November 15, 2002

Mr. [redacted]

Dear Mr. [redacted]

In response to your letter dated August 30, 2002, the staff of the U.S. Nuclear Regulatory Commission (NRC) has reconsidered the proposed denial issued to you on July 24, 2002, and reviewed the grading of the operating test administered to you on June 3 - 13, 2002. In spite of the additional information you supplied, the staff finds that you did not pass the 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 on June 14, 2002, you may request a waiver of that portion.

b. Because you did not pass the operating test administered to you on June 3 - 13, 2002, 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 in accordance with 10 CFR 2.103 (b)(2). Submit your request in writing to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the Associate General Counsel for Hearings, Enforcement, and Administration, Office of the General Counsel, at the same address.

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.

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

If you have any questions, please contact David Trimble, Chief, Operator Licensing and Human Performance Section, 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 w/encl: R. J. Hovey, Vice President, Dresden Nuclear Power Station

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ADAMS DOCUMENT TITLE: Dresden 2002 Operating Test Appeal - [redacted] (SRO) - Sustained Denial

OFFICE	NRR/DIPM/IEHB/IOHS	NRR/DIPM/IEHB/IOHS:SC	NRR/DIPM/IEHB:BC	NRR/DIPM: DD
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DATE	11/13 /2002	11 /14 /2002	11/14/2002	11/ 15/2002

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INFORMAL REVIEW RESULTS - [redacted]
SENIOR REACTOR OPERATOR APPLICANT - DRESDEN

In response to the applicant's letter of August 30, 2002, the U.S. Nuclear Regulatory Commission (NRC) reconsidered the proposed denial issued on July 24, 2002, and reviewed the grading of the operating test administered to the applicant on July 3 - 13, 2002. 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.

OVERALL SUMMARY AND GRADING RESOLUTION

The applicant requested a review of the original grading of his performance on Category C of the NRC operating test (dynamic simulator scenarios). In particular, the applicant contends that the diagnosis competency was graded too severely by the NRC, given his actual performance during Dresden simulator scenario N-1 event #6 ("Main Feed Breaker to Bus 23-1 Trips with a Failure of Emergency Diesel Generator to Start Automatically") and Dresden simulator scenario N-3, events 7, 8, & 9 ("Recirculation Loop Break with Loss of High Pressure Injection"). Although this review partially agreed with several of the applicant's contentions, this review determined that the applicant did commit multiple diagnostic errors during the NRC simulator scenarios. These errors included: (1) incorrectly recognizing the effects of a de-energized electrical bus; (2) incorrectly diagnosing an electrical bus as potentially faulted, when all indications showed it was not faulted; (3) incorrectly diagnosing a slow leak in the drywell when no leak existed; and (4) slow to recognize a loss of feedwater. As a result of these errors, the findings of this review agreed with the original NRC grading. This review determined that the applicant's performance on the NRC operating test was unsatisfactory, due to his errors in the diagnosis competency area during the simulator scenarios.

SIMULATOR SCENARIO N-3, EVENTS 7, 8 & 9

During simulator scenario N-3, the applicant was in the lead reactor operator position (NSO), with another applicant in the secondary reactor operator position (ANSO), and a surrogate (non license applicant) in the senior reactor operator (SRO) position. Simulator scenario N-3, events 7, 8, & 9, resulted in a recirculation loop break with a loss of high pressure injection (feedwater and HPCI).

Expected Operator Actions:

One of the actions the applicant was expected to perform was to recognize the failure of the feedwater flow path, report this failure to the SRO, and coordinate with the ANSO on the need for HPCI.

Actual Operator Actions:

The applicant did not recognize the unavailability of the feedwater system in a timely fashion, even though the feedwater system was on an adjacent panel. The ANSO asked the applicant for the status of the feedwater system, which the applicant checked slowly, such that the ANSO was able to determine the status of the feedwater system on his own from several panels away.

ENCLOSURE

Original NRC Grading

The applicant's lack of recognizing the failure of the feedwater flow path contributed to a score of "1" for rating factor C.2.a, "Recognize."

Applicant's contentions regarding scenario N-3, events 7, 8, & 9

The applicant acknowledges that he was not the first person to recognize the feed pump trip. However, the applicant also states that at the time, he was busy performing the proper post-scram lead reactor operator immediate actions:

> "...when we received the high drywell pressure scram alarm, I immediately made that report to the Unit Supervisor, and proceeded to perform the immediate operator actions. I pushed the scram buttons and placed the reactor mode switch in the shutdown position. While I was scanning the full core display to report the status of the control rods, the ANSO standing at the ECCS panel recognized that HPCI started and per our training looked over to the feedwater panel to determine if HPCI was needed for injection. He saw the [feedwater] pumps tripped and made a control room announcement. I completed my scan and reported all rods in, then [I] tried to manually restart a feed pump with no success and reported that to the US. I then completed the rest of the immediate operator actions."

