Ms. Charlissa C. Smith
[redacted]

Dear Ms. Smith:

In response to your letter received by this office on June 5, 2012, the staff of the U.S. Nuclear Regulatory Commission (NRC) has reconsidered the proposed denial issued to you on May xx, 2012, and reviewed the grading of the operating test administered to you during the period of March 26 to April 13, 2012. In spite of the additional information you supplied, the staff has determined that you did not pass the simulator operating test. The results of our review are enclosed.

Consequently, the proposed denial of your license application is sustained. If you accept the proposed denial and decline to request a hearing within 20 days as discussed below, the proposed denial will become a final denial. You may then reapply for a license in accordance with Title 10, Section 55.35, of the *Code of Federal Regulations* (10 CFR 55.35), subject to the following conditions:

a. Because you passed a written examination and the administrative/systems walkthrough, administered on October 4-13, 2004, you may request a waiver of those portions.

b. Because you did not pass the simulator operating test administered to you on October 4-8, 2004, you will be required to retake that portion.

c. You may reapply for a license two months from the date of this letter.

If you do not accept the proposed denial, you may, within 20 days of the date of this letter, request a hearing pursuant to 10 CFR 2.103 (b)(2). Submit your request in writing to the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemakings and Adjudications Staff, with a copy to the Associate General Counsel for Hearings, Enforcement, and Administration, Office of the General Counsel, at the same address. (Refer to 10 CFR 2.302 for additional filing options and instructions.)

Failure on your part to request a hearing within 20 days constitutes a waiver of your right to demand a hearing. For the purpose of reapplication under 10 CFR 55.35, such a waiver renders this letter a notice of final denial of your application, effective as of the date of this letter.

If you have any questions, please contact John McHale, Chief, Operator Licensing and Training Branch, Office of Nuclear Reactor Regulation, at (301)415-3254.

Sincerely,

Ho K. Nieh, Director
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

Docket No. 55-23694

Enclosure: As stated

cc: Catawba Nuclear Station

CERTIFIED MAIL
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If you have any questions, please contact John McHale, Chief, Operator Licensing and Training Branch, Office of Nuclear Reactor Regulation, at (301)415-3254.

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INFORMAL REVIEW RESULTS – CHARLISSA C. SMITH
SENIOR REACTOR OPERATOR APPLICANT, VOGTLE ELECTRIC GENERATING PLANT

In response to the applicant's letter received by this office on June 5, 2012, the U.S. Nuclear Regulatory Commission (NRC) reconsidered the proposed denial issued on May xx, 2012, and reviewed the grading of the operating test administered to the applicant during the period of March 26 to April 13, 2012. In spite of the information supplied by the applicant, the NRC has determined that the applicant did not pass the operating test. The results of NRC's review are outlined below.

INTRODUCTION AND REVIEW METHODOLOGY

Taking into consideration the applicant's contentions, this review re-examined s errors during these three events, and using the grading criteria contained in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Rev. 9 Supp. 1 Section ES-303, determined revised rating factor scores. In particular, this review:

1. Determined revised root causes and the affected rating factors for the errors (ES-303, D.1.d)

and

2. Using the "counting rules for errors" (ES-303, D.2.b), assigned revised rating factor (RF) scores.

DETAILED REVIEW RESULTS

Scenario 3, Event 5: Main Turbine EHC Pump A trips with a Failure of Standby EHC Pump to Automatically Start

Expected Action/Response: The applicant, as the Shift Supervisor (SS) (a senior reactor operator position), while directing crew response, was expected to recognize that the A EHC pump tripped, that the standby EHC pump failed to automatically start (if EHC pressure dropped below 1400 psig), and to direct a manual start of the standby EHC pump prior to EHC pressure reaching 1100 psig to prevent an unnecessary main turbine trip at low EHC pressure. Alternatively, the applicant as SS could have directed a prompt start of the standby EHC pump when the A EHC pump tripped (prior to the 1400 psig automatic start of the standby EHC pump), based up the knowledge that at least one EHC pump was necessary to maintain EHC pressure. If the standby EHC pump was promptly started (prior to 1400 psig EHC pressure), then the applicant/crew would NOT be able to determine if the automatic start feature of the standby pump was functional or not, since the 1400 psig automatic start set point would not be reached.

Applicant Action/Response: The applicant took the alternative action and directed a prompt start of the standby EHC pump prior to EHC pressure reaching 1400 psig. However, the applicant also directed an investigation into the automatic start feature of the standby pump, even though EHC pressure never decreased to 1400 psig. After the scenario, the assigned NRC examiner asked the applicant to explain her directives, and the applicant incorrectly stated that the standby EHC pump should have automatically started.

ENCLOSURE

Original NRC Grading, Affected Rating Factors (RF) and Scores:

RF 1.b (Interpretation/Diagnosis—Ensure Accuracy) = 1.0 (Contributed to a score of 1.0 along with an error during scenario 3, event 7)

"The applicant was downgraded in this competency because she misdiagnosed the failure of the automatic start of the standby EHC pump when pressure had not yet decayed to less than 1400 psig, which is when an automatic start of the standby pump would have been demanded."

Applicant's Contentions:

"The examiner identifies that the applicant incorrectly diagnosed that the EHC pressure had dropped below 1400 psig, which is when the standby pump automatically starts.

The event starts with an alarm on the electrical panel (due to pump trip). The RO quickly reports to the SRO that the EHC pump tripped. There were no alarms on ALB20 illuminated when the EHC pump was recognized as being in a tripped condition. The applicant directed the UO to pull the ARP for ALB20 D05 HYD FLUID LO PRESS because it was the anticipated alarm. As the ARP was reviewed, the alarm came in for ALB20 D05 as expected. Shortly afterwards the applicant directed the UO to start the second EHC pump.

The scenario was designed for the automatic start of the standby pump to fail once pressure lowered to less than 1400 psig. The crew responded quickly and the second pump was placed in service in a timely matter. The examiner states that the applicant correctly directed the start of the standby pump but provided the direction because she believed the standby pump had failed to start. The applicant did not start the second pump because the standby pump did not start. The applicant started the second pump because there were only two pumps. If one pump trips, pressure will drop. The expectation is not to wait for an automatic action to occur if time permits. Per NMP-OS007-001 Conduct of Operations Standards and Expectations, step 6.21.9 under *Manual Operator Actions and Early Operator Action* states (See supporting documents): 'Crews may take early operator actions per site specific direction that mitigate the consequences of the event but do not interfere with recovery strategies.'

The priority was to get pressure trending back up and stabilized to prevent a Turbine trip which would cause the Reactor to Trip. If it is known that pressure will continue to lower (until a pump starts at 1400 psig or the turbine will trip at 1100 psig as identified in the ARP 17020-See supporting documents) then it is expected for the operator to mitigate the situation, in this case starting the backup pump. The examiner states that the pressure had not fallen below 1400 psig, the applicant is downgraded because of a statement in which she identifies that the second pump did not start. The increments on the pressure gauge, especially from a distance, are not as precise as reading a digital meter and could be easily determined to be below a set point versus above it (See supporting documents for pictures). No actions were performed based on that statement. If the pressure were not low enough, the impact would be that when investigated it would be determined that the pump was operating properly. It appears that the applicant was penalized for "stating" that the second EHC pump did not start versus recognizing the impact and directed the UO to pull the annuciator response before the alarm even illuminated. The applicant's biggest concern was to ensure that the second pump was started to prevent a Turbine trip. In addition, the Annunciator Response Procedure initial operator action states (See supporting

documents):

1. If a reactor trip occurs, Go to 19000-C
2. **Verify** standby EHC Fluid Pump is on, if needed

Step 2 **does not** state to start the second pump only if you are below the setpoint for the second pump to start. It identifies to verify it is on, IF NEEDED.

