



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0190

Report Nos.: 50-325/95-24 and 50-324/95-24

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324

License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: November 4 - December 1, 1995

Lead Inspector: A. R. Wiseman
for C. A. Patterson, Senior Resident Inspector

12/28/95
Date Signed

Other Inspectors: P. M. Byron, Resident Inspector
M. T. Janus, Resident Inspector

Approved By: M. B. Shymlock
M. B. Shymlock, Chief
Reactor Projects Branch 4
Division of Reactor Projects

12-29-95
Date Signed

SUMMARY

Scope:

This routine resident inspection included the areas of operations, maintenance and surveillance, engineering, and plant support.

Results:

In the area of Operations, a violation of the Technical Specification limit for inoperable equipment was identified after a residual heat removal pump failed to start when attempting to provide suppression pool cooling, paragraph two. The pump breaker had been improperly racked into position for a period of 14 days exceeding the seven days permitted by technical specifications for one inoperable pump. Independent verification did not ensure the breaker was properly in position. The licensee's corrective action for this problem was thorough. A non-cited violation was identified by the licensee during implementation of the final phase of the feedwater temperature reduction. The procedure requirements were not followed. Operations management took strong corrective action to address this reactivity addition made outside the procedure requirements.

In the Maintenance and Surveillance area, the licensee's repair of a steam leak on a reheater dump valve were well planned and coordinated, paragraph three. The evolution was conducted with controls on the amount of sealant that could be added.

In the Engineering area, the licensee conducted a thorough review of a Part 21 issue concerning 4160 V circuit breaker indication problems, paragraph four. The licensee ensured the proper operation of all breakers and developed a long term corrective action plan. The plant nuclear safety review committee continued to show good performance during review of two engineering issues. An emphasis on safety and a questioning attitude were displayed.

In the plant support area, a non-cited violation was identified concerning contractor falsification of psychological tests, paragraph five. The licensee's actions were very responsible and timely. Since no vital access was gained no safety significant issues were evident. The licensee's response to an oil spill was conducted in an excellent manner.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *W. Campbell, Vice President, Brunswick Nuclear Plant
- *G. Barnes, Manager, Training
- *A. Brittain, Manager, Security
- *N. Gannon, Manager, Maintenance
- J. Gawron, Manager, Environmental & Radiological Control
- *R. Lopriore, General Plant Manager
- *G. Gibbs, Manager, Brunswick Engineering Support Section
- G. Honma, Supervisor, Licensing
- *W. Levis, Director, Site Operations
- *J. Lyash, Manager, Operations
- *D. Hicks, Manager, Regulatory Affairs
- *J. Thompson, Acting Manager, Nuclear Assessment
- M. Turkal, Supervisor, Regulatory Compliance

Other licensee employees or contractors contacted included licensed reactor operators, auxiliary operators, craftsmen, technicians, and public safety officers, in addition to quality assurance, design, and engineering personnel.

NRC Personnel

- *C. Patterson, Senior Resident Inspector
- P. Byron, Resident Inspector
- *M. Janus, Resident Inspector

* ATTENDED EXIT MEETING

Acronyms and initialisms used in the report are listed in the last paragraph.

2. Operations

- a. Operational Safety Verification (71707)

Unit Status

Unit 1 operated continuously during this inspection period and had been on-line 60 days. A power reduction to 60% occurred on November 21, 1995, to repair a steam leak. This is discussed in paragraph three.

Unit 2 operated continuously during this inspection period and had been on-line 518 days. During this time the licensee implemented the second phase of the feedwater temperature reduction to maximize reactor power during coastdown to the refueling outage.

After the second phase was implemented increases in offgas radiation levels were observed associated with the power level change to implement the FWTR.

Elevated Offgas Levels

The inspector reviewed the guidance given to plant operators concerning how to deal with the problem. Standing Instruction 95-105 dated November 9, 1995, provided several recommendations for operator action in the event of elevated offgas levels. These recommendations came from a task force assembled to review the fuel failure on Unit 2. Significant offgas level increases are an indication of further failed fuel rod degradation. The recommendations were to monitor steam jet air ejector radiation levels. If the readings remain doubled for more than five minutes, the RE on shift is to be notified. Also, if the readings increase by a factor of four then any power increase is to be stopped and the RE on shift notified. The inspector discussed the instruction with operators on shift. The operators understood the guidance and actions to be taken. The inspector concluded that appropriate guidance had been given to the operators to deal with the fuel situation.

