## U.S. NUCLEAR REGULATORY COMMISSION

# REGION II

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Facility:	Oconee Nuclear Station, Units 1, 2, and 3
Location: _	7812B Rochester Highway Seneca, SC 29672
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### EXECUTIVE SUMMARY

### Oconee Nuclear Station, Units 1, 2, and 3 NRC Inspection Report 50-269/98-01, 50-270/98-01, and 50-287/98-01

This team inspection covered aspects of the licensee's corrective action program as defined in Nuclear System Directive (NSD) 210; Corrective Action Program Directive, Revision 1, and other related procedures, as it applied to operations, maintenance, engineering, and plant support. The report covers a two-week period of inspection by a team consisting of resident and regional inspectors.

#### <u>Operations</u>

- Generally, problem investigation process reports reviewed by the inspection team reflected appropriate screening, operability and reportability determinations, with adequate documentation of the problem and corrective actions. The inspection team identified instances of non-compliance with Nuclear System Directive 208 which paralleled the licensee's audit findings stemming from the Oconee Recovery Plan focus on problem investigation process report quality improvements. The licensee was actively pursuing corrective actions for the previously identified problems with problem investigation process implementation. (Section 07.1)
- The reviewed licensee audits and assessments were performed in accordance with NRC regulations and the licensee's quality assurance program commitments and procedures. The audits and assessments were effective in identifying continued weaknesses and areas for improvement in problem investigation process report quality. The audit findings generally reflected those identified by the inspection team and the licensee was actively addressing the audit-related deficiencies during the inspection period. (Section 07.2)
- Plant Operations Review Committee activities were generally in compliance with selected licensee commitments and licensee administrative procedures. Related licensee-identified discrepancies had been properly addressed in the corrective action program. (Section 07.3)
- The licensee's administrative procedures for the Nuclear Safety Review Board contradicted Technical Specifications regarding review of Title 10 Code of Federal Regulations 50.59 safety evaluations. This was left unresolved pending further NRC review of licensee changes to the review process. (Section 07.4)

### Maintenance

- System and equipment reliability is a major focus area of the Oconee Recovery Plan. Newly implemented under this Plan, the Top Equipment Problem Resolution process has begun to focus attention on the resolution of a considerable number of equipment/material condition issues; some of which are long-standing. (Section M2.1)
  - Problem deficiency tags observed during plant tours, were generally only around six months old. Some of the oldest deficiency tags observed

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(October 1994 and August 1996), identified auxiliary service water (tornado) pump supply valve seat leakage and noticeable operator oil leakage. The licensee indicated that these problems, along with an auxiliary service water pump seal leak that was beginning to cause pump base corrosion, were scheduled for resolution during the upcoming Unit 2 refueling outage. (Section M2.1)

- The licensee's newly implemented program to trend and analyze cause and event code data from problem investigation process reports had yet to produce auditable results. In conjunction with the licensee's Engineering Support Program, the Failure Analysis and Trending program and its associated semi-annual Equipment History Trend Report were considered adequate tools for assisting engineering in identifying and assessing plant equipment performance trends. An in-depth review of two risk significant systems and associated components discerned that a considerable length of time passed before arriving at viable solutions for resolving repetitive problems. (Section M2.2)
- A violation of Technical Specification 6.4.1.e was identified regarding an inadequacy in maintenance procedure MP/0/A/1810/014. Specifically, the procedure did not provide sufficient instructions for limiting the amount of purge paper to be used as weld damming material. As a result, the drain line connected to the Unit 1 pressurizer surge line became blocked following welding. The licensee had previous opportunities to correct this procedural inadequacy from earlier related experiences documented in problem investigation process reports. (Section M3.1)
- The inspection team concluded that not requiring Less Significant Event Category 3 problem investigation process reports to be reviewed for generic applicability was a weakness in Nuclear Site Directive NSD 208 and the problem investigation process. (Section M3.1)
- Continuing problems in the area of Technical Specification surveillance tracking and scheduling have not been resolved through the corrective action program. The inspection team identified a number of clerical errors and the licensee has documented problems with the tracking or completion of surveillance activities in a number of problem investigation process reports. Accordingly, more licensee management attention is warranted in this area. (Section M7.1)

#### Engineering

• The Failure Analysis and Trending Program and Equipment History Trend Reports for the evaluation of equipment performance were adequate. However, the inspection team identified examples of incorrect documentation of engineering responses regarding failure analysis of certain equipment. Accordingly, more attention to detail is warranted in compiling engineering review comments in this area. (Section E2.1)