NRC RESOLUTION OF SIMULATOR SCENARIO N-3, EVENTS 7, 8 & 9:

Although the applicant was performing other post-scram actions, he should have also been able to rapidly determine the status of the feedwater system (on an adjacent panel) when questioned by the ANSO. This review agrees with the original NRC grading. The applicant's lack of recognizing the failure of the feedwater flow path will be reflected in this review's grading.

SIMULATOR SCENARIO N-1, EVENT #6

During simulator scenario N-1, the applicant was in the supervisory or senior reactor operator (SRO) position, another license applicant was in the lead reactor operator position (NSO), and a surrogate was in the secondary reactor operator position (ANSO). Relevant plant conditions when event #6 started included: reactor power ~ 37%, and a half scram condition on reactor protection system B (inserted by the crew during events 4 and 5). Simulator scenario N-1, event #6, resulted in the loss of bus 23-1, due to the trip of the 23-1 main feed breaker and the failure of the 2/3 diesel generator (2/3 D/G) to auto start and tie onto the bus. Major effects of the bus loss included:

- A loss of power to one division of drywell cooling fans, which resulted in rising drywell pressure.
- Numerous simultaneous annunciators, due to the loss of power to several plant systems, including: the automatic trip system, recirculation system ventilation fans, and feedwater heater drain valves.

- A loss of power to one of the running reactor building closed cooling water pumps, which resulted in only one pump supplying flow.

Expected Operator Actions:

Although the loss of bus 23-1 impacts several plant systems and causes many simultaneous alarms, the applicant was expected to determine that the underlying cause of these alarms was the loss of bus 23-1, and to focus his efforts on the bus loss. In accordance with the operator action forms (Form ES-D-2) for event #6 and plant procedures, the key mitigating action that the applicant was expected to direct was starting the 2/3 D/G and re-energizing the bus. Re-energizing the bus would have restored drywell cooling and reactor building closed cooling water, since these loads do not automatically strip on the loss of bus 23-1.

Actual Operator Actions:

The applicant did investigate the loss of bus 23-1 and the failure of the 2/3 D/G to auto start. Actions included: dispatching field operators to check out the buses and breakers locally; the applicant entering procedures DOA 6500-01, "4KV Bus Failure," and DGA 12, "Partial or Complete Loss of AC Power;" and the applicant and crew discussing whether the 2/3 D/G should have auto started. However, the applicant did not direct nor did the crew start the 2/3 D/G and re-energize the bus, even though (1) the control room annunciators and the field reports indicated that there were no faults on the bus, (2) except for not auto starting, control room indications and annunciators indicated no faults on the 2/3 DG, and (3) three different plant procedures (DGA-12, DOA 6500-01, and DOA 6600-01) each directed manually starting the 2/3 D/G for the given plant conditions. As a result of not re-energizing the bus, one division of drywell coolers was without electrical power, which resulted in a continual increase in drywell pressure. Due to the increasing drywell pressure, the applicant entered DOA 40-1, "Slow Leak," and the applicant directed a manual scram (prior to the automatic scram on high drywell pressure) at approximately 23 minutes after event #6 started.

Follow-up questions and applicant's answers

At the conclusion of scenario N-1, the NRC examiner of record asked follow-up questions, and the applicant provided the following approximate answers:

Follow-up question: Why was drywell pressure slowly increasing?

Applicant's answer: Due to a small recirculation system leak.

Follow-up question: Could the loss of drywell cooling cause an increase in drywell pressure?

Applicant's answer: Yes.

Follow-up question: What caused the loss of power?

Applicant's answer: Loss of power from bus 23 feeding bus 23-1.

Follow-up question: Why did the 2/3 D/G fail to start?

Applicant's answer: Bus 23-1 may be faulted. Also, there is no cooling water available for starting the 2/3 D/G.

