

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



Report Nos.: 50-269/95-31, 50-270/95-31 and 50-287/95-31

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

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

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

Facility Name: Oconee Nuclear Station Units 1, 2 and 3

Inspection Conducted: December 11 - 15, 1995

Inspector: *J. Merriweather* 1/2/96
N. Merriweather Date Signed

Approved by: *Chas. Casto* 1/4/96
C. Casto, Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of engineering and technical support activities, design changes and plant modifications, and follow-up on previous inspection findings.

Results:

In the areas inspected, violations or deviations were not identified.

The Main Steam Line Break detection and mitigation circuitry design change and plant modification was implemented on Unit 1 in accordance with the licensee's commitments to NRC, and the installation and testing were performed in accordance with the implementing procedures. However, a wiring error in the modification package was left undetected because of a deficient post modification test procedure. The inspector concluded that overall engineering performance was good, except in the area of post modification testing, which was considered lacking (paragraph 2.a).

Enclosure

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The backlog of Problem Investigation Process corrective actions assigned to engineering were being tracked and trended by the Corrective Action Continuous Improvement Team program. Management had assigned performance measures with a goal of zero overdue PIPs. PIPs requiring modifications to implement the corrective action are selected for implementation with operations priorities considered (paragraph 2.b).

Backlogged work orders assigned to engineering were being addressed in a timely manner and were being tracked by management for timeliness (paragraph 2.b).

The most recent self assessment of the engineering organization provided reasonable recommendations for management to improve engineering performance (paragraph 2.c).

Deviation 50-287/94-33-01, Non isolation of a temporary recorder connected to the reactor protection system was closed (paragraph 3.).

Enclosure

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *E. Burchfield, Regulatory Compliance
- *D. Coyle, Manager, Mechanical Systems Engineering
- *#J. Davis, Engineering Manager
- *T. Grant, Electrical Engineer
- *J. Hampton, Site Vice President
- *T. Ledford, Supervisor, Electrical Engineering
- B. Loftis, Supervisor, Electrical Systems and Equipment
- #C. Little, Manager, Electrical Systems and Equipment
- *#D. Nix, Regulatory Compliance
- *#J. Peele, Station Manager
- *J. Smith, Regulatory Compliance
- D. Taylor, Supervisor, Electrical Engineering
- *L. Underwood, Electrical Engineer

Other licensee employees contacted during this inspection included engineers and technicians.

NRC Employees

- *P. Harmon, Senior Resident Inspector

*Indicates attended pre-exit meeting on December 14, 1995

#Indicates attended exit meeting on December 15, 1995.

2. Engineering and Technical Support Activities (37550)

a. Design Changes and Plant Modifications

This inspection evaluated the performance of the site engineering organization in regard to the development and implementation of Nuclear Station Modification (NSM) ON-12873, " Installation of Main Steam Line Break (MSLB) Detection and Mitigation Circuitry" which was implemented on Unit 1 during the end of cycle (EOC) 16 refueling outage. This modification was implemented to resolve a safety issue involving the potential of over pressurizing the containment during a MSLB inside containment without operator action. This safety issue resulted from the licensee's reanalysis of the FSAR Chapter 15 MSLB transient.

The inspector reviewed the licensee's supplemental response to NRC for IE Bulletin 80-04 dated June 14, 1995, which provided a general description of the scope, intent, and limitations of the modifications. The licensee implemented this modification as an enhancement to the plants mitigation strategy for MSLB inside containment. This submittal states that the associated pressure transmitters, logic, and control circuitry installed by this modification for mitigation of a MSLB will

Enclosure

be safety-related, redundant and single failure proof. However, the main feedwater equipment being controlled by the new circuitry is non safety-related and is not single failure proof.

The inspector concluded that the plant modification was implemented on Unit 1 in accordance with the above licensee commitments. However, a wiring error in the modification package was left undetected because of a deficient post modification test procedure. The error was discovered during surveillance testing when the operator tried to manually start the turbine driven emergency feedwater (TDEFW) pump from the control room switch with both main feedwater pumps running. The wiring error was corrected and the TDEFW pump was successfully retested and returned to service. The details of how this issue was discovered and the inspection findings are summarized in the following paragraphs.

On December 12, 1995, during the scheduled performance of PT/1/A/0600/12, TDEFW Pump Test, the turbine driven emergency feedwater pump would not start from the control room switch. The solenoid valve which bleeds air from the actuator for valve IMS-93 was not responding to the control switch manipulations. Subsequent investigation by system engineering revealed that the recent implementation and interaction of NSM-12873 and MM-7252 resulted in the wiring problem with the TDEFW pump control circuit in that a jumper was left attached to the wrong contact. The wiring error was traced back to the installation instructions of NSM ON-12873. The wiring error and the drawings were corrected by Minor Modification OE-8718. Only one wire had to be moved to correct the wiring error.