- The inspection team concluded that the licensee conducted good reviews during Phase 1 of the voluntary Updated Final Safety Analysis Report Review Project. The licensee appropriately captured the majority of identified UFSAR discrepancies into its corrective action program and added those that were identified by the inspection team. One inspector followup item was identified for further evaluation of startup thermal transient number 23, associated with the reactor coolant system, and incorporation of the related calculations into fatigue analyses. (Section E7.1)
- The Self-Initiated Technical Audit of the High Pressure Injection and Low Pressure Injection systems and the High Pressure Injection System Reliability Study were thorough and detailed efforts that effectively identified equipment and programmatic issues, as well as provided pertinent recommendations. These recommendations were appropriately captured in the licensee's corrective action program. (Section E7.2)
  - The inspection team concluded that operating experience information reviewed by the team was being processed in accordance with the licensee's procedures. However, as indicated by the violation identified in Section M3.1 of this inspection report, not all of the corrective actions identified through the operating experience program reviews were being implemented by the Oconee site. Findings from assessments of the operating experience program were documented and tracked in the licensee's corrective action program. (Section E7.3)

#### Report Details

### Summary of Plant Status

Unit 1 began the inspection period in hot shutdown on January 26, 1998, due to continuing problems with the control rod drive system and was reduced to cold shutdown on January 27, 1998, because of a leaking drain line on the pressurizer surge line. The unit remained in cold shutdown for the remainder of the period.

Unit 2 operated at 100% power for the duration of the inspection period.

Unit 3 operated at 100% power for the duration of the inspection period.

### Review of Updated Final Safety Analysis Report (UFSAR) Commitments

While performing inspections discussed in this report, the inspection team reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspection team verified that the UFSAR wording was consistent with the observed plant practices, procedures, and parameters. (See Section E7.1 for inspection findings related to the licensee's UFSAR Review Project.)

#### I. Operations

- 07 Quality Assurance in Operations
- 07.1 Problem Identification and Resolution
  - a. <u>Inspection Scope (40500, 71707)</u>

The inspection team reviewed the licensee's process for identifying, documenting, and responding to problems, as established under Nuclear System Directive (NSD) 208, Problem Investigation Process (PIP), Revision 16, dated November 17, 1997.

#### b. <u>Observations and Findings</u>

The licensee's method for documenting and resolving identified problems is the PIP report. Because identified problems varied in significance. each PIP report is screened, with respect to established significance criteria (category 1 - 4), to differentiate between the more significant events (MSE) and the less significant events (LSE). In accordance with NSD 208, a MSE (category 1 or 2) requires a root cause analysis and programmatic corrective actions to prevent recurrence. By comparison, a LSE category 3 only requires an apparent cause and corrective actions to fix the identified problem; thereby, providing a reasonable assurance of preventing recurrence. Category 4 LSEs do not require any additional corrective actions. To assure sufficient information is provided, operability issues have not been overlooked, and consistency is maintained in significance categorization, NSD 208 requires each PIP report to be reviewed by a Centralized Screening Team (CST). The CST is also tasked with assigning the group(s) responsible for evaluating the cause and resolution, as appropriate. Any necessary evaluations and corrective actions are addressed and concurred upon accordingly in the PIP report. In order to assess this process, the inspection team interviewed the Safety Review Group (SRG) site PIP coordinator and group PIP coordinators from Maintenance and Mechanical Systems Engineering; attended several CST PIP report screening meetings and other management meetings where PIP reports are discussed; followed through portions of the process for certain issues that occurred during the inspection period; assessed the disposition of findings from assessments and audits (e.g., SRG, Institute of Nuclear Power Operations (INPO), Nuclear Safety Review Board (NSRB), Self-Initiated Technical Audits (SITA)); and reviewed numerous PIP reports. Generally, PIP reports reviewed by the inspection team reflected appropriate screening, operability and reportability determinations, adequate problem documentation and proposed or actual corrective actions. Some areas for attention and associated findings from the inspection team's assessment were as follows:

<u>Problem Identification</u> - Appendix O of NSD 208 indicates that the findings or recommendations from group assessments, as well as management attention items, observations and conclusions from NSRB meetings, be captured in a PIP report for appropriate corrective action. Addressed below are inspector identified examples where this was not done:

- Out of the 14 issues applicable to Oconee from the March 1997 NSRB meeting minutes, 1 of 6 management attention items and 7 of 8 observations or conclusions were not captured in a PIP report.
- Neither of the two management attention items nor any of the observations or conclusions from the July 1997 NSRB meeting minutes were included in a PIP report.
- None of the observations or conclusions from the September 1997 NSRB meeting minutes were captured in a PIP report.
- As discussed in Section 07.3, a finding from SRG assessment SA-97-45, which could result in site specific changes to NSD 308. Plant Operations Review Committee Review Requirements, was not captured in a PIP report indicating its applicability to Oconee until identified by the inspection team.