Final Phase of Feedwater Temperature Reduction

On November 4, 1995, the licensee initiated the final phase of their planned FWTR to increase plant capacity during the end of cycle coast down to the next refueling outage scheduled for February 2, 1996. The FWTR was controlled by special procedure 2SP-95-212, Final Feedwater Temperature Reduction And Pressure Set Adjustment. The reduction in feedwater heating reduces the final temperature of the feedwater returned to the reactor vessel, thus adding positive reactivity due to the cold water addition. The initial phase of FWTR involved the isolation of extraction steam to the number 5 feedwater heaters. This portion of the SP was successfully performed on September 16, 1995. The net result was a decrease in feedwater temperature of 32 degrees F at 100% rated thermal power, and a gain of 17 MW. The second phase of FWTR involved the restoration of the number 5 feedwater heaters, and the isolation of the number 4 feedwater heaters. This resulted in a feedwater temperature reduction of 64 degrees F at 100% rated thermal power and a gain of an additional 17 MW. The SP requires that extraction steam to the feedwater heaters be restored prior to normal reduction in power below 50%.

The SP procedure has several prerequisites which must be met prior to performing this evolution. A PLP-17 briefing for the conduct of infrequently performed tests or evolutions with the potential to reduce margins of safety or introduce unwanted transients must be conducted with management prior to starting this evolution. Reactor power was required to be reduced as recommended by the RE prior to manipulation of the feedwater heaters. On November 4, the final phase of FWTR was initiated. Reactor power was reduced to 65% in accordance with the requirements of step 7.5.2, the steps of the SP were performed, and the

procedure manipulations were completed when the shell pressure limits for number 4 heaters was reached. Once the limit on the shell pressure was reached, no further manipulation of the 2-FW-V120, Feedwater Heaters 4 and 5 Bypass Valve was allowed by the procedure. Following initiating a computer calculation by the RE at the reduced power level, the next step in the procedure required the operators to raise power as recommended by the RE in accordance with thermal limits. The reactor returned to maximum power of approximately 88%, on November 5, 1995. The completed procedure was left on the Unit 1 CRS's desk to provide guidance for continuing monitoring of various parameters, and component manipulation should a power reduction be necessary.

On November 9, a control room operations crew who were not part of the implementation of SP-FW-95-212, and had not had the required PLP-17 briefing decided that if conditions allowed, they would open the 2-FW-V120 further to maximize generation. The crew mistakenly understood from their turnover, that the SP was in progress and that the unit was holding at the present power due to thermal limits. The crew's review of the procedure identified the need to contact the RE and reduce power in accordance with his guidance. The CRS instructed one of the ROs to contact the duty RE and get instruction and guidance for further opening of the 2-FW-V120. Due to inadequate communications, the duty RE thought only the pressure set was to be adjusted and gave his concurrence on the operation. Based on this, the crew conducted a pre-job brief without notifying the Shift Superintendent of the intended action and proceeded to open the 2-FW-V120. The crew failed to reduce reactor power to 65% as required by procedure step 7.5.2, prior to manipulating the 2-FW-V120. The crew slowly continued this evolution until the valve was fully open. In accordance with the procedural guidance, the crew monitored all necessary parameters and thermal limits during the evolution. The opening of the 2-FW-V120 resulted in an additional drop in feedwater temperature of 10 degrees F, and a subsequent increase in reactor power of approximately 1%. Net increase in generation was an additional 4 MW. These failures to act in accordance with the established procedures is identified as a violation. This licensee - identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy, and is identified as NCV 324/95-24-01, Failure to Follow Feedwater Temperature Reduction Procedure.

The unauthorized further reduction in feedwater temperature was identified the next morning by the day shift duty RE. The CRS on duty during the evolution promptly initiated a CR to document the event. Following the identification, the licensee began an investigation into the actions of those individuals involved. The CRS was removed from licensed duties from November 14 through November 27, 1995. The individual was also counseled regarding communication standards, procedure use, and conservative decision making for PLP-17 activities. Additional corrective actions included: enhancing the standing instruction for the 2-SP-95-212; implementing a daily check sheet for monitoring plant parameters for 2-SP-95-212; providing a PLP-17 brief to all operating shifts

on this evolution; revising O-PLP-17, to include requirements for briefing the overall conduct including closure and followup activities; reviewing turnover procedures and processes, initiating needed enhancements; and reviewing with all personnel involved the importance of communications standards, procedure usage, and conservative decision making. The majority of these corrective actions have been completed, with the remaining ones to be fully completed by January 26, 1996.

