[redacted] CCS-036

March 15, 2006

[redacted]

Ex 6

Dear Mr [redacted]

Ex 6

In response to your letter of November 7, 2005, the staff of the U.S. Nuclear Regulatory Commission (NRC) has reconsidered the proposed denial issued to you on October 20, 2005, and reviewed the grading of the operating test administered to you on September 12–15, 2005. 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 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 operating test, administered on September 19 and 12-15, 2005, respectively, you may request a waiver of those portions.

b. Because you did not pass the simulator operating test administered to you on September 12–15, 2005, you will be required to retake that portion.

c. You may reapply for a license 2 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.)

Pursuant to 10 CFR 55.35, you may not reapply for a license until your license application has been finally denied. Failure on your part to request a hearing within 20 days constitutes a wavier of your right to demand a hearing. For the purpose of reapplication under 10 CFR 55.35, such a wavier renders this letter a notice of final denial of your application, effective as of the date of this letter.

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[redacted]

Ex 6

If you have any questions, please contact Mr. Neil O'Keefe, Acting Chief, Operator Licensing and Human Performance Branch, Office of Nuclear Reactor Regulation at (301) 415-1017.

Sincerely,

/RA/

Michael J. Case, Director
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

Docket No. [redacted]

Ex 6

Enclosure: As stated

[redacted]

Ex 6

If you have any questions, please contact Mr. Neil O'Keefe, Acting Chief, Operator Licensing and Human Performance Branch, Office of Nuclear Reactor Regulation at (301) 415-1017.

Sincerely,

/RA/
Michael J. Case, Director
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

Docket No. [redacted]

Ex 6

Enclosure: As stated

cc:
[redacted] Site Vice President, Crystal River 3 Nuclear Plant
General Manager
, Training Manager

Ex 6

Accession Number: ML060690225

OFFICE	IOLB:DIRS	BC:IOLB:DIRS	D:DIRS:NRR
NAME	LVick	DCTrimble	MJCase
DATE	03/06/06	03/10/06	03/10/06

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INFORMAL REVIEW RESULTS–[redacted]
SENIOR REACTOR OPERATOR APPLICANT—CRYSTAL RIVER 3

5x6

In response to the applicant's letter of November 7, 2005, the U.S. Nuclear Regulatory Commission (NRC) reconsidered the proposed denial issued on October 20, 2005, and reviewed the grading of the operating test administered to the applicant on September 12–15, 2005. In spite of the information supplied by the applicant, the NRC has determined that the applicant did not pass the operating test. The following outlines the results of the NRC's review.

OVERALL SUMMARY

The applicant requested an informal review of his performance on the simulator operating test, in which he was evaluated as the operator at the controls (OAC) during Scenario 1 and as the control room supervisor (CRS) during Scenarios 2 and 3. The findings of this review agreed with the original grading of the applicant's performance overall as unsatisfactory, in conformance with Section ES-303, "Documenting and Grading Initial Operating Tests," of Revision 9 to NUREG-1021, "Operator Licensing Examination Standards for Power Reactors."

The following Table provides a summary of the rating factor (RF) and competency scores determined by the examiner following the operating test and the scores determined by this informal review.

Enclosure

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SUMMARY OF APPEAL FOR INFORMAL REVIEW OF NRC GRADING

Competency/RFs	Original RF Score/ Grades	Original Compentency Grades	Review RF Score RF Grades	Review Competency Grades
1. Interpretation/Diagnosis		1.80		1.60
a. Recognize & Attend	1 / 0.20		1 / 0.20	(Reviewed)
b. Ensure Accuracy	2 / 0/40		1 / 0.20	(Reviewed)
c. Understanding	1 / 0.30		1 / 0.30	(Reviewed)
d. Diagnose	3 / 0.90		3 / 0.90	(Not Reviewed)
2. Procedures		3.00		3.00
a. Reference	3 / 0.90		3 / 0.90	(Not Reviewed)
b. EOP Entry	3 / 0.90		3 / 0.90	(Not Reviewed)
c. Correct Use	3 / 1.20		3 / 1.20	(Not Reviewed)
3. Control Board Operations		2.67		2.34
a. Locate & Manipulate	3 / 1.02		3 / 1.02	(Not Reviewed)
b. Understanding	3 / 0.99		3 / 0.99	(Not Reviewed)
c. Manual Control	2 / 0.66		1 / 0.33	(Reviewed)
4. Communications		2.60		2.60
a. Clarify	2 / 0.80		2 / 0.80	(Not Reviewed)
b. Crew & Others Informed	3 / 1.20		3 / 1.20	(Not Reviewed)
c. Received Information	3 / 0.60		3 / 0.60	(Not Reviewed)
5. Directing Operations		2.50		2.20
a. Timely & Decisive Action	3 / 0.90		3 / 0.90	(Not Reviewed)
b. Oversight	2 / 0.60		1 / 0.30	(Reviewed)
c. Solicit Crew Feedback	3 / 0.60		3 / 0.60	(Not Reviewed)
d. Monitor Crew Activities	2 / 0.40		2 / 0.40	(Reviewed)
6. Technical Specifications		3.00		3.00
a. Recognize & Locate	3 / 1.20		3 / 1.20	(Not Reviewed)
b. Compliance	3 / 1.80		3 / 1.80	(Not Reviewed)

REVIEW RECOMMENDATION: SUSTAIN LICENSE DENIAL

APPEAL AREA 1

1.1 Pertinent Competency

Applicant Appeal Area 1 involves SRO Competency 1 (Interpretation/Diagnosis), which includes, among other things, the ability to diagnose plant conditions to guard against and mitigate conditions that do not meet specifications. It also includes the abilities to prioritize one's attention in keeping with the severity and importance of the annunciators and alarms and to correctly interpret the significance of each alarm and verify that it is consistent with plant and system conditions. Competency 1.b (Ensure Accuracy) involves a demonstration of the applicant's knowledge and ability to ensure the collection of correct, accurate, and complete information and reference material on which to base diagnoses.

1.2 Original NRC Grading:

The applicant received an unsatisfactory grade of 1.80 for SRO Competency 1, based on the following assigned RF scores:

SRO RF score for competency: 1.a = 1, 1.b = 2, 1.c = 1, and 1.d = 3

1.2.1 NRC Examiner Comments:

With regard to Competency 1.b, the examiner assigned a RF of 2 based on the applicant's performance during Scenario 3, Event 5. Event 5 is a spurious closure of MUV-258 (reactor coolant pump (RCP)-1A seal return controlled bleed-off (CBO) line isolation valve to the makeup and purification system).

The examiner contends that the applicant, as SRO (CRS), failed to first ensure that operators refer to the appropriate annunciator response procedure (ARP) (upon receiving alarm "RC Pump Seal Bleed-Off High") before taking any action to secure RCP-1A at his command. Instead, the examiner contends that the applicant, as SRO (CRS), immediately directed the reactor operator (RO) to secure RCP-1A based on limited information received from the balance of plant (BOP) operator without verifying whether a RCP-1A seal failure actually existed. The examiner contends that the applicant failed to ensure that the crew collected correct, accurate, and complete information that would have aided the crew in a correct diagnosis. The examiner asked two followup questions—(1) "What would the indications be if the seal injection [correction—seal return] valve were to spuriously close?" and (2) "What other indications would help differentiate between an actual [RCP] seal failure and a [RCP] seal injection [correction—seal return] valve closure?" In answer to the first question, the examiner contends that the applicant replied that the indications for a spurious incident would be the same as those he observed during the scenario. The applicant's reply to the next question was to the effect that he could have looked at seal temperatures, but he did not. The examiner noted that the applicant could have looked at Annunciator I-4-4, "RCP Seal Upper Stage Temp High," which remained off, to help diagnose that the RCP-1A seal had not failed.

In summary, the examiner assigned a score of 2 since the applicant directed an improper action based on an inaccurate diagnosis that resulted from the applicant's failure, as SRO (CRS), to ensure that all available and necessary information was correctly collected and assessed.

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1.3 Applicant's Contention:

The applicant contends that the RF score of 2 was too severe and that some information upon which the RF score is based is incorrect. The applicant correctly asserts that MUV-258 is not the seal injection inlet (valve) for RCP-1A but is used to isolate (seal return) CBO for RCP-1A. (The review acknowledges the incorrect description by the examiner.)

The applicant contends that, following receipt of alarm "RCP Seal Bleed-Off High," he directed the BOP operator to monitor the RCP seal recorder to determine the cause of the RCP-1A seal problem. He received a report from the BOP operator who reviewed the RCP seal recorder and reported that RCP-1A first and second stage seals had failed. The applicant asserts that he personally observed on the Computer Alarm monitor that RCP-1A second and third stage seal cavity pressures exceeded 1500 pounds per square inch gauge (psig). He determined that the plant was in the initial phase of a transient and therefore decided not to direct the use of ARPs. The applicant argues that his actions to suspend normal three-way communications, suspend acknowledgment of alarms, and suspend use of ARPs during the initial phase of a plant transient were consistent with his knowledge of administrative instruction (AI)-505 (Conduct of Operations During Abnormal and Emergency Events).

Additionally, the applicant asserts that operating procedure (OP)-302 (Reactor Coolant Pump Operation) supports his diagnosis that RCP-1A seals had failed (i.e., seal degradation), as evidenced by both the second and third stage seal cavity pressures exceeding 1500 psig. He asserts that he properly directed the shutdown of RCP-1A in accordance with OP-302, Step 4.7.1.3. The applicant contends that because of the need to secure RCP-1A with the observed indications, referring to the ARPs at the time was not appropriate.

The applicant contends that, based on his previous training and experience as both a RO and operations instructor, he properly recognized the actions needed to promptly secure the RCP. He also contends that training demonstrated a seal failure that was caused by clogging one of the RCP seal pressure breakdown devices. He personally ran this particular failure on the simulator, designating the third stage seal pressure breakdown device for RCP-1A as the affected component. He states that, for this type of failure, he was trained to shut down RCP-1A in accordance with Step 4.7.1.3 of OP-302, for the same reasons stated above. The applicant contends that he also ran the closure (failure) of MUV-258 for approximately 10 minutes and concluded that in comparing the two failure plots (i.e., clogged seal pressure breakdown devices versus closure of MUV-258) one can conclude that the two events provide very similar indications. The applicant contends that his decision to proceed directly to shut down RCP-1A was prudent and conservatively taken to minimize the possibility of a loss-of-coolant accident (LOCA) due to uncontrolled seal leakage.

The applicant disagrees with the examiner's comment that the applicant could have looked at Annunciator I-4-4, "RCP Seal Upper Stage Temp High," which was off, to determine that a seal failure did not exist. He maintains that the indications he observed showed that the first and second stage seals had failed. According to the applicant, the referenced alarm (I-4-4) is for the third stage seal, which did not indicate failure. The applicant contends that the examiner's statement is also too severe in that he is not trained to look at alarms that are not actuated to determine the status of failed equipment during the initial phase of a component failure or plant transient.

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Finally, the applicant disagrees with the examiner's comment that he failed to request all of the information required from the team to make a correct diagnosis of plant conditions. He contends that the RCP seal recorder information as well as his own observation of pertinent computer points indicated seal failure and that he had ascertained all the information necessary to make a correct diagnosis.

1.4 Reviewer's Analysis:

With regard to Competency 1.b, the review finds that the applicant, as SRO (CRS), made errors in at least two areas.

1.4.1 *Area 1—Failure to ensure that operators collected correct, accurate, and complete information regarding the status of the RCP-1A seal parameters on which to diagnose whether or not seal failure occurred.*

Based on the following, the review finds the applicant, as SRO (CRS), failed to ensure that the operators collected correct, accurate, and complete information regarding the true status of the RCP-1A seal parameters while operating the reactor in ITS (Improved Technical Specifications) Mode 1.

As background, the review notes that the NRC examiners' had planned to initiate Event 6 (RCP-1A Seal Failure) 30 seconds following any re-opening of MUV-258 by the operators. However, Event 6 was not initiated nor used at any time during the NRC operating test. In other words, no RCP-1A seal failure occurred at any time during the operating test. This was because the applicant, as SRO (CRS), incorrectly diagnosed the problem and prematurely directed operators to trip RCP-1A, without ever realizing that Event 5 (MUV-258 closure) isolated the RCP-1A seal return CBO flowpath and subsequently de-staged first, second, and third stage seal pressures (i.e., second and third stage seal pressures equalized with first stage pressure).