Aside from the above findings related to NSD 208, Appendix O, the inspection team found no other concerns related to problem identification in the PIP report process. The licensee's threshold for PIP report initiation was adequately established to facilitate the identification and correction of low level issues or potential precursors to more significant events.

<u>Operability Determinations</u> - NSD 208 required that any PIP report requiring a technical evaluation for operability be classified as a MSE. The operability determination would be completed in accordance with NSD 203, Operability. If the documented operability determination showed the system to be operable, then the PIP report could be classified as a LSE. Revision 9 of NSD 203, dated December 30, 1997, provided specific guidelines and requirements for operability determination related to timeliness, engineering evaluation considerations, and overall evaluation considerations. The NSD differentiated between "current" operability evaluations and "past operability evaluations" and provided timeliness guidelines for both. Generally, evaluations of systems, structures, or components for current operability should be completed within 72 hours per the NSD, while those only being evaluated for past operability (to support NRC reporting requirements in 10 CFR 50.73) were given a guideline of 30 working days for completion. The NSD also allowed that while a verifiable technical basis for past operability determinations must be provided, engineering conservatism may be decreased for past operability evaluations because there would be no attendant duty of protecting the public. The inspection team verified that revision 9 of NSD 203 incorporated recent guidance adopted by the NRC as described in NRC Generic Letter 91-18, Revision 1.

The inspection team selected and reviewed several operability determinations, including those documented in PIP reports 3-097-0216, 2-097-0069, and 0-097-0710. The PIP reports were appropriately categorized as MSEs and downgraded to LSEs when warranted. In general, operability evaluations were documented adequately with proper references to external calculations or documents containing engineering assumptions. In a few cases, however, the inspection team noted a lack of continuity of information provided in the PIP report to support the operability determinations. Further discussions with engineers were required to fill in the missing or implied information. The inspection team informed licensee personnel that this was an area that warranted further scrutiny since the PIP reports and associated operability evaluations served as records of these activities.

The inspection team found cases where the timeliness for meeting NRC reporting requirements was not always well-established. For PIP report 0-097-0710, regarding low temperature over-pressure protection (LTOP) inoperability, a second train of LTOP was determined to be inoperable on March 3, 1997, when the action to perform a "current" operability evaluation had been assigned six days earlier on February 26. Further, it was not reported to the NRC in accordance with 10 CFR 50.72 until April 17, 1997. These activities appeared to be in contrast with requirements contained in NSD 203. However, upon further review and discussions with licensee personnel, the inspection team learned that the previous philosophy for current operability determinations was based on 72 working hours, allowing time off for weekends. This philosophy has since been revised to require continuous off-hours pursuit of operability resolution. In accounting for the delayed report to the NRC, the licensee had established compensatory measures as allowed in Technical Specification 3.1.2.9.5.c for the second inoperable train of LTOP. This action allowed the licensee (per its program) to pursue operability and reportability from a "past" inoperable standpoint, and make subsequent reports accordingly. The NRC report associated with this issue was later retracted when further calculations were performed using up-to-date pressure limits.

<u>PIP Screening</u> - As indicated above, NSD 208 requires each PIP report to be reviewed by the CST in order to assure that sufficient information is provided, operability issues have not been overlooked, and consistency is maintained in significance categorization. Accordingly, NSD 208 indicates that the CST should consist of a representative from Operations, Engineering, Maintenance and Safety Review, with others as determined appropriate. Inspector identified screening-related findings are listed below:

- The pressurizer drain line purge paper plugging event addressed in Section M3.1 was initially screened by the CST as a category 3, but later upgraded to a category 2. This repetitive Operating Experience issue might have been initially screened a category 2 had the Maintenance organization been represented in the CST.
- Security PIP reports were presented at the two CST meetings attended by the inspection team. There was no Security representative at either of these two meetings and the inspection team noted that the subject PIPs appeared to be only receiving a "cursory" review by the CST. When asked, the CST members informed the inspection team that as a rule. Security is not represented at the CST meetings and, because of the nature of security-type issues, heavy reliance is placed on the screening/categorization made at the time a security-related PIP report is initially put in the system. From the inspection teams' review of audit report SA-97-04(ON)(RA) (addressed in Section 07.2), it was evident that the categorization of several security-related PIP reports were brought into question.
  - As allowed by NSD 208. some PIP reports categorized as level 3 could be exempted from problem evaluation and proposed resolution completion if they met certain criteria. Those PIP reports would not have an apparent cause determination performed in accordance with NSD 212. Cause Analysis. Items falling in this category were informally referred to by licensee personnel as "3-4 PIPs." The inspection team identified that PIP report 2-097-4392. documenting a conflict identified in December 1997 between a Technical Specification Surveillance refueling outage frequency due date and the next Unit 2 refueling outage, was screened as a 3-4 PIP. The inspection team noted that the PIP report contained several corrective actions. including reviewing procedures and the work management system to ensure that TS surveillance requirements were coded properly to preclude further conflicts in this area. Given continuing problems at the Oconee station with TS surveillance tracking and compliance, as well as the multitude of corrective actions specified in the PIP report, the inspection team considered that the PIP report, the inspection available to them during the week of the inspection was not available at the time the PIP was screened, but that the PIP would be recategorized to require the problem evaluation and proposed resolution fields to be completed.

