March 10, 2005

Mr. [redacted]

Dear Mr. [redacted]:

In response to your letter of December 7, 2004, the staff of the U.S. Nuclear Regulatory Commission (NRC) has reconsidered the proposed denial issued to you on November 19, 2004, and reviewed the grading of the operating test administered to you on October 4-8, 2004. In spite of the additional information you supplied, the staff has determined that you did not pass the simulator operating test. The results of our review are enclosed.

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

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

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

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

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

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

[redacted] -2-

If you have any questions, please contact David Trimble, Chief, Operator Licensing and Human Performance Section, Office of Nuclear Reactor Regulation, at (301)415-2942.

Sincerely,

/RA/

Bruce A. Boger, Director
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

Docket No. 55-[redacted]

Enclosure: As stated

cc: D. M. Jamil, Site Vice President, Catawba Nuclear Station

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[redacted] -2-

If you have any questions, please contact David Trimble, Chief, Operator Licensing and Human Performance Section, Office of Nuclear Reactor Regulation, at (301)415-2942.

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cc: D. M. Jamil, Site Vice President, Catawba Nuclear Station

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INFORMAL REVIEW RESULTS - [redacted]
REACTOR OPERATOR APPLICANT - CATAWBA NUCLEAR STATION

In response to the applicant's letter of December 7, 2004, the U.S. Nuclear Regulatory Commission (NRC) reconsidered the proposed denial issued on November 19, 2004, and reviewed the grading of the operating test administered to the applicant on October 4-8, 2004. In spite of the information supplied by the applicant, the NRC has determined that the applicant did not pass the operating test. The results of NRC's review are outlined below.

INTRODUCTION AND REVIEW METHODOLOGY

During the applicant's NRC simulator operator test, errors were observed in his responses to three events:

1. As the balance of plant operator (BOP) during Scenario 1, Event 3: "1NV-148 Letdown Pressure Control Valve Fails Closed."

2. As the operator at the controls (OAC) during Scenario 2, Event 2: "Main Generator Voltage Regulator Failure."

and

3. As the OAC during Scenario 2, Event 9: "1A Steam Generator (SG) Power Operated Relief Valve (PORV) Fails Open during Cooldown in Response to a 1C Steam Generator Tube Rupture." (CRITICAL TASK)

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

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

and

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

DETAILED REVIEW RESULTS

Scenario 1, Event 3: 1NV-148, Letdown Pressure Control Valve fails closed

Event Description: 1NV-148, the letdown pressure control valve, failed closed in automatic with manual control available. This caused an alarm (1AD-7 F/1, "Letdown HX Outlet Hi Pressure"), increased upstream letdown pressure to greater than 600 psig, and lifted an upstream letdown relief valve.

ENCLOSURE

Expected Action/Response: The applicant, as BOP, was to take manual control of 1NV-148 and restore letdown pressure to approximately 350 psig by opening 1NV-148 per OP/1/B/6100/010H (annunciator response procedure (ARP) for alarm 1AD-7 F/1).

Applicant Action/Response: The applicant did not take manual control of 1NV-148 and restore letdown pressure to approximately 350 psig by opening 1NV-148. Instead, the senior reactor operator (SRO) directed the applicant to isolate normal letdown and establish excess letdown, which the applicant correctly performed. The applicant did not refer to or follow the guidance of the ARP for alarm 1AD-7 F/1. The applicant did not recommend taking manual control of the valve to the SRO, but the OAC (the other board operator on the crew) did recommend this action.

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

RF 3.c ("Control Board Operations - Manual Control") = 1.0 (Contributed to a score of 1.0 along with an error during the voltage regulator failure event)

RF 4.a ("Communications - Provide Information") = 2.0

Applicant's Contentions:

"For the failure of 1NV-148 (Scenario 1, Event 3), the grading was inappropriately applied.

