UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-269/96-02, 50-270/96-02 and 50-287/96-02

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242-0001

Docket Nos.: 50-269, 50-270 and 50-287

License Nos.: DPR-38, DPR-47 and DPR-55

Facility Name: Oconee Units 1, 2 and 3

Inspection Conducted: January 8-25, 1996

Inspectors: S. B. Rudisail 1/31/96
for P. E. Harmon, Senior Resident Inspector per telcon 1/31/96 — Date Signed

P. G. Humphrey, Resident Inspector

Approved by: R. V. Crlenjak 2/1/96
R. V. Crlenjak, Chief — Date Signed
Reactor Projects Branch 1

SUMMARY

Scope: This special inspection was conducted to review the circumstances surrounding a spent fuel assembly being inadvertently left withdrawn from the Unit 1/2 spent fuel pool rack from December 14, 1995, until January 8, 1996.

Results: An apparent violation was identified involving the inadequate control over fuel assembly movement on December 14, 1995, which resulted in a fuel assembly being left in the fuel handling mast for over three weeks.

Enclosure 1

REPORT DETAILS

Acronyms used in this report are defined in paragraph 4.0.

1.0 Persons Contacted

Licensee Employees

B. Peele, Station Manager
*E. Burchfield, Regulatory Compliance Manager
D. Coyle, Systems Engineering Manager
*J. Davis, Engineering Manager
T. Coutu, Operations Support Manager
*W. Foster, Safety Assurance Manager
*J. Hampton, Vice President, Oconee Site
*D. Hubbard, Maintenance Superintendent
C. Little, Electrical Systems/Equipment Manager
J. Smith, Regulatory Compliance
G. Rothenberger, Operations Superintendent
*R. Sweigart, Work Control Superintendent

Other licensee employees contacted included technicians, operators, mechanics, security force members, and staff engineers.

2.0 December 14, 1995, Fuel Handling Event (71707, 62703 and 93702)

2.1 Background

Oconee Units 1 and 2 have a common SFP and Unit 3 has its own separate SFP. Each SFP is a reinforced concrete pool located in its respective Auxiliary Building. New and spent fuel assemblies are stored inside individual storage cells within the pool storage racks. The fuel storage racks rest on the bottom of the SFP. Spent fuel assemblies are manipulated within the SFP via a fuel handling bridge equipped with a fuel handling mechanism and fuel grapple. This bridge spans the SFP and permits access to any one of the storage rack positions. A description of the SFPs, the SFP Cooling Systems, and the Fuel Handling System is described in Chapter 9 of the Oconee FSAR.

A SSF exists at ONS as a standby system for use under extreme emergency conditions. It is provided as an alternate means to achieve and maintain hot shutdown conditions for up to 72 hours on all three units following postulated fire, sabotage, or flooding events. Loss of all other station power is assumed for each event. The SSF is designed in part to maintain a minimum water level above the reactor core and maintain RCP seal cooling. RCS inventory and seal cooling is provided by the SSF RCMU pumps (one per unit). The Unit 1 and 2 RCMU pumps take suction from the shared Unit 1/2 SFP. The Unit 3 RCMU pump takes suction from the Unit 3 SFP. Each affected unit's RCMU pump draws 29 gpm from its corresponding SFP.

SFP cooling is assumed to be lost at the start of an SSF event. Since SFP cooling is not available, the temperature of the pool begins to increase due to decay heat generated by the fuel contained in the pool. The initial temperature of the pool, the mass of water contained in the pool, and the rate of decay heat generation will determine how fast the temperature of the water in the pool increases. The rate of decay heat generation depends on the amount of fuel burn up that occurred prior to removing the fuel from the core, the amount of time the spent fuel has been subcritical, and the amount of spent fuel contained in the pool. In any case, SFP temperature will reach the boiling point well before 72 hours elapse. This boiling, in conjunction with the water being removed by the RCMU pumps, decreases the SFP level. The licensee does not take any credit for water which might be returned to the SFP via the RCMU system recirculation line, the SSF letdown line, or condensation of steam in the SFP room.

