UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INVESTIGATIONS FIELD OFFICE, REGION II
101 MARIETTA STREET NW, SUITE 2900
ATLANTA, GEORGIA 30323

Report No.: 50-261/90-23

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

Docket No.: 50-261 License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: October 11 - November 10, 1990

Lead Inspector: _____ 11/30/90
L. W. Garner, Senior Resident Inspector Date Signed

Other Inspector: K. R. Jury

Approved by: _____ 11/30/90
for R. E. Carroll, Acting Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of operational safety verification, surveillance observation, and maintenance observation.

Results:

An unresolved item was identified involving the potential for prior operation outside of the 10 CFR 50.46 Emergency Core Cooling system performance acceptance criteria due to a plant specific computer code user error in the large break loss of coolant accident analysis. Another unresolved item was identified associated with an incorrect interpretation of a Technical Specification figure which also resulted in the potential for operation outside this same requirement (paragraph 2).

Two weaknesses were identified during observation of new fuel receipt inspection: measures to prevent foreign material intrusion into fuel assemblies were not consistently applied and non-standardized inspection practices had the potential for inspection steps not being performed (paragraph 2).

9012170076 901130
PDR ADOCK 05000261
Q PDR

During a spent fuel shipment trial run on November 9, 1990, an automobile collided with the spent fuel train. The empty spent fuel casks were not affected (paragraph 2).

REPORT DETAILS

1. Persons Contacted

*R. Barnett, Manager, Outages and Modifications
C. Baucom, Shift Outage Manager, Outages and Modifications
J. Benjamin, Shift Outage Manager, Outages and Modifications
C. Bethea, Manager, Training
*W. Biggs, Manager, Nuclear Engineering Department Site Unit
S. Billings, Technical Aide, Regulatory Compliance
*R. Cady, Project Engineer, Quality Assurance
R. Chambers, Manager, Operations
*D. Crook, Senior Specialist, Regulatory Compliance
*J. Curley, Manager, Environmental and Radiation Control
C. Dietz, Manager, Robinson Nuclear Project
*D. Dixon, Manager, Control and Administration
J. Eaddy, Supervisor, Environmental and Radiation Support
S. Farmer, Supervisor - Programs, Technical Support
R. Femal, Shift Foreman, Operations
*E. Harris, Manager, Onsite Nuclear Safety
*J. Kloosterman, Director, Regulatory Compliance
D. Knight, Shift Foreman, Operations
E. Lee, Shift Outage Manager, Outages and Modification
A. McCauley, Supervisor - Electrical Systems, Technical Support
R. Moore, Shift Foreman, Operations
D. Nelson, Shift Outage Manager, Outages and Modifications
*M. Page, Manager, Technical Support
*R. Parsons, Manager, Robinson Engineering Support Section
D. Seagle, Shift Foreman, Operations
*J. Sheppard, Plant General Manager
*R. Smith, Manager, Maintenance
*D. Stadler, Engineering, Onsite Licensing
R. Steele, Shift Foreman, Operations
*A. Wallace, Operations Coordinator, Operation
D. Winters, Shift Foreman, Operations
H. Young, Director, Quality Assurance/Quality Control

Other licensee employees contacted included technicians, operators, mechanics, security force members, and office personnel.

*Attended exit interview on November 21, 1990.

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

2. Operational Safety Verification (71707)

The inspectors evaluated licensee activities to confirm that the facility was being operated safely and in conformance with regulatory requirements. These activities were confirmed by direct observation, facility tours,

interviews and discussions with licensee personnel and management, verification of safety system status, and review of facility records.

To verify equipment operability and compliance with TS, the inspectors reviewed shift logs, Operation's records, data sheets, instrument traces, and records of equipment malfunctions. Through work observations and discussions with Operations staff members, the inspectors verified the staff was knowledgeable of plant conditions, adhered to procedures and applicable administrative controls, and aware of inoperable equipment status. Shift changes were observed, verifying that system status continuity was maintained and that proper control room staffing existed. Access to the control room was controlled and operations personnel carried out their assigned duties in an effective manner. Control room demeanor and communications continued to be informal, yet effective.