The scenario description stated that the operator would take manual control of 1NV-148 per the annunciator response procedure. I noted that 1NV-148 was closed and announced that to the crew. The OAC stated that the letdown line relief valve (1NV-14) was lifting and the SRO directed me to isolate normal letdown to stop the challenge to the relief valve and implement the procedure to establish excess letdown. This sequence of events happened in less than a minute, and based on the urgency and priority implied by the SRO, I took the directed action without referring to the annunciator response procedure, knowing that this action would stop the relief valve from lifting. The operating test comments state that I failed to demonstrate the ability to manipulate controls in an accurate and timely manner. I contend that I did not have an opportunity to operate the control that was designated in the scenario because of the mitigating strategy selected by the SRO. The actions I took as directed by the SRO were appropriate, timely and accurate given the nature of that direction. While this was not the most correct path that the crew could have taken based on all available indications, it was certainly an acceptable action which did mitigate the consequences of the failure of 1NV-148 and the subsequent inventory loss through the lifting relief valve. Losing letdown has minimal safety impact on plant operation since excess letdown is available as an alternative. While I acknowledge that a performance deficiency exists, it should have been categorized in one or more of the following areas:

- 1.b - Interpret and Diagnose Conditions (there were sufficient indications of the problem available to me to correctly diagnose and mitigate this failure)

- 2.b - Procedure Compliance (there was procedural guidance available in the annunciator response procedure that would have mitigated this failure)

- 4.a - Provide Information (I could have provided more information to the crew and particularly the SRO to ensure the most appropriate actions were taken).

In conclusion, I contend for this failure (1NV-148), the grading was inappropriately applied. Based on decisive direction from the SRO to isolate letdown, it does not appear that area 3.c (Manual Control) is the appropriate area to document the performance deficiency, and it should have been applied to one or more of the areas previously stated."

This review's conclusions:

This review partially agreed with the applicant. The errors during this event will be re-assigned to RF 3.b ("Control Board Operations - Understanding") and RF 2.a ("Procedures/Tech Specs - Reference").

This review's analysis:

This review did partially agree with the applicant, in that during this event, he was not afforded the opportunity to demonstrate his ability to take manual control of valve 1NV-148, due to the direction by the SRO. This review therefore agrees with the applicant that rating factor 3.c, "Manual Control," should not have been affected by the errors made during this event. Also, as discussed below, due to a lack of understanding, the applicant was not in a position to communicate any additional information, so RF 4.a should be unaffected as well. However, this review did not agree with the applicant's assessment of how he should be re-scored as a result of his performance during this event.

This review has determined two primary root causes for the applicant failing to take the correct action during this event:

1. Although the applicant was not afforded the opportunity to actually take manual control of valve 1NV-148, due to the direction by the SRO, he was afforded the opportunity to demonstrate his understanding of system operation, by recommending to the SRO that he should take manual control of 1NV-148. In accordance with NUREG-1021, Appendix E, "Policies and Guidelines for Taking NRC Examinations," (which was briefed to the applicant prior to the exam), Part E, Item 4: "If you recognize, but fail to correct, an erroneous decision, response, answer, analysis, action, or interpretation made by the operating team or crew, the examiner may conclude that you agree with the incorrect item." By recognizing that 1NV-148 was failed closed, but by not making the recommendation to take manual control of 1NV-148 (and then not performing the follow-on action of taking manual control), and in accordance with Appendix E, this review concluded that the applicant agreed with the incorrect direction of the SRO. In this regard, the applicant demonstrated an error in RF 3.b, "Control Boards Operations - Understanding." As a result, this single error was assigned to RF 3.b ("Did the applicant's actions demonstrate UNDERSTANDING OF SYSTEM OPERATION, including set points, interlocks, and automatic actions?").

2. Given the applicant's error in understanding system operation, the applicant still could have recommended and taken the correct action if he had referred to the ARP. However, during this event, the applicant did not refer to the ARP, and demonstrated an error in RF 2.a,

"Procedures/Tech Specs - Reference." As a result, this single error was assigned to RF 2.a ("Did the applicant REFER TO the appropriate procedure or reference in a timely manner?").