Based on the thermal hydraulic analysis of the SFP racks and NPSH requirements of the RCMU pumps, the licensee has determined that the water level in the SFP should not drop below one foot above the top of the fuel assemblies in 72 hours (reference preliminary calculation OSC-619). NRC Inspection Report 50-269,270,287/94-31 identified concerns with the failure of the licensee to fully account for the high radiation levels (approximately 2,000,000 Roentgens per hour) near the SFP when the water level drops to one foot above the top of the spent fuel. This issue is still under NRC review and is being tracked under URI 50-269,270,287/94-31-06.

2.2 Fuel Handling Event and Related Issues

On the morning of December 14, 1995, a Reactor Engineer contacted the Fuel Handling Supervisor to request support in an inspection of a fuel assembly in the SFP. This inspection was part of an ongoing root cause investigation into minor damage of a fuel assembly grid strap which had occurred during the Unit 1 EOC 16 defueling evolution. The request was initially denied due to the scheduled work load of the Maintenance fuel handlers. Later that morning, due to a work delay, the fuel handling supervisor informed the Reactor Engineer that Maintenance could support the fuel inspection after all. The Maintenance fuel handler and the Reactor Engineer briefly discussed the fuel inspection, but no formal pre-job brief was conducted. The fuel assembly inspection was essentially viewed and treated as filler or non-scheduled work.

At approximately 1:00 p.m., on December 14, 1995, the fuel handler raised fuel assembly NJ05T8 into the refuel bridge mast while the Reactor Engineer video taped it. At the Reactor Engineer's direction, the fuel handler moved the fuel assembly to an area in the pool where the video camera could more effectively view the assembly. This fuel assembly was then returned to its proper location and lowered back into the rack. The Reactor Engineer then decided to inspect another assembly for further comparison of minor scratches on the lower assembly plenum.

Assembly NJ06E7 was selected. The fuel handler traversed the bridge and trolley to the SFP rack location for assembly NJ06E7, grappled the assembly and raised it to within one foot of the top of the mast. After raising the assembly into the mast, the fuel handler turned off the hydraulic pump, which mechanically locks the grapple in the engaged position. Fuel handlers routinely turn off the hydraulic pump because of previous experiences with hydraulic line leaks and failures. The Reactor Engineer informed the fuel handler that his inspection was complete. The fuel handler then left the bridge to assist the Reactor Engineer in removing the video camera. The fuel handler and the Reactor Engineer then reviewed the video tape of the fuel assembly. After confirming that the video was adequate, the fuel handler returned to the bridge and secured power to the bridge. Neither individual recognized that the fuel assembly was still withdrawn in the mast. The activity was performed without the use of a procedure and at the direction of the Reactor Engineer, who was performing the video taping and acting as the independent verifier and spotter.

At approximately 11:00 a.m., on January 8, 1996, the same individual that had operated the SFP fuel handling bridge on December 14, 1995, was preparing to use bridge again. The individual turned the power on and noticed on the bridge control panel that the indicated weight on the fuel lifting hook was what would be expected when a fuel assembly was being lifted. He determined that a fuel assembly had been left in the mast. At that time, he and another fuel handler decided that the bundle should not be in the mast and lowered it into its position in the rack, and then notified the fuel handling manager.

On January 8, 1996, at approximately 3:00 p.m., the resident inspectors were notified of the event. The inspectors reviewed the circumstances of the two separate fuel handling evolutions. Procedures OP/0/A/1506/01, Fuel And Component Handling, and OP/0/A/1503/09, Documentation Of Fuel Assemblies And/Or Component Shuffle Within A Spent Fuel Pool, were inadequate in that specific steps were not defined to accomplish raising, repositioning, inspection, and lowering the assembly back into its proper location in the SFP during the evolution on December 14, 1995. Therefore, this is being identified as Apparent Violation 269,270,287/96-02-01, Inadequate Control Over Fuel Assembly Movement.

