated as a design basis tube rupture on the #1 Steam Generator (S/G).

-At time 12:06:04, the reactor was manually tripped; at time 12:06:18 safety injection was initiated. The team entered procedure E-0.

-At time 12:17:37, procedure E-3 was entered.

-At approximately 12:31 the team reached procedure step 12 of E-3. This procedure step reads as follows:

NOTE

When the low steamline pressure SI/SLI signal is blocked, main steamline isolation will occur if the high steam pressure rate setpoint is exceeded.

\*12. **Check if low steamline pressure SI/SLI should be blocked:**

a. Steam Dumps - AVAILABLE.

b. PRZR pressure - LESS THAN 2000 PSIG.

c. High steam pressure rate alarms - CLEAR.

d. Block low steamline pressure SI/SLI using the following:

• HS-40068

• HS-40069

a. Go to Step 14.

b. WHEN PRZR pressure is less than 2000 psig and the high steam pressure rate alarms are clear, THEN block low steamline pressure SI/SLI by performing Step 12.d.

Go to Step 13.

- When the team reached this step in the procedure, [REDACTED] reported to Carla that pressurizer pressure was approximately 2007 psig. Carla directed [REDACTED] to perform the 12.b. RNO step (when/then for blocking SI/SLI). Carla further amplified the procedure direction by telling [REDACTED] to identify the SI/SLI block switches HS-40068 and -40069 (for future use).
- Slightly after this time, either [REDACTED] notified Carla that pressure was at 1998 psig, or Carla read 1998 psig from a digital recorder.
- At time of approximately 12:32, Carla directed [REDACTED] (RO/OATC) to block low steamline pressure SI/SLI. Before giving this direction, Carla did not check the status of the P-11 bistable lights.
- At time 12:33:41, pressurizer pressure was 2006.9 psig.
- When [REDACTED] attempted to block low steamline pressure SI/SLI using HS-40068 and -40069, it did not work.
- Carla then continued reading subsequent procedure steps to prepare for a cooldown.
- Approximately six minutes after initially attempting to block low steamline pressure SI/SLI, [REDACTED] was holding interlock switches HS-0500A and -0500B in BYPASS INTERLOCK position.
- At time 12:37:30, Carla notified [REDACTED] that the P-11 lights were extinguished.
- At this time, [REDACTED] then released the HS-0500A and -0500B switches, quickly moved across the control room, and successfully blocked low steamline pressure SI/SLI.
- At a time of 12:37:56, [REDACTED] states to Carla, I blocked SI/SLI.
- Carla then directed [REDACTED] to “get the bypass at 550 degrees;” and immediately after blocking low steamline pressure SI/SLI, [REDACTED] quickly rushed back to continue manipulating the HS-0500A and -0500B switches.

During post-scenario follow-up questions, the examiner asked Carla Smith what Pressurizer Pressure was at the time the first attempt was made to block the steamline pressure SI/SLI. She stated that pressure was at 1998 psig, and that P-11 was not exactly in the same spot.

## B. EXAMINER EVALUATION AND COMMENTS

The applicant was downgraded in Interpretation/Diagnosis – Ensure Accuracy because she failed to properly verify the correct status of the P-11 interlock, which caused her to incorrectly direct the RO to block low steamline pressure SI/SLI when plant conditions would not allow the action to be

successful. The root cause of this error was that the applicant did not ensure the collection of correct, accurate, and complete pressurizer pressure information prior to providing this direction. Specifically, the correct indications to verify whether the attempt to block would be successful, was to verify the status of the P-11 interlock lights, irrespective of which pressure the RO reported to her. These interlock lights could be verified by the applicant while performing her SRO role.

The crew performance during this sequence created a situation where a board operator was required to take hasty actions to block and verify blocked multiple interlocks at the same time. As detailed in the ES-303 documentation, an accurate initial diagnosis would have been more conducive to providing clear direction to both board operators to accomplish both actions in a more controlled manner. These aspects relate to competency 5, Directing Shift Operations. The error was placed only in rating factor 1.b, and not competency 5, because the root cause of the error was an inability to collect correct, accurate, and complete information on which to base a diagnosis.

In the applicant's appeal to the examiner comment on page 18 of 32 on the 303 forms, she states:

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.

This comment from the applicant is in accordance with the examiner discussion of potential consequences from this event on page 10 of 32 of the 303 form. Carla's direction during this event, causing a board operator to rapidly block/bypass two interlocks in a simultaneous fashion, is therefore recognized as creating an error-likely situation.

M. Bates also noted a procedural error during the performance of this event that was not documented in the 303 form because Carla self-corrected the error. This error was related to making an improper transition from E-3 step 4.b, upon receipt of a logical "no" answer, to E-3 step 4.a. RNO.