



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report Nos. 50-269/82-04, 50-270/82-04 and 50-287/82-04

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

Facility Name: Oconee Nuclear Station

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

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

Inspection at Oconee site near Seneca, South Carolina

Inspectors: W. Orders *A. Ignatonis for* 3/5/82
 Date Signed

A. Ignatonis *A. Ignatonis* 3/5/82
 Date Signed

Approved by: J. C. Bryant *J. C. Bryant* 3/5/82
 J. C. Bryant, Section Chief
 Division of Project and Resident Programs
 Date Signed

SUMMARY

Inspection on January 10 - February 10, 1982

Areas Inspected

This routine, announced inspection involved 184 inspector-hours on site in the areas of operations safety verification, surveillance testing, maintenance activities, refueling operations, and TMI action item verification.

Results

Of the five areas inspected, no violations or deviations were identified in four areas; one item of noncompliance was found in one area (Violation-Failure to secure equipment hatch during fuel handling (270/82-04-01)).

DETAILS

1. Persons Contacted

Licensee Employees

- *J. E. Smith, Station Manager
- *J. M. Davis, Superintendent of Maintenance
- *J. N. Pope, Superintendent of Operations
- *T. B. Owen, Superintendent of Technical Services
- *T. Cribbe, Licensing and Projects Engineer

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

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on February 10, 1982, with those persons indicated in paragraph 1 above. The violation as described herein was discussed with and acknowledged by management. The unresolved item, LPSW-256 was also discussed.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 12.

5. Plant Operations

The inspector reviewed plant operations throughout the report period, January 10 - February 10, 1982 to verify conformance with regulatory requirements, technical specifications and administrative controls. Control room logs, shift supervisors log, shift turnover records and equipment removal and restoration records for the three units were routinely perused. Interviews were conducted with plant operations, maintenance, chemistry, health physics, and performance personnel on day and night shifts.

Activities within the control rooms were monitored during all shifts and at shift changes. Actions and/or activities observed were conducted as prescribed in the Oconee Station Directives. The complement of licensed

personnel on each shift met or exceeded the minimum required by technical specifications. Operators were responsive to plant annunciator alarms and appeared to be cognizant of plant conditions.

Plant tours were taken throughout the reporting period on a routine basis. The areas toured included but, were not limited to the following:

Turbine Building

Auxiliary Building

Units 1, 2, and 3 Electrical
Equipment Rooms

Units 1, 2, and 3 Cable
Spreading Rooms

Station Yard Zone within the
protected area

Unit 2 Reactor Building

During the plant tours, ongoing activities, housekeeping, security, equipment status and radiation control practices were observed.

Oconee Unit 1 began the report period in a forced outage which began January 6, 1982 to repair a generator hydrogen seal leak, feedwater heater leaks and to perform several balance shots on the main turbine. After repairs were completed and the turbine was balanced to an acceptable condition, the unit was placed on line February 3, 1982. Power escalation testing was completed at the 75% power plateau and 100% power was attained on February 6, 1982.

On February 9, 1982 a steam generator tube leak of approximately 0.11 gpm magnitude was identified in the "A" generator. The unit began a controlled shutdown at 8:54 a.m. that morning, the generator was taken off-line at 2:21 p.m. and the reactor was subcritical at 3:41 p.m. As the report period ends, the unit is in cold shutdown, entering what is scheduled to be a two week outage. Details of the outage will be included in the resident inspector's next report.

Oconee Unit 2 continued what is scheduled to be a 103 day refueling/ISI outage throughout the report period. No major difficulties were experienced aside from a malfunction of the Babcock and Wilcox Automated Reactor Inspection System (ARIS), which resulted in the machine's computer controlled mast over-extending into the reactor vessel. The bottom of the mast impacted upon the vessel bottom, continued to drive such that the 5700 pound machine lifted itself from it's supports and leaned over against the

refueling bridge. Preliminary video inspection does not reveal any damage to the reactor vessel or the ARIS machine. As the report period ends, plans are underway to right the machine and analyze the reactor vessel for possible damage. The results of the analysis as well as the cause of the malfunction will be reported in a future report.