Residual Heat Removal Pump Failure to Start

On October 4, 1995, during preparations to conduct a RCIC performance test, PT 10.1.1, an attempt was made to initiate suppression pool cooling but the 2B RHR pump failed to start. The pump breaker was found to not be properly racked into position. The breaker was racked in sufficiently to engage the breaker stabs which provide power to the breaker indication lights both locally and on the RTGB. However, the breaker was not fully racked in as indicated by the "mechanical trip push button" being in the depressed position and the latching release mechanism not in the fully counter clockwise position. The licensee determined that on September 21, 1995, the breaker had been racked out, and then back in, for another surveillance test. The breaker was independently verified as being in the correct position by observing the remote indicating lights. As a result of the pump being inoperable for 14 days the TS LCO requirements for one pump out of service for LPCI, 3.5.3.2, and Suppression Pool Cooling, 3.6.2.2 were exceeded. Accordingly, this will be identified as VIO 324/95-24-02, RHR Pump Breaker Not Properly Racked.

The licensee verified that each 4160 V breaker on the emergency buses was properly racked into position. The inspector accompanied the licensee during a portion of this verification. No other problems were identified. The licensee performed a number of other corrective actions including a stand-down of Operations personnel to discuss the event, added a requirement that an SRO perform independent verification for each safety related 4160 V breaker, revised the IV procedure to not allow remote verification of 4160 and 480 VAC load center breakers, and revised breaker training requirements. The event was documented in LER 2-95-003. The inspector concluded the licensee's actions were thorough and complete.

One violation and one non-cited violation was identified.

3. Maintenance and Surveillance

a. Maintenance Observation (62703)

Steam Leak Repair

On November 21, 1995, at 10:47 a.m., the licensee initiated a downpower to 60% on Unit 1 to repair a steam leak on 1-MD-LV-2SRDCV-C-1, the East Moisture Separator Reheater high level dump

valve. The leak was a body to bonnet leak on the valve. The leak had previously been leak repaired following its emergence after startup. Due to interferences with the valve yoke, a permanent clamp repair was not performed at that time. Instead a wire wrap and sealant injection was performed which had stopped the leak. The valve had been under surveillance by remote camera since the leak repair was performed. Several months after the original repair, the leak reappeared and continued to degrade. The licensee decided to perform a down power and repair the leak before it degraded further.

The downpower was scheduled to last approximately 8 hours from start to finish. The leak repair was performed by a two man contractor team who performed the hot side entry and re-injected sealant into the valve to stop the steam leak. The leak was successfully repaired and stopped. Following the exit from the hot side work, the licensee commenced power ascension and reached 100% power later that same day.

The inspector attended the prejob briefing and monitored the repair activities while they were in progress. During the pre-job brief the inspector noted that the contractors performing the work were well prepared and had all the necessary tools and equipment prestaged for any possible contingencies. The inspector reviewed the ESR which covered this evolution and noted that the crew was only authorized the use of two tubes of sealant, additional tubes would require engineering review and approval. The downpower evolution was conducted in a well controlled and efficient manner with no problems or discrepancies observed. The inspector observed that the overall evolution and repair activity was well planned, coordinated and completed ahead of schedule.

b. Surveillance Observation (61726)

LPRM Calibration

On November 14, 1995, the inspector observed a portion of periodic test OPT-01.9, LPRM Calibration on Unit 2. This procedure calibrates the LPRMs to adjust for the change in neutron sensitivity to fuel burnup. The test is required to satisfy the signal portion of TS Table 4.3.1-1, 2f. The procedure provides instructions on how to return LPRMs to service after maintenance and zero balancing LPRM cards. Zero balancing is such that with no signal being generated from the detector, the LPRM indicates zero. The inspector verified the prerequisites for reactor power and steady state conditions were met. All test equipment was in current calibration. The test was properly performed and no problems were identified.