<u>Documented Problem Resolution</u> - NSD 208 indicates that when closing a PIP corrective action (CA), a cross reference (e.g., nuclear station modification (NSM), minor modification (MM), work request (WR), etc.) shall be provided. In the event that the NSM, MM or WR is canceled, the PIP must be reopened (if closed) or new corrective action created (if PIP is open) to have corrective actions re-evaluated. Listed below are inspector identified instances where this was not done [note: numbers in brackets reflect the correct references]:

- Incorrect NSM numbers were provided or referenced in CAs of PIP 1-095-0513 (incomplete NSM numbers - [1]2941 and [1]2901) and PIP 4-095-0257 (unrelated canceled NSM - 52955 [52918]).
- PIP 1-095-0513 CA number 2 indicated NSM [1]2901 for corrective modifications to the 1B second stage reheater drain tank and pipe supports. This NSM was canceled on March 12, 1997 (scope incorporated into NSM [1]2941), but CA number 2 was not revised or reopened.
- PIP 5-095-0594 CA number 1 indicated resolution of leakage past valve 1LPSW-134 would be pursued by WR 96080939. This WR was canceled on June 11, 1997 (MM 9685 was established to add a valve downstream of 1LPSW-134), but CA number 1 was not revised or reopened.

The failures to revise or reopen PIP corrective actions that were addressed above, are apparently not isolated cases. This is evidenced by three other such examples identified in licensee corrective action audit SA-96-02(ON)(RA), as well as by the occurrence documented in PIP 0-098-0365 that was identified by the licensee during the inspection period.

### c. <u>Conclusion</u>

Generally, PIP reports reviewed by the inspection team reflected appropriate screening, operability and reportability determinations, with adequate documentation of the problem and corrective actions. The inspection team identified instances of non-compliance with NSD 208 which paralleled the licensee's audit findings stemming from the Oconee Recovery Plan focus on PIP quality improvements, as addressed in Section 07.2. The licensee was actively pursuing corrective actions for the previously identified problems with PIP program implementation.

### 07.2 Quality Assurance Audits and Assessments

#### a. <u>Inspection Scope (40500)</u>

Audit and assessment reports were reviewed for compliance with 10 CFR 50 Appendix B requirements, the Duke Power Company Quality Assurance Program Topical Report (Duke-1-A), the ONS Technical Specifications (TS), Nuclear System Directive (NSD) 208. Problem Investigation Process, and NSD 607, Self Assessments. These audits and assessments were performed on various corrective action program activities.

### b. Observations and Findings

The inspection team reviewed selected audits and assessments performed by the Regulatory Audit Group from the Nuclear Assessment and Issues Division, and the Safety Review Group (SRG) from the Oconee Nuclear Station (ONS) Safety Assurance Department. The following audits and assessments were reviewed:

- SA-96-06(ON)(RA), Consolidated Performance Audit
- SA-97-04(ON)(RA), Corrective Action
- SA-97-08(ON)(RA), Corrective Action
- SA-97-09(ON)(RA), Consolidated Performance Audit
- SA-97-10(ON)(SITA)(HPI/LPI), Self-Initiated Technical Audit (SITA) High Pressure Injection and Low Pressure Injection
- SA-97-21(ON)(SRG), Common Cause Analysis (97-1)
- SA-97-30(ON)(SRG), Operating Experience Data Base Use for MSE PIP Resolution
- SA-97-50(ALL)(PA), ISEG/SRG Activities
- SA-97-53(ON)(SRG), PORC Effectiveness
- SA-97-61(ONS)(SRG), In-Plant Review of: Problem Investigation Process (PIP) Compliance
- SA-97-62(ALL)(PA), Operating Experience Program
- SA-97-64(ONS)(SRG), Common Cause Analysis (97-2)