Oconee Unit 3 operated at full power throughout the report period with no major difficulties. At the end of this report period, Oconee three has operated 157 consecutive days.

6. Surveillance Testing

The surveillance tests detailed below were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy.

The completed test procedures examined were analyzed for embodiment of the necessary test prerequisites, preparations, instructions, acceptance criteria and sufficiency of technical content.

The selected tests witnessed were examined to ascertain that current written approved procedures were available and in use, that test equipment in use was calibrated, that test prerequisites were met, system restoration completed and test results were adequate.

The selected procedures perused attested conformance with applicable Technical Specifications, they appeared to have received the required administrative review and they were performed within the surveillance frequency prescribed.

<u>Procedure</u>	<u>Title</u>
PT/1/A/600/10	RCS Leakage
PT/0/A/610/5A	Solid State Breaker Trip Test
PT/1/A/115/02	LPSW Valve Verification
PT/0/A/200/44	Fuel Transfer System
PT/0/A/230/15	HPI Motor Cooler
PT/0/A/115/07	Reactor Building Spray
PT/1/A/115/01	CCW Valve Verification
PT/1/A/600/01	Periodic Instrument Surveillance

The inspector employed one or more of the following acceptance criteria for evaluating the above items:

10 CFR
ANSI N 18.7
Oconee Technical Specifications

Oconee Station Directive
Duke Administrative Policy Manual

Within the areas inspected, no items of non-compliance were identified, however, as identified in paragraph 12, entitled "Misaligned Valve, LPSW-256," an item concerning valve position remains unresolved.

7. Maintenance Activities

Maintenance activities were observed and/or reviewed throughout the report period to ascertain that the work was being performed by qualified personnel, that activities were accomplished employing approved procedures or the activity was within the skill of the trade. Limiting conditions for operation were examined to ensure that technical specification requirements were satisfied.

Activities, procedures, and work requests were examined to ensure that adequate fire protection, cleanliness control and radiation protection measures were observed and that equipment was properly returned to service.

Acceptance criteria employed for this review included but were not limited to:

Station Directives
Administrative Policy Manual
Technical Specifications
Title 10 CFR

Detailed below are 9 of 29 maintenance activities which were observed and/or reviewed during the report period.

<u>Work Request</u>	<u>Applicable Procedure</u>	<u>Component</u>
21290	MP/0/A/1800/1 MP/0/A/1200/2	1-HP-221
21685	MP/0/A/1600/01 MP/0/A/1800/01	2-B Seal Supply Filter
21783	MP/0/A/7200/2B	1-FDW-215
21569	IP/0/A/3006/1	1-FDW-45

21765	MP/O/A/1200/2A	1-FDW-268
61106B	MP/O/A/1200/68	2-LP-36
50261B	N/A	1-B2-RCP
21517	MP/O/A/1800/1 MP/O/A/1600/1	1-B Seal Supply
21779	MP/O/A/1310/8	1-A-RCP

Within the areas inspected, no violations were identified.

8. HPI Piping Cracks

On February 5, 1982, Oconee Nuclear Station was made aware of make-up system piping cracks which had been identified on Crystal River 3. The cracks had been identified during the performance of a visual inspection of the make-up system, to identify the source of reactor coolant system leakage. Subsequent to becoming aware of the Crystal River cracks, the licensee performed dye penetrant tests on the applicable suspect welds on Oconee Unit 2. The results of the tests did not reveal any abnormalities. Though further analysis is currently being contemplated on Unit 2, as well as on Unit 1 during its ongoing forced outage, the extent and schedule is, at the close of this report period, uncertain.