LACK OF ABILITY/KNOWLEDGE

The examiner states that the potential consequences would be starting equipment unnecessarily before it is demanded to start as well as not starting equipment when a demand is present. There were no potential consequences to starting the second EHC pump prior to any automatic actions. The second EHC pump would have been started if:

1. The second pump did not start automatically and
2. If one EHC pump is in service and trips

In both cases the procedure directs that the standby EHC pump is started.

In addition, it should be noted that the applicant performed this scenario with a surrogate operator and due to the restrictions in place this individual is limited in his ability to function as a normal team member (NRC required this alignment, 17 total applicants available for crew assignments). If another candidate was performing the UO position a better flow of information and crew member exchange takes place and the applicant would not be required to perform in this more isolated mode. The pressure gauge, annunciator panel, and EHC Pump control handswitchs (sic) are on the far end of panel B which limits the SRO's view, this makes the information exchange between the operator and SRO all the more important. I would like for the NRC examiner to reconsider this deduction in light of this crew alignment and the additional burden placed on the applicant.

Also looking at the NRC reviewed and approved simulator scenario outline (Form ES-D1) you will find the following:

Verifiable Actions:

UO—Starts EHC pump B prior* to *Main Turbine/Reactor trip on low EHC pressure* of *1100 psig. This will prevent an unnecessary Turbine/Reactor trip and transient on the plant.

Note; the candidate met this criteria and it appears the NRC examiner went well outside this approved outline with the expected candidate actions for his comments and point deductions. (The NRC examiner was the Chief-Of-Record for this exam and there as part of the pre-test review team that reviewed and approved the expected actions and responses above)."

Additional information provided by the applicant:

1. An illustration of the control room indicating the SRO's view of the EHC pressure gauge.

2. Annunciator Response Procedure page for ALB20, window D05, “HYD FLUID LO PRESS.”
3. Page 40 of Procedure NMP-OS-007-001, “Conduct of Operations Standards and Expectations.”
4. Two pictures: one of annunciator panel ALB20, and one of panel 1B2 where ALB20 and the EHC pressure gauge are located.
5. Pages 2 and 22 of Procedure 13840-1, “Main Turbine Electro-Hydraulic Control System.”

Results of this review:

This review disagreed with the applicant and agreed with the original grading. The error during this event will be assigned to RF 1.b (Interpretation/Diagnosis—Ensure Accuracy).

Analysis:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. Correct and timely action was taken to start the standby EHC pump.
2. The applicant did not direct starting the standby EHC pump because it failed to automatically start, but because a running EHC pump was necessary to support plant conditions.
3. The EHC pressure gauge was hard to read from far away, i.e., from my supervisory position as the SS.
4. The unit operator who responded to this event on the control panels was a surrogate operator. Due to the restrictions in place for this individual, it limited his ability to function as a normal crew member, affected the flow of information, and placed the applicant in a “more isolated mode,” which resulted in an additional burden placed on the applicant.
5. There were no adverse consequences to any of the applicant’s actions.

This review determined the following:

1. Agree. Timely and correct action was taken to start the standby EHC pump.
2. Unknown. It is not clear if the direction to start the standby was given because the applicant recognized the need for a running pump, or because the applicant believed the standby pump had failed to automatically start. However, this was not important in determining that an error had occurred during this event.
3. and 4. The distance to the EHC pressure gauge and the use of a surrogate operator should not have hindered the applicant’s ability to ensure an accurate diagnosis and were not considered germane to this review. If the applicant was unsure of what EHC pressure was, the applicant could have asked for this information from the surrogate operator; there is no record that the applicant ever asked for this information.
5. Agree in part. By whatever rationale used by the applicant, starting the standby EHC pump was ultimately the correct course of action. However, directing a check on the standby EHC pump’s automatic start feature when there was no way of knowing whether it should have automatically started (EHC pressure never dropped below 1400 psig) is not a good use of personnel resources and could add confusion as to the status of the EHC pumps.

If the correct action was ultimately taken in a timely fashion with no major adverse consequences, then why did this review still assign an error to RF 1.b (Interpretation/Diagnosis—Ensure Accuracy)?

1. NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Rev. 9, Supp. 1, Section ES-303, Item D.2.b (ES-303 D.2.b) states in part: "Keep in mind that the simulator test is generally graded on competencies rather than consequences; every error that reflects on an operator's competence is considered equal unless it is related to the performance of a critical task…"

2. This review determined that the applicant did make an error in diagnosis associated with RF 1.b, in that the applicant during this scenario event did request an investigation of the automatic start feature of the standby EHC pump, and when asked a follow-up question by the examiner of record, the applicant stated that the standby EHC pump should have automatically started. Since EHC pressure never decreased to 1400 psig (the pressure set point for the automatic start of the standby EHC pump), the applicant could not have known if automatic start feature was functional, and the standby EHC pump should not have automatically started. These items, e.g., the applicant's request for an investigation and her answer to the follow-up question, were not disputed by the applicant in her contention.

3. The applicant does cite a major element of the simulator scenario outline for this event (e.g., "Start EHC pump B prior to main turbine/reactor trip…") but the simulator scenario outline does include criteria to notify maintenance if an equipment failure is indicated. The NRC examiner of record therefore did NOT "go well outside the approved outline" (as stated by the applicant) in conducting the evaluation.

Scenario 3, Event 7: DBA Steam Generator Tube Rupture on SG#1

Expected Action/Response: The applicant as SS was expected to direct blocking the low steam line pressure SI/SLI when pressurizer pressure was less than 2000 psig, in accordance with Procedure 19030-C, "E-3 Steam Generator Tube Rupture," step 12.

Applicant Action/Response: The applicant as SS directed blocking the low steam line pressure SI/SLI when presurizer pressure was less than 2000 psig on only one instrument and without checking the P-11 status lights. Note that both P-11 status lights must be extinguished for the block to be successful, and at least one P-11 status light was still lit when the applicant directed the block, so the block as initiated by the reactor operator was unsuccessful. After a few minutes, with pressurizer pressure still decreasing and with both P-11 status lights now extinguished, the reactor operator made a second attempt to block the low steam line pressure SI/SLI, and was successful.

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 1.b (Interpretation/Diagnosis—Ensure Accuracy) = 1.0	(Contributed to a score of 1.0 along with an error during scenario 3, event 5)

"The SRO was downgraded in this competency because she did not ensure the appropriate interlock was met (pressurizer pressure below 2000 psig) when first attempting to block SI/SLI."