The candidate's contention under Appeal Area 1 is that his diagnosis was correct in concluding that RCP-1A seals had failed is rendered moot by the fact that seal failure was never initiated within the as-given scenario. Nonetheless, the review gave due consideration to the applicant's contentions.

The review finds the applicant's rationale, that a plant transient was ongoing at the time prior to his directing that RCP-1A be secured, is flawed. On the contrary, prior to the securing of RCP-1A, the crew had just completed surveillance procedure (SP)-321, Enclosure 1, Data Sheet 1 (Off-Site to On-Site Breaker/Power Verification). A review of the record shows that the plant remained at steady-state ITS Mode 1 conditions for at least an additional 7 minutes following completion of SP-321 (Event 4) before the applicant directed RCP-1A to be stopped.

The review finds that the applicant's error primarily involves issues with not complying with AI-500 (Conduct of Operations Department Organization and Administration), OP-302 (Reactor Coolant Pump Operation), AI-505 (Conduct of Operations During Abnormal and Emergency Events), and ARP H-04-05 (Alarm "RC Pump Seal Bleed-Off High").

1.4.1.1 AI-500 (Conduct of Operations Department Organization and Administration)

Contrary to Step 3.2.1 (regarding licensed SRO responsibilities), the review finds the applicant, as SRO (CRS), among other things, did not ensure that crew members performed according to station operating practices. Specifically, the operators did not fully investigate condition-indicating signals and perform appropriate remedial actions where applicable. In other words, the applicant, as well as the operators under his purview, completely disregarded and ignored an alarm procedure (RC Pump Seal Bleed-Off High) as appropriate reference material to aid in diagnosing the cause of RCP-1A high second and third stage seal pressures.

Contrary to Step 3.2.3, the review finds that the applicant, as SRO (CRS), did not ensure that the plant (i.e., RCP-1A) was rigorously monitored in a timely manner and that operating activities were conducted in accordance with applicable administrative controls. The review finds that although the applicant had up 5 minutes to determine the state of the RCP-1A seals before taking any action, he directed a trip of the pump within 3 minutes after receiving the high CBO alarm. In this case, the applicant did not make good use of the time available to fully investigate the cause of the high seal pressures (i.e., MUV-258 closure). The applicant did not ensure that other supporting indicators (e.g., status of CBO line pathway) were checked to determine if the indications were faulty.

The applicant contends that his actions were based on a report from the BOP operator that the RCP-1A 1st and 2nd stage seals had failed, his own observations of high pressures in the 2nd and 3rd stage seal cavities, and his training and experience. He did not base his actions on procedural direction or guidance. Thus, the applicant did not take advantage of all the information available to the crew to ascertain the true status of the RCP-1A seals and understand accurately and completely the reason for the elevated seal pressures.

Contrary to Appendix 3 (Control Room Activities) to AI-500, the applicant, as SRO (CRS), did not ensure that operators collected available reference material such as ARPs to discern whether or not MUV-258 was a possible reason for the RCP-1A elevated seal pressures. Previous review comments given above also apply to this error review.

1.4.1.2 OP-302 (Reactor Coolant Pump Operation)

Contrary to Step 3.2.6 (regarding limits and precautions), the applicant, as SRO (CRS), did not take advantage of the maximum allowable time (5 minutes) to operate RCP-1A with its CBO line secured with its associated seal injection and/or SW (Nuclear Service Closed Cycle Cooling Water) cooling maintained. In other words, more than enough time was available to re-establish proper seal staging.

Contrary to Step 4.7.3.3 (with regard to abnormal seal injection flow), the applicant, as SRO (CRS), did not give due consideration to the ACTION statement, "IF Seal injection flow is Low THEN DETERMINE cause and return seal injection flow to normal." Furthermore, the applicant gave no consideration to the DETAILS statement, "ENSURE CBO valves are open. IF an isolated CBO flowpath is NOT restored with 5 minutes THEN SHUTDOWN affected RCP ...." The review finds that absent the establishment of any CBO flowpath, seal injection flow would decrease below its expected range. The review finds that ample condition-indicating signals existed to provide cues that the CBO line was isolated rather than that the seals had failed.

Contrary to Enclosure 4 (RCP Seal Leak Rate Determination), Steps 1.1 through 2.2, the applicant, as SRO (CRS), could have made use of the provided methodology for calculating and determining RCP-1A seal leakage and readily concluded that no seal failure occurred.

Contrary to Enclosure 3 (Calculated CBO Flow), the applicant, as SRO (CRS), could have reviewed reference material and determined the expected CBO flow (in gallons per minute (gpm)) based on third stage cavity pressure (in pounds per square inch (psi)) and readily concluded that no CBO flowpath existed.

Finally, contrary to Steps 4.7.1.2 and 4.7.1.3 (with regard to seal degradation), the applicant, as SRO (CRS), erroneously concluded that seal degradation had occurred when in fact it had not. The applicant argues that based upon the NOTE prior to the steps, he considered the seals degraded (and therefore failed). The review finds that the applicant's conclusion is too narrowly focused and that he did not stop, think, and understand the guidance provided by the NOTE. The NOTE stated that, "Seal degradation may be indicated by one or more of the following symptoms...abnormal or fluctuating seal cavity pressure...." The applicant erroneously considered the "may" portion of the note as an absolute instead of also considering that the term "may" relates to other possibilities. In this case, no seal degradation took place, only seal de-staging occurred. The review finds that no other symptom such as high seal temperatures, high seal leakage flow, or high pump vibration occurred that could bolster the applicant's argument. The applicant's basis for securing the RCP was flawed.

1.4.1.3 AI-505 (Conduct of Operations During Abnormal and Emergency Events)

Contrary to Step 3.1.7 (with regard to normal operation), the applicant, as SRO (CRS), did not ensure that operators, based on plant conditions (i.e., no abnormal or emergency event procedure was applicable at the time of Event 5), collected or obtained and made correct use of operating procedures and ARPs that were applicable. As noted earlier, the review finds no basis for the applicant's contention that the plant was in a transient state at the time when MUV-258 spuriously closed (Event 5).

1.4.1.4 ARP H-04-05 (Alarm "RC Pump Seal Bleed-Off High")

Contrary to "Operator Actions for a Valid Alarm," the applicant, as SRO (CRS), did not ensure proper CBO flowpath by checking that MUV-258 (inboard isolation valve) and/or MUV-253 (outboard isolation valve) were open. The applicant as well as the crew failed to identify or diagnose at any time that MUV-258 had closed and remained so for the remainder of the operating test.

1.4.2 *Area 2—After the RCP was stopped, the applicant had another opportunity and failed a second time to collect correct, accurate, and complete information regarding the status of the RCP-1A seals.*

The review finds that after the RCP-1A was stopped, the applicant, as SRO (CRS), had another opportunity and failed a second time to ensure that operators collected correct, accurate, and complete information regarding the status of the RCP-1A MUV-258 to diagnose a seal de-staging event rather than a seal failure event (which did not exist). The review finds that the applicant's error primarily involves issues with AI-500, AI-505, ARP-H-04-05, and OP-302.

1.5 Reviewer's Conclusion:

With regard to Competency 1.b, the review finds that the applicant failed to ensure the collection of correct, accurate, and complete information and reference material on which to base diagnoses. In light of the number of errors, the review concludes that a score of 1 is more appropriate for this RF than a score of 2 given by the examiner. Therefore, the examiner's overall evaluation of the applicant's performance, as SRO (CRS), during Scenario 3, Event 5, is downgraded, and the SRO RF score of 2 is changed to 1 with a RF grade change from 0.40 to 0.20.

With respect to the criteria specified in 10 CFR 55.45(a) during this event, the applicant, as SRO, failed to:

- (Item 3)—Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.
- (Item 4)—Identify the instrumentation systems and the significance of facility instrument readings.
- (Item 7)—Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

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APPEAL AREA 2

2.1 Pertinent Competency

Applicant Appeal Area 2 also involves SRO Competency 1, which includes, among other things, the ability to diagnose plant conditions to guard against and mitigate conditions that do not meet specifications. Competency 1.a (Recognize & Attend) involves a demonstration of the applicant's knowledge and ability (1) to prioritize one's attention in keeping with the severity and importance of the annunciators and alarms and (2) to correctly interpret the significance of each alarm and verify that it is consistent with plant and system conditions.

2.2 Original NRC Grading:

The applicant received an unsatisfactory grade of 1.80 for SRO Competency 1, based on the following assigned RF scores:

SRO RF score for competency: 1.a = 1, 1.b = 2, 1.c = 1, and 1.d = 3

2.2.1 *NRC Examiner Comments*:

With regard to Competency 1.a, the examiner assigned a RF score of 1 based, in part, on the applicant's performance during Scenario 1, Event 2. Event 2 is a 55 gpm reactor coolant system (RCS) pressure boundary leak into the reactor building (RB).

The examiner noted that the applicant, as RO (OAC), among other things, determined that RCS leakage was approximately 60 gpm. The examiner also noted that RB air pressure had increased from ambient to 1.7 psig and was rising. The examiner asserts that the crew unnecessarily delayed the start of the plant shutdown for more than 30 minutes after determining that significant RCS leakage existed. The examiner also asserts that RB air pressure was continuing to rise towards the 4.0 psig engineered safeguard (ES) actuation signal.

The examiner contends that the crew failed to take prompt and prudent action, as a result of the unnecessary delay, to place the plant in a condition that would lessen the leak rate and remove the challenge to the RB containment barrier. The examiner contends that, when the crew decided to shut down the plant, they decided to use OP-204 (Power Operation) rather than abnormal procedure (AP)-510 (Rapid Power Reduction). The examiner contends that the applicant, as RO, did not question the SRO's decision to ramp the unit down at the lower rate (0.5 percent per minute) instead of at a higher rate even though it was apparent that Event 2 involved a significant leak. The examiner contends that the applicant did not recognize the severity of the RB pressure trend in response to the RCS leak and failed to take actions to address deteriorating conditions of RB pressure. Failure to take prompt and prudent actions to ramp the unit down in a timely manner allowed the plant to remain in an operational condition that could have allowed the leak to worsen.

With regard to Competency 1.a, the examiner contends that the applicant, as RO, was given a grade of 1 due, in part, to his failing to recognize the severity of the RCS leak into the RB and to therefore take the unit off line in a timely manner as RB conditions deteriorated.

2.3 Applicant's Contention:

The applicant contends that his actions were appropriate and consistent with the actions required of the RO position. He points out that Operations and Training Management representatives at Crystal River 3 who observed and/or reviewed his crew's performance have stated that use of either OP-204 or AP-510 was acceptable for the scenario event.

The applicant contends that the controlling procedure at the time was AP-520 (Loss of RCS Coolant or Pressure), which does not specifically direct performance of AP-510. He points out that Step 3.17 of AP-520 directs that a plant shutdown and cooldown should begin within 4 hours, with no procedure reference or required power reduction rate specified. The applicant contends that during RCS leaks that are within normal makeup capability, operators are trained first to perform those sections of AP-520 which may potentially isolate the leak and terminate the event; then, if the leak is not isolated using the guidance contained in AP-520, an orderly plant shutdown is required. The applicant contends that AP-510 does not provide for or require higher ramp rates than those allowed by OP-204. The applicant contends that if it was imperative to begin a plant shutdown immediately after exceeding the ITS limit for unidentified leakage, rather than within 4 hours, then the associated ITS actions would have directed that a shutdown be initiated immediately.

The applicant disagrees that the crew delayed beginning the plant shutdown for more than 30 minutes after determining that significant leakage existed while RB pressure was continuing to rise. He contends that no credit was given for the prompt actions taken by the crew during this time period in an attempt to identify and isolate the leak. As RO, the applicant contends that he closely monitored RCS parameters (RCS pressure and pressurizer level) and did not observe any increase in the magnitude of the RCS leak.

He further contends that immediately following completion of AP-520, the CRS, as SRO, directed use of OP-204 for plant shutdown, and a power reduction was commenced within the required timeframe. The applicant contends that following initiation of the plant shutdown, the crew monitored the RB air pressure trend and decided that the use of AP-510 (at a 2 percent per minute ramp rate) would be more appropriate and was now justified based on the increase in RB pressure.

The applicant contends that the examiner's comment that "The applicant, as RO, did not question the SRO's decision for ramping the unit down at the lower rate even though it was apparent that this was a significant leak" is too severe because the rate at which the unit should be shut down is not identified as a criterion applicable to the RO position.