9. Broken Holddown Springs

Subsequent to being notified on May 16, 1980 that Toledo Edison had discovered several broken holddown springs at Davis-Besse I, Duke Power began inspecting all spent fuel assemblies and core verification video tapes in order to identify similar problems at Oconee. Of 1217 assemblies inspected at that time, five assemblies were identified as having broken springs; 1D47, 1D17, 1C43, 3C33 and 1D30.

Coincident with the identification of the problem. Duke Power initiated a three-fold precautionary program to facilitate expeditious identification of broken springs. The program consisted of the following:

- (a) Increased frequency of control rod exercising
- (b) Modified loose parts monitoring practices
- (c) Entailed radio chemistry analysis intended to identify control rod damage.

Subsequent refueling outages have entailed ongoing video examinations of spent and reload fuel assemblies in order to detect the presence of more broken holddown springs. During the ongoing Unit 2 outage, four assemblies were identified as having broken springs, three of which are to be reloaded. The assemblies are reload assemblies 1K3, 1JC, 1KX and spent assembly OGO. These are the first broken holddown springs to have been identified at Oconee since May 1980.

The probable failure mechanism of the most recently identified broken holddown springs is reported to be fatigue cracking, initiating at an existing surface flaw.

The broken holddown springs in those assemblies to be reloaded will be replaced.

The precautionary and surveillance measures as previously discussed are ongoing.

The results of the safety analysis concerning the safety implications of power operations employing a core with broken springs, as reported to the NRC, does not reveal any increased risk to the public health and safety.

10. Thermal Shield Bolts

On January 22, 1982, three thermal shield bolts were observed to have broken heads during a visual inspection of the Oconee Unit 2 core support assembly. The attachment bolts for shock pad Y-2 were also discovered broken. Ultrasonic testing revealed crack indications on a total of 24 of the 96 thermal shield bolts. The apparent cause of the bolt failures, is as was the case on Oconee Unit 1, intergranular stress corrosion cracking. An evaluation was performed concerning the safety implications of the thermal shield bolt failures on Oconee Unit 1 (RO-269/81-11). The results were reported in previous correspondence, and are considered applicable to the recent Oconee 2 failures.

The thermal shield bolts will be replaced with stud and nut assemblies as they were on Oconee Unit 1. The shock pad, Y-2, has been removed, not to be replaced. B&W and Duke Power are evaluating the shock pad failure to determine cause and ultimate resolution.

The broken thermal shield bolts were inspected, their replacement was planned and at the close of the report period, 83 of the 96 replacement studs have been installed.

The resident inspector will monitor the activity and report same in his next report.

11. Equipment Hatch

On January 17, 1982 Oconee Unit 2 was at cold shutdown with defueling in progress. At 3:40 p.m. that date, it was detected that the reactor building equipment hatch, which is required by technical specification 3.8.6 to be closed and secured during fuel handling, was standing open at the bottom by $\frac{1}{4}$ " to $\frac{1}{2}$ ". Fuel handling was immediately suspended, a maintenance crew was dispatched, the equipment hatch properly sealed and defueling recommenced by 6:35 p.m.

Oconee Technical Specification 3.8.6 requires the following:

"During the handling of irradiated fuel in the reactor building at least one door on the personnel and emergency hatches shall be closed. The equipment hatch cover shall be in place with a minimum of four bolts securing the cover to the sealing surfaces."

Contrary to the above requirements, on January 17, 1982, for a period of 14 hours, fuel handling transpired on Oconee Unit 2 with the equipment hatch unsecured. This is a Violation. (270/82-04-01)

12. Misaligned Valve LPSW-256

On February 7, 1982 at 6:30 a.m. low pressure service water (LPSW) valve LPSW-256 was found throttled by approximately 50% during the performance of an LPSW valve verification test. The valve, a 10" manually operated gate, is on the outlet line of the Unit 1, "B", low pressure injection (LPI) decay heat cooler. The normal operating position of the valve is full open and is verified to be in that position pursuant to the unit pre-critical checklist. An investigation is underway in order to determine when the valve was misaligned and if, with the valve throttled, the system would have functioned as designed if called upon to do so. Pending the results of that investigation, this item will remain Unresolved. (82-04-02)