Applicant's Contentions: "The event description states that the applicant directed the RO to block SI/SLI when pressurizer pressure was at approximately 2007 psig, but his actions were not

successful. The examiner also identifies that the applicant stated that she thought pressurizer pressure was 1998 psig. Note: reading the following values [pressurizer pressure] from the SRO desk would be very difficult; the NRC examiner indicated he observed 2007 psig.

The NRC examiners event description is not accurate in reference to the attempt to block SI/SLI. When the applicant reached step 12 of 19030 and asked the RO if pressurizer pressure was less than 2000 psig. The RO's response was no and he identified that we were currently at a value slightly above the setpoint. The applicant directed the RO to notify her when pressure was less when (sic) 2000 psig so that SI/SLI can be blocked. The applicant also identified that this was a continuous action step. As soon as the pressure was less than 2000 psig, the RO notified the applicant that pressurizer pressure was at 1998 psig. The applicant looked at the digital readout on PR 455 to verify that we were at 1998 psig (below the P-I1 setpoint-see supporting documents). Once verified, the applicant immediately directed the RO to block SI/SLI using the guidance from the RNO at step 12b of 19030, which states: "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 12 d." 12d (See supporting documents):

Block low steamline pressure SI/SLI using the following

- **HS -40068**
- **HS -40069**

When the RO attempted to block the SI/SLI, the applicant did not see a status light change on the BPLB and identified that the block did not occur (Note; that using multiple/diverse plant indications and expected responses is normally considered a positive attribute for operator response and is not normally discouraged by the NRC). In addition, the applicant immediately looked up and noticed that the status of all the bistables did not change to meet the coincident for P-11 which was required to block P-11 (See supporting documents for pictures). Only one channel was extinguished (meaning that it was less than 2000 psig). The one channel that was extinguished provided input to the PR-455 recorder (that was verified prior to the action). Recognizing that the expected response was not obtained the SRO did direct the initiation of the required blocks. Initiation of an early block has no consequences. This event identifies that there is no merit in recognizing the expected response and self correcting the issue.

The SRO's actions in this case points to a good understanding of plant design using the correct procedure in a timely manner to perform multiple complex equipment operations with good communication between crew members in transient conditions."

Additional information provided by the applicant:

1. Pictures of pressurizer pressure instruments, trip status light indicators (TSLB) and bistable/permissive indicators (BPLP).
2. Pages 10 and 11 from Procedure 19030-C, "E-3 Steam generator Tube Rupture."
3. A signed statement from the Operator at the Controls (OATC) on the applicant's crew:

"Charlissa (SRO) asked me (RO) if pressurizer pressure was less than 2000psig. I informed her it was not at the time and she directed me, per continuous action step 12 of 19030-C, to block SI/SLI when pressure was below 2000psig:

WHEN PRZR pressure is less than 2000 psig and the high steam pressure rate alarms

are clear, <u>THEN</u> block low steamline pressure SI/SLI by performing Step 12.d.

At approximately 1998 psig as read on the pressurizer pressure digital recorder Charlissa directed me, per the continuous action step, to block SI/SLI. I attempted to block it at this time, but was unsuccessful due to P-11 status lights still being lit while all indications were below 2000 pisg. After verifying the P-11 status lights were extinguished I was able to successfully block SI/SLI per step 12.d."

<u>Results of this review</u>:

<u>This review partially agreed with the applicant and disagreed with the original grading. No error will be assessed to the applicant as a result of her performance during this event, since her direction was in accordance with Procedure 19030-C step 12.b.</u>

<u>Analysis</u>:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. The applicant's version of events, including her check that pressurizer pressure was at 1998 psig when she directed the block of the low steamline pressure SI/SLI,
2. Reading exact pressurizer pressure would be difficult from the SRO desk.
3. Directing an early block of the low steamline pressure SI/SLI had no adverse consequences.
4. No credit was given for self-correcting the first unsuccessful attempt at blocking SI/SLI.
5. Ultimately, her actions as SS in this case points to a good understanding of plant design.

This review determined the following:

1. The applicant's version of events appears factual, based upon a discussion with the assigned examiners' and a review of their notes, and based upon the signed statement provided by the reactor operator applicant.
2. Agree, although this does not particularly support a re-grade, since the applicant also stated that she was able to read pressurizer pressure on the digital readout of a recorder for PR-455. In addition, if the applicant was unsure of pressurizer pressure, she could have asked her control board operators.
3. Agree for the most part, although the applicant's actions did appear to add confusion and extra work for the reactor operator. However, in accordance with NUREG-1021, ES-303 D.2.b, the simulator examination is generally graded on competencies, not consequences, so any lack of specific actual consequences was not germane to this review.
4. Agree. The original NRC grading did not take into account any self correction performed by the applicant, although it is possible that the reactor operator primarily did all the self correction, in accordance with his signed statement: "After verifying the P-11 status lights were extinguished **I** [emphasis added] was able to successfully block SI/SLI per step 12.d."
5. Unknown. While the low steamline pressure SI/SLI was successfully blocked on the second attempt, this may have largely occurred due to the reactor operator's efforts. While it appears likely the applicant recognized an unsuccessful block on the first attempt, if the applicant truly had good understanding of plant design, she would have waited until both P-11 lights were extinguished prior to directing the block in the first place.

Given the above, why did this review determine that no error should be assessed to the applicant?

1. Although it took two attempts, the low steamline pressure SI/SLI was successfully blocked.

2. It appears true that at least by one indication, pressurizer pressure was less than 2000 psig (1998 psig) when the applicant directed the block. It is plausible that pressurizer pressure could indicate 1998 psig on one indication, while other indications were above 2000 psig and at least one P-11 status light was lit, given the 800 psig pressure span of the pressure instruments and indications (1700-2500 psig).

3. Procedure 19030-C step 12.b does NOT refer to the P-11 status lights. Step 12.b simply states: "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." So the direction provided by the applicant was in accordance with the procedure, given that one pressurizer instrument indicated 1998 psig.

4. With the appropriate direction given by the applicant and the distance of the applicant from the pressure indications and P-11 status lights, the opinion of this review was that it was largely up to the reactor operator to properly carry out this direction; i.e., in addition to checking pressurizer pressure, check the P-11 status lights prior to blocking the low steamline pressure SI/SLI. The reactor operator did perform this correctly when the block was successful on the second attempt.

Scenario 3, Event 4: Controlling Pressurizer Pressure Channel PT-455 Fails High

Expected Action/Response: The applicant as SS was expected to direct the steps of Procedure 18001-C, "Systems Instrumentation Malfunction," Section C to gain control of pressurizer pressure and to select an unaffected channel on PS-455F. After selecting an unaffected channel, the applicant was expected to direct returning pressurizer pressure control to automatic per steps C8 through C10. Step C8 states:

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
C8.	Perform the following:	
	a. Check PRZR pressure – STABLE AT APPROXIMATELY 2235 PSIG.	a. Adjust PRZR pressure to approximately 2235 psig using PRZR heaters and sprays.
	b. Place PRZR heaters in AUTO.	
	c. Place PRZR spray valve controllers in AUTO.	