At approximately 6:00 a.m., on January 9, the inspectors reviewed the SPOC manager's log and noted that the event had not been documented and the SPOC manager was not aware of the incident. The inspectors then reviewed the control room operator's log and learned that the event had not been logged, and the control room operators (ROs and SROs) were not aware of the event.

On the evening of January 8, 1996, the licensee initiated a SEIT to review the incident. The team exited on January 12, 1996, with several

preliminary findings and concerns. The SEIT concluded that there were two principal root causes for the event:

- The fuel bridge operator did not apply appropriate self-checking measures during the December 14, 1995, fuel manipulation
- Management had not clearly defined expectations for formality in all aspects of the fuel handling process

Other SEIT findings included:

- The event was improperly scheduled and planned
- Clear lines of responsibility were not defined
- Procedures were inadequate and were not followed
- The pre-job briefing was inadequate
- There was no written guidance for the evolution.

In addition, the team identified that the plant response to the event was inadequate in that the assembly was lowered back into the fuel storage rack without notification to supervision, plant management, or the control room; notification to the NRC residents was not timely, and the 10CFR 50.72 notification made on January 9, 1996, should have been made earlier.

2.3 Corrective Actions

The licensee suspended all fuel handling activities until the evaluation and recommendations from the SEIT have been formalized and corrective actions implemented.

2.4 Recent History of Fuel Handling Errors

Under Enforcement Action 94-104 (dated August 4, 1994) the licensee was cited for fuel handling activities when a fuel bundle was placed in the wrong position in the reactor vessel on May 25, 1994. That citation resulted in a civil penalty in the amount of $15,000.00 (fifteen thousand dollars). It was the fourth citation in four years for failure to maintain adequate control of fuel assemblies in the SFP and the Reactor Vessel during core offload and reload activities. Also cited in Enforcement Action 94-104 was a second violation involving the movement of fuel assemblies to different locations within the reactor core without a procedure.

The licensee's response to the second violation recognized that the cause for that violation was in part due to an insufficient awareness

that ANY fuel movement required detailed instructions. However, the corrective actions were limited to requiring procedures for the placement of fuel in the core.

2.5 Significance of the Event

The licensee evaluated an accident scenario involving the SSF where water was supplied from the SFP. The evaluation concluded that pool inventory could be depleted to where the thrice burned assembly suspended in the mast, could be uncovered. The licensee evaluation also concluded that after the assembly was uncovered, the 10 CFR, Part 100 limits could be exceeded at the site boundary. Due to this evaluation, the licensee made a 10 CFR 50.72, 1-hour notification on January 9, 1996.

Subsequently, the licensee performed a more detailed evaluation and determined that the 10 CFR, Part 100 limits would not have been exceeded. The design basis event assumes that water in the SFP could be lowered to within 1 foot above the top of the stored spent fuel. Rough calculations concluded that radiation levels in the SFP could reach approximately 900,000 Roentgens per hour during the event. The licensee has calculated that an increase of 4 percent in radiation levels above the design basis would occur as a result of the suspended assembly being out of the water when the borated water level was dropped to one foot above the stored fuel. The most recent licensee analysis also indicated that the fuel clad of the specific fuel assembly involved in the event would not be breached upon being uncovered. However, a different assembly might in fact have experienced clad failure, which would result in release of the fuel assembly gap activity.

3.0 Exit Interview

The inspection scope and findings were summarized on January 25, 1996, with those persons indicated by an asterisk in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results. A listing of inspection findings is provided. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Item Number	Status	Description and Reference
Apparent Violation 269,270,287/96-02-01	OPEN	Inadequate Control Over Fuel Assembly Movement (paragraph 2.2).