Plant tours and perimeter walkdowns were conducted to verify equipment operability, assess the general condition of plant equipment, and to verify that radiological controls, fire protection controls, physical protection controls, and equipment tagging procedures were properly implemented.

Black Creek Flooding

During the weekend of October 12, 1990, lake water releases from the Robinson Impoundment resulted in localized flooding downstream of the site. Approximately 70 people were evacuated and sheltered by Darlington County. As of November 10, approximately 60 individuals residing along Black Creek had applied for emergency disaster relief. Darlington County was one of twelve counties in South Carolina which were declared disaster areas by the Federal Government due to high water in several river flood plains. During the first two weeks of October, rainfall was abnormally high as a result of the remnants of both hurricanes Klaus and Marco passing through the state. By 5:30 p.m., on October 12, the lake level was 221.45 feet and increasing at a rate of 0.1 feet per hour. At approximately 9:00 p.m., the lake level had increased to 221.7 feet. At that time, the licensee apprised the Sheriff's Department and the Darlington County Emergency Preparedness Department of the situation. The Sheriff and emergency preparedness personnel visited the site and concurred that conditions warranted actions to prevent further lake level increase. At 11:00 p.m., with the lake level at 221.9 feet, the B tainter gate was opened approximately 3 feet in accordance with Operation Instruction OI-16, Robinson Impoundment, to maintain lake level below 222.0 feet. The control of the dam and lake level are the responsibility of Unit 1 personnel. Unit 2, the nuclear unit, shares the site with Unit 1, a coal fired unit. Lake level crested at 221.98 feet during the night. During October 13, the release rate was adjusted to maintain levels between 221.8 and 222.0 feet. On October 14 at 11:05 a.m., inflows into the lake had decreased to a acceptable level and the B tainter gate was closed.

Unit 2 activities were not affected by the flooding. Unit 2 plant grade is 225 feet (i.e., 3 feet higher than the maximum recorded lake levels). The dam was never in jeopardy of failure as: the maximum lake level was 10 feet below the dam's crest and 3 feet below the dam's compacted clay core top; and the maximum release rate never exceeded 10 percent of the 40,000 cfm design release rate. The inspectors noted that the Unit 2 UFSAR section 2.4.4.2 described the B tainter gate operation, as well as the A and B tainter gate position indications as being associated with the control room. This statement is true for the Unit 1 control room, not the Unit 2 control room as implied in the UFSAR. This was discussed with the Director of Regulatory Compliance.

Most property damage resulting from the release was at Sonoco Products Company and at residences in the Crestwood and Meadowbrook subdivisions of northern Hartsville, South Carolina . To help respond to telephone inquires involving the flooding, Unit 2 emergency response personnel operated a rumor control center for approximately eight hours on October 13. Also, on October 13, due to media interest (i.e., newspaper, radio, and TV), the licensee notified the NRC via the ENS of the situations.

New Fuel Inspection

On October 28, 1990, while observing fuel receipt inspection activities per FHP-002, Unpacking And Handling Of New Fuel Assemblies And Shipping Containers, and FMP-013, Inspection Of New Fuel Assemblies And Shipping Containers, the inspectors identified two weaknesses. The first weakness involved raising the strongback containing two fuel assemblies to the vertical position without removing sawdust and small wood chips/splinters from the upper portion of the strongback. This material apparently came from the wooden shipping supports. This created the potential for foreign material to fall onto or into the fuel assembly. This was discussed with the cognizant personnel. Visual inspection did not reveal any of this material on or in these fuel assemblies. Subsequently, personnel were observed to wipe this area prior to upending other strongbacks. The inspectors had observed that the previous fuel handling crew had consistently wiped this area with a rag prior to upending the strongback.