Given the actual conditions when step C8 was reached by the applicant - pressurizer sprays were in manual control and pressurizer heaters were in "off", the prescribed pressure band was between 2220 and 2250 psig, and pressurizer pressure was 2248 psig - it was expected that the applicant

would direct placing both pressurizer heaters and sprays in automatic via the following sub steps contained in step C8:

1. With actual pressurizer pressure at 2248 psig, the applicant should have determined that pressurizer pressure was NOT stable at approximately 2235 psig. Although a 15 psig pressure difference may not seem like much, it actually is a significant difference, given that only 90 psig separates full power operation of the proportional heaters versus full spray flow.

2. The applicant then should have moved to the response not obtained (RNO) column and directed that pressurizer pressure be adjusted to approximately 2235 psig using pressurizer heaters and sprays.

3. After pressurizer pressure was adjusted to approximately 2235 psig, the applicant should then have directed that pressurizer heaters and sprays be placed in automatic.

After completing step C8, it was then expected that the applicant would perform steps C9 and C10, to place the pressurizer PORVs in automatic and to return the pressurizer master controller to automatic, respectively.

Applicant Action/Response:

The applicant correctly directed restoration of pressurizer pressure and selecting an unaffected channel. Upon reaching step C8, the applicant stated/directed the following actions:

1. Instead of proceeding to the RNO column, the applicant directed that pressurizer heaters be placed in automatic. The reactor operated replied that he could not stay within the prescribed pressure band if heaters were taken to automatic, and so the applicant directed that they should wait.

2. About one minute later, the applicant stated: "I do not think the heaters are operating properly, and taking the heaters to automatic may not be what we want."

3. After about another two minutes, the applicant directed: "Go ahead and take pressurizer heaters to automatic, now we can go to automatic." The reactor operator responded that he was maintaining pressure in the band in manual, and the reactor operator left all pressurizer heaters in "off" except for the "A" backup heaters, which he placed in "on."

4. After performing these actions, step C8.c was completed, which placed both pressurizer spray controllers in automatic, and steps C9 and C10 were completed, which placed the pressurizer PORVs in automatic and returned the pressurizer master controller to automatic, respectively.

The end result was that automatic control of pressurizer heaters was never established and that manual control of pressurizer heaters remained in effect for the remainder of the scenario.

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 1.c (Interpretation/Diagnosis—Understanding) = 1.0 (Contributed to a score of 1.0 along with an error during scenario 6, event 4)

"The applicant was downgraded in this competency because the pressurizer pressure control system was functioning properly after an unaffected channel was selected, and the applicant decided not to direct completion of 18001-C, Step C8.b, which would have returned heaters to automatic."

Applicant's Contentions:

"The applicant entered 18001-C, Section C and performed all steps with the exception of directing pressurizer heaters to be placed in automatic. As quoted in the comment on page 12: 'When the applicant reached step C8b to place heater in automatic, she stated that they were going to wait to place heaters in automatic'. The examiner does not include that prior to the pressurizer pressure channel failure that letdown isolated due to a letdown line break that required excess letdown to be placed in service. With letdown isolated this will cause pressurizer level to rise until some form of letdown is placed back in service. Once excess letdown was in service pressurizer level was trending back to program. Although level was trending downward to program, pressurizer level still had a greater than 5% deviation. When pressurizer level is greater than 5% the pressurizer level system causes the heaters to energize (to preheat any cold water entering the pressurizer - anticipating an insurge of cold water).

This* is *an example of the NRC examine *(sic)* ***teams issues with the timing of the simulator malfunctions, if the intent was* to *grade the applicant* on *completing the AOP actions and returning systems* to *automatic control (must conclude that this was the objective since points were deducted) then more time must be allowed. When time compression* is *used* to *complete the required simulator scenarios then individual actions that may be altered due* to *this compression should not be used* to *penalize a candidate.****

When the crew received the pressurizer pressure channel failure, 18001-C was entered. Step C4 which is a continuous action step - states to: Control PZR pressure using heaters and sprays -Between 2220 and 2250 psig. If the applicant would have directed the heaters to be returned to automatic it would cause the heaters to energize (Due to PZR level deviation) causing the crew to have a parameter outside the requirements of the procedure ***(note; that based* on *the NRC examiners logic related* to *the point deduction for Tavg control he would have again deducted points either way leaving* no *correct response for the candidate).*** Although spray would also energize they would not respond until 2260 psig which is 10 psig greater than the procedures guidance. The applicant explained to the examiner that the heaters were impacted by two systems that were currently applicable. The applicant was concerned about staying within the bounds of procedure guidance. Because pressurizer level would soon be within 5% the crew would wait until that time to return the heaters to automatic. Per 18001-C when all steps are completed to select an unaffected channel the procedure does not lead the performer to return to the procedure step in effect until the failure is repaired and surveillances are complete. This means that the procedure is still in progress and the continuous action step is still in effect.

In addition, it should be noted that with CVCS letdown isolated and VCT makeup in progress it is preferred to energize the Pressurizer heaters for mixing to establish the required conditions in the event of a out-surge from the Pressurizer. The action to manually energize the Pressurizer

heaters should be considered a positive as opposed to negative action under these circumstances. These actions would be covered by the following procedure all which would be applicable in this condition (all of which were part of the frozen references in the exam package provided to the NRC testing team).

LACK OF ABILITY/KNOWLEDGE

The applicant understood the pressurizer pressure control system as well as the impact of the pressurizer level control system. It is unclear how the applicant is penalized for taking into consideration that two systems impacted the heaters.

(*) 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. <u>BY SIGNAL OF THE LEAD EXAMINER/ EVALUATOR</u>, 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. <u>This cuts short the observers ability to evaluate the operators response to the earlier malfunction and may be prejudicial to a fair evaluation.</u>"

<u>Additional information provided by the applicant</u>:

1. Pages 16-19 of Procedure 18001-C, "Systems Instrumentation Malfunction."
2. Annunciator Response Procedure page for ALB17, window C01, "PZR CONTROL HI LEVEL DEV AND HEATERS ON."
3. Annunciator Response Procedure page for ALB20, window D05, "HYD FLUID LO PRESS."
4. Figure 1, "Pressurizer Pressure Controller Band," from Procedure 18000-C, "Pressurizer Spray, Safety, or Relief Valve Malfunction."
5. An excerpt from Unit Operating Procedure 12004-C associated with pressurizer heater and pressure control.
6. A training material excerpt associated with pressurizer level and pressurizer pressure: instruments, control, and protection.
7. A signed statement from the OATC on the applicant's crew:

"Charlissa (SRO) directed me (RO) to place heaters in Auto per step C8.b. I discussed with Charlissa that this would take pressure out of the band established in the continuous action step C4 due to pressurizer level being greater than 5% of program level which would cause all of the backup heaters to energize:

C4. Control PRZR pressure using heaters and sprays -BETWEEN 2220 AND 2250 PSIG.

After a discussion Charlissa instructed me to maintain pressurizer pressure IAW the continuous action step while allowing pressurizer level to return to program. Pressurizer level was out of band due to a previous failure and subsequently placing excess letdown in service. Pressurizer level was trending slowly to program at this time."

Results of this review:

This review did not agree with the applicant and identified an additional error beyond what was assigned in the original grading. This review assessed errors to RF 2.c (Procedures – Correct Use) and RF 5.b (Directing Operations—Oversight) based upon her performance during this event.