The applicant contends that the examiner's comment that "The applicant did not recognize the severity of the trend of RB pressure and failed to take actions to address deteriorating conditions of RB pressure which indicated a non-recoverable RCS leak" is incorrect, in that, during this type of event it is not the responsibility of the RO (OAC) to perform actions to increase RB cooling and perform leak isolation steps in AP-520. He contends that these actions are performed by the BOP operator under the direction of the CRS.

The applicant contends that the examiner's comment that "Failure to take prompt and prudent actions to ramp the unit down in a timely manner allowed the plant to remain in an operational condition that could have allowed the leak to get worse" is too severe, since appropriate actions were taken to assure that plant conditions were maintained in accordance with ITS and applicable plant procedures.

Finally, the applicant contends that he functioned within the control room team appropriately by participating in the diagnosis of the RCS leak and subsequently performing a very accurate RCS leak rate calculation. According to the applicant, he communicated his concurrence with the entry into AP-520 and performed RO actions as directed by the CRS. He contends that he adhered to AI-505 (Conduct of Operations During Abnormal and Emergency Events) and correctly applied ITS limitations associated with RCS leakage. He notes that he did not challenge any additional ITS limitations or amendments while shutting down the plant.

2.4 Reviewer's Analysis:

With regard to Competency 1.a, the examiner arrived at his RF score of 1 based, in part, on the applicant's performance as RO (OAC) during Scenario 1, Event 2.

With regard to Scenario 1, Event 2, the review was unable to substantiate that the applicant committed any error.

2.4.1 *Observation —The applicant apparently did not fully recognize that the increase seen during this event in RB pressure was not indicative of a further increase in RCS leakage (i.e., leak rate remained at 55 gpm).*

As detailed below, the review finds that the applicant, as RO and a member of the shift crew, may not have fully recognized and communicated in a timely manner that the increase seen during this event in RB pressure was not indicative of a further increase in RCS leakage (i.e., leak rate remained at 55 gpm). The applicant appeared to not exhibit a level of understanding commensurate with that of a licensed operator in terms of recognizing, analyzing, and understanding the effect of a relatively small RCS pressure boundary leak (55 gpm) on the very large volume (2 million cubic feet) RB containment air temperatures and air pressure over time.

The review finds that Event 2 is a relatively small RCS pressure boundary leak that over an extended period of time slowly increases the RB average bulk air temperature from ambient (assuming normal lineup and operation of RB cooling units and RB area cooling fans). In turn, this temperature increase slowly raises the RB bulk air pressure above ambient. For Event 2, the rate of increase in the RB average air temperature and air pressure was primarily limited by the rate of heat removal and water vapor condensation of the RB cooler(s). The simulator operating test data show that the net effect of the 55 gpm RCS leak is a slow increase in RB average air temperature and air pressure parameters. During Event 2, RB cooling ventilation was in its normal lineup, maintaining the RB average air temperature at less than 130 °F.

The review finds that the RCS leakage rate in Event 2 did not (and could not) cause a significant change (i.e., rapid increase) in RB average air temperature and thus RB air pressure

in the 30-minute timeframe of concern (i.e., from the onset of Event 2 until entry into AP-510). The review finds that although RB temperature and pressure increased (and stabilized), they did not rise so fast and were not so significant that these increases alone would mandate more aggressive operator action.

Simulator data provided by the facility licensee shows, absent any operator action, the RB pressure would not (and did not) challenge the RB 4.0 psig ES actuation set point or any ITS limiting conditions for operations (LCOs) with regard to RB average air temperature or RB air pressure. The governing reasons for the power reduction are, for the most part, related to prudence and the ITS action statement of 4 hours to reduce the RCS leakage to less than the ITS LCO limits. There is no threat to the RB 4.0 psig ES actuation, unless RB cooling is significantly reduced or the RCS leakage becomes greater than the cooling capacity. Only during Event 5 (a 200 gpm RCS leak rate) did RB pressure increase, and then only to approximately 2.4 psig. Event 5 was introduced into the scenario after the crew had entered AP-510.

While the applicant contends that, as RO (OAC), he closely monitored the RCS pressure and pressurizer level and did not observe any increase in the magnitude of the leak rate, it is not clear that he fully recognized and communicated this to the CRS. This was evidenced by the CRS's decision to shutdown faster based on increasing containment pressure.

2.5 Reviewer's Conclusion:

With regard to Competency 1.a, as it relates to Scenario 1, Event 2, the review was not able to substantiate an error by the applicant. The review did not fault the crew's decision to increase the rate of shutting down the plant, which was a conservative decision given the existence of a significant small break loss of coolant event.

APPEAL AREA 3

3.1 Pertinent Competency

Applicant Appeal Area 3 also involves SRO Competency 1, which includes, among other things, the ability to diagnose plant conditions to guard against and mitigate conditions that do not meet specifications. Competency 1.a involves a demonstration of the applicant's knowledge and ability (1) to prioritize one's attention in keeping with the severity and importance of the annunciators and alarms and (2) to correctly interpret the significance of each alarm and verify that it is consistent with plant and system conditions.

3.2 Original NRC Grading:

The applicant received an unsatisfactory grade of 1.80 for SRO Competency 1, based on the following assigned RF scores:

SRO RF score for competency: 1.a = 1, 1.b = 2, 1.c = 1, and 1.d = 3

3.2.1 *NRC Examiner Comments*:

With regard to Competency 1.a, the examiner assigned a RF score of 1 based, in part, on the applicant's performance during Scenario 1, Events 3 and 4. Event 3 is a failure of Feedwater (FW) Loop "A" station controller automatic mode demand output (fails "as-is"). Event 4 is a manual power decrease (i.e., reactivity manipulation).

The examiner contends that the applicant, as RO (OAC), failed to diagnose an FW flow mismatch, which resulted in the BOP operator placing the turbine in manual mode in an attempt to control turbine header pressure. The examiner asserts that the applicant monitored the diverging FW flows but failed to take action or inform other crew members. The examiner contends that the CRS, as SRO, noticed FW Loop "A" flow straight lining and subsequently directed the applicant to place the reactor demand Bailey and both FW Loop "A" and "B" flow control stations in manual mode. The examiner noted that the applicant placed the reactor demand Bailey in manual mode but failed to place both of the FW control stations in manual mode until redirected a second time by the CRS.

The examiner contends that the applicant failed to recognize the off-normal FW trends and respond in a timely manner to preclude the unnecessary placement of several Integrated Control System (ICS) controls into manual mode, which in turn made it more difficult to control RCS temperature and pressure and pressurizer level later in the scenario.

Additionally, the examiner contends that the applicant's actions (that resulted in several ICS controllers in manual rather than automatic mode) compounded the excessive heat transfer event in that it caused several ES actuations resulting in three automatic starts of the high-pressure injection (HPI)-1C pump. The examiner contends that the three starts exceeded the starting duty limitations listed in the precaution and limitations in Section 3.2 of OP-402 (Make-Up and Purification System).

The examiner contends that the applicant, as RO, was given a grade of 1 in this competency due in part to his failure to recognize and attend to in a timely manner the FW flow mismatch caused by FW Loop "A" station controller failing as-is in automatic mode.

3.3 Applicant's Contention:

With regard to Scenario 1, Events 3 and 4, the applicant, as RO, contends that he was graded incorrectly and/or too severely. The applicant acknowledges that the communications between himself and the BOP operator were not as crisp as desired.

The applicant contends that the examiner's comment, "The RO monitored FW flow which indicated a divergence. However, he failed to take actions addressing the divergence in FW flow, or inform other crew members of the problem," is incorrect. The applicant contends that during this time he was monitoring several parameters, including FW flow. The applicant contends that because of the scaling on the FW flow (0–6 million lbm/hr) chart recorder, he did not notice an appreciable divergence in FW flows at the time. The applicant contends that shortly after the main turbine was placed in manual mode, the CRS noted that it appeared that FW flows were diverging. The applicant contends that the CRS obtained this information from the overhead CRT (left side of panels) and that the scaling of the CRT FW flow indication made small divergences in FW flows more readily apparent to the CRS, as compared to the main control board (MCB) chart recorder that the applicant was monitoring. He contends that he subsequently observed the CRT FW flows and then concurred with the observation of the CRS. The applicant contends that he then observed FW flows, once-through steam generator (OTSG) levels, RCS pressure, and the change in temperature of the cold-leg of the RCS loop on the MCB to qualify, validate, and verify the information in an to attempt to diagnose the reason FW flows were diverging. The applicant contends that at this time no alarms were associated with instrument failures. The applicant contends that while he was attempting to diagnose the source of the FW flow divergence, the CRS, as SRO, directed him to place the reactor and FW controls in manual mode, which he did at that time. He also contends that had the CRS allowed him more time to finish his qualification, validation, and verification process, he is confident that he would have correctly diagnosed the failure of the FW Loop "A" demand station and would have recommended placing the appropriate stations in manual mode.

The applicant contends that the examiner's comment, "Failing to recognize off-normal trends and respond in a timely manner could have delayed the response required to mitigate events," is incorrect. He contends that the response he took did not prevent mitigating the effects of the FW Loop "A" demand failure "as-is," and that when directed by the CRS, he successfully placed the reactor and FW controls in manual mode and established stable conditions.

The applicant contends that the following comment by the examiner, with regard to taking manual control of ICS stations, is incorrect:

> This made it more difficult to control RCS temperature, pressurizer level and RCS pressure. This compounded the excessive heat transfer event in that it caused several ES actuations resulting in three starts of the IC HPI pump.

The applicant contends that the main turbine was placed in manual mode before the reactor was tripped and, therefore, prior to the excessive heat transfer event. The applicant contends

that once the reactor was tripped, so too was the turbine, thereby removing the status of the main turbine station in manual mode as a contributor to the excessive heat transfer event that occurred shortly after the reactor trip.

The applicant contends that several ES actuations followed termination of the excessive heat transfer event, but they were not attributable to the additional station (i.e., main turbine) being taken to manual mode during Events 3 and 4. The applicant contends that the ES actuations were caused by less than desirable coordination between himself, as RO, and the BOP operator when throttling HPI and stabilizing RCS temperature using the OTSG "B" turbine bypass valves following the termination of the excessive heat transfer event. The applicant contends that this could have been averted had he, as RO, and the BOP operator communicated their plant manipulations better to one another or had the CRS, as SRO, provided coordinating guidance.

3.4 Reviewer's Analysis:

With regard to Competency 1.a, the examiner arrived at his RF score of 1 based, in part, on the applicant's performance as RO (OAC) during Scenario 1, Events 3 and 4.

With regard to Scenario 1, Events 3 and 4, the review finds that the applicant, as RO (OAC), made at least two errors.

3.4.1 Error 1—Failure to recognize a FW Loop "A" station controller failure

The FW Loop "A" station controller failure occurred at 0800. According to the examiner's notes, at 0808, a down-power was commenced, which is the point of and cause for an increasing divergence between FW Loop "A" and Loop "B" flow. The applicant did not recognize this divergence until 0823 (15 minutes after the divergence began). While the applicant informed the crew of the divergence, he did not take action (i.e., place the Loop "A" FW or other controllers in manual) until ordered to do so by the CRS at 0826. The review finds that 15 minutes is more than ample time for a RO (OAC) to recognize, investigate, diagnose, and/or recommend or take action to correct off-normal FW loop flow trends.

The applicant argues that the scaling on the FW Loop "A" and "B" chart recorder made it difficult to recognize a significant mismatch in flows given the complexity of events already occurring at the time (i.e., ongoing power reduction as well as ongoing RCS leakage). The review finds that although no control room annunciators had yet alarmed to warn of the mismatch, the applicant, as RO (OAC), is nevertheless accountable for controlling parameters, including FW loop flow to OTSGs, under his purview. The review finds that ample control room indications were available to the applicant to warn of a problem, including, but not limited to, ICS FW Loop "A" versus "B" flow control station deviations, MFP-3A versus MFP-3B turbine speed deviations, OTSG "A" versus "B" level deviations, and deviations between FW Loop "A" versus "B" flow.

The applicant contends that "communications between myself as the RO and BOP were not as crisp as desired." The review finds that the applicant had more than adequate time to inform others that off-normal FW-related trends were occurring as he reduced reactor power. The review finds that the applicant's contention that the primary reason for his error, that "due to the

scaling on the chart recorder for FW flow (0–6 million lbm/hr) I did not notice an appreciable divergence in FW flows at this time," is inconsistent with the need for heightened awareness of plant parameters during reactor power reduction operations.