During review of the audit and assessment reports. the inspection team noted that audit reports SA-97-04(ON)(RA) and SA-97-08(ON)(RA) identified findings where PIPs needed to be re-opened to provide clarification or address deviations from procedure NSD-208. Some of the licensee-identified concerns included, but were not limited to: corrective actions not being properly specified, corrective actions not being completed as stated, apparent causes not being properly addressed. PIP reports being inappropriately classified or downgraded to Category 4. and proposed resolutions not adequately addressing the problem. The inspection team noted that two of the PIP reports (4-097-0878[SEC] and 4-096-1985[SEC]) that were re-opened due to being improperly classified as Category 4 PIPs instead of Category 3 PIPs were in the Security area. The licensee initiated PIP reports to document the findings from audits SA-97-04(ON)(RA) and SA-97-08(ON)(RA) in accordance with their corrective action program. The inspection team further noted that, in addition to these two audits, other licensee assessments and indicators have found numerous examples of poor PIP quality and failure to comply with NSD 208. As a result of the findings concerning poor PIP quality, the licensee established an initiative in August 1997 to improve PIP quality as part of the overall Oconee Site Recovery Plan. This initiative was intended to raise the level of PIP quality to meet the intent of NSD 208. On August 1, 1997, the SRG within the Oconee Safety Assurance Department began a review of closed PIP activities for compliance with NSD 208. The inspection team noted that the SRG review results indicated a slight improvement in PIP quality, but the number of PIPs re-opened was still above the licensee's goal. The final goal would be

determined by an assessment performed by the General Office (corporate) audit group. The inspection team noted that the General Office assessment of PIP quality was in progress, but was not completed at the conclusion of this inspection.

c. <u>Conclusion</u>

The inspection team concluded that the audits and assessments reviewed were performed in accordance with NRC regulations and the licensee's QA program commitments and procedures. The audits and assessments were effective in identifying continued weaknesses and areas for improvement in the licensee's corrective action program concerning PIP quality. Findings identified during the audits and assessments were documented and included in the licensee's corrective action program, including those for the High Pressure Injection System Reliability Study.

### 07.3 <u>Plant Operations Review Committee</u> (PORC)

#### a. <u>Inspection Scope (40500)</u>

The inspection team evaluated the performance of the PORC for the period from June 1997, to February 1998, including compliance with selected licensee commitments (SLC) and licensee administrative procedures.

#### b. <u>Observations and Findings</u>

The inspection team reviewed SLC 16.13-2 and 16.13-3; reviewed NSD 308, Plant Operations Review Committee. Revision 3; reviewed self-assessment SA-97-45, Comparison of SLC and NSD 308 PORC Review Requirements; reviewed PORC minutes from June 23, 1997, to December 30, 1997; and attended a PORC meeting on January 30, 1998.

The inspection team found that SA-97-45 accurately described the discrepancies between the SLC and NSD 308, and these discrepancies were addressed in a PIP report. The inspection team found, however, this PIP report to be specific to the McGuire Station with no generic applicability designated. The inspection team then reviewed the PIP report (0-M97-3905) for any applicability to the Oconee Station.

Generally, the inspection team found that corrective actions stated in the McGuire PIP Report would apply to the Oconee Station because the corrective actions involved changes to NSD 308 which would be approved by all Duke Power sites. However, the inspection team found that one discrepancy addressed by PIP Report 0-M97-3905 did not apply equally to the Oconee Station and the McGuire Station. PIP Report 0-M97-3905 addressed the discrepancy regarding the SLC 16.13-2e requirement for PORC to review the investigations of incidents reportable pursuant to TS by requiring a determination of which reports were included in the requirement and a subsequent change to NSD 308. The inspection team found that determining which McGuire Station reports were included would not ensure that all Oconee Station reports would be included. This was because Oconee Station TS contained different NRC reporting requirements than did the McGuire TS. The licensee initiated Oconee PIP Report 0-098-0557 to address the discrepancy for Oconee Station.

### c. Conclusion

The inspection team concluded that Plant Operations Review Committee activities were generally in compliance with selected licensee commitments and licensee administrative procedures. Related licenseeidentified discrepancies had been properly addressed in the corrective action program.

### 07.4 <u>Nuclear Safety Review Board (NSRB)</u>

#### a. <u>Inspection Scope (40500)</u>

The inspection team assessed the performance of the NSRB for the previous three meetings, including compliance with the TS.

### b. <u>Observations and Findings</u>

The inspection team reviewed TS 6.1.3; reviewed NSD 309, Nuclear Safety Review Board, Revision 5; reviewed the resumes of all NSRB members; reviewed minutes for the three most recent NSRB meetings; interviewed the NSRB alternate director; and interviewed members of the NSRB staff.

The inspection team found the NSRB activities and related program procedures to be in compliance with TS 6.1.3.1 and 6.1.3.2 regarding function and organization. The inspection team also found NSD 309 to agree with TS 6.1.3.1 and 6.1.3.2 except for the frequency of meetings. TS 6.1.3.2f required two meetings per year while NSD 309, Section 3.9.7.1 required NSRB to meet once per quarter. The NSRB held three meetings during 1997.