Analysis:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. For the given plant conditions, the pressurizer heaters would have energized if placed in automatic. This was due to a previous event, which resulted in pressurizer level having a greater than 5% deviation (i.e., pressurizer level was greater than 5% above program level).
2. Energizing the pressurizer heaters at this time would have caused us to exceed 2250 psig, which was the upper end of the pressurizer pressure control band stated in Procedure 18001-C step C4.
3. Based on other grading by the examiner, points would have been deducted either if the event proceeded as it did (i.e., pressurizer heaters left in manual, but pressure remained in the control band) or if the heaters were placed in automatic and the pressure control band was exceeded. There was no correct response for the applicant.
4. The applicant was concerned about staying within the bounds of procedure guidance. Because pressurizer level would soon be within 5% of program level, we could wait until that time to return the heaters to automatic.
5. With letdown isolated and VCT makeup in progress, it is preferred to energize the pressurizer heaters for mixing. The action to manually energize the pressurizer heaters under the given conditions should be considered a positive as opposed to a negative action under these circumstances.
6. This was an example of poor timing of simulator events by the NRC examination team. If the intent of this event was to complete Procedure 18001-C actions and place pressurizer heaters and sprays in automatic, then more time should have been allowed from the previous event where letdown was isolated. The applicant then quoted items from NUREG-1021 Appendix D, including: "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 review determined the following:

1. Agree. Pressurizer level was 5% above program (i.e., greater than 5% deviation) as a result of a previous event, and the backup heaters would have energized if they were restored to automatic.
2. Unknown but plausible. With pressurizer level being high, energizing the backup heaters may only add *sensible* heat to raise pressurizer temperature back to saturation, and not cause any additional *vaporization* to increase the pressurizer steam bubble and raise pressurizer

pressure. However, pressurizer pressure was at 2248 psig and very close to 2250 psig (the upper end of the control band).
3. Unknown speculation. There was a correct way to proceed during this event, as explained above in the "Expected Action/Response" section and as discussed further below.
4. Noted, and waiting could have been appropriate, but the applicant directed restoring pressurizer heaters to automatic anyway and only allowed an approximate 3 minute wait. See below for how the applicant should have proceeded.
5. Plausible. Energizing pressurizer heaters for mixing may be desired after placing excess letdown in service. However, this statement which supports energizing the heaters adds confusion and contradicts her previous statement NOT to energize pressurizer heaters so that pressurizer pressure would stay within the prescribed control band. In addition, if energizing pressurizer heaters was desirable, placing the heaters in automatic would also accomplish this, which supports performing Procedure 18001-C step C8.b.
6. Disagree. Excess letdown was established 10 minutes before this event started (PT-455 failed high) and pressurizer level was trending down, this NRC . Even given the previous event, there was a correct way to proceed during this event.

Given the above, how did this review determine that the applicant's performance during this event should be assessed errors for RF 2.c (Procedures—Correct Use), and RF 5.b (Directing Operations—Oversight)?

1. Pressurizer heaters did remain in manual control for the remainder scenario, which was not expected or correct. There was a correct way for pressurizer heaters to be returned to automatic during this event, as discussed in the next item.

2. For procedure use, there was a correct way for the applicant to perform step C8 of Procedure 18001-C which would have resulted in both pressurizer pressure remaining within the designated control band of 2250 – 2250 psig AND pressurizer heaters being returned to automatic for the given plant conditions. The applicant, however, did NOT perform step C8 in this fashion. Refer to the "Expected Action/Response" section for more details, but upon reaching step C8, with pressurizer pressure at 2248 psig, the applicant should have proceeded to the RNO column and directed that pressurizer pressure be adjusted to approximately 2235 psig prior to directing that pressurizer heaters and sprays be restored to automatic. Alternatively, if pressurizer pressure was trending down from 2248 psig, the applicant could have waited until pressurizer pressure was approximately 2235 psig prior to directing that pressurizer heaters and sprays be restored to automatic. However, the applicant did neither of these; the applicant never directed adjusting pressurizer pressure to approximately 2235 psig, nor did the applicant wait until pressurizer pressure was approximately 2235 psig prior to directing that pressurizer heaters be placed in automatic. Although a 15 psig pressure difference between an actual pressure of 2248 psig and the target of 2235 psig may not seem like much, it actually is a significant difference, given that only 90 psig separates full power operation of the proportional heaters versus full spray flow. The applicant's incorrect performance of Procedure 18001-C step C8 for the given plant conditions was therefore assessed as an error for RF 2.c (Procedures—Correct Use).

3. During this event, the applicant provided direction which did not facilitate crew performance. Refer to the "Applicant Response/Action" section for more details, but during this event the applicant directed/stated, in sequential order that: (a) pressurizer heaters be placed in automatic (which would energize the heaters for the given plant conditions), even with pressurizer pressure at only 2 psig below the upper level of the control band, (b) "I do not think the heaters are operating properly,

and taking the heaters to automatic may not be what we want," and (c) "Go ahead and take pressurizer heaters to automatic, now we can go to automatic." Instead of providing precise direction (unlike item (c) above, the applicant should have stated "take pressurizer heaters to automatic") at the appropriate time (i.e., when pressurizer pressure was lower and closer to 2235 psig), the applicant provided direction which did not facilitate crew performance. Thus, this review assigned an error to RF 5.b (Directing Operations—Oversight).

3. With regard to the original NRC grading, which assessed an error to RF 1.c (Interpretation/Diagnosis—Understanding), this review believes that the applicant's lack of understanding may have contributed to her overall performance during this event, but that it was not a primary root cause. In accordance with NUREG-1021, ES-303 D.1.d, "Whenever possible, attempt to identify the root cause of the applicant's deficiencies and code each deficiency with no more than two different rating factors," this review identified deficiencies with procedure use and providing direction (RFs 2.c and 5.b) as the primary root causes as to why pressurizer heaters were not restored to automatic during this event.

Scenario 6, Event 4: Controlling Pressurizer Level Transmitter (LT-459) Failed Low

Expected Action/Response: For the given plant conditions, the applicant as SS was expected to understand that the charging flow control valve (FCV-121) would rapidly close upon directing a return to automatic control on the valve's flow controller (FIC-121). The plant conditions at the time where that actual pressurizer level was on program, but actual pressurizer level had also been above program for approximately 15 minutes, such that the FIC-121 would demand closing FCV-121 upon a return to automatic, due to the integral control aspect of FIC-121.

Applicant Action/Response: The applicant directed a return to automatic on FIC-121, which resulted in FCV-121 rapidly closing. The reactor operator informed the applicant that FIC-121 was failed in automatic, at which point the applicant directed a return to manual control on FIC-121. When asked by the NRC examiner after the scenario about her actions during this event, the applicant stated that FCV-121 should not have closed when FIC-121 was returned to automatic, because pressurizer level was on program.

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 1.c (Interpretation/Diagnosis—Understanding) = 1.0	(Contributed to a score of 1.0 along with an error during scenario 3, event 4)

"The applicant was downgraded in this competency because she did not understand that charging flow would lower due to the controller's response to a high pressurizer level over several minutes."