4.0 Acronyms

EOC	End-Of-Cycle
FA	Fuel Assembly
FSAR	Final Safety Analysis Report
GPM	Gallons Per Minute

NPSH	Net Positive Suction Head
NI	Nuclear Instrument
OSC	Oconee Site Calculation
RCMU	Reactor Coolant Makeup
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RO	Reactor Operator
SEIT	Significant Event Investigation Team
SPOC	Single Point Of Contact
SRO	Senior Reactor Operator
SFP	Spent Fuel Pool
SSF	Standby Shutdown Facility
URI	Unresolved Item

factors in arriving at the appropriate severity level will be dependent on the circumstances of the violation. However, if a licensee refuses to correct a minor violation within a reasonable time such that it willfully continues, the violation should be categorized at least at a Severity Level IV.

D. Violations of Reporting Requirements

The NRC expects licensees to provide complete, accurate, and timely information and reports. Accordingly, unless otherwise categorized in the Supplements, the severity level of a violation involving the failure to make a required report to the NRC will be based upon the significance of and the circumstances surrounding the matter that should have been reported. However, the severity level of an untimely report, in contrast to no report, may be reduced depending on the circumstances surrounding the matter. A licensee will not normally be cited for a failure to report a condition or event unless the licensee was actually aware of the condition or event that it failed to report. A licensee will, on the other hand, normally be cited for a failure to report a condition or event if the licensee knew of the information to be reported, but did not recognize that it was required to make a report.

V. Predecisional Enforcement Conferences

Whenever the NRC has learned of the existence of a potential violation for which escalated enforcement action appears to be warranted, or recurring nonconformance on the part of a vendor, the NRC may provide an opportunity for a predecisional enforcement conference with the licensee, vendor, or other person before taking enforcement action. The purpose of the conference is to obtain information that will assist the NRC in determining the appropriate [illegible] enforcement action, such as: (1) A [illegible] common understanding of facts, root causes and missed opportunities [illegible] associated with the apparent violations, (2) a common understanding of [illegible] corrective action taken or planned, and (3) a common understanding of the significance of issues and the need for lasting comprehensive corrective action.

If the NRC concludes that it has sufficient information to make an informed enforcement decision, a conference will not normally be held unless the licensee requests it. However, an opportunity for a conference will normally be provided before issuing an order based on a violation of the rule on Deliberate Misconduct or a civil penalty to an unlicensed person. If a conference is not held, the licensee will normally be requested to provide a written response to an inspection report, if issued, as to the licensee's views on the apparent violations and their root causes and a description of planned or implemented corrective action.

During the predecisional enforcement conference, the licensee, vendor, or other persons will be given an opportunity to provide information consistent with the purpose of the conference, including an explanation to the NRC of the immediate corrective actions (if any) that were taken following identification of the potential violation or nonconformance and the long-term comprehensive actions that were taken or will be taken to prevent recurrence. Licensees, vendors, or other persons will be told when a meeting is a predecisional enforcement conference.

A predecisional enforcement conference is a meeting between the NRC and the licensee. Conferences are normally held in the regional offices and are not normally open to public observation. However, a trial program is being conducted to open approximately 25 percent of all eligible conferences for public observation, i.e., every fourth eligible conference involving one of three categories of licensees (reactor, hospital, and other materials licensees) will be open to the public. Conferences will not normally be open to the public if the enforcement action being contemplated:

(1) Would be taken against an individual, or if the action, though not taken against an individual, turns on whether an individual has committed wrongdoing;

(2) Involves significant personnel failures where the NRC has requested that the individual(s) involved be present at the conference;

(3) Is based on the findings of an NRC Office of Investigations report; or

(4) Involves safeguards information, Privacy Act information, or information which could be considered proprietary;

In addition, conferences will not normally be open to the public if:

(5) The conference involves medical misadministrations or overexposures and the conference cannot be conducted without disclosing the exposed individual's name; or

(6) The conference will be conducted by telephone or the conference will be conducted at a relatively small licensee's facility.