The second weakness was associated with non-standardized fuel inspection practices which had the potential for resulting in incomplete fuel inspections. The inspectors witnessed fuel inspections by one crew in which the inspections were consistently performed in a set order and then the applicable steps were signed off. Another crew which was observed had not established a set methodology; however, the applicable steps were also signed off after each fuel assembly inspection was completed. For example, the upper tie plate to fuel rod free space measurement was performed either just after the assembly was lifted out of the strongback or as the assembly was lowered into its storage location. In one instance, this resulted in one fuel assembly being lowered into storage without this measurement being taken. When questioned about this, the fuel vendor inspector had the assembly raised and took the measurement.

Though the fuel vendor inspector did not initially indicate that he had performed this measurement, he subsequently indicated that he had performed it as required. This difference of opinion and non-standardized work practices was discussed with management.

Spent Fuel Shipment Trail Run

On November 9, 1990, at approximately 2:45 p.m., an automobile collided with the CP&L Spent Fuel Train near McBee, South Carolina. The train was conducting a trial run for a spent fuel shipment and was heading to the HBR site. The automobile's driver incurred injuries which required hospital treatment. The train's locomotive sustained minimal damage and the empty spent fuel casks were not affected. Officials from the South Carolina Emergency Preparedness Division and South Carolina Law Enforcement Division were aboard the train. The Darlington and Chesterfield County Emergency Preparedness Agencies were notified of the incident.

Hydrogen Recombiner Survey

In response to an NRC regional office memorandum dated September 26, 1990, a survey of the licensee's hydrogen recombiner system was performed. This system is not addressed by TS; however, it is described in the UFSAR, section 6.2.5.

The hydrogen recombiner, which is stored at and shared with Duke Power Company's Oconee plant, is utilized as the primary post-accident hydrogen concentration reduction system at HBR. The licensee also has a PACV system which is a Q-system available for post-accident hydrogen and pressure control. The recombiner is a skid-mounted, containment external apparatus, and is classified as a "non-Q" system. The hydrogen recombiner system ties into the PACV system and utilizes the PACV system's piping as the supply and return points for containment gases.

The piping and valves which are exclusive to the recombiner system are "designed for seismic loads", as portions of the system would be inaccessible following an accident. The recombiner is located in the new fuel handling building when installed, which is a not a harsh radiation environment. The recombiner itself is not environmentally qualified; however, the intervals are designed for anticipated radiation levels. Dose rates during recombiner operation are expected to be 20 mR/hr to 110 mR/hr, depending on whether or not shielding is installed in the building and/or on system piping.

As the recombiner is stored at Oconee, routine inspection and testing occurs there. The recombiner was on-site in 1984 during the system installation modification and for training purposes. The system engineer occasionally performs evaluations of installed equipment condition and is planning to witness future recombiner testing at Oconee.

Error In LOCA Computer Code Usage

On October 23, 1990, the licensee notified the NRC of a potential reportable event per 10 CFR 50.72 (b)(2)(i). The fuel vendor, Advanced Nuclear Fuels, informed the licensee of a user error involving computer codes which were used to perform large break LOCA analysis as required by 10 CFR 50.46. The frequency for generating and transferring data from one computer code to another was improperly specified. This resulted in one of the computer codes using information non-conservatively from previous iterations to perform its calculations. This created the potential for operation in an unanalyzed condition (i.e., the 10 CFR 50.46 ECCS performance acceptance criteria may not have been met for a large break LOCA). Additional calculations are being performed to determine if the plant had indeed operated outside of the 10 CFR 50.46 criteria. Results of this reanalysis should be available during early December 1990. This is an URI: Review LOCA Reanalysis For Compliance With 10 CFR 50.46 Criteria, 90-23-01.