Applicant's Contentions: "The examiner wrote in the EXPECTED ACTION/RESPONSE that the applicant was expected to:

1. Understand the LT 459 failure on charging flow
2. Direct the crew to place charging flow controller FIC-121 to manual prior to selecting the unaffected channel
3. Maintain FIC- 121 in manual until the controller output signal was 'unsaturated'

The examiner writes in the APPLICANT ACTION/RESPONSE that the applicant directed placing the charging flow controller to manual prior to selecting an unaffected channel. He also states the applicant afterward directs the RO to place FIC -121 to automatic. The event description does not identify that when FIC-121 was initially placed in manual that the applicant identified to the crew members (prior to placing to manual) the impact of the controller staying in auto while selecting an unaffected channel and the response that would occur if the controller was not taken to manual i.e., the lowering of the charging flow. This supports that the applicant understood the impact of the LT 459 failure on charging flow and that she directed the crew to place FIC-12l to manual prior to selecting an unaffected channel. The event description as written implies that the controller was immediately placed in automatic. The controller remained in manual for several minutes. The crew entered 18001-C, Section D and performed all the steps prior to placing the level control system back to auto. The applicant at that time (while FIC-121 was still in manual), called a crew briefing to discuss the current failure as well as the previous failure. (This was the second crew briefing performed -first briefing covered the first two failures). In fact, for evidence that this briefing occurred, see the comment on page 23 (Communication) - Where the applicant briefed the crew on the current status of FIC- 121. After the briefing FIC-121 was directed to be placed in **automatic** and another failure occurred at the same time (PT 508) on the secondary side. Note the timing of the failure.

The crew responded to the next failure at which time FIC-l21 was closing. The applicant quickly directed that the crew place FIC 121 **back to manual** (which was the next step inthe 18001-C procedure.

1. Step D9 in 18001-C states: Return PZR level control in Auto.
2. Step DIO IN 18001-C states: Check PZR level is maintained at program by auto control. If it is not the RNO states: **Maintain PZR level at program using manual control.**

FIC 121 was taken back to manual at which time it was under the control of the RO. The applicant then addressed the secondary failure. The events following this were entries into the AOP and EOP network, where any further discussions concerning FIC 121 were not likely to occur as the scenario was moving at a faster pace. After the scenario the examiner asked a question about FIC-121. The applicant describe what occurred, the examiner did not ask any follow-up questions to imply that he was looking for more details or that particular detail.

It is important to note that to determine when a controller with a 9000 second (15 minutes) time constant becomes unsaturated is always a try-and-see approach. As seen in the plant and simulator all the operator can do is establish the required control conditions, place the controller in automatic then monitor the controller response, this may take several attempts. It's also important to consider that the timing of the PT-508 failure may have distracted the crew and prevented the initial verification of the 1-FIC-0121 response.

LACK OF ABILITY/KNOWLEDGE

The applicant did not make an error in this scenario to justify a comment. Placing FIC-121 back to auto is directed per 18001-C. If it is not identified at the time that the controller is saturated the procedure's next step ensures that FIC-121 is operating properly. If, it is not operating properly (i.e., saturated), The RNO ensures that it is taken back to manual."

Additional information provided by the applicant:

1. Page 23 of the applicant's Individual Examination Report, where her response to this event is also detailed for RF 4.a, Communications—Clarity.
2. Pages 23-25 of Procedure 18001-C, "Systems Instrumentation Malfunction."

Results of this review:

This review did not agree with the applicant and identified an additional error beyond what was assigned in the original grading. This review assessed errors to RF 1.c (Interpretation/Diagnosis—Understanding) and RF 5.b (Directing Operations—Oversight) based upon her performance during this event.

Analysis:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. The applicant did (earlier in the event) correctly identify the impact of FIC-121 remaining in automatic while selecting an unaffected pressurizer level channel. This supports that the applicant understood the impact of the pressurizer level channel failure on charging flow, including her direction to place FIC-121 in manual prior to selecting an unaffected channel.
2. The applicant's Individual Examination Report (i.e., original NRC grading) implies that FIC-121 was immediately placed in automatic. However, FIC-121 remained in manual for several minutes.
3. The applicant's version of events, including performing all steps of Procedure 18001-C Section D prior to returning FIC-121 to automatic, conducting a crew brief, directing FIC-121 be placed in automatic, another event occurring (PT-508 failure), and directing FIC-121 be placed back in manual in accordance with step D10 of Procedure 18001-C.
4. It is a "try and see" approach with regard to saturation of FIC-121 as this controller has a 15 minute time constant. If FIC-121 is not operating properly (i.e., saturated), the response not obtained column for step D10 ensures it is taken back to manual control.
5. The timing of the next event (PT-508 failure) may have distracted the crew and prevented the initial verification of the response for FIC-121.

This review determined the following:

1. Unknown but plausible. However, this did not affect the outcome of this review.
2. Disagree. The original grading did not imply that FIC-121 was immediately taken to automatic. This review determined that FIC-121 did stay in manual for approximately 20 minutes during this event.
3. This review verified the applicant's detailed version of events, and did contribute to the results

of this review. See below.
4. Agree in some respects. A "try and see" approach may perhaps be best when operating a controller with an integral aspect. Disagree with the applicant's terminology that a controller in saturation is equivalent to a controller not operating properly.
5. Disagree. The timing of events in this case was reasonable in that the PT-508 failure occurred approximately 20 minutes after the pressurizer level channel failure.

Given the above, how did this review determine that the applicant's performance during this event should be assessed errors for RF 1.c (Interpretation/Diagnosis—Understanding), and RF 5.b (Directing Operations—Oversight)?

1. After the scenario and when asked by the examiner, the applicant did incorrectly state that FCV-121 should not have been closing when FIC-121 was taken to automatic with her rationale being that pressurizer level was on program at the time. This was determined to be an error for RF 1.c, in that this statement by the applicant demonstrated that she did not understand that FCV-121 was responding appropriately and in an integral fashion to pressurizer level being above program for approximately 15 minutes prior to taking FIC-121 to automatic. The applicant did not contest that she made this incorrect statement during this event, and this statement was verified to have occurred by this review.

2. When the applicant did direct returning FIC-121 to automatic, the crew had just completed identifying and taking the immediate actions for the PT-508 failure. In effect, this initiated another transient and caused two alarms (REGEN HX LTDN HI TEMP and RCP SEAL INJ LO FLOW) while the crew was still in the process of addressing the PT-508 failure. Returning FIC-121 to automatic could have waited until the crew more fully addressed the PT-508 failure, and waiting to return FIC-121 to automatic would have had the added benefit of the controller coming out of saturation. In directing the return to automatic for FIC-121 right after the PT-508 failure had been identified, the applicant exhibited an error for RF 5.b (Directing Operations—Oversight).

Scenario 7, Event 1: Raise Power in accordance with Procedure 12004-C, Power Operation (Mode 1)

Expected Action/Response: The applicant as the OATC, and as directed by the SS at the start of the power ascension, was expected to make the required reactivity adjustments to maintain Tave within 2°F of Tref in response to this event.

Applicant Action/Response: Tave dropped to greater than 2°F below Tref, which was low out of the band designated by the senior reactor operator at the start of the power ascension. The lowest that Tave went was 2.3°F below Tref, and Tave was low out of the designated band for approximately 5 minutes. During the time period over which Tave was lowering (approximately 40 minutes and with other scenario events occurring), the applicant did request to pull control rods on at least one occasion prior to Tave going low out of the band.