With regard to the applicant's contentions concerning the consequences of his incorrect actions, e.g., applicant statements such as "The actions I took where ... appropriate, timely, and accurate," and "losing letdown has minimal safety impact," the NRC disagrees that the actions were appropriate, and these statements do not counter the fact that the errors did occur. In accordance with NUREG-1021, ES-303 D.2.b, the simulator test is graded based on competencies rather than consequences, and every error that reflects on an operator's competence is considered equal unless it is related to a critical task (this event involved no critical tasks).

Scenario 2, Event 2: Main Generator Voltage Regulator Failure

Event Description: The main generator voltage regulator automatically transferred to the manual mode, resulting in low main generator output voltage, degraded voltage on the essential buses, and high main generator VARs.

Expected Action/Response: As the OAC, the applicant was to respond to annunciators 1AD1- D/2 (EXCESSIVE GEN V/H OR OVERVOLTS) and 1AD1 - E/10 (REG AUTO TO MANUAL TRIP). Using the appropriate ARPs contained in OP/1B/6100/010B, the OAC was to take manual control of main generator voltage and restore voltage to normal (approximately 22,000 volts).

Applicant Action/Response: The applicant responded to the annunciator by getting the appropriate ARPs, however, the applicant requested that "someone needs to help me read this" (OP1/B/6100/010B for 1AD1- D2 EXCESSIVE GEN V/H OR OVERVOLTS). The SRO and applicant reviewed the procedure and then the applicant began raising voltage in accordance with the immediate actions of the ARP. The applicant's inability to take immediate actions of the ARP and work through the ARP allowed voltage on the essential buses to remain in a degraded condition for approximately 4 minutes. Generator voltage was raised to 21 KV instead of 22 KV. This left the Main Generator with a leading power factor or under excited field carrying 437 MVARs. 14 minutes after the start of the event, the BOP (the other board operator on the crew) provided assistance and generator voltage was raised to 22 KV and MVAR was reduced to 39.

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

RF 2.b ("Procedures/Tech Specs - Procedure Compliance") = 2.0

RF 3.c ("Control Board Operations - Manual Control") = 1.0 (Contributed to a score of 1.0 along with an error during the letdown valve closure event)

Applicant's Contentions: "For the voltage regulator failure (Scenario 2, Event 2) the grading appears to be too severe. I did not appropriately follow and did not initially fully understand the directions stated in the annunciator response because this particular failure, although covered in the training program, is not reinforced to the level of other more "common" failures. As a result, grading in area 2.b (Procedure Compliance) suffered which was appropriate. However,

this single "error" was also applied to area 3.c (Manual Control). The examiner contended that the degradation of the essential busses [sic] lasted for 4 minutes and that main generator KW and MVAR were not returned to nominal values for 14 minutes. These facts are not in question; however, the consequences implied in the comments are more severe than actual consequences. In fact, once I fully understood the required action, I was able to successfully operate the correct controls to:

- bring the main generator conditions to a point that was well within the operating capability of the main generator. It would have been desirable to have the generator in a nominal condition (22KV, 39 MVAR) *sooner,* however the generator is designed to operate at 21 KV and 437 MVAR without degradation (assuming approximately normal hydrogen pressure). (Reference Generator Capability Curve - Unit 1 revised Databook Figure 43 attached).

- mitigate the degraded condition of the essential busses [sic] prior to the busses [sic] separating from the grid (normal power) in less than half the required time (there is a 9 minute and 20 second timer that would automatically separate the essential bus from the grid and cause the emergency diesel generator to automatically start and supply the essential busses [sic]).

In conclusion, I contend that for this failure (Voltage Regulator), the grading was too severe and request a re-evaluation. It should be noted that this was not a critical task."

This review's conclusions:

This review did not agree with the applicant, but agreed with the original grading. The errors during this event will be assigned to RF 2.b ("Procedures/Tech Specs - Procedure Compliance") and RF 3.c ("Control Board Operations - Manual Control").