13. Equipment Misalignment

At 12:14 a.m. on January 1, 1982, Oconee Unit 1 main turbine tripped as the result of a moisture separator high level signal. Reactor power was 18%, below the 20% power level necessary to arm the Turbine Trip/Reactor Trip anticipatory trip circuitry, thus no reactor trip occurred. An I&E technician affected supposed repairs to the applicable equipment and the turbine-generator was placed on line at 12:12 p.m. that date.

At 12:44 p.m. the main turbine tripped initiating an anticipatory reactor trip from 22% power. Once again, the trip was attributed to moisture separator high level. Another I&E technician investigated the cause of the trip and detected that the level detectors controlling moisture separator level were valved out of service. The level controllers were returned to service, reactor restarted and the turbine generator placed on line at 6:56 p.m. that date.

At 7:07 p.m. the main turbine tripped again, initiating a reactor trip from 20% power. The trip was once again attributed to moisture separator high level. Although it was detected that a fitting had been inadvertently left off one of the level controllers discussed above, licensee personnel indicate that instrument air line blockage (oil residue) prevented the level controller from functioning, not the missing fitting. The instrument air lines were purged, the fitting replaced, reactor restarted and the turbine-generator was placed a on-line at 11:48 p.m.

At 2:37 p.m. on January 2, 1982 the main turbine tripped initiating an anticipatory reactor trip from approximately 27% power. The trip was attributed to a loss of-stator coolant signal. Investigation revealed the stator coolant discharge pressure switch, PS-216, was valved out of service, leading to the plant trip. PS-216 was valved back into service, and plant recovery ensued.

The above detailed events constitute an apparent disregard for sound maintenance practice. The equipment involved is not safety-related, nor did the events result in any undue risk to public safety. They do, however, reveal an area warranting immediate licensee and inspector scrutiny. Discussions with Oconee management reveals that efforts are underway to effect measures to preclude maintenance inadequacies akin to the foregoing.

The resident inspector will monitor the licensee's progress in implementing these measures.

14. TMI Action Items

Categorized below are those TMI Action Items which were required to have been implemented prior to and by January 1, 1982. Certain items such as auxiliary feedwater system short-term modifications have been at least

partially verified by the inspectors, but not previously reported. This type of item as well as others that have been completed by the licensee are addressed below, and are considered to be closed by the inspector unless indicated otherwise.

II.B.1.3 Reactor Coolant System Vent Procedures

As reported in the previous inspection report, (number 82-01), the reactor coolant system (RCS) high point vents have been installed, but are not operational on Oconee Unit 1. The same type of modifications have been partially completed on Units 2 and 3. The licensee RCS vent design and system operation is under review by NRR (NRC staff letter to the licensee dated January 18, 1982). Therefore, since the design has not yet been accepted, the licensee has not developed any new emergency procedures reflecting use of the RCS vents. However, there are plans to incorporate RCS vent information into the existing emergency procedures.

II.B.4 Training for Mitigating Core Damage

On February 4, 1982, the inspector held discussions with the licensee's training department personnel pertaining to the implementation of their program on training for mitigating core damage. The subject training program was initiated on May 6, 1981 and completed by October 21, 1981 for all licensee personnel. For the operations staff this training was included in the operator license requalification training. The course was of a three day duration followed by an administered examination as a requirement for successful completion. The inspector selectively reviewed the operator training records and verified that the operators have received and completed the required training.

The subject material covered in training consisted of all topic areas addressed in H. R. Denton's letter dated March 28, 1980 with the exception of two topic areas. They were: (1) determination of pressurizer level if all level transmitters fail, and (2) determination of letdown flow with a clogged filter (low flow). The licensee requested from B&W more details on these topics so that they can be presented in the future.