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 3.a (Control Board Operations—Locate & Manipulate) = 1.0 (Contributed to a score of 1.0 along with an error during

scenario 7, event 5, and an error during scenario 7, event 6)

"The applicant was downgraded in this competency because her reactivity manipulations were not timely enough to maintain the control band [for Tave] provided by the SRO."

Applicant's Contentions: "SRO directed the applicant to maintain Tavg within 2°F of Tref for power ascension. Comment written by examiner states that the applicant allowed Tavg to drop approximately 2.3°F below Tref 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-OO1, 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. <u>This cuts short the observers ability to evaluate the operators response to the earlier malfunction and may be prejudicial to a fair evaluation.</u>

ABILITY /KNOWLEDGE

Applicant understood requirements to maintain 2 F tavg/tref 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 Tavg-Tref Deviation alarm (set point was at 3F)."

<u>Additional information provided by the applicant</u>:

1. Pages 12-13 of Procedure NMP-OS-001, "Reactivity Management Program."
2. A signed statement from the SS on the applicant's crew:

"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."

<u>Results of this review</u>:

<u>This review partially agreed with the applicant and disagreed with the original grading. No error will be assessed to the applicant as a result of her performance during this event, since she did on at least one occasion request to the SS to withdraw control rods before Tave went low out of the designated band.</u>

<u>Analysis</u>:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. The applicant did request to the SS withdrawing control rods on two occasions prior to Tave reaching 2.3°F below Tref.
2. On both occasions, the SS suspended control rod withdrawal due to addressing other scenario events/failures.
3. Procedure NMP-OS-001 states that all reactivity manipulations must first be approved by the SS.
4. The applicant continued to update the SS on the status of the Tave/Tref temperature deviation.

This review determined the following:

1. Partially agree. Based upon a discussion with the assigned examiners' and a review of their notes, the applicant did request to the SS to withdraw control rods when Tave was approximately 1.6°F below Tref. This review could not verify that the applicant also requested to withdraw control rods at an earlier time.
2. Partially agree. For the control rod withdrawal request that was verified by the review, the SS did suspend control rod withdrawal at one step withdrawn, likely due to the SS addressing other scenario events/failures.
3. Agree. In addition, Procedure NMP-OS-001 requires a peer check of control rod manipulations.
4. Unknown, although plausible and supported by the signed statement from the SS.

Given the above, this review determined that no error should be assessed to the applicant based upon her performance during this event. The applicant did on at least one occasion request to the SS to withdraw control rods before Tave went low out of the designated band, and the SS had the ultimate authority to allow the control rods to be withdrawn. Instead, the SS chose to suspend control rod withdrawal to address other scenario events/failures.

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

Expected Action/Response: The applicant as the OATC could have provided assistance to the crew in ensuring that the RWST leak was terminated in a timely fashion. This assistance could have included discussing that the sludge mixing valves should have automatically closed on RWST low level, and that these valves could be closed using hand switches located on control room back panel QPCP.

Applicant Action/Response: The applicant only provided minimal assistance to the crew during this event, which included monitoring RWST level and a discussion of closing other manual valves to stop the leak. The applicant did not assist the crew in locating the sludge mixing valves' hand switches.

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 3.a (Control Board Operations—Locate & Manipulate) = 1.0 (Contributed to a score of 1.0 along with an error during scenario 7, event 1, and an error during scenario 7, event 5)

"The applicant did not recommend to the crew that they needed to ensure that the sludge mixing isolation valves were closed. The applicant demonstrated a weakness in locating the sludge mixing valves' hand switches."

Applicant's Contentions: "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."

Additional information provided by the applicant:

1. Pages 26-29 of the NRC ES-D-2 forms for Scenario 7, Event 6.
2. A signed statement from the SS on the applicant's crew:

"When ALB06-E04 was received, Charlissa (RO) silenced and announced the alarm. I (SS) directed Charlissa to continue to monitor reactivity and directed Rodney (UO) to pull the ARP for the alarm and investigate actions to be taken. Rodney 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 Rodney or me. I made a conscious decision to isolate the sludge mixing system by use of the SOP13105-1 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."

3. A signed statement from the Unit Operator (UO) on the applicant's crew:

"Jamie (SS) directed me to pull the ARP for ALB06-E04 while Charlissa (RO) was directed to monitor reactivity. After reviewing the ARP, I informed Jamie that the automatic action of the valves going shut should have occurred. I waited on direction from Jamie to shut the valves. There was no confusion on where the valves were located. Jamie 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."

Results of this review:

This review partially agreed with the applicant and disagreed with the original grading. No error will be assessed to the applicant as a result of her performance during this event.

Analysis:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. The applicant was directed by the SS to monitor reactivity during this event.
2. While monitoring reactivity, the applicant to the extent possible did assist the SS and UO, including monitoring trends, updating status, and asking about whether any manual valves could be manipulated to halt the decrease in RWST level.
3. The UO communicated to the SS (not the applicant) that the sludge mixing valves should have closed on RWST low level.
4. The SS and the UO were aware that the sludge mixing valves did not isolate and they were aware of the location of the valves' hand switches.
5. The SS and UO were looking for the correct procedure guidance to isolate the sludge mixing valves to ensure that any associated pumps were properly stopped.

6. 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.
7. The original NRC grading criteria utilized (per the NRC ES-D-2 forms for this event) do not list closing the RWST sludge mixing valves as an expected action for the OATC. The NRC ES-D-2 forms list this as an expected action for the UO.

This review determined the following:

1. Not verified but highly plausible. The NRC examiners did not document this direction by the SS to monitor reactivity and could not recall if it occurred, but directing the applicant to monitor reactivity was supported by the written statement provided by the SS.
2. Largely agree. The applicant did report RWST level and communicated closing manual valves. However, the applicant could have also discussed the automatic valves that should have closed and the location of their hand switches even while monitoring the plant.
3. Disagree. Examiner records clearly indicate that the UO made this communication with the applicant as well as with the SS.
4. Disagree. Based on a discussion with the examiners and their records, it is not clear that the UO and SS knew (in a timely fashion) that the sludge mixing valves had failed to automatically close, nor was it clear that they knew (in a timely fashion) the location of the valve hand switches. The RWST leak continued for 19 minutes until the UO finally closed the sludge mixing valves using hand switches on control room back panel QPCP.
5. Agree, although searching for the correct procedure guidance does not fully explain why the RWST leak continued for 19 minutes.
6. Largely disagree. Although other applicants on other crews were not failed as a result of their performance during this event, due to an insufficient number of other errors in accordance with the grading criteria contained in NUREG-1021 ES 303, other applicants were downgraded for demonstrating difficulty in locating the RWST sludge mixing valves' hand switches.
7. Agree. Per the NRC ES-D-2 forms for this event, the action to close the sludge mixing valves was assigned to the UO, and the examiners made no attempt to "steer" this event onto the applicant. (Examiners can and do sometimes "steer" events onto a specific applicant to ensure that each applicant responds to the required numbered of events.).

Given the above, why did this review determine that no error should be assessed to the applicant?