This review's analysis:

This review has identified two errors (with two different root causes) associated with the applicant's response to this event:

1. The applicant did have difficulty reading and executing the ARPs during this event, and the applicant did not contest this. This review agreed with the original grading, and this single error was assigned to RF 2.b, "Procedures/Tech Specs - Procedure Compliance" (Did the applicant COMPLY WITH procedures (including precautions and limitations) and references in an accurate and timely manner?").

2. The applicant also committed an error in control board operations, in that he did not properly take manual control of the voltage regulator to restore main generator voltage back to 22 KV for 14 minutes. By not properly taking manual control of a normally automatic function, the applicant demonstrated an error in RF 3.c, "Control Board Operations - Manual Control." As a result, this single error was assigned to RF 3.c ("Did the applicant demonstrate the ability to take MANUAL CONTROL of automatic functions?").

Regarding the consequences of his incorrect actions, e.g., applicant contentions such as "the generator is designed to operate at 21 KV and 437 MVARS" and "I mitigated the degraded condition on the essential busses [sic] prior to the busses [sic] separating from the grid," these statements do not counter the fact that errors did occur. In accordance with NUREG-1021, ES-303 D.2.b, the simulator test is graded based on competencies rather than consequences, and every error that reflects on an operator's competence is considered equal unless it is related to a critical task (this event involved no critical tasks).

Scenario 2, Event 9: 1A Steam Generator (SG) Power Operated Relief Valve (PORV) Fails Open during Cooldown in Response to a 1C Steam Generator Tube Rupture (CRITICAL TASK).

Event Description: A SG tube rupture was in progress on the 1C SG and the 1C SG's main steam isolation valve (MSIV) failed to close. The crew took the correct action to close the MSIVs for the 1A, B, and D SGs, and a reactor cooldown was in progress using SG 1A, B, and D PORVs in accordance with procedure EP/1A/5000/E-3, "Steam Generator Tube Rupture." As part of the scenario, the 1A SG PORV failed open and would not close on demand to terminate the cooldown.

Expected Action/Response: When the target reactor coolant temperature of 520EF was reached (as indicated by core exit thermocouples (T/Cs)), the applicant was expected to stabilize reactor coolant temperature to slightly less than 520EF by manually closing the 1A, B, and D SG PORVs. The applicant was expected to recognize that the 1A SG PORV was failed open, and subsequently close the 1A SG PORV's block valve to stop further cooldown. This was a critical task.

Applicant Action/Response: The applicant commenced the cooldown as directed. When core exit T/Cs approached 520EF, the applicant reported to the SRO that reactor coolant temperature was 520EF. The applicant, using the SG PORV manual controllers, successfully closed SG 1B and D PORVs, and attempted to close the SG 1A PORV. However, the applicant failed to verify, using available control board indicators, that all PORVs were closed, and the reactor coolant system continued to cooldown, due to the SG 1A PORV being failed open. The applicant was subsequently inattentive to the ongoing cooldown, which continued for another 7 minutes to 494EF. The cooldown was stopped when the BOP (the other board operator on the crew) informed the applicant that the SG 1A PORV was still open and the SRO directed the applicant to close the associated block valve.

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

RF 1.c ("Interpretation/Diagnosis - Prioritize Response") = 1.0 (critical task)

RF 3.b ("Control Board Operations - Understanding") = 1.0 (critical task)

Applicant's Contentions: None. However, based on the applicant's previous contentions, and for completeness, this review examined all the applicant errors to assess the root causes and grading.

This review's conclusions:

This review did not agree with the original NRC assessment of the affected rating factors, due to a more detailed examination of the root causes . As a result of this review, the errors during this event will be assigned to RF 3.a ("Control Board Operations - Locate and Manipulate") and RF 1.a ("Interpretation/Diagnosis - Recognize and Verify Status").