No violations or deviations were identified

4. Engineering

a. On Site Engineering (37551)

4160 V Circuit Breaker Part 21

On November 21, 1995, the licensee completed initial evaluation of a 10 CFR Part 21 Notification submitted by ABB to users of ITE 5HK, 7.5 HK, and 15 HK Switchgear. The notification was submitted based on problems experienced at another facility involving lack of breaker indication in the control room. The problem was that one of the stationary secondary disconnect conductor strips for breaker control had broken. Analysis of the broken conductor strip and other strips on the disconnect block indicated the presence of cracks in the conductor material. Mechanical cycling during the removal and insertion of the breaker further hardened the material and propagated the cracks until failure. ABB determined that the material in the broken conductor strips was Cold Form Brass Alloy 260, one of the two materials supplied under the original specification. In 1982, the specification was changed to specify only Cold Form Brass Alloy 230, a less brittle material than the 260 alloy. Breakers manufactured prior to 1982 could have conductor strips manufactured of either material with the same stock number, laboratory analysis is necessary to differentiate between the two materials.

The licensee performed a record review and determined that all 4160 V switchgear was procured prior to 1982 and could contain either material. In the interim, until the disconnect blocks could be inspected and replaced, the following actions were to be taken or verified taken for all safety related switchgear following racking in a breaker to the connect position: place charging spring motor to ON and verify the charging springs are charged; with breaker in the open position verify green indicating lights are lit; and close breaker and verify red indicating lights are lit. For equipment which can be operated, cycle associated equipment following returning breaker to service. The licensee verified the above conditions for all safety related 4160 V breakers through direct inspection or records verification. For those components whose breakers had not been recently racked out or whose components had not be cycled, the licensee ran the associated component and verified control power to the breakers.

The licensee is developing a long term corrective action to address this problem. These actions will include direct inspection of the disconnect blocks on the safety related switch gear, and possible replacement with new blocks composed of Alloy 230. The decision of replacing the balance of plant 4160 V breakers will be made if inspection of the safety related breakers indicates that this is warranted. These actions have been reviewed by the inspector who

has followed this issue and they appear sufficient to adequately address this issue. The licensee's immediate actions have been prompt and thorough in their handling of this issue.

b. Self Assessment (40500)

Nuclear Safety Committee Meeting

On November 16, 1995, the inspector attended a PNSC meeting. The topics of discussion were: a LER on problems with the Control Building Emergency Air Filtration System and a License Amendment Request for the Performance Based Containment Leakage Testing Program. The inspector confirmed that the proper plant personnel were in attendance, and that the required quorum was present prior to the start of the meeting. The inspector noted that the PNSC members maintained a good questioning attitude during the meeting and were unwilling to accept the LER as originally written. The PNSC members also questioned why the LER was proposed as a voluntary informational LER when a follow-up LER to the 50.72 red phone report was required. The PNSC changed the LER to a required follow-up and determined that a supplemental LER would be issued once the final determinations were completed. The inspector views the overall performance of the PNSC as a continuation of past good performance, with an emphasis on safety and a questioning attitude.

No violations or deviations were identified.

5. Plant Support (71750)

a. Security

(Closed) Unresolved 95-06-01, Contractor Falsification of Psychological Test.

During an inspection conducted March 20-24, 1995, Unresolved Item No. 50-325/95-06-01 and 50-324/95-06-01 was opened, Contractor Falsification of Psychological Test (Turbine Technicians Incorporated).

On October 18, 1995, the inspector reviewed the events and concluded that a contractor employee had possibly on two separate occasions August 21, 1999 and September 10, 1990, altered the psychological tests of two contractors, who were subsequently granted unescorted access.

The contractors actions are the licensee's responsibility when they are authorized to implement requirements of the Physical Security Plan. Therefore, based on the review of the event the NRC has determined that the contractor on two separate occasions had failed to comply with Paragraph 1.3.1 of the Paragraph 1.3.1 of the Physical Security Plan, Revision 5, dated July 20, 1978, states in part, "Employees of

contractors who will be granted unescorted access to protected and vital areas shall have been subject to a screening process as follows: Psychological testing to detect aberrant behavior by a test acceptable to CP&L".