The inspection team found the NSRB in compliance with TS 6.1.3.3 regarding review, except for review of safety evaluations completed under 10 CFR 50.59. TS 6.1.3.3a required the NSRB to review safety evaluations completed under the provisions of 10 CFR 50.59 to verify such actions did not constitute an unreviewed safety question. TS 6.1.3.2g required a quorum of NSRB for the review functions specified in the TS. NSD 309, Section 309.10.2.1, differed from the TS in that the NSD allowed 10 CFR 50.59 safety evaluations to be reviewed by the NSRB support staff and if the staff determined any were not significant the staff was authorized to conclude no formal review by NSRB members was required.

When questioned by the inspection team, the NSRB alternate director and staff both indicated that each 10 CFR 50.59 safety evaluation was reviewed by one NSRB member with any objections or problems discussed at the full board meeting. The reviews were documented in a nuclear safety evaluation review log. The inspection team reviewed the log and found that for each 10 CFR 50.59 safety evaluation issued since July 1997 one NSRB member signed the log as having reviewed the safety evaluation. The licensee also indicated TS 6.1.3 would be relocated as part of the Improved Technical Specification Submittal and would be changed to clarify how 10 CFR 50.59 safety evaluations would be reviewed. The licensee subsequently initiated PIP report 0-G98-0025 to track the changes.

The circumstances surrounding this issue will be tracked as Unresolved Item (URI) 50-269,270,287/98-01-01, NSRB Review of 10 CFR 50.59 Safety Evaluations, pending: (1) the resolution of differences between TS 6.1.3 and NSD 309 regarding review of 10 CFR 50.59 safety evaluations; and (2) further NRC review of how NSRB members currently review 10 CFR 50.59 safety evaluations.

#### c. <u>Conclusion</u>

The inspection team identified that licensee administrative procedures for the Nuclear Safety Review Board contradicted Technical Specifications regarding review of 10 CFR 50.59 safety evaluations. This was left unresolved pending further NRC review of licensee changes to the review process.

#### II. Maintenance

## M2 Maintenance and Material Condition of Facilities and Equipment

### M2.1 <u>Material Condition of Facility</u>

a. <u>Inspection Scope (40500, 71707)</u>

The inspection team assessed material condition of the facility to gain some insight as to the effectiveness of the licensee's corrective action program to identify and correct equipment-related problems. This assessment was accomplished through walkdowns of various plant areas and by reviews of System Assessment (Health) Reports, the Operator Workaround list and the Top 15 Major Equipment Problem Resolution (MEPR) list.

#### b. <u>Observations and Findings</u>

During the course of the inspection, the inspection team conducted tours of the control rooms and various areas of the turbine building. auxiliary buildings and standby shutdown facility. In these areas of the plant, most of the hanging problem deficiency (PD) tags were only around six months old. Exceptions to this were as follows:

- February 1997 PD tag identifying the Unit 1 turbine driven emergency feedwater pump steam supply relief as leaking. [The licensee indicated that the work was done during the recent Unit 1 refueling outage, but the tag was not removed as required.]
- October 1994 and August 1996 PD tags identifying the auxiliary service water (tornado) pump condenser circulating water (CCW) supply valve CCW-99 as having a seat leak and operator oil leak that was very noticeable. The tornado pump's obvious seal leak, which was beginning to cause signs of pump base corrosion, was captured on a September 1997 PD tag. [The licensee indicated that the work was tied to the upcoming Unit 2 refueling outage.]

July 1995 PD tag identifying a cracked fuse block for the 3A CCW pump breaker. [The licensee indicated that the fuse block had been on order.]

Additionally, during tours of the Unit 3 auxiliary building, the inspection team identified what appeared to be Teflon tape on various joints of the seal water lines for the 3B and 3C low pressure injection pumps. The licensee captured this issue in a PIP report for evaluation. Further followup of this issue was accomplished by the resident inspectors and documented in Inspection Report 50-269.270.287/97-18.

As part of the licensee's focus on system and equipment reliability under the Oconee Recovery Plan, the Top Equipment Problem Resolution (TEPR) process was recently implemented. Parts of this process included the Operator Workaround and MEPR lists. A review of these two lists revealed that a considerable number of equipment material condition issues have been identified for resolution; some of which, like the CRDMs discussed in Section M2.2, have been long-standing issues. Based on the Recovery Plan, a licensee self-assessment of the TEPR process is scheduled for May 1998. Further review of this process by the resident inspection staff is currently planned for later this year.

#### c. Conclusion

System and equipment reliability is a major focus area of the Oconee Recovery Plan. Newly implemented under this Plan, the Top Equipment Problem Resolution process has begun to focus attention on the resolution of a considerable number of equipment material condition issues; some of which are long-standing.