3.4.2 Error 2—Failure to fully carry out actions to attend to increasing mismatch in FW flow.

The review found that the applicant, even after being alerted to an increasing FW divergence, only partially complied with the CRS's directive (i.e., only placed the reactor demand controller in manual) and had to be directed a second time to also place the feedwater controller stations in manual. Contrary to Step 4.3 of procedure AI-500 (Conduct of Operations Department and Administration), the review finds that, during the reactor down-power evolution, the applicant improperly relied on ICS system deviation alarms.

3.5 Reviewer's Conclusion:

The review finds that, during Event 3, the applicant had sufficient time to discern and evaluate the situation with regard to off-normal FW trends, inform the CRS that FW loop flows were diverging, and then take action to place the malfunctioning FW Loop "A" (and/or "B") station controller(s) into manual mode or otherwise stop the evolution before being directed by the CRS. It also found that the applicant only partially complied with the CRS's directive and had to be directed a second time to place the feedwater control stations in manual.

With regard to Competency 1.a, as it relates to Scenario 1, Events 3 and 4, the review finds that the applicant exhibited at least two substantiated errors. The examiner's overall evaluation of the applicant's performance on Competency 1(a) (Recognize and Attend), as RO (OAC), during Scenario 1, Events 3 and 4 is sustained and the SRO RF score of 1 with a RF grade of 0.20 was appropriately assigned.

With respect to the criteria specified in 10 CFR 55.45(a) during these events the applicant, as RO (OAC), failed to:

- (Item 3)—Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.
- (Item 4)—Identify the instrumentation systems and the significance of facility instrument readings.
- (Item 5)—Observe and safely control the operating behavior characteristics of the facility.
- (Item 6)—Perform control manipulations required to obtain desired operating results during normal, abnormal, and emergency situations.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

APPEAL AREA 4

4.1 Pertinent Competency

Applicant Appeal Area 4 also involves SRO Competency 1, which includes, among other things, the ability to diagnose plant conditions to guard against and mitigate conditions that do not meet specifications. Competency 1.c (Understanding) involves a demonstration of the applicant's knowledge of system operation, such as set points, interlocks, or automatic actions, or the understanding of how one's actions affect the plant and system conditions, unless that knowledge is evaluated under Competency 3 (Control Board Operations).

4.2 Original NRC Grading:

The applicant received an unsatisfactory grade of 1.80 for SRO Competency 1, based on the following assigned RF scores:

SRO RF score for competency: 1.a = 1, 1.b = 2, 1.c = 1, and 1.d = 3

4.2.1 *NRC Examiner Comments*:

With regard to Competency 1.c, the examiner assigned a RF of 1 based on the applicant's performance, in part, during Scenario 2, Event 2. Event 2 is a small vacuum leak with a failure of air removal pump ARP-1B to automatically start.

The examiner contends that the applicant, as SRO (CRS), with the reactor at 2 percent rated thermal power (RTP), appropriately directed the BOP operator to start the standby vacuum pump ARP-1B to recover and re-establish main condenser vacuum. The examiner contends that the applicant, believing that vacuum was not corrected, continued throughout the remainder of the scenario to search for air in-leakage. The examiner contends that in looking for leakage, the applicant displaced more important actions, such as restoring complex cooling ventilation after an isolation signal from radiation monitor (RM)-A5G (Gas) (Event 3). In order to understand the applicant's persistence in looking for vacuum leaks, the examiner asked the followup question, "What was maintaining main condenser vacuum prior to the vacuum leak?" The examiner contends that the applicant incorrectly replied that condensing steam was maintaining condenser vacuum. The examiner contends that he then reminded the applicant that reactor power was at 2 percent RTP. After receiving this cue, the applicant then replied that the air removal pump would be maintaining vacuum, and that he had forgotten that the plant was at such a low power. The examiner contends that the applicant's response failed to demonstrate his understanding of how the plant, systems, and components operate and interact at this low-power condition, and this lack of understanding could lead to improper decisions. The examiner contends that such an improper decision was made when the applicant allowed Control Complex (CC) temperatures to increase and exceed the design time and temperature limitations described in the CAUTION statement of AP-250 (Radiation Monitor Actuation), Enclosure 5 (RM-A5 Actions). The examiner contends that the applicant did not understand or was unable to demonstrate adequate knowledge and ability, as appropriate to the assigned position of SRO (CRS), to assume the responsibilities associated with the safe operation of the facility.

4.3 Applicant's Contention:

With regard to Scenario 2, Event 2, the applicant contends that he was graded too severely. He asserts that the examiner did not take into full consideration the technical and procedural basis for actions during the event. The applicant contends that it was his responsibility to identify the source of the main condenser vacuum leak; therefore, he appropriately directed the secondary plant operator (SPO) to look for potential vacuum leaks in accordance with OP-607 (Condenser Vacuum System), Section 4.5 (Condenser Air Removal). The applicant asserts that with both air removal pumps running to maintain condenser vacuum, a significant vacuum leak still existed that would have detrimental affects on secondary plant chemistry, specifically oxygen level. The applicant contends that an increase in the oxygen level caused by the presence of an unmitigated leak can lead to increased corrosion of secondary plant components, in particular the acceleration of some oxygen-dependent forms of steam generator tube corrosion mechanisms. The applicant contends that since corrosion of steam generator tubes can lead to primary and secondary tube leaks, he felt it important to continue efforts to identify the source of the vacuum leak.

The applicant contends that RM-A12 was considered inoperable. The applicant contends that because RM-A12 is the primary instrument used for detecting the presence of steam generator tube leaks, coupled with concerns regarding oxygen in-leakage, it was very important to continue efforts to identify the source of the vacuum leak. The applicant contends that he did not continue to look for the vacuum leak for the remainder of the scenario. He contends that once the pressurizer-level instrument failed, he focused his attention on attending to that failure and all subsequent failures in the remainder of the scenario.

With regard to the examiner's question on what was maintaining condenser vacuum, the applicant contends that he correctly answered the question based on normal operation at 100 percent power. The applicant contends that when the examiner reminded him that the plant was at 2 percent power, he replied with the correct answer. He further contends that if he did not understand how the plant, systems, and components operate and interact at low-power conditions, he would not have given the correct answer once reminded of the current low-power condition.

The applicant contends that the examiner's remarks that the applicant, as SRO, displaced important actions that allowed the CC temperature to increase and exceed the time listed in the CAUTION statement of AP-250, Enclosure 5, are too severe. The applicant contends that given the type of failure observed for RM-A5G, he determined that the actuation was not valid at Step 3.5 of AP-250. He also contends that he considered RM-A5G to be inoperable since it had failed high. The applicant points out that DETAIL 2 for Step 3.5 of AP-250 would not be applicable since RM-A5G was not operable. The applicant contends that the performance of Enclosure 5 was not required and therefore the CAUTION statement was not read, nor was it required to have been read.

Finally, the applicant contends that he directed the restoration of ventilation in accordance with Section 4.10 of OP-409 (Plant Ventilation), which does not have a CAUTION statement regarding CC temperature exceeding 95 °F in 30 minutes. The applicant contends that with RM-A5G failed high and inoperable, he proceeded through AP-250 to Step 3.5 and exited

without performing Enclosure 5 for the reasons stated above. The applicant contends that he directed the performance of Section 4.10 of OP-409 without ever having read a CAUTION statement that CC temperature may exceed 95 °F in 30 minutes.

4.4 Reviewer's Analysis:

With regard to Competency 1.c, the examiner arrived at his RF score of 1 based, in part, on the applicant's performance as the SRO (CRS) during Scenario 2, Event 2.

With regard to Scenario 2, Event 2, the review substantiated only one of the two errors identified by the examiner.

4.4.1 (Unsubstantiated) *Error 1—Failure to demonstrate an understanding, with regard to condenser vacuum, of how the plant, systems, and components operate and interact at low-power conditions*

The examiner contends that the applicant, as SRO (CRS), failed to demonstrate an understanding, with regard to condenser vacuum, of the operation and interaction of the plant, systems, and components at low-power conditions. Specifically, the examiner based this contention, for the most part, upon the applicant's ongoing and persistent action to determine the source of the main condenser vacuum air in-leakage that required the operation of two air removal pumps, rather than one, to recover and maintain adequate condenser vacuum. Additionally, the examiner's followup questioning (with regard to the maintenance of main condenser vacuum while at low power) and the applicant's initial response/answer led the examiner to conclude that the applicant exhibited a lack of understanding of the relationship between low-power operations and maintaining main condenser vacuum. The error review primarily involves OP-607.

4.4.1.1 OP-607 (Condenser Vacuum System)

In accordance with Step 4.5.5, the applicant, as SRO (CRS), notified available personnel to visually inspect the turbine building for vacuum leaks and resolve them if possible. The review finds that the applicant, as SRO (CRS), was not precluded from trying to understand where the vacuum leak was occurring. The review finds the applicant ensured that both air removal pumps were operating and recovering vacuum. With regard to Event 2, the review finds that the applicant's directives and actions, as SRO (CRS), were reasonable based upon the fact that main condenser vacuum could not be maintained with one air removal pump only given the size of the vacuum leak.

Although the applicant had difficulty in correctly answering one of the examiner's followup questions, the review finds that the applicant adequately corrected his response once the examiner reminded him that power was at 2 percent RTP. Hence, on balance, the review finds the error unsubstantiated.

4.4.2 *(Substantiated) Error 2—Failed to demonstrate sufficient understanding of the operation and interaction of the protective instrumentation for the plant's radiation monitoring system and the CC ventilation system and associated components to preclude exceeding the facility's maximum allowed temperatures for personnel habitat and safety-related equipment in the CC.*

As detailed below, the review finds that the applicant, as SRO (CRS), failed to demonstrate sufficient understanding of the operation and interaction of the protective instrumentation for the plant's radiation monitoring system and the CC ventilation system and associated components to preclude exceeding the facility's maximum allowed temperatures for personnel habitat and safety-related equipment in the CC.

Event 3 (RM-A5G fails high) resulted in the automatic shutdown and isolation of the CC ventilation system (i.e., control room and ES switchgear room ventilation). The review substantiated that Event 3 had been ongoing for approximately 49 minutes when the applicant, as SRO (CRS), with prompting from the BOP operator, directed the BOP operator to place the CC ventilation in emergency recirculation mode.

The reviewer examined whether the applicant properly addressed a loss of cooling within the CC during the operating portion of the exam. The scenario initiated a loss of control room cooling when a radiation monitor failure tripped the ventilation fans. The design basis supports the reliable performance of the equipment in the control room and the operators by providing cooling through ventilation. Without cooling, the heat load from humans (small) and electrical equipment (much larger), will cause the control room to heat up. Based on the design basis, equipment reliability and human performance will begin to suffer above 95°F. The CC is designed to have a mild environment, so the equipment contained therein is not environmentally qualified to operate reliably under conditions of high temperature, humidity, or radiation. The licensee's analyses and Technical Specification Bases have determined that the control room temperature can reach the 95°F design basis limit in about 30 minutes. Once temperatures exceed this limit, equipment will no longer be operating within their qualified parameters; equipment in operation may no longer continue to function properly, and equipment called upon to mitigate a subsequent or concurrent accident may not actuate and function as designed.

In some situations, including the one in this test scenario, the safety of the plant relies on operators to take manual action to restore CC cooling prior to reaching the temperature above which equipment and operator performance begins to be affected. This reliance was determined to be translated into procedure steps in various procedures, which covered a spectrum of situations which could interrupt cooling.

In particular, Abnormal Procedure AP-520 (Radiation Monitor Actuation) addresses the failure of the radiation monitor. Steps 3.5 and 3.8 were required to be performed concurrently; the former step was performed, but the latter step was missed. The review concluded that following this latter step would direct the operator to Enclosure 5, Step 5.1 to continue to restore the ventilation system to operation. Between Steps 5.1 and 5.2, the procedure contained a caution statement which reads: "With all CC ventilation stopped, the CC may reach its design limit of 95°F in 30 minutes." The applicant was expected to have reached this step and concluded that action to restore cooling to the CC was needed within 30 minutes to remain within the design analysis.

Additionally, since cooling was not restored, an alarm was received during the exam indicating that a high temperature condition was present in a switchgear area of the CC (104°F setpoint). This indicated that critical equipment was above the design temperature, and should have triggered corrective action to restore cooling.