The inspector considered the following corrective actions: (1) the immediate action of conducting an investigation of the event; (2) issuing badge denials for the 24 contractor employees who were previously granted access; (3) verifying that none of the contractor currently have access; (4) verified that none of the 24 contractors have access anywhere in the country; (5) suspending the contractor from conducting work at any Carolina Power and Light Nuclear Facilities and (6) eliminating the self-screening contractor programs. The inspector concluded that these actions were very responsible and timely. Additionally, since the events were over five years old, the individuals did not gain access to a vital area, and there does not appear to have been any safety significant issues. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII, B.1 of the NRC Enforcement Policy, and is identified as NCV 325,324/95-24-03, Contractor Falsification of Psychological Test. These Unresolved items are closed.

b. Emergency Preparedness

Oil Spill in Cape Fear River

On November 21, 1995, at 8:13 a.m., the licensee received notification from the U.S. Coast Guard of an oil spill in the Cape Fear River. The information provided at that time described the spill as: being of unknown origin; located near the Sunny Point Military Ocean Terminal; headed down river with the outgoing tide; believed to be number 2 fuel oil; and forming a slick approximately 150 feet wide and 2800 feet long. The SRO receiving the call questioned the source and amount of the spill, both of which were unknown, but based on the size of the spill, the amount was believed to be approximately 40 gallons. Both Units immediately entered AOP-33, Oil Spill In the Cape Fear River, and initiated the appropriate actions. LPU was notified, security and LPU stationed personnel at the diversion screen for the intake canal to monitor for the spill, and the oil booms and fire hoses were prestaged at the intake structure. At 10:24 a.m., a follow-up notification from the U.S. Coast Guard reported that the spill had a strong probability of impacting the Brunswick Plant. At that time, the Coast Guard recommended deployment of the oil booms in the intake canal. At 11:10 a.m., the Coast Guard still had not determined the origin of the leak, but had revised their estimate of its size to approximately 200 gallons. By 12:18 p.m., both the primary and secondary oil retention booms had been deployed in the intake canal, despite the fact that no oil was present. By 3:46 p.m., the U.S. Coast Guard response team was stationed on site to assist with any response actions should they become necessary. The licensee exited the AOP the following day, after the Coast Guard had reported that the spill had broken up and dissipated. The inspector was present in the control room during the initial

notifications, and followed the licensee's response actions through out the event. The inspector concluded that the licensee acted in a swift and efficient manner, making all necessary preparations for the event following the initial call. The licensee's actions were well planned and quickly and properly executed with little difficulty. The overall response observed by the inspector was excellent, in the command and control and in the implementation of the necessary actions.

One non-cited violation was identified.

6. Exit Interview

The inspection scope and findings were summarized on December 4, 1995, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference Paragraph</u>
324/95-24-01	Open, Closed	NCV, Failure to Follow Feedwater Temperature Reduction Procedure, paragraph 2.
324/95-24-02	Open	VIO, RHR Pump Breaker Not Properly Racked, paragraph 2.
325,324/95-24-03	Open, Closed	NCV, Contractor Falsification of Psychological Test, paragraph 5.a.
325,324/95-06-01	Closed	URI, Contractor Falsification of Psychological Test (Turbine Technicians Incorporated), paragraph 5.a.

7. Acronyms and Initialisms

ABB	Asea Brown Boveri
AOP	Abnormal Operating Procedure
CFR	Code of Federal Regulations
CP&L	Carolina Power and Light
CRS	Control Room Supervisor
ESR	Engineering Services Request
F	Fahrenheit
FWTR	Feedwater Temperature Reduction
IV	Independent Verification
LER	Licensee Event Report
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
LPRM	Local Power Range Monitor
LPU	Loss Prevention Unit

MW	Megawatt
NCV	Non-cited violation
NRC	Nuclear Regulatory Commission
PLP	Plant Program Procedure
PNSC	Plant Nuclear Safety Committee
PT	Periodic Test
RCIC	Reactor Core Isolation Cooling
RE	Reactor Engineer
RHR	Residual Heat Removal
RO	Reactor Operator
RTGB	Reactor Turbine Gaugeboard
SP	Special Procedure
SRO	Senior Reactor Operator
TS	Technical Specification
URI	Unresolved Item
V	Volt
VAC	Volt Alternating Current
VIO	Violation