Problem deficiency tags observed during plant tours/walkdowns. were generally only around six months old. Some of the oldest deficiency tags observed (October 1994 and August 1996), identified auxiliary service water (tornado) pump supply valve seat leakage and noticeable operator oil leakage. The licensee indicated that these problems, along with an auxiliary service water pump seal leak that was beginning to cause pump base corrosion, were scheduled for resolution during the upcoming Unit 2 refueling outage.

### M2.2 <u>Trending</u>

#### a. <u>Inspection Scope (40500)</u>

The inspection team conducted a review of the licensee's processes for identifying potentially negative trends and evaluating them for appropriate corrective actions. These processes included those established under Nuclear System Directive (NSD) 223, Trending of PIP Data, and Engineering Directives Manual (EDM) 201, Engineering Support Program, which references EDM 215, Failure Analysis and Trending.

### b. Observations and Findings

As part of the review of NSD 223, the inspection team interviewed the Safety Review Group (SRG) site trend evaluator, as well as group trend evaluators from Maintenance and Mechanical Systems Engineering. NSD 223 requires the site and group evaluators to perform quarterly PIP data trending of events and causes at the site and group levels, respectively. The site evaluator is also required to do semi-annual common cause trending, focusing on causes that involve human error or program or process deficiencies. The inspection team discussed preliminary findings and trending difficulties with the evaluators; but, since NSD 233 was implemented on September 16, 1997, the first quarterly reports were not yet issued. However, the inspectors were able to review SRG common cause analysis reports SA-97-21(ONS)(SRG) and SA-97-64(ONS)(SRG) for the periods of September 1, 1996, - March 31, 1997, and April 1, 1997, - October 30, 1997, respectively. Assessing cause code PIP data over their respective periods, these SRG reports addressed both site and individual groups with respect to human error types; human error/inappropriate action failure mode; organizational and programmatic failure mode; work process review; and key activity review. Skill-based error continued to be the leading site human error type, showing an increase in the later report from 39% to 43%. The inspection team verified that the identified problems and recommendations were captured in PIPs for corrective action resolution.

The Failure Analysis and Trending (FAT) program established under EDM 215, used equipment history records to identify problem equipment and adverse trends in equipment. Discussed in detail in Section E2.2, the inspection team found the FAT program and its associated semi-annual Equipment History Trend Report to be an adequate tool for assisting Engineering in identifying and assessing plant equipment performance trends.

To further assess the effectiveness of Engineering's trending processes, the inspection team interviewed system and component engineers and reviewed Engineering Support Program system health reports and PIPs associated with selected equipment and components from three risk significant systems (i.e., standby shutdown facility diesel, control rod drive mechanisms, and Keowee-Westinghouse DB breakers). The results of this assessment were as follows:

<u>Standby Shutdown Facility (SSF)</u> - SSF reliability appeared as item number 11 on the Top 15 Major Equipment Problem Resolution List. Reflective of this, the SSF diesel generator (DG) A super system (DG and supporting equipment and systems) was declared (a)(1) under the maintenance rule on June 10, 1997, due to a number of non-repetitive Maintenance Preventable Functional Failures (MPFFs) and potentially falling below the maintenance rule availability goal. From a review of PIPs over the last four years, the inspection team discerned a potentially negative trend involving a March 1996 failure of the SSF DGB fuel oil return line and a June 1997 SSF DGA fuel oil primer line. Further review revealed that after the second failure, the licensee determined that these lines were susceptible to cracking (caused by vibration induced high cycle fatigue) at around 300 hours of DG operation and replaced the fuel oil return and primer lines on both diesels. The inspection team verified that DG run times were being tracked to ensure integrity of these newly installed lines until minor modification ONOE-10584 is implemented to install flexible type lines. Scheduled for a non-outage period in March 1998, ONOE-10584 is one of several prerequisites addressed in PIP 1-097-1746 to return the SSF DGA super system to (a)(2) status under the maintenance rule. Similarly, various unrelated SSF heating ventilation and air conditioning (HVAC) system refrigerant leaks identified in PIPs over the last two years were collectively addressed in PIP 1-097-1746 for appropriate resolution.