The reviewer determined that the action to restore cooling to the CC within 30 minutes meets the criteria for a critical action, because successful completion of this action was necessary to ensure the reliable operation of mitigation equipment during the subsequent steam generator tube rupture. This action was not initiated for 31 minutes, when the applicant instructed the BOP operator to restore CC ventilation in the emergency recirculation mode. However, this action was not taken, and the applicant did not ensure that the action was completed. This was recognized several minutes later, when the applicant was prompted by the RO. The failure to restore CC cooling within the required 30 minutes represents a problem with following procedures and supervising operators. Based on the above, the reviewer considers this to represent a failure of a critical action on the part of the applicant.

The following paragraphs, included for reference, provide excerpts from licensee documents which provided the technical basis for the summary above.

4.4.2.1 AI-500 (Conduct of Operations Department and Administration)

Contrary to Section 3.2.1 with regard to SRO safety responsibilities, the applicant, as SRO (CRS), did not recognize and avoid activities that impact safe operating limits. Specifically, the applicant, as SRO (CRS), did not give proper consideration to AP-250's CAUTION statement, "With all CC ventilation stopped, the CC may reach its design limit of 95°F in 30 minutes." The review finds that the applicant failed to monitor the status and safely control the operation of the facility's CC so as to preclude exceeding the design temperature limitations.

4.4.2.2 AP-250 (Radiation Monitor Actuation)

Contrary to Step 3.8, the review finds that the applicant did not demonstrate an understanding of the interaction of the upscale high trip actuation of the RM-A5G and the automatic shutdown and isolation of the CC ventilation. Specifically, the applicant did not perform the followup actions in Enclosure 5, Step 5.1, regarding the RM-A5G radiation monitor reaching its trip set point.

The applicant's rationale for not adhering to the procedure also shows his lack of understanding of the interactions that were ongoing. For example, the applicant asserts that because of the type of RM-A5G failure, he determined that RM-A5G was inoperable and therefore the actuation was not valid. He then asserts that Enclosure 5 to AP-250 is not required to be performed. This ignores the fact that, regardless of whether the radiation monitor actuation was valid, the CC ventilation had stopped, and actions were necessary to restore ventilation.

4.4.2.3 OP-409 (Plant Ventilation)

Contrary to OP-409, Step 3.2.6 (with regard to limits and precautions), the applicant did not demonstrate an understanding of the interaction of CC ventilation with important ES safety-related equipment/components, as evidenced by the fact that his actions did not appropriately consider the CAUTION statement, "Maximum Switchgear Room temperature is 104 °F." By the time the applicant, as SRO (CRS), directed that CC ventilation emergency recirculation be placed into service, the critical time for taking action had passed.

4.4.2.4 FSAR Section 9.7.2.7 (CC Emergency Air)

The applicant did not demonstrate an awareness of FSAR, Section 9.7.2.7, regarding CC emergency ventilation, which points out the necessity for starting the CC emergency ventilation system within 30 minutes following a loss of normal CC ventilation to ensure room temperatures in the habitability envelope of the CC will be acceptable to support proper functioning of safety related equipment located therein.

4.4.2.5 ITS B.3.7.18 (CC Cooling System)

The applicant, as SRO (CRS), did not demonstrate an awareness of ITS B.3.7.18 regarding the effect of CC ventilation area air temperatures on control room habitability and environment and on other portions of essential ES safety-related equipment cooled by CC emergency fans.

4.4.3 Appendix D to NUREG-1021 Appendix D (regarding CTs)

In accordance with Appendix D(1)(a) and (b) to NUREG-1021, the review finds that the time-critical restarting/restoration of the CC ventilation system within 30 minutes is a CT, in that the task is essential to safety if its improper performance or omission by an operator will result in direct adverse consequences or significant degradation in the mitigative capability of the plant. For a CT to be valid, an external stimulus must prompt at least one operator to perform the task. In this case, at least two external stimuli (related alarm and indication of fan(s) status) were apparent. Hence the applicant, as SRO (CRS), missed a CT. This emphasizes the seriousness of the error.

4.5 Reviewer's Conclusion:

With regard to Competency 1.c, Scenario 2, Event 2, the review finds that the applicant exhibited a substantiated error. (This review also considers the error identified in Appeal Area 5.) The applicant's directives and actions failed to demonstrate an understanding of the operation and interaction of the plant, systems, and components (including set points, interlocks, and automatic actions). Because this was a critical error, the examiner's overall evaluation of the applicant's performance, as SRO, during Scenario 2, Event 2 (and Scenario 3, Events 8, 9, and 10) is sustained, and the SRO RF score of 1 with a RF grade of 0.30 was appropriately assigned. Furthermore, this error should also be combined with the error discussed under Area 5, which also dictates that a RF score of 1 be assigned.

With respect to the criteria specified in 10 CFR 55.45(a) during this event the applicant, as SRO, failed to:

- (Item 3)—Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.
- (Item 4)—Identify the instrumentation systems and the significance of facility instrument readings.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.

- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

APPEAL AREA 5

5.1 Pertinent Competency

Applicant Appeal Area 5 also involves SRO Competency 1, which includes, among other things, the ability to diagnose plant conditions to guard against and mitigate conditions that do not meet specifications. Competency 1.c involves a demonstration of the applicant's knowledge of system operation, such as set points, interlocks, or automatic actions, or the understanding of how one's actions affect the plant and system conditions, unless that knowledge is evaluated under Competency 3.

5.2 Original NRC Grading:

The applicant received an unsatisfactory grade of 1.80 for SRO Competency 1, based on the following assigned RF scores:

SRO RF score for competency: 1.a = 1, 1.b = 2, 1.c = 1, and 1.d = 3

5.2.1 NRC Examiner Comments:

With regard to Competency 1.c, the examiner assigned a RF of 1 based, in part, on the applicant's performance during Scenario 3, Events 8, 9, and 10. Event 8 is a pressurizer steam space leak with a failure of the reactor protection system (RPS) to actuate on low RCS pressure, Event 9 is a failure of MUV-586 (HPI cross-tie valve) to remain open and MUV-25 (normal HPI injection valve) to open automatically, and Event 10 is a failure of DHV-110 (Decay Heat Loop A flow control valve) to automatically control.

The applicant, as SRO, directed the crew to trip the reactor based on lowering RCS pressure; 2 minutes later the plant conditions indicated a loss of subcooling margin event. The applicant correctly entered emergency operating procedure (EOP)-03 (Inadequate Subcooling Margin) and directed the team to perform Rule 1 (Loss of SCM). The examiner contends that 13 minutes later a low-pressure injection (LPI) actuation occurred. The examiner noted that the BOP operator realized that decay heat removal (DHR) pump DHR-1B did not automatically start and that attempts to manually start it were unsuccessful. The examiner contends that when the RCS pressure decreased below approximately 170 psig, DHR-1A pump should have started injecting water into the RCS. The examiner contends that the BOP operator informed the applicant that the LPI flow was 500 gpm. The examiner noted that with the RCS at 100 psig, the LPI Loop "A" injection flow rate should have been about 3000 gpm. The examiner contends that the applicant did not take action to raise the LPI flow, even though several reports from the crew indicated that the flow was steady at 500 gpm with RCS pressure continuing to decrease.

As a followup, the examiner asked the applicant, "What should the DHR (LPI) flow rate be for the current plant conditions?" The applicant replied, "I don't have the pump curves to determine DHR flow." The examiner then asked, "At what RCS pressure does the DHR pump begin to inject flow into the RCS?" The applicant replied, "about 170 psig." The examiner then asked, "With the RCS at 100 psig should DHR flow be greater than 500 gpm?" The applicant replied, "I don't know." The examiner contends that the applicant, as SRO, should have known what the approximate LPI flow should have been, given the plant conditions.

The examiner contends that the applicant failed to understand the relationship between the RCS pressure and the LPI flow and, as a result, allowed incorrect operation of LPI Loop "A" during a valid ES signal at flow rates less than those assumed in the accident analysis. The examiner contends that the applicant did not understand or was unable to safely operate the facility's heat removal systems, including emergency coolant and DHR systems, and was unable to identify the relationship of the proper operation of these systems with operation of the facility. In addition, the examiner contends that the applicant did not demonstrate the ability to function within the control room team, as appropriate to the assigned position, in such a way as to ensure that the facility licensee's procedures were adhered to and that the limitations in its license and amendments were not violated.

Finally, the examiner contends, "The applicant was downgraded to a '1' in this competency for multiple errors: (a) failure to demonstrate an understanding of how the plant, systems, and components operate and interact at low power condition, and (b) failure to display an understanding between RCS pressure and LPI flow during a valid ES actuation."

5.3 Applicant's Contention:

With regard to Scenario 3, Events 8, 9, and 10, the applicant contends that he was graded too severely.

The applicant contends that the examiner's comment (with regard to Step 3.9 of EOP-03), "The crew was required to take manual control of DHV-110 (LPI Control Valve) and control Low Pressure Injection flow at 3,000 gpm," is too severe. The applicant contends that "we are trained to review the Engineered Safeguards (ES) status lights on the vertical section of the ES portion of the MCB following an ES actuation to determine that ES systems have properly aligned." The applicant contends that DHV-110 does not have an ES status light.

The applicant contends that during the performance of EOP-03, his attention was focused on the performance of the EOP's time critical steps as required by AI-505 (Attachment 6), Section 3.1.11. The applicant acknowledges that Step 3.11 of EOP-03 asks whether the LPI flow exceeds 1400 gpm. The applicant contends that at this time in the scenario, the MCB operator reported to him that the LPI flow was 500 gpm and just beginning to inject into the core. The applicant contends that this indicated to him that the RCS pressure was still not low enough for the LPI flow to be greater than 500 gpm. The applicant acknowledges that Step 3.16 of EOP-03 asks whether the temperature in the reactor core is rising. The applicant contends that the MCB operator reported that the temperature was lowering, which indicated that adequate core cooling with HPI and the limited LPI Loop "A" flow was occurring. The applicant contends that it was important to verify adequate core cooling during this event to assure protection of public health and safety.

The applicant contends that once he progressed to Step 3.19 in EOP-03, he transitioned to EOP-08 (LOCA Cooldown) since adequate subcooling margin did not exist. The applicant contends that shortly thereafter, the examination team stopped the scenario. The applicant contends that, had the examination team allowed the scenario to continue, Step 3.42 of EOP-08 would have ensured proper LPI alignment. The applicant contends that at this step he would have identified the failure of DHV-110 and directed the control board operator to place DHV-110 in manual mode and establish a proper LPI flow of 3000 gpm. The applicant

contends that because of the size of the leak, the reduction in RCS pressure was such that the crew had not had enough time to progress to the procedure steps associated with the RCS pressure at that time.

The applicant contends that his recollection of the examiner's questions (and his responses) differs from the examiner's remarks. The applicant contends that the examiner asked him what the flow should be with the RCS pressure at 100 psig and that he replied, "I don't know the exact flow but if I could refer to the pump curve I could tell." The applicant contends that the examiner then asked if the flow rate should be greater than 500 gpm and that he stated that, with the differential pressure developed by the LPI pump with the RCS pressure at 100 psig, the LPI flow should be greater than 500 gpm.

The applicant contends that once he identified to the examiner that DHV-110 was not controlling properly, the examiner asked him to demonstrate the method to correct the situation. The applicant contends that he demonstrated placing the DHV-110 station in manual mode and manually raising the LPI flow. The applicant contends that the Superintendent of Training observed this demonstration from the Simulator Control Booth. The applicant contends that he adequately proved his understanding of the operation of the LPI system by showing the examiner that he knew when the LPI pumps would begin to discharge into the RCS **(below 170 psig)**, demonstrating how to compensate for DHV-110 failure, and explaining that, with the current differential pressure between the RCS and the LPI pump discharge, the LPI flow would exceed 500 gpm. The applicant contends that during the scenario he was not made aware of the exact RCS pressure, and, therefore, when the LPI flow was reported to be 500 gpm, he assumed that the RCS pressure was at the point at which the LPI pumps were just beginning to discharge into the core. He contends that the BOP operator also communicated this to him. The applicant contends that he was monitoring the indicators of the temperature in the reactor core as they were continually lowering and that this indicated to him that adequate core cooling was occurring.

The applicant contends that during the examiner's followup questions, he adequately displayed his understanding of the relationship between RCS pressure and LPI flow by correctly answering questions pertaining to the pressure at which the LPI pumps will discharge into the RCS, identifying the DHV-110 failure, and demonstrating required manual actions to compensate for the DHV-110 failure.