1. As stated by the applicant, it is highly plausible that she was directed to monitor reactivity. Given that during this event the UO was researching procedures, the SS was reviewing prints, and the valve hand switches were located on a control room back panel, it was appropriate for the applicant to monitor the plant, especially if assigned that duty by the SS.
2. This review did partially agree with the original grading, in that the applicant could have provided additional assistance in getting the RWST sludge line valves closed, even while monitoring the plant, such that the RWST leak could have been terminated in much less time than 19 minutes. However, this assistance was not listed on the NRC ES-D-2 forms for the OATC, and thus was not strictly an appropriate grading criterion for evaluating the applicant, considering that the applicant was monitoring the plant with the UO reviewing procedures and the SS reviewing prints.

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

Expected Action/Response: Following the correct diagnosis, the applicant as the OATC and while in the vicinity of the affected controller (TIC-130), was expected to recommend or actually take manual control of TIC-130 to restore auxiliary component cooling water flow to the letdown heat exchanger

Applicant Action/Response:

Original NRC Grading, Affected Rating Factors (RF) and scores:

RF 3.c (Control Board Operations—Manual Control) = 2.0

"The applicant was downgraded in this competency due to not demonstrating the ability to manually control an automatic function."

Applicant's Contentions: "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"

Additional information provided by the applicant:

1. Pages 8-13 of the NRC ES-D-2 forms for Scenario 7, Event 3.
2. Page 19 of the applicant's Individual Examination Report (Form ES-303-1), where the NRC documented her operation of the pressurizer PORV during scenario 7, event 5.
2. A signed statement from the SS on the applicant's crew:

"Charlissa (RO) was the first to recognize that TE-0130 was the failed component. I directed Rodney (UO) 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."

Results of this review:

This review did not agree with the applicant and identified an additional error beyond what was assigned in the original grading. This review assessed errors to RF 3.c per the original grading (Control Board Operations—Manual Control) and RF 1.c (Interpretation/Diagnosis—Understanding) based upon her performance during this event.

Analysis:

The applicant requested reconsideration of this apparent error based upon the following factors:

1. The applicant as the OATC was directed by the SS to monitor reactivity during this event.
2. The UO was directed by the SS to address the alarm and respond to the failure, and the NRC examination team did not "steer" this event to the applicant. Therefore, the applicant should not have been downgraded for actions which should have been performed by the UO, especially since the applicant was directed to monitor reactivity.
3. Although not "steered" or "assigned" this event by the examiners, the applicant did assist the crew by identifying that TV-0130 was closed and that the temperature element had failed low.
4. With regard to a statement she made during this event, "The only thing we can do is call C&T [Clearance and Tagging] to get the TE [temperature element] fixed" (from her original grading, page 21 of her Individual Examination Report Form ES-303-1), the applicant explained that this statement was made to notify the SS that there was no associated AOP (abnormal operating procedure) entry for the failure and that it could only be fixed by contacting C&T.
5. The applicant did acknowledge incorrectly pressing the "up" arrow first on TIC-130, but that this error was quickly corrected by pressing the "down" error with no negative impact, in part because TV-0130 was already in the closed position.
6. After the scenario and when asked by the examiner, the applicant correctly explained how TIC-130 and associated valve TV-0130 functioned, including how to operate TIC-130 using the "up" and "down" arrows.
7. Based on a similar error made by the applicant during scenario 7 event 5, where the applicant incorrectly manipulated a pressurizer PORV switch and had to be prompted to take the correct action, it would be more appropriate to assign the applicant's initial incorrect action of pressing the "up" arrow on TIC-130 to RF 3.a (Control Board Operations—Locate & Manipulate).

This review determined the following:

1. Unknown. The NRC examiners did not document this direction by the SS to monitor reactivity and could not recall if it occurred, nor did the written statement provided by the SS support this direction.
2. Agree in part. The UO was directed by the SS to refer to the annunciator response procedure for this event, and the NRC examiners did not "steer" this event to the applicant. With regard to grading, see the next section, item 2.
3. Agree.
4. It remains unclear what the applicant intended with her statement. See the next section regarding grading, item 2.
5. Agree that the applicant pressed the correct arrow button on her second attempt after being corrected by the SS, and that this was performed quickly with no adverse consequences. Supporting "no negative impact" with the statement that "TV-0130 was already in the closed position" makes no sense, since the purpose of operating the arrow buttons on TIC-130 under the circumstances was to <u>open</u> TV-0130.
6. Agree.
7. Disagree. The manual operation of TIC-130 is clearly associated with taking manual control of an automatic function, since letdown temperature is normally automatically controlled by TIC-130. Thus, any errors in the manual operation of TIC-130 clearly should be assigned to RF 3.c (Control Board Operations—Manual Control). Pressurizer pressure, however, is NOT normally automatically controlled by the pressurizer PORVs, and errors in manually operating the PORVs should be assigned to RF 3.a (Control Board Operations—Locate & Manipulate)..

Given the above, how did this review determine that the applicant's performance during this event should be assessed errors for RF 3.c (Control Board Operations—Manual Control) and RF 1.c (Interpretation/Diagnosis—Understanding)?

1. The applicant did make an error (which she admitted to) by incorrectly pressing the "up" arrow on TIC-130, which was corrected by the SS. Although this review agreed that there were no significant adverse consequences associated with this error, NRC dynamic simulator examinations are graded based on competencies, not consequences, in accordance with NUREG-1021, ES-303 D.2.b: "Keep in mind that the simulator test is generally graded on competencies rather than consequences; every error that reflects on an operator's competence is considered equal unless it is related to the performance of a critical task…" As discussed in item 7 above, this review determined that the applicant's error in the manual operation of TIC-130 clearly should be assigned to RF 3.c (Control Board Operations—Manual Control), and thus, an error in RF 3.c is justified.

2. With regard to RF 1.c (Interpretation/Diagnosis—Understanding) this review disagreed with the applicant's argument that following her diagnosis "all the NRC grading and point reduction related to the OATC response would not appear appropriate," i.e., that only the UO (and SS) should be downgraded, based upon the following:

a. This review did not conclusively determine that the applicant was specifically assigned to monitor reactivity during this event.
b. The NRC ES-D-2 forms assigned this event to the OATC.
c. **The applicant remained in close proximity to TIC-130 during the entire event.**
d. At any time during this event, the applicant should have taken (without direction) or recommended taking manual control of TIC-130 to open TCV-0130 and restore cooling flow to the letdown heat exchanger. Instead, the applicant was directed by the SS to take manual control 10 minutes after the temperature input had failed low, at which point the applicant incorrectly pressed the "up" arrow.
e. The action or recommendation to take manual control of TIC-130 does not require checking the annunciator response procedure or other procedures, but simply requires an understanding of the operation of TIC-130 given a failed temperature input. Instead of taking action or making a recommendation for manual control, the applicant provided a misleading statement to the SS that "The only thing we can do is call C&T to get the TE fixed."
f. When compared to the previous event just discussed (RWST sludge line break), this event did not require the applicant to perform any diagnosis or operations from a control room back panel. All diagnosis and actions could be performed from the front panel where TIC-130 was located, which was where the applicant remained during the entire event.