Original NRC Grading

The applicant received an overall score of 1.00 in the diagnosis competency. The individual rating factors were each scored as 1, and the justifying comments can be summarized as follows:

C.2.a, "Recognize"	Did not recognize a loss of feedwater heating and did not enter DGA-7 (scenario N-1, event #6). Did not recognize the unavailability of the feedwater system (scenario N-3, event 7, 8, & 9).
C.2.b, "Accuracy"	Did not accurately identify the loss of bus 23-1 and the failure of the 2/3 D/G to auto start (scenario N-1, event #6).
C.2.c, "Diagnose"	Did not correctly diagnose the rise in drywell pressure was due to the loss of drywell cooling. The applicant instead diagnosed this as a small recirculation system leak (scenario N-1, event #6).
C.2.d, "Crew Response"	Did not have the crew confirm the presence of a drywell leak, by checking other indications (scenario N-1, event #6).

Summary of applicant's contentions regarding scenario N-1, event #6

The applicant contends that the diagnosis competency of the simulator operating test was graded too severely by the NRC, especially regarding his actions as the supervisor during scenario N-1, event #6. Although the 2/3 D/G was not started, and he did direct a manual scram due to rising drywell pressure, the applicant would like the NRC to consider the following:

1. *Recognition:* I did recognize that bus 23-1 had lost power and that the 2/3 D/G failed to auto start.

2. *Procedure Usage:* I did enter several abnormal procedures associated with the bus loss and failure of the 2/3 D/G to auto start.

3. *Actions Taken:* Myself and the crew did take actions regarding the bus loss and failure of the 2/3 D/G to auto start. These actions included: sending non-licensed operators to the buses to report signs of a fault, discussing the failure of the 2/3 D/G to auto start, and discussing the loss of one division of electrical power.

4. *Safety of the Public:* The health and safety of the public was never threatened. Adequate core cooling will be maintained even with the loss of one division of electrical power. Scramming the reactor does not challenge the reactor, and it was the appropriate action to take given the rising drywell pressure.

5. *Potentially Faulted Bus:* The reason for not starting the 2/3 D/G and placing it on bus 23-1 was that the bus was potentially faulted. Event #6 was not the typical loss of AC power or complete loss of one division of power with the failure of a D/G to auto start. Manually starting the 2/3 D/G and allowing it close onto a potentially faulted bus would have been an unsafe action. So, I waited to get a more accurate diagnosis of the buses before attempting to start the D/G. This is consistent with our event based abnormal procedures. While waiting for the report of the buses, drywell pressure increased to 1.5 psig, so I directed a manual scram. If the scenario event did not want us to consider a potential bus fault, then why were these actions included on the scenario ES-D-2 forms?

6. *Slow Leak:* With drywell pressure increasing, and no indications given to me by the ANSO to rule out a leak, I opted not to take any chances, so I entered DOA 40-1, "Slow Leak." At that time, I mentioned to the ANSO that the leak may be from the reactor recirculation system, since we had received some alarms on the recirculation panel. After the scenario, the NRC examiner asked me what could have made drywell pressure increase. I responded that drywell pressure would increase from the loss of the coolers that tripped on loss of power. I also indicated that it would increase on a leak in the drywell. The NRC examiner incorrectly noted my answer, and his grading comments made it seem like I did not know that drywell pressure would increase on a loss of coolers.

NRC ANALYSIS OF SIMULATOR SCENARIO N-1, EVENT #6 AND OVERALL APPLICANT PERFORMANCE

NRC Partial Agreement with Applicant

The NRC partially agrees with the applicant on the first four of the above contention summaries. Specifically, the NRC agrees that:

1. *Recognition:* The applicant did recognize that bus 23-1 had lost power and that the 2/3 D/G failed to auto start, although this recognition was not immediate. However, even after the applicant recognized the bus loss, the applicant did not correctly recognize the effects of the loss of bus 23-1. This will be discussed further below.

2. *Procedure Usage:* The applicant did enter several abnormal procedures associated with the bus loss and failure of the 2/3 D/G to auto start. However, not all the actions in these procedures were properly directed or carried out. This appears to be due to the applicant incorrectly believing that the bus was potentially faulted.

3. *Actions Taken:* The applicant and crew did take actions regarding the bus loss and failure of the 2/3 D/G to auto start. These actions included: sending non-licensed operators to the buses to report signs of a fault, discussing the failure of the 2/3 D/G to auto start, and discussing the loss of one division of electrical power. However, not all the procedure required actions were properly directed or carried out. This appears to be due to the applicant incorrectly believing that the bus was potentially faulted.

4. *Safety of the Public:* The NRC agrees that the health and safety of the public was never threatened. Adequate core cooling will be maintained even with the loss of one division of electrical power. Scramming the reactor does not challenge the reactor, although in this case it

did subject the plant to an unnecessary transient. As far as how this should affect the applicant's grading, the NRC simulator operating exam is graded based on operator competencies. The grading of applicants includes examining all of their actions, including actions that may not directly affect the health and safety of the public.