The applicant contends that the examiner's remark that he "operated LPI during a valid demand at flow rates less than those assumed in the accident analysis" is incorrect. The applicant contends that the leak size presented was equal to 0.19635 ft^2, as determined by the simulator engineers at Crystal River 3. He also contends that, historically, loss-of-coolant accidents (LOCAs) have been defined as "small" when the break cross-sectional area is less than 0.5 ft^2. Therefore, this was a small break LOCA (SBLOCA).

The applicant contends that, per FSAR Section 14.2.2.5.7.1 (Attachment 18), the main requirement identified by the analysis is that flow from at least one HPI pump must be maximized by injecting water from the emergency core cooling system (ECCS) into the RCS through all four cold-leg nozzles within 10 minutes following actuation by the emergency safeguards actuation system (ESAS). The applicant contends that the accident analysis does

not mention that LPI flow is required for a leak of this size and that, in addition, FSAR Section 14.2.2.5.7.4 analyzes the flow requirements for a 0.44 ft^2 break, which is more than twice the size of the break used during the scenario.

The applicant contends that the combination of the single failure assumption and the break location (LPI nozzle) does not require LPI flow for core cooling; HPI flow is sufficient. The applicant contends that during Scenario 3 both HPI pumps were running and all four HPI valves were open, in accordance with Steps 3.3 and 3.4 of EOP-03, therefore meeting the requirements of the safety analysis.

Finally, the applicant contends that the requirement to identify the failure of DHV-110 was originally listed as a CT but subsequently deleted. The applicant contends that because the temperature in the reactor core indicated adequate core cooling, the task was no longer deemed critical. The applicant contends that the "justification to remove listing of DHV-110 failure as a Critical Task (CT) should also be justification to remove this as a consequence for this failure."

5.4 Reviewer's Analysis:

With regard to Scenario 3, Events 8, 9, and 10, the review finds that the applicant, as SRO (CRS), made at least one error.

The review finds that the applicant, as SRO (CRS), failed to sufficiently demonstrate an understanding, with regard to RCS low pressure and LPI actuation, of the operation and interaction of the plant, systems, and components during emergency operations. As a result of this lack of understanding, the applicant's directives and actions, while in the EOPs, led to inadequate (i.e., significantly less than design) ECCS ES LPI Loop "A" flow to the reactor when called upon by a valid ES actuation signal for the duration of the scenario. Specifically, the review finds that the applicant, as SRO (CRS), was unable to determine, despite numerous cues, that the DHR system's flow control station DHV-110 failed to automatically control LPI flow to 3000 gpm rather than 500 gpm when the RCS pressure decreased below approximately 170 psig during the SBLOCA event. This error primarily involves noncompliance with AI-505, as well as EOP-03 and EOP-08.

5.4.1 AI-505 (Conduct of Operations During Abnormal and Emergency Events)

Contrary to AI-505, Step 4.2.11, the applicant, as SRO (CRS) and procedure director, did not demonstrate an understanding of how reduced ECCS design flow from one LPI system diminishes the capability to mitigate a large-break LOCA (LBLOCA) to preclude core damage. The applicant also did not demonstrate an understanding of the long-term ramifications of operating the LPI system in the recirculation mode. The review finds that the applicant, as SRO (CRS), did not understand that the LPI Loop "A" safety-related equipment (i.e., DHV-110) did not perform its design function (i.e., 3000 gpm versus 500 gpm) at any time from the onset of the RCS depressurization (LPI actuated at 480 psig) to the end of the operating test (less than 100 psig), for a period of at least 30 minutes.

A minimum flow rate of 2685 gpm (per FSAR 6.1.2.1.2) is necessary to adequately cool the core during an LBLOCA, the applicant unnecessarily challenged the facility's FSAR analysis.

5.4.2 EOP-03 (Inadequate Subcooling Margin)

Contrary to EOP-03, Step 3.9, the applicant, as SRO (CRS) and procedure director, did not remain attentive to the need to ensure that the ES LPI equipment, such as the LPI Loop "A" flow control station (DHV-110 throttles open to deliver flow up to a set point of 3000 gpm as limited by the RCS pressure) was properly aligned.

Contrary to EOP-03, Step 3.32, the applicant, as SRO (CRS), did not ensure compliance with followup actions required by the instruction, "WHEN RCS PRESS is <500 psig, THEN ensure LPI is properly aligned." Specifically, the applicant did not verify at any time that LPI control valve DHV-110 was controlling in automatic mode and set for 3000 gpm. Had the applicant paid attention to this followup action, he would have ensured proper LPI Loop "A" alignment.

5.4.2.1 EOP-08 (LOCA Cooldown)

Contrary to EOP-08, Step 3.3, the applicant, as SRO (CRS) and procedure director, did not demonstrate an understanding of the operation and interaction of the ES LPI Loop "A" flow control station (i.e., DHV-110) with RCS system pressure. The applicant did not understand at any time that LPI control valve DHV-110 was not controlling in automatic mode, as evidenced by its prolonged operation at 500 gpm instead of 3000 gpm. The review finds that, had the applicant demonstrated an understanding of the proper and correct alignment of the injecting LPI Loop "A" train, then LPI flow in excess of 1400 gpm would have been provided to mitigate the low RCS pressure condition.

5.5 Reviewer's Conclusion:

With regard to Scenario 3, the review finds that the above errors point to a lack of awareness and understanding that LPI was less than expected for the situation. The review finds no assurance that the applicant understands the nature of his error. His demonstration to the examiner, after-the-fact, of the correct operation of the DHV-110 valve did not prevent his error. The fact remains that he did not demonstrate during the operating test that he understood what was happening with regard to LPI Loop "A" flow and pressure given the RCS pressure and thus was unable to ensure that ECCS flow was being delivered to the reactor as designed. The record indicates that insufficient LPI flow was ongoing for more than 30 minutes until the examiners stopped the simulation.

ES-303 requires the examiner to evaluate the applicant's performance on the operating test and determine whether the applicant's level of knowledge and understanding meets the minimum requirements to safely operate the facility for which the applicant seeks a SRO license. Therefore, the review finds that the applicant, as SRO (CRS), does not meet the standard for this competency. The review finds that the applicant's lack of concern, even after the control board operator informed him that LPI Loop "A" flow was not as expected (i.e., it did not exceed 1400 gpm as dictated by the RCS low pressure conditions at the time), indicates a lack of understanding of the LPI system and an important aspect of the safe operation of the reactor during an emergency.

Given this error coupled with the applicant's critical error described in Appeal Area 4 in this competency, a RF score of 1 and a grade of 0.30 are appropriate. Therefore, the examiner's overall evaluation of the applicant's performance, as SRO (CRS), during Scenario 2, Event 2 (discussed in Appeal Area 4), and Scenario 3, Events 8, 9, and 10, is sustained.

With respect to the criteria listed in 10 CFR 55.45(a) during these events the review finds that the applicant, as SRO (CRS), failed to:

- (Item 3)—Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.

- (Item 4)—Identify the instrumentation systems and the significance of facility instrument readings.

- (Item 7)—Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.

- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.

- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

APPEAL AREA 6

6.1 Pertinent Competency

Applicant Appeal Area 6 involves SRO Competency 3, which includes, among other things, the ability to locate and manipulate controls to attain a desired plant and system response or condition. It comprises knowledge of system operation, including set points, interlocks, and automatic actions, the ability to locate plant and system instruments, and an understanding of how one's actions affect plant and system conditions. Competency 3.c (Manual Control) requires the applicant to demonstrate the knowledge and ability necessary to take manual control of automatic functions, when appropriate.

6.2 Original NRC Grading:

The applicant received a grade of 2.67 for SRO Competency 3, based on the following assigned RF scores:

SRO RF score for competency: 3.a = 3, 3.b = 3, and 3.c = 2

6.2.1 NRC Examiner Comments:

With regard to Competency 3.c, the examiner assigned a RF of 2 based on the applicant's performance during Scenario 1, Events 6, 7, and 8. Event 6 is a manual reactor trip with the MSV-9, OTSG "A" turbine bypass valve, failing open. Event 7 is a failure of the OTSG "A" main steamline isolation valves (MSV-411 and MSV-412) to close automatically. Event 8 is a failure of the emergency FW valves (EFV-11 and EFV-56) - fail as-is after opening.

The examiner contends that the applicant, as RO (OAC), along with the BOP operator, failed to control RCS temperature and pressurizer level and, as a result, did not control the RCS pressure. The examiner contends that the inadequate control of RCS pressure led to three ES-actuated HPI-1C pump automatic restarts on low RCS pressure following the BOP operator's manual securing of the ECCS pump on three separate occasions during the crew's mitigation of a SBLOCA [Event 5] and excessive heat transfer event. The examiner contends that the applicant, as a member of the crew, allowed the HPI-1C pump motor to exceed the starting duty limitations stated in the precaution and limitations listed in OP-402, Section 3.2. The examiner contends that allowing the HPI-1C pump to experience three starts in a 29-minute period could have resulted in damage to the pump.

6.3 Applicant's Contention:

The applicant contends that the examiner is basically describing the same issue (consequence) (i.e., difficulty in controlling RCS parameters and the resultant manual securing and automatic restarting of HPI-1C pump on three separate occasions) previously addressed in Competency 1.a. The applicant contends that the same issue as described in Competency 1.a is better suited for Competency 3.c and therefore should be deleted from Competency 1.a. The applicant, as RO (OAC), contends that the issue clearly describes his difficulty in controlling the RCS temperature, as well as the BOP operator's control board actions using ICS controls in manual, which then resulted in ES actuations (three HPI automatic restarts).

6.4 Reviewer's Analysis:

The review finds that the examiner simply commented, under Competency 1.a, that the three HPI-1C pump manual stops and subsequent automatic restarts could possibly exceed the motor starting duty limitations. The review finds that the examiner did not consider the HPI-1C pump motor restarts, in and of themselves, in evaluating the applicant's performance under Competency 1.a. Hence, the review finds the examiner's comments to be acceptable within the discussion of Competency 1.a.

The review finds the applicant's rationale for adjustment to Competency 1.a to be flawed because the issues/errors the examiner identified in Competency 3.c differ from those assigned to Competency 1.a and relate to the applicant's demonstrated ability to take manual control of automatic functions. On the other hand, the issues/errors the examiner identified in Competency 1.a involve the applicant's ability to recognize and attend to off-normal trends and status in the order of their importance and severity.

With regard to Scenario 1, Events 6, 7, and 8, the review finds that the applicant, as RO (OAC) and a member of the crew, made at least two errors.

6.4.1 *Error 1—Failure to adequately control RCS temperature and pressurizer level to preclude challenging subsequent automatic restarts of the HPI system's HPI-1C pump on three separate occasions*

The review finds that the applicant, as RO (OAC), failed to adequately control RCS temperature and pressurizer level to preclude challenging subsequent automatic restarts of the HPI system's HPI-1C pump on three separate occasions during a SBLOCA event. This error primarily involves issues of non-compliance with AI-500, as well as EOP-02 (Vital System Status Verification) and EOP-13 (Rules), Rule 2 (HPI Control)).

6.4.1.1 AI-500 (Conduct of Operations Department Organization and Administration)

Contrary to Step 3.2.5 of AI-500 regarding OAC responsibilities, the applicant, as RO (OAC), did not closely monitor (and thereby adequately control) operation of the reactor and associated ICS controls for proper response and expected behavior during an RCS inventory loss and excessive heat transfer evolution. Specifically, the applicant, as RO (OAC), did not maintain oversight of all ICS stations that were in manual mode and did not take the lead in coordinating actions with the BOP operator when multiple ICS stations were in manual mode. As a result, the review finds that the applicant, as RO (OAC), failed to manually control RCS and pressurizer parameters as required to obtain the desired control.

6.4.1.2 EOP-02 (Vital System Status Verification)

Contrary to EOP-02, Step 3.17, the applicant, as RO (OAC), did not ensure that the ES ECCS equipment was properly aligned with regard to DETAIL Item 3, "Control ES systems as required—Rule 2, HPI Control." Specifically, the review finds that the applicant, as RO (OAC), failed to control the operation of the plant in such a manner as to prevent or preclude the need for the BOP operator to secure the HPI-1C pump on three separate occasions during valid ES RCS low pressure (less than 1625 psig) automatic actuations.

6.4.1.3 EOP-13, Rule 2 (Rules—HPI Control)

The applicant's performance with regard to EOP-13, Rule 2 is discussed below.