The inspector reviewed the modification instructions and confirmed that this was the cause of the error. The reason the error was not detected during post mod testing or subsequent performance testing of the TDEFW pump was due to the fact that a portion of the circuit is defeated when the main feedwater pumps are not running. This was the plant configuration when the post modification test was performed and the test procedure did not require that this portion of the circuit be functionally tested. This resulted in the wiring error being undetected until the performance of PT/1/A/0600/12 on December 12, 1995.

The licensee documented this issue on Problem Investigation Process Report 1-095-1673 to evaluate the apparent cause and determine past operability of the TDEFW Pump. Based on discussions with appropriate licensee personnel and a review of modification package NSM ON-12873, minor modification packages OE-8718 and OE-7252, and a review of the appropriate elementary and connection drawings, the inspector concluded that the wiring error would not have prevented the TDEFW pump from automatically starting on either a loss of both main feedwater pumps or an anticipated transient without scram (ATWS) event.

Enclosure

The inspector found that Minor Modification OE-7252 made changes to the TDEFW Pump control circuit during the outage. These changes had to be coordinated such that they were installed before or in conjunction with NSM ON-12873. The inspector verified through interviewing appropriate personnel in engineering and by examining NSM ON-12873 that this Minor Mod had been properly considered during the development of NSM ON-12873. Modification engineering had been issued a copy of the Minor Mod through the normal interfaces between the plant engineering group and Modifications. However, the inspector found that the mechanical system engineer who performed the cross discipline review of NSM ON-12873 was not aware that Minor Modification OE-7252 made changes to the TDEFW Pump control circuit. In addition, NSM ON-12873 did not receive a cross discipline review by the Electrical Systems and Equipment section that implemented Minor Modification OE-7252. Notwithstanding the above, it appears that modification engineering had all the necessary information to implement the mod correctly, however, they failed to properly translate this information into the implementing instructions of NSM ON-12873 and the post modification test procedure failed to provide proper overlap testing of all the changes made to the control circuit as a result of the modification. A review of the licensee's performance over the past two years in this area did not reveal any problems with inadequate post modification testing.

The inspector concluded that engineering performance was good, except in the area of post modification testing, which was considered lacking.

Within the areas examined, no violations or deviations were identified.

b. Engineering Backlog

The inspector reviewed the status of selected engineering backlogs to determine if sufficient engineering resources and management attention were being focused to prevent the buildup of a large engineering work backlog. The inspector determined through interviews and review of appropriate documentation that the backlog of Problem Investigation Process corrective actions assigned to engineering were being tracked and trend by management as part of the Corrective Action Continuous Improvement Team (CACIT) program. Management had assigned performance measures with a goal of zero overdue PIPs. PIPs requiring modifications to implement the corrective action are selected for implementation by engineering and plant management in quarterly activation meetings with operations priorities and other factors considered. The CACIT Report for the November 1995 meeting indicated that approximately half of the PIPs open longer than 6 months were awaiting a NSM or MM to implement the corrective action. The number of open PIPs awaiting a NSM may not be a true indicator of how well the licensee identifies safety problems and implements corrective actions. The inspector concluded that the safety significance of the open PIPs must be investigated further to understand if any safety significant issues are not being corrected in a

Enclosure

timely manner. Based on the information reviewed, the inspector concluded that the licensee is effectively managing the backlog of PIP corrective actions assigned to engineering.

The inspector also found that backlogged work orders assigned to engineering were being addressed in a timely manner and were being tracked by management for timeliness.

Within the area examined, no violation or deviation was identified.

c. Engineering Self Assessment

The inspector reviewed a draft of the final report for the engineering self assessment that was completed on October 13, 1995. Although, the report was in draft, the inspector concluded that the scope of the assessment, the identified findings, and proposed recommendations provided a reasonable basis for management to improve engineering performance. No concerns were identified in this area.

3. Follow-up on Previous Inspection Findings (92701)

(Closed) Deviation 287/94-33-01, Non Isolation of a Temporary Recorder Connected to the Reactor Protective System.

The NRC identified that Temporary Modification (TM) 1133 connected a multi-channel chart recorder to Unit 3 reactor protective system (RPS) Channel C without electrical isolation as required by the Final Safety Analysis Report Section 7.2.3.3. The licensee responded to the Notice of Deviation in a letter dated December 6, 1994. The inspector verified that the corrective actions described in the submittal had been completed. This deviation is closed.

4. Exit Interview

The inspection scope and findings were summarized on December 14 and 15, 1995 with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in details the results, including the status of the item listed below. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
287/94-33-01	Closed	Deviation - Non isolation of a temporary recorder connected to the reactor protective system (paragraph 3).

Enclosure