Control Rod Drive Mechanisms (CRDMs) - CRDM reliability was item number 3 on the Top 15 Major Equipment Problem Resolution List. Based on a review of CRDM-related PIPs over the last five years. it became apparent that an adverse trend existed with respect to rod/group out limit problems. A considerable number of these PIPs concerned losses of a group's rod out limit, resulting in unnecessary integrated control system (ICS) runbacks that challenged the plant and control room operators. In a September 1995 update to PIP 3-093-0475, reliance on operator action to terminate these unnecessary runbacks was considered acceptable due to an unrelated reduction in the ICS runback rate from 30%/min to 5%/min (and later 1%/min associated with a preplanned ICS replacement). Because of continuing problems (particularly in Unit 2), the loss of CRDM out limit was recognized on the Unit 2 control room operator workaround list in February 1997, where it remained at the time of this inspection. Minor modification ONOE-11229 (reflective of an early Three Mile Island design change) was being developed to add an asymmetric rod interlock to the ICS runback circuitry; thereby eliminating spurious runbacks caused by a loss of the group out limit. Considering the number and age of PIP reports related to CRDM rod/group out limits, the inspection team concluded that the licensee's planned permanent resolution of recurring problems had been untimely.

In addition to the out limit problems, there were also several PIPs concerning rod latching-related problems similar to the most recent occurrences in Unit 1. The subject of three different PIPs (1-097-1236, 0-097-4595 and 1-098-0259), Group 5 Rod 7 experienced latching problems on three separate occasions since April 1997; the last of which in January 1998 resulted in considerable restart delays due to CRDM replacement. Long-term plans (based on obsolescence and slow rod issues) to replace/upgrade CRDMs (including stators and position indicator tubes) under Nuclear Station Modifications 13032 and 23032, should have a positive impact on resolving these latching-related problems, as well as on reducing the actual causes for rod out limit problems.

<u>Keowee Westinghouse DB Breakers</u> - The inspection team found seven PIP reports that dealt with failures in safety-related switchgear at Keowee (KHU) during 1993 and 1994. Each of these failures involved the control power fuse or closing coil in a Westinghouse Model DB breaker. These failures were attributed to a variety of causes including component aging, improper coil, and excessive use. The last report of the seven, PIP report 0-094-1753, described an event in December 1994 where the close coil of the field breaker in KHU-1 overheated and burned out because the breaker received a close signal followed almost immediately by a trip signal.

The anti-pump logic on the breaker consisted of one auxiliary relay (X-relay) and one time delay relay (Y-timer and relay) wired

such that on a close signal the X-relay energized the breaker closing coil. When the breaker closed the Y-relay energized, which after a short time delay caused the X-relay and closing coil to deenergize. In the case described in PIP report 0-094-1753, a trip signal occurred before the Y-timer could complete its timing; therefore, the X-relay and closing coil remained energized. With the closing coil energized, the continuous current either caused the coil to overheat and burn or caused the control power fuse to fail.

One corrective action for PIP report 0-094-1753 specified a review of the X and Y-relays to resolve the problem of the closing coil remaining energized. This corrective action was proposed in January 1995 with a due date of June 1996. A later corrective action changed the due date to January 1997. A third corrective action again changed the due date to April 1998.

In June 1997. (PIP report 0-097-1927) and again in September 1997 (PIP report 0-097-2983), two more incidents occurred that involved the failure of a control power fuse or closing coil in a Keowee Westinghouse Model DB breaker. The cause of both of these incidents was attributed to a random failure of the Y-timer. In each case, the failure of the Y-timer caused the X-relay and closing coil to remain energized. A corrective action for PIP report 0-097-2983 again specified a review of the X and Y-relays to determine if the Y-timer should be replaced. The licensee's due date for this action was March 15, 1998. An augmented inspection team investigated the June event and documented findings in Inspection Report 50-269,270,287/97-11.

The inspection team found another PIP report (0-097-2362) which documented the recommendations to address the failure of the KHU-1 field flashing breaker in June 1997. This failure was a separate failure from the Y-timer failure documented in PIP report 0-097-1927, but did involve a Westinghouse breaker. PIP report 0-097-2362 recommended that all Keowee Westinghouse Model DB breakers be replaced, specifying that half be done in 1998 and the remainder in 1999. Each of these three PIP reports reached the same cause and eventually specified the same corrective action. However, two additional failures occurred before the licensee reached the correct root cause, and the corrective actions have yet to be implemented.

#### c. <u>Conclusion</u>

As reflected in the Oconee Nuclear Site Recovery Plan and Safety Review Group Assessments, the licensee has been focusing on human performance; however, their newly implemented program to trend and analysis cause and event code data from Problem Investigation Process reports had yet to produce auditable results. In conjunction with the licensee's Engineering Support Program, the Failure Analysis and Trending program and its associated semi-annual Equipment History Trend Report were considered adequate tools for assisting Engineering in identifying and assessing plant equipment performance trends. An in-depth review of two risk significant systems/components discerned that a considerable length of time passed before arriving at viable solutions for resolving repetitive problems involving losses of control rod group out limits and failures of the X/Y anti-pump relays in Keowee Westinghouse Model DB breakers.

### M3 Maintenance Procedures and Documentation

### M3.1 Maintenance Procedures/Documentation

#### a. <u>Inspection Scope (40500)</u>