6.4.2 *Error 2—Failure to control ECCS ES HPI-1C pump (i.e., allowed three manual pump stops to control HPI flow when such flow should have been controlled by throttling the injection valves).*

The review finds that the applicant, as RO (OAC), failed to properly control the HPI-1C pump (i.e., he allowed three manual pump stops to control HPI flow when such flow should have been controlled by throttling the injection valves) during a SBLOCA/excessive heat transfer event. The review of this error primarily involves AI-505, OP-402, and EOP-13, Rule 2. The examiner contends that the applicant, as RO (OAC), exhibited an error as a result of his lack of intervention to limit the number of restarts of the HPI-1C pump motor. The number of restarts is limited to preclude damage to the pump motor.

6.4.2.1 EOP-13, Rule 2 (Rules—HPI Control)

Contrary to EOP-13, Rule 2, the applicant, as RO (OAC), did not control the flow rate of the HPI system by means of the injection valves. The applicant, as RO (OAC), could have demanded that the BOP operator manually throttle the HPI injection valves to adjust HPI system flow as necessary to control RCS inventory. Instead, without expressing disagreement, the applicant, on three separate occasions, allowed the HPI system flow to be significantly reduced (controlled) by securing the HPI-1C pump.

The review considered the HPI events that occurred during the timeframe of interest (i.e., from the onset of HPI actuation until the time at which one of the two operating HPI pumps was secured for a third time). The review recognized that the RCS system, the pressurizer, and both OTSGs were undergoing rapid transients (i.e., RCS pressure boundary gross leakage of 200 gpm in conjunction with OTSG "A" excessive heat transfer). This error is focused on the issue of manually controlling the ECCS HPI system flow when the system was called upon to perform its design function, which is to inject borated coolant into the reactor to recover inventory being lost.

6.4.2.2 AI-505 (Conduct of Operations During Abnormal and Emergency Events)

Step 4.1.1 regarding Guidelines for Event Procedure Use provides useful insight into whether or not the stopping and starting of the HPI-1C pump motor is an issue while in an event procedure such as EOP-13, Rule 2. Specifically, Step 4.1.1.4 states, "During an EVENT, operation of plant equipment will be directed by the EVENT PROCEDURE." Step 4.1.1.5 states, "If similar guidance for equipment operation exists in operating procedures and EVENT PROCEDURES, the guidance in EVENT PROCEDURES takes precedence." EOP-13, Rule 2 calls for throttling HPI flow but does not direct or infer that stopping an ECCS pump is a proper means of throttling.

6.4.2.3 OP-402 (Makeup and Purification System)

The review finds that the examiner believes that allowing the HPI-1C pump motor to experience three successive restarts (automatic in this case) in a 29-minute period could result in

exceeding the pump's motor-starting duty limitations. The applicant does not dispute the examiner's viewpoint with regard to the restart motor duty limitations.

Step 3.2.15, with regard to precautions and limitations, states, "The following MU Pump motor guidelines should be observed: NO more than two starts in succession with motor initially at ambient temperature and coasting to rest between starts. One restart may be performed following a TRIP/STOP after operating at rated load." The BASIS statement of Step 3.2.15 reads, "Exceeding number of allowed starts may cause the rotor and/or stator to overheat."

The review reconstructed the actual operating test data to determine the starting and stopping times and intervals of the HPI-1C pump; the record indicates the following (t = 0 minutes from start of scenario):

t+105 minutes	HPI-1C pump motor automatically started (first time) on ES actuation signal (low RCS pressure less than 1625 psig)
t+118 minutes	HPI-1C pump motor manually secured by BOP operator (first time) after operating approximately 13 minutes
t+126 minutes	HPI-1C pump motor automatically started again (second time) on ES actuation signal (low RCS pressure less than 1625 psig) after being off for 8 minutes
t+132 minutes	HPI-1C pump motor secured by BOP operator (second time) after operating approximately 6 minutes
t+137 minutes	HPI-1C pump motor automatically started again (third time) on ES actuation signal (low RCS pressure less than 1625 psig) after being off for 5 minutes

In this case, the review finds that adequate time may have elapsed between successive pump motor starts to preclude the challenge of any motor duty limitations. However, the potential for damage existed.

6.5 Reviewer's Conclusion:

The review finds that the examiner simply commented, under Competency 1.a, that the three HPI-1C pump manual stops and subsequent automatic restarts could possibly exceed the motor starting duty limitations. The review finds that the examiner did not consider the HPI-1C pump motor restarts, in and of themselves, in evaluating the applicant's performance under Competency 1.a. Hence, the review finds the examiner's comments to be acceptable within the discussion of Competency 1.a.

With regard to Competency 3.c, the review finds that the issues differ from those assigned to Competency 1.a and that the applicant exhibited at least two substantiated errors. Therefore, a RF score of 1 is appropriate.

With regard to the criteria listed in 10 CFR 55/45(a) during these events the applicant, as RO, failed to:

- (Item 5)—Observe and safely control the operating behavior characteristics of the facility.
- (Item 6)—Perform control manipulations required to obtain desired operating results during normal, abnormal, and emergency situations.
- (Item 7)—Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

APPEAL AREA 7

7.1 Pertinent Competency

Applicant Appeal Area 7 involves SRO Competency 5 (Directing Operations), which includes, among other things, the ability to take timely and decisive actions in response to problems during both normal and off-normal situations. It also includes the ability to provide timely and well-thought-out directions that indicate concern for safety, to encourage a team approach to problem-solving and decision-making by soliciting and incorporating feedback from crew members, and to remain in a position of oversight to maintain the "big picture." Competency 5.b (Oversight) requires the applicant to demonstrate the knowledge and ability necessary to ensure that the crew carries out correct and timely activities.

7.2 Original NRC Grading:

The applicant received a grade of 2.50 for SRO Competency 5, based on the following assigned RF scores:

SRO RF score for competency: 5.a = 3, 5.b = 2, 5.c = 3, and 5.d = 2

7.2.1 NRC Examiner Comments:

With regard to Competency 5.b, the examiner assigned a RF of 2 based on the applicant's performance during Scenario 2, Event 3. Event 3 is an upscale high failure of RM-A5G.

The examiner contends that the applicant, as SRO (CRS), was not attentive to the loss of CC ventilation until prompted by the RO, continued to direct the RO and BOP operator to have plant operators searching for vacuum leaks when, in fact, vacuum leaks were no longer an issue, and, after prompting by the RO and upon receiving a CC fan temperature alarm approximately 31 minutes after isolation of CC ventilation, belatedly directed the BOP operator to place CC ventilation back in service. The examiner contends that the applicant did not give due attention and consideration to AP-250, Enclosure 5, which states, with regard to the RM-A5 CAUTION, "With all CC ventilation stopped, the CC may reach its design limit of 95 °F in 30 minutes."

7.3 Applicant's Contention:

The applicant contends that the examiner is basically describing the same issue (i.e., his directives with regard to looking for main condenser vacuum leaks) previously addressed in Competency 1.c. The applicant contends that the same issue, as described in Competency 1.c, is better suited for Competency 5.b, and therefore should be deleted from Competency 1.c. The applicant also contends that the issue clearly demonstrated his actions and ability, as the SRO, to direct the operators in the proper response to a failure of RM-A5G.

7.4 Reviewer's Analysis:

With regard to Scenario 2, Event 3, and Competency 5.b the review finds that the applicant, as SRO (CRS), made at least two errors.

The applicant neither challenged nor directly acknowledged his poor performance as SRO (CRS) in this competency area. The applicant contends that the issues (i.e., errors) with regard to this competency area are basically the same issues previously described in Competency 1.c and, as such, should be deleted from Competency 1.c. The review finds the applicant's rationale for adjusting Competency 1.c's grading to be flawed because the issues/errors identified in Competency 5.b differ from those described in Competency 1.c and involve the applicant's ability to remain attentive to control room indications, stay in a position of oversight, and provide an appropriate amount of direction and guidance to facilitate crew performance. On the other hand, the issues/errors identified in Competency 1.c involve the applicant's directives and actions demonstrating an understanding of the operation and interaction of the plant, systems, and components (including set points, interlocks, and automatic actions).

7.4.1 *Error 1—Failure to remain attentive to control room indications that facilitated crew performance with regard to CC cooling capability*

The review finds that the applicant, as SRO (CRS), failed to remain attentive to control room indications that facilitated crew performance with regard to CC cooling capability. This error primarily involves issues with AI-505, AP-250, and ITS B.3.7.18. The error also involves OP-409.

7.4.1.1 AI-505 (Conduct of Operations During Abnormal and Emergency Events)

Contrary to Step 3.1.11 (regarding time-critical actions), the applicant, as SRO (CRS) and procedure director, did not remain attentive to increasing control room and/or ES safety-related switchgear room air temperature, thus challenging assumptions in the design or licensing basis with respect to loss of CC cooling capability (i.e., all normal supply fans, emergency supply fans, and return fans off) for more than 30 minutes. Contrary to AI-505, Enclosure 4 (Post Trip/Transient Checklist), the applicant, as SRO (CRS) and procedure director, during and subsequent to implementation of AP-250, did not ensure that CC control room emergency ventilation (CREV) was in emergency recirculation mode within 30 minutes. The review finds that the applicant, as SRO (CRS), unnecessarily became engaged and/or overextended in troubleshooting main condenser vacuum leaks (even though both air removal pumps were maintaining sufficient vacuum) rather than remaining attentive to CC temperature control for the control room and other portions of the CC containing safety-related equipment so that air temperatures would not increase to 95 °F within 30 minutes.

7.4.1.2 AP-250 (Radiation Monitor Actuation)

Contrary to AP-250, Step 3.8, Enclosure 5, Step 5.2, the review finds that the applicant, as SRO (CRS), did not remain attentive to control room indications that showed that the CC normal supply fans (AHF-17A/17B), emergency supply fans (AHF-18A/18B), and return fans (AHF-19A/19B) were off. The applicant also did not remain attentive to RO prompting, indicating the need to start the CREV. The review finds that the applicant disregarded the procedure's CAUTION statement, "With all CC ventilation stopped, the CC may reach its design limit of 95 °F," during the operating test, and, in his subsequent contentions, rationalized his failure to adhere to the CAUTION by asserting that performance of Enclosure 5 was not required. Had the applicant remained attentive to the time-critical aspects of an event involving the complete loss of CC ventilation, a challenge to the facility's design CC air temperature limitations would not have occurred.

7.4.1.3 ITS B.3.7.18 (CC Cooling System)

ITS B.3.7.18 provided the basis for the concern with the applicant's lack of attentiveness (potential for exceeding limiting temperatures).

7.4.1.4 OP-409 (Plant Ventilation)

Contrary to OP-409, Step 3.2.6 (Limits and Precautions), the review finds that the applicant, as SRO (CRS), did not remain attentive to the maximum switchgear room temperature limit of 104 °F. The review finds that the applicant did not ensure that the limit would not be approached as a result of all CC fans being off for more than 30 minutes.

7.4.2 *Error 2—Failure to stay in a position of oversight and provide appropriate amount of direction and guidance to preclude exceeding CC time-critical maximum allowable temperatures for personnel habitat and ES safety-related equipment/component areas*

The review finds that the applicant, as SRO (CRS), failed to stay in a position of oversight and failed to provide appropriate direction and guidance to the crew to ensure that the CC ventilation design operating temperature limits would not be exceeded. The review reveals that the applicant, as SRO (CRS), exhibited weaknesses in two important ITS areas (ITS B.3.7.18 and ITS 5.1.2) that warrant discussion under this error.

7.4.2.1 ITS B.3.7.18 (CC Cooling System)

Contrary to ITS B.3.7.18, Action A.1 (with regard to the CC cooling system), the applicant, as SRO (CRS), allowed the facility to be in a condition outside the accident analysis. The loss of CC cooling function (i.e., all CC fans stopped with no CREV in emergency recirculation mode for over 30 minutes) occurred in such a way that a cooling capability equivalent to 100 percent of a single train did not remain available and in operation. The ITS bases for Crystal River 3 specifically note that adequate cooling capability exists when the CC air temperature is maintained within the limits for the contained equipment and components. As result of this error, the review indicates that the applicant, as SRO (CRS), failed to enter immediately ITS LCO 3.0.3 based on the facility being in a condition outside the accident analysis. The review finds that the applicant did not stay in a position of oversight sufficiently to realize that, with all CC ventilation stopped, the CC could reach its design temperature limit of 95 °F in 30 minutes.

7.4.2.2 ITS 5.1.2 (CRS Responsibility)

Contrary to ITS 5.1.2, the review finds that the applicant, as SRO (CRS), during Scenario 3, Event 5, did not take responsibility for the control room command function, including, but not limited to, oversight of the crew's activities, as evidenced by the need for RO prompting to place the CREV in service.