Potential For Previous Operation Outside TS

On November 2, 1990, the licensee discovered and reported a condition pursant to 10 CFR 50.72 (b)(2)(iii)(D), that potentially allowed operation outside TS 3.10.2.7 requirements and the 10 CFR 50.46 ECCS performance acceptance criteria. The TS required that for power levels between 50 and 90 percent (or 0.9 x APL) the indicated axial flux difference not exceed the limits shown in Figure 3.10-5. However, an incorrect methodology was applied for interpreting the limitations of the figure when APL was less than 100 percent during cycles 10 through 13. This may have allowed the plant to unknowingly operate in an unacceptable region of the figure. The licensee is in the process of reviewing operating data for the affected cycles to determine if operation outside TS and/or 10 CFR 50.46 actually occurred. Preliminary results indicate that operation outside of TS 3.10.2.7 did not occur. This is an URI: Review Investigation Results Associated With Incorrect Application Of TS Figure 3.10-5, 90-23-02.

No violations or deviations were identified.

3. Monthly Surveillance Observation (61726)

The inspectors observed certain safety-related surveillance activities on systems and components to ascertain that these activities were conducted in accordance with license requirements. For the surveillance test procedures listed below, the inspectors determined that precautions were adhered to, the required administrative approvals and tagouts were obtained prior to test initiation, testing was accomplished by qualified personnel in accordance with an approved test procedure, test instrumentation was properly calibrated, the tests were completed at the required frequency, and that the tests conformed to TS requirements. Upon test completion, the inspectors verified the recorded test data was complete,

met TS requirements, and test discrepancies were properly identified for correction. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

EST-033	Functional Testing Of Hydraulic And Mechanical Shock Suppressors
OST-401	Emergency Diesels (slow speed start)

Flexureless Insert Installation

As delineated in IR 90-22, the licensee was scheduling control rod guide tube flexure and insert replacements with flexureless inserts. The licensee currently plans on replacing all the existing flexures and inserts , as Westinghouse is able to provide a sufficient number (53) of flexureless inserts for complete replacement during this RO. This will eliminate the potential for any additional flexure failures.

No violations or deviations were identified.

4. Monthly Maintenance Observation (62703)

The inspectors observed safety-related maintenance activities on systems and components to ascertain that these activities were conducted in accordance with TS and approved procedures. The inspectors verified that required administrative, material, radiological, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

PM-008	Emergency Diesel Generator Inspection Number 2
WR 90-ANMA1	Inspection of B EDG Engine Cooling Heat Exchangers
WR 90-APGUI	Cleaning of A EDG Neutral Ground Buss Bars
WR 90-AQY435	PM Activities on B EDG

Inspection Report 90-22 documented that A EDG had both turbocharger nozzle rings cracked and had two lower pistons with burnt tops. Inspection of the B EDG turbocharger nozzle rings and pistons did not reveal similar deficiencies.

No violations or deviations were identified.

5. Exit Interview (30703)

The inspection scope and findings were summarized on November 21, 1990, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below and in the summary. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

Item Number	Description/Reference Paragraph
90-23-01	URI - Review LOCA Reanalysis For Compliance With 10 CFR 50.46 Criteria (paragraph 2)
90-23-02	URI - Review Investigation Results Associated With Incorrect Application of TS Figure 3.10-5 (paragraph 2)

10. List of Acronyms and Initialisms

APL	Allowable Power Level
cfm	Cubic Feet Per Minute
CFR	Code of Federal Regulations
CP&L	Carolina Power & Light
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
ENS	Emergency Notification System
ESF	Engineered Safety Feature
EST	Engineering Surveillance Test
FHP	Fuel Handling Procedure
FMP	Fuel Management Procedure
HBR	H. B. Robinson
IR	Inspection Report
LCO	Limiting Condition for Operation
LOCA	Loss Of Coolant Accident
mR/hr	Millirem/hour
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
OST	Operations Surveillance Test
PACV	Post Accident Containment Vent
PM	Preventive Maintenance
PNSC	Plant Nuclear Safety Committee
RO	Refueling Outage
TS	Technical Specification
TV	Television
URI	Unresolved Item*
UFSAR	Updated Final Safety Analysis Report
W/R	Work Request