This review's analysis:

This review has identified two errors (with two different root causes) associated with the applicant's response to this event:

1. As a part of the manipulation to close the 1A SG PORV, the applicant should have checked the valve indicators for a fully closed PORV. However, the applicant failed to observe the dual valve indication on the 1A SG PORV. By not accurately completing the control manipulation, due to not checking the PORV's position after the controller had been manipulated, the applicant demonstrated an error in RF 3.a, "Control Board Operations - Locate and Manipulate." As a result, this single critical task error was assigned to RF 3.a ("Did the applicant LOCATE AND MANIPULATE controls in an accurate and timely manner?").

2. Subsequent to the applicant not checking the 1A SG PORV closed, the applicant also did not recognize that core exit T/C temperatures continued to decrease, and that the cooldown was still in progress. Only after the open PORV was recognized by the BOP (the other board operator on the crew) was the PORV block valve closed and the cooldown stopped. By not recognizing the continued cooldown and decrease in core exit T/C readings, the applicant demonstrated an error in RF 1.a, "Interpretation/Diagnosis - Recognize and Verify Status." As a result, this single critical task error was assigned to RF 1.a ("Did the applicant RECOGNIZE and VERIFY off-normal trends and status?").

REVIEW SUMMARY

Simulator Event	Identified Errors from this Review	Rating Factor scores
Scenario 1, Event 3: Letdown Pressure Control Valve Fails Closed.	1 error in understanding letdown system operation. (Not a critical task) 1 error in referring to the ARP. (Not a critical task)	RF 3.b = 2.0, Control Boards Operations - Understanding. RF 2.a = 2.0, Procedures/Tech Specs - Reference.
Scenario 2, Event 2: Main Generator Voltage Regulator Failure.	1 error in timely procedure compliance. (Not a critical task) 1 error in taking manual control of the voltage regulator. (Not a critical task)	RF 2.b = 2.0, Procedures/Tech Specs - Procedure Compliance. RF 3.c = 2.0, Control Board Operations - Manual Control.
Scenario 2, Event 9: 1A SG PORV Fails Open during Cooldown (CRITICAL TASK)	1 error in manipulating the 1A SG PORV, valve position not checked. (Critical task) 1 error in recognizing continued cooldown. (Critical task)	RF 3.a = 1.0, Control Board Operations - Locate and Manipulate. RF 1.a = 1.0, Interpret/Diagnose - Recognize and Verify Status.

REVISED GRADE SHEET

ES-303 Individual Examination Report Form ES-303-1

Applicant Docket Number: 55-[redacted]

Reactor Operator Simulator Operating Test Grading Details

Competencies/Rating Factors (RFs)	RF Scores	RF Grades (Wt. Factor X RF Score)	Comp. Grades	Comment Page No.
1. Interpretation / Diagnosis a. Recognize & Verify Status b. Interpret & Diagnose Conditions c. Prioritize Response	 1.0 3.0 3.0	 0.40 X 1.0 = 0.40 0.30 X 3.0 = 0.90 0.30 X 3.0 = 0.90	2.20	
2. Procedures / Tech Specs a. Reference b. Procedure Compliance c. Tech Spec Entry	 2.0 2.0 3.0	 0.30 X 2.0 = 0.60 0.40 X 2.0 = 0.80 0.30 X 3.0 = 0.90	2.30	
3. Control Board Operations a. Locate & Manipulate b. Understanding c. Manual Control	 1.0 2.0 2.0	 0.40 X 1.0 = 0.40 0.30 X 2.0 = 0.60 0.30 X 2.0 = 0.60	1.60	
4. Communications a. Provide Information b. Receive Information c. Carry Out Instructions	 3.0 3.0 3.0	 0.33 X 3.0 = 1.00 0.33 X 3.0 = 1.00 0.33 X 3.0 = 1.00	3.00	

OVERALL, this review determined that the applicant did not pass the simulator operator test, based on a (continued) failing grade in Competency 3, “Control Board Operations.”