Personnel in such departments as I&C, health physics, and chemistry have also received training commensurate with their responsibilities. Their course was of eight hour duration followed by an examination. All new licensee personnel receive appropriate training. In addition, the licensee is developing a Phase II training program which will be more site specific.

II.E.1.1.1 Auxiliary Feedwater System Short-term Modifications

In response to NRR's evaluation of the auxiliary feedwater (AFW) systems, the licensee committed to perform the following modifications per their letter dated April 3, 1981:

1. Replacement of existing manual valve LPSW-138 with an air operated valve which would fail open upon loss of AC power. This will provide cooling water to the turbine driven EFP cooling water jacket upon loss of AC power.
2. Addition of a branch line upstream of valves LPSW-137 and LPSW-138 to the existing cooling water inlet to the EFP turbine oil cooler including an air over operated valve, HPSW-184.
3. Addition of a nitrogen backup system to supply air to all instrumentation associated with steam control valves MS-87, MS-126, and MS-129.

The inspector walked down the AFW system for Unit 1 and verified that the above described modifications have been implemented. The same modifications for Units 2 and 3 have already been inspected and reported in inspection report number 81-18.

II.E.1.2.1.B.2 Auxiliary Feedwater System Initiation

The inspector verified that the licensee has implemented safety grade system circuit modification on Unit 1 necessary to provide automatic initiation of the auxiliary feedwater (AFW) system. The modifications were performed through the implementation of Nuclear Station Modification 1394 work package.

The inspector reviewed the implementing procedures, work request, and field installation, and had no further questions. The same modifications have been completed on Units 2 and 3, and are reported in inspection report number 81-18.

II.K.2.10.B B&W orders -- Safety-Grade Reactor Trip

This item requires a safety-grade anticipatory reactor trip on loss of feedwater pumps or turbine trip for B&W designed units. The licensee's system design to meet the above requirement was approved by NRR and installed on Unit 1. The modifications were performed through implementation of Nuclear Station Modification 1489 work package.

The inspector reviewed NSM 1489, work requests, implementation procedures, and walked down the field installation for Unit 1. The inspector had no further questions.

This modification has been completed on Units 1 and 3, and is ongoing for Unit 2 during this outage.

III.D.3.3.2 Inplant Radiation Monitoring

This item, which requires the licensee to provide equipment, training, and procedures necessary to accurately determine the presence of airborne radioiodine in areas within the plant where personnel may be present during an accident, applies only to applicants for a fuel-loading license. Therefore, it is not applicable for Oconee Units 1, 2 and 3. However, similar requirements for operating plants have been met by the licensee and are reported in inspection report numbers 80-23, 80-20, 80-17 and 81-13. There was one exception in that the Emergency Count Room, which was still under construction, will be used as a backup facility for analyzing post-accident containment air samples (Inspection Report No. 81-13).

II.F.1.2.B.2 Iodine/Particulate Sampling

This item requires continuous sampling of plant gaseous effluent for post-accident releases of radioactive iodines and particulates.

The inspectors have followed up on this item in the past and have reported their findings in inspection report numbers 81-13 and 82-01. Per NRC letter to Duke Power Company dated October 15, 1981, the inspector interprets that the licensee has met the requirements of this item since NRR has reviewed DPC's submittals and stated that the licensee has no technical deviations from NRC stated positions. Therefore, this item is considered closed for all three Oconee units.

15. IE Bulletin Review

IE Bulletin 79-23, "Potential Failure of Emergency Diesel Generator Field Exciter Transformer" expressed concern on potential transformer damage or failure due to improper circuit installation. This bulletin does not apply to the Oconee units because no emergency diesel generators are currently in use. The Oconee Nuclear Station relies on two Keowee hydro units for redundant onsite power. However, this bulletin may apply to the diesel generator installed inside the Standby Shutdown Facility (SSF) which is currently under construction. Plans are to re-apply this bulletin upon completion of the SSF.