7.5 Reviewer's Conclusion:

With regard to Competency 5.b, the review finds that the applicant exhibited at least two substantiated errors. Therefore, a rating factor score of 1 is appropriate.

With regard to the criteria listed in 10 CFR 55.45(a) during these events the applicant, as SRO, failed to:

- (Item 4)—Identify the instrumentation systems and the significance of facility instrument readings.
- (Item 5)—Observe and safely control the operating behavior characteristics of the facility.
- (Item 7)—Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

The review concluded that the nature of the concerns described in this area (Competency 5.b) differed sufficiently from those discussed under Competency 1.c to justify the examiner's decision to consider applicant performance during this event to be relevant to both competencies. Per ES-303, a significant deficiency may be coded in two rating factors, and in additional rating factors if the error can be shown to be relevant.

APPEAL AREA 8

8.1 Pertinent Competency

Applicant Appeal Area 8 involves SRO Competency 5, which includes, among other things, the ability to take timely and decisive actions in response to problems during both normal and off-normal situations. It also includes the ability to provide timely and well-thought-out directions that indicate concern for safety, to encourage a team approach to problem-solving and decision-making by soliciting and incorporating feedback from crew members, and to remain in a position of oversight to maintain the "big picture." Competency 5.d (Monitor Crew Activities) requires the applicant to demonstrate the knowledge and ability necessary to ensure that the crew carries out correct and timely activities.

8.2 Original NRC Grading:

The applicant received a grade of 2.50 for SRO Competency 5, based on the following assigned RF scores:

SRO RF score for competency: 5.a = 3, 5.b = 2, 5.c = 3, and 5.d = 2

8.2.1 NRC Examiner Comments:

With regard to Competency 5.d, the examiner assigned a RF score of 2 based on the applicant's performance during Scenario 3, Event 5. Event 5 is a spurious closure of MUV-258 (RCP-1A seal return CBO line motor operated isolation valve to MU).

The examiner contends that the applicant, as SRO (CRS), failed to direct the crew to refer to ARPs to implement correct followup action (i.e., open MUV-258 within 5 minutes and restore seal staging CBO flow) to preclude the need to secure RCP-1A. The examiner contends that the applicant failed to direct the crew to backup its initial diagnosis that the RCP-1A seals had failed (when in fact no seal failure occurred) with other indications that could have substantiated whether the RCP-1A seals had failed. The examiner contends that the applicant failed to ensure that he had received correct and complete information from the BOP operator (who erroneously reported that the RCP-1A seals had failed). The examiner also contends that the applicant failed to ensure that his directive to the RO to secure RCP-1A was based on a correct diagnosis of seal parameters.

8.3 Applicant's Contention:

With regard to Competency 5.d, the applicant did not contest the examiner's assigned RF score of 2 for his performance as SRO (CRS) during Scenario 3, Event 5. The applicant contends that the examiner is basically describing the same issue (i.e., his directive to secure RCP-1A) previously addressed in Competency 1.b. The applicant contends that the same issue as described in Competency 1.b. is better suited for Competency 5.d and therefore should be deleted from Competency 1.b. The applicant also contends that the use of phrases such as "did not direct," "failed to ensure the crew collected," and "directed the RO to secure" clearly described his actions and his ability, as the SRO, to direct crew operations and ensure that

operators were performing their required functions for current plant conditions. The applicant implies that he accomplished his role by observing the operators and correcting their behavior when their performance was not in accordance with plant standards.

8.4 Reviewer's Analysis:

With regard to Scenario 3, Event 5, the review finds that the applicant, as SRO (CRS), made at least one error. The applicant contends that the issues (i.e., errors) described above with regard to this competency area are the same issues previously described in Competency 1.b and as such should be deleted from Competency 1.b. Per ES-303, a significant error can be coded in two rating factors, and in additional rating factors if the error can be shown to be relevant. Although this error involves an issue similar to that described in Appeal Area 1 (Competency 1.b), the issue does relate to both competencies 1.b and 5.d. The review finds that sufficiently different aspects of the issue are addressed by the two competencies to warrant consideration in both. The review finds that the applicant's rationale for an adjustment to Competency 1.b is flawed because the issues/errors identified in Competency 5.d principally relate to the applicant's ability to ensure that the crew carried out correct and timely activities (most notably procedure adherence and proper communication protocol). On the other hand, the issues/errors identified in Competency 1.b principally relate to ensuring the collection of correct, accurate, and complete information and reference material on which to base diagnoses.

8.4.1 *Error—Failure to ensure that the crew carried out correct and timely administrative procedure and ARP implementation to detect closure of MUV-258 and to preclude unnecessarily securing RCP-1A*

The review finds that the applicant, as SRO (CRS), failed to ensure that the crew carried out correct and timely administrative and ARP implementation to detect closure of MUV-258 and to preclude unnecessarily securing RCP-1A. This error primarily involves AI-500 and ARP-PSA-H-04-05. The error also involves OP-302.

8.4.1.1 AI-500 (Conduct of Operations Department Organization and Administration)

Contrary to Step 3.2.1, regarding licensed SRO responsibilities, the review finds that the applicant, as SRO (CRS), did not ensure that crew members performed according to station operating practices, such as correctly responding and adhering to unexpected alarm protocols before taking action. Contrary to Step 3.2.3, the review finds that the applicant did not ensure that crew members conducted operating activities in accordance with applicable administrative controls, such as AI-500 and its appendices.

Contrary to AI-500, Appendix 3, Step 5.1, the review finds that the applicant, as SRO (CRS), did not ensure adherence to the general requirements for the ARP or the use of self-checking techniques to avoid omitting ARP requirements. Contrary to Step 5.1.2, the review finds that the applicant did not ensure that operations personnel knew the reason why each illuminated annunciator (i.e., AR-H-4-5) in their area of responsibility was in alarm. Contrary to Step 5.1.3, the review finds that the applicant did not ensure that, during normal operations (i.e., no plant transient was ongoing at the time of the event), three-way communication of alarms and use of ARPs were in place, as required. (The applicant states, in effect, that he suspended normal alarm response protocol, although there is no substantiation for this claim.) Contrary to Step

5.1.11, the applicant suspended normal alarm response protocol during planned normal plant conditions in which only one alarm occurred (i.e., the RC Pump Seal Bleed-Off High alarm), in that he did not ensure that MCB operators reviewed the illuminated alarm, understood why it was lit, and reported completion to him (i.e., any alarm condition not fully understood should be announced and its ARP reviewed).

Contrary to Step 5.3 ("Unexpected Alarm" Response Protocol), the review finds that the applicant, as SRO (CRS), did not ensure that the control board operators diagnosed the alarm condition for the likely cause and then discussed relevant ARP items with him. The review finds that the applicant did not ensure that the operator pulled, reviewed, and performed the applicable ARP. The review finds that the applicant did not ensure that the operator complied with the ARP sections addressing "Redundant Indication Which Will Verify Alarm" and "Operator Actions for a Valid Alarm," and he did not ensure that the ARP actions for a valid alarm were promptly performed or properly dispositioned. The review finds that the applicant did not ensure that annunciator alarms were investigated and corrective actions necessary to clear the alarms were taken. The review finds that the applicant did not ensure that the evaluation of alarm conditions was based on reasonably available pertinent instruments and information sources.

Contrary to Step 6.1, the review finds that the applicant, as SRO (CRS), did not ensure the use of concise communications at all times, including the use of the phonetic alphabet and closed loop communication techniques, which could have mitigated the problem.

8.4.1.2 ARP PSA-H-04-05 (RC Pump Seal Bleed-Off High)

Contrary to ARP H-04-05, the review finds that the applicant, as SRO (CRS), did not ensure that a proper CBO flowpath existed for RCP-1A (i.e., he did not confirm that MUV-258 and/or MUV-253 were open).

8.4.1.3 OP-302 (Reactor Coolant Pump Operation)

Contrary to OP-302, Step 3.2.6 (with regard to limits and precautions), the review finds that the applicant, as SRO (CRS), did not ensure that the crew considered the CAUTION statement, "Maximum allowable time to operate RCPs with Controlled Bleed-off line secured is 5 minutes (30 minutes when in an EOP) provided that Seal Injection and/or SW cooling is maintained," to preclude the need to immediately secure the RCP. Instead, the review finds that the applicant directed the RO to trip RCP-1A within 3 minutes of receiving the high CBO alarm. The review finds that 5 minutes is sufficient time to diagnose and reopen MUV-258 to ensure proper seal staging without tripping the RCP.

Contrary to Step 4.7.3.3, the review finds that the applicant, as SRO (CRS), did not ensure that the CBO valves were open and, if they were not, direct that they be reopened within 5 minutes. Contrary to Enclosure 4, Steps 1.1 through 2.2, the review finds that the applicant did not use methodology provided for calculating and determining the RCP-1A seal leakage (i.e., no abnormal seal leakage). Finally, contrary to Enclosure 3, the review finds that the applicant did not ensure that calculated CBO flow comported with expected CBO flow (gpm) based on third stage cavity pressure (psi).

8.5 Reviewer's Conclusion:

With regard to Competency 5.d, the review finds that in Scenario 3, Event 5, the applicant made an error in not monitoring crew activities to ensure adherence to facility procedures. He thereby showed an insensitivity to normal protocols relied upon in the control room to ensure consistent safe operation of the facility. Therefore, in accordance with ES-303, Subsection D.2.b, the examiner must assign a score of "2." Therefore the examiner's determination of a RF score of 2 remains unchanged with a RF score of 0.40.

The review concluded that the nature of the concerns discussed in this area (Competency 5.d) differed sufficiently from those discussed under Competency 1.c to justify the examiner's decision to consider applicant performance during this event to be relevant to both competencies. Per ES-303, a significant deficiency may be coded in 2 rating factors, and in additional rating factors if the error can be shown to be relevant.

With regard to the criteria listed in 10 CFR 55.45(a) during these events the applicant, as SRO, failed to:

- (Item 3)—Identify annunciators and condition-indicating signals and perform appropriate remedial actions where applicable.
- (Item 5)—Observe and safely control the operating behavior characteristics of the facility.
- (Item 12)—Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- (Item 13)—Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

FURTHER INSIGHTS ON APPLICANT PERFORMANCE

Further observations were developed during this review. For example, in Competency 2 (Procedures), the examiner assigned the applicant a RF score of 3.00, indicating that he did not identify or observe any errors. However, the review finds that several significant procedural issues were at the center of many of the errors or deficiencies the applicant exhibited. As another example, in Competency 4 (Communications), the examiner assigned the applicant a passing RF score of 2.60. However, the review finds several instances in which the applicant exhibited less-than-acceptable communication performance for an individual seeking a license at the senior operator level. In spite of these obvious areas of performance deficiencies, Competencies 2 and 3 were not re-evaluated. However, they provide further insights into the weakness in applicant performance and confirm the appropriateness of the failure decision.

The applicant did not sufficiently demonstrate an understanding of and the ability to perform the actions necessary to accomplish 8 of 13 items in 10 CFR 55.45(a).

The following briefly summarizes additional issues or errors identified by this review for the purpose of informing the applicant of other errors or deficiencies that could have, but did not, lower his operating test score.

With regard to Scenario 3, Event 8 (large pressurizer steam space leak, RPS fails to actuate on low RCS pressure, RCS leak), the review identified that the applicant, as SRO (CRS), failed to do the following:

- Remain attentive to control room indications that facilitated crew performance with regard to failure of the RPS to actuate on low RCS pressure during an SBLOCA event.

- Stay in a position of oversight and provide an appropriate amount of direction and guidance to ensure that the operators carried out proper actions with regard to RPS trip bistable actuations (specifically RCS low pressure trip bistable actuations) during an SBLOCA event.

- Remain attentive to control room indications that facilitated crew performance with regard to a failure of the DHP-1B to automatically start upon receiving a valid ES manual/automatic actuation signal during an SBLOCA event.

- Stay in a position of oversight and provide an appropriate amount of direction and guidance to ensure that the operators carried out proper actions with regard to a failure of the DHP-1B to automatically start when required.

- Remain attentive to control room indications that facilitated crew performance with regard to ensuring that adequate emergency FW flow to the OTSG occurred in a timely manner during an SBLOCA event.

- Stay in a position of oversight and provide an appropriate amount of direction and guidance to ensure that the operators carried out proper EOP actions with regard to emergency FW manual flow control to the OTSG.

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