Notwithstanding meeting any of these criteria, a conference may still be open if the conference involves issues related to an ongoing adjudicatory proceeding with one or more intervenors or where the evidentiary basis for the conference is a matter of public record, such as an adjudicatory decision by the Department of Labor. In addition, with the approval of the Executive Director for Operations, conferences will not be open to the public where good cause has been shown after balancing the benefit of the public observation against the potential impact on the agency's enforcement action in a particular case.

As soon as it is determined that a conference will be open to public observation, the NRC will notify the licensee that the conference will be open to public observation as part of the agency's trial program. Consistent with the agency's policy on open meetings, "Staff Meetings Open to Public," published September 20, 1994 (59 FR 48340), the NRC intends to announce open conferences normally at least 10 working days in advance of conferences through (1) notices posted in the Public Document Room, (2) a toll-free telephone recording at 800–952–9674, and (3) a toll-free electronic bulletin board at 800–952–9676. In addition, the NRC will also issue a press release and notify appropriate State liaison officers that a predecisional enforcement conference has been scheduled and that it is open to public observation.

The public attending open conferences under the trial program may observe but not participate in the conference. It is noted that the purpose of conducting open conferences under the trial program is not to maximize public attendance, but rather to determine whether providing the public with opportunities to be informed of NRC activities is compatible with the NRC's ability to exercise its regulatory and safety responsibilities. Therefore, members of the public will be allowed access to the NRC regional offices to attend open enforcement conferences in accordance with the "Standard Operating Procedures For Providing Security Support For NRC Hearings And Meetings," published November 1, 1991 (56 FR 56251). These procedures provide that visitors may be subject to personnel screening, that signs, banners, posters, etc., not larger than 18" be permitted, and that disruptive persons may be removed.

Members of the public attending open conferences will be reminded that (1) the apparent violations discussed at predecisional enforcement conferences are subject to further review and may be subject to change prior to any resulting enforcement action and (2) the statements of views or expressions of opinion made by NRC employees at predecisional enforcement conferences, or the lack thereof, are not intended to represent final determinations or beliefs.

Persons attending open conferences will be provided an opportunity to submit written comments concerning the trial program anonymously to the regional office. These comments will be subsequently forwarded to the Director of the Office of Enforcement for review and consideration.

When needed to protect the public health and safety or common defense and security, escalated enforcement action, such as the issuance of an immediately effective order, will be taken before the conference. In these cases, a conference may be held after the escalated enforcement action is taken.

VI. Enforcement Actions

This section describes the enforcement sanctions available to the NRC and specifies the conditions under which each may be used. The basic enforcement sanctions are Notices of Violation, civil penalties, and orders of various types. As discussed further in Section VI.D, related administrative actions such as Notices of Nonconformance, Notices of Deviation, Confirmatory Action Letters, Letters of Reprimand, and Demands for Information are used to supplement the enforcement program. In selecting the enforcement sanctions or administrative actions, the NRC will consider enforcement actions taken by other Federal or State regulatory bodies having concurrent jurisdiction, such as in transportation matters. Usually, whenever a violation of NRC requirements of more than a minor concern is identified, enforcement action is taken. The nature and extent of the enforcement action is intended to reflect the seriousness of the violation involved. For the vast majority of violations, a Notice of Violation or a Notice of Nonconformance is the normal action.

A. Notice of Violation

A Notice of Violation is a written notice setting forth one or more violations of a legally binding requirement. The Notice of Violation normally requires the recipient to provide a written statement describing (1) the reasons for the violation or, if contested, the basis for disputing the violation; (2) corrective steps that have been taken and the results achieved; (3) corrective steps that will be taken to prevent recurrence; and (4) the date when full compliance will be achieved. The NRC may waive all or portions of a written response to the extent relevant information has already been provided to the NRC in writing or documented in an NRC inspection report. The NRC may require responses to Notices of Violation to be under oath. Normally, responses under oath will be required only in connection with Severity Level I, II, or III violations or orders.