Errors made by the applicant

Given the above four points of NRC partial agreement, the review of the grading of the "Diagnosis" competency will be based upon the grading of the following four errors made by the applicant:

1. *Recognition:* Although it appears that the applicant did recognize the loss of bus 23-1, the applicant did not accurately recognize the effects of the loss of bus 23-1. For example, the alarms on the recirculation panel and the rising drywell pressure were both due to the bus loss, although the applicant believed that these indications were indicative of a slow recirculation system leak. Also, as demonstrated by the follow-up questions, the applicant incorrectly believed that the bus loss resulted in a loss of cooling water to the 2/3 D/G, when no cooling water loss to the 2/3 D/G had occurred.

2. *Potentially Faulted Bus:* Throughout event #6, the applicant incorrectly diagnosed bus 23-1 as potentially faulted, even though there were no faults on bus 23-1, and there was ample time (23 minutes) to make a proper diagnosis. Indications that bus 23-1 was not faulted included: (1) Control room annunciator 902-8 F-5, "4KV Bus 23-1 Overcurrent" was NOT in alarm, and (2) a report from the field of "open, no targets" was received regarding the status of the bus 23 to bus 23-1 feeder breaker. Although the applicant contends that he was waiting for further information to determine the status of bus 23-1, all the necessary information was already made available to determine that bus 23-1 was not faulted. Note that for the plant conditions of event #6 (D/G fails to auto start), THREE different procedures all direct attempting a manual start of the 2/3 D/G (DGA-12, "Partial or Complete Loss of AC Power"; DOA 6500-01, "4KV Bus Failure"; and DOA 6600-01, "Diesel Generator Failure"). As a result of this incorrect diagnosis, the 2/3 D/G was not started and placed on bus 23-1, drywell pressure continued to increase, and the applicant directed the plant be manually scrammed, subjecting the plant to an unnecessary and avoidable transient.

3. *Slow Leak:* The applicant incorrectly entered the slow leak procedure based solely on rising drywell pressure. Since the increase in drywell pressure was due to the loss of power to the drywell cooling fans, the applicant should have used or directed the crew to use other indications to positively diagnose that no leak in the drywell existed. Other indications (as specified in DOA 0040-01, "Slow Leak") that could have been used to check for a leak in the drywell included drywell sump high level alarms and drywell sump temperature indication. During event #6, no drywell sump level alarms were received, and drywell sump temperature remained constant.

Plus the error from the other scenario:

4. *Loss of Feedwater*. While in the NSO position, the applicant was slow to recognize a loss of feedwater flow path on an adjacent panel. The loss of feedwater was actually recognized by the ANSO, from several panels away.

NRC GRADING RESOLUTION:

Based upon the above four applicant errors, this review agrees with the original NRC grading. Specifically, the above four errors did demonstrate a performance level of 1.0 in the SRO diagnosis competency. Examining each of the four rating factors that makes up the diagnosis competency, this review determined that the applicant did demonstrate:

1. Serious omissions, delays, or inaccuracies in recognizing trends (C.2.a = 1):

    - The applicant did not correctly recognize the effects of the loss of bus 23-1, including the effects on drywell cooling, cooling to the 2/3 D/G, and alarms on the recirculation system panel.
    - As NSO, the applicant was slow to recognize a loss of feedwater.

2. Serious instances of misusing or failing to use important information or data (C.2.b = 1):

    - The applicant misused drywell pressure and recirculation panel alarms, failed to use other data (e.g., drywell sump level alarms, drywell sump temperature indication) and incorrectly determined that a slow leak was in progress.
    - The applicant incorrectly used the available information associated with bus 23-1, and incorrectly determined that the bus was potentially faulted.

3. Faulty diagnoses which adversely affected plant status (C.2.c = 1):

    - The applicant incorrectly diagnosed a slow leak, when none existed.
    - The applicant incorrectly diagnosed bus 23-1 as potentially faulted. This resulted in a continual rise in drywell pressure and an eventual manual scram.

AND

4. Faulty diagnostic activities by the crew which adversely affected plant status (C.2.d = 1):

    - For the above errors associated with scenario N-1, the crew fully participated in the faulty diagnostic activities. Plant status was adversely affected by these incorrect diagnoses: drywell pressure continuously increased and an unnecessary and avoidable reactor scram transient occurred.