The NRC uses the Notice of Violation as the usual method for formalizing the existence of a violation. Issuance of a Notice of Violation is normally the only enforcement action taken, except in cases where the criteria for issuance of civil penalties and orders, as set forth in Sections VI.B and VI.C, respectively, are met. However, special circumstances regarding the violation findings may warrant discretion being exercised such that the NRC refrains from issuing a Notice of Violation. (See Section VII.B, "Mitigation of Enforcement Sanctions.") In addition, licensees are not ordinarily cited for violations resulting from matters not within their control, such as equipment failures that were not avoidable by reasonable licensee quality assurance measures or management controls. Generally, however, licensees are held responsible for the acts of their employees. Accordingly, this policy should not be construed to excuse personnel errors.

B. Civil Penalty

A civil penalty is a monetary penalty that may be imposed for violation of (1) certain specified licensing provisions of the Atomic Energy Act or supplementary NRC rules or orders; (2) any requirement for which a license may be revoked; or (3) reporting requirements under section 206 of the Energy Reorganization Act. Civil penalties are designed to deter future violations both by the involved licensee as well as by other licensees conducting similar activities and to emphasize the need for licensees to identify violations and take prompt comprehensive corrective action.

Civil penalties are considered for Severity Level III violations. In addition, civil penalties will normally be assessed for Severity Level I and II violations and knowing and conscious violations of the reporting requirements of section 206 of the Energy Reorganization Act.

Civil penalties are used to encourage prompt identification and prompt and comprehensive correction of violations, to emphasize compliance in a manner that deters future violations, and to serve to focus licensees' attention on violations of significant regulatory concern.

Although management involvement, direct or indirect, in a violation may lead to an increase in the civil penalty, the lack of management involvement may not be used to mitigate a civil penalty. Allowing mitigation in the latter case could encourage the lack of management involvement in licensed activities and a decrease in protection of the public health and safety.

1. Base Civil Penalty

The NRC imposes different levels of penalties for different severity level violations and different classes of licensees, vendors, and other persons. Tables 1A and 1B show the base civil penalties for various reactor, fuel cycle, materials, and vendor programs. (Civil penalties issued to individuals are determined on a case-by-case basis.) The structure of these tables generally takes into account the gravity of the violation as a primary consideration and the ability to pay as a secondary consideration. Generally, operations involving greater nuclear material inventories and greater potential consequences to the public and licensee employees receive higher civil penalties. Regarding the secondary factor of ability of various classes of licensees to pay the civil penalties, it is not the NRC's intention that the economic impact of a civil penalty be so severe that it puts a licensee out of business (orders, rather than civil penalties, are used when the intent is to suspend or terminate licensed activities) or adversely affects a licensee's ability to safely conduct licensed activities. The deterrent effect of civil penalties is best served when the amounts of the penalties take into account a licensee's ability to pay. In determining the amount of civil penalties for licensees for whom the tables do not reflect the ability to pay or the gravity of the violation, the NRC will consider as necessary an increase or decrease on a case-by-case basis. Normally, if a licensee can demonstrate financial hardship, the NRC will consider payments over time, including interest, rather than reducing the amount of the civil penalty. However, where a licensee claims financial hardship, the licensee will normally be required to address why it has sufficient resources to safely conduct licensed activities and pay license and inspection fees.

2. Civil Penalty Assessment

In an effort to (1) emphasize the importance of adherence to requirements and (2) reinforce prompt self-identification of problems and root causes and prompt and comprehensive correction of violations, the NRC reviews each proposed civil penalty on its own merits and, after considering all relevant circumstances, may adjust the base civil penalties shown in Table 1A and 1B for Severity Level I, II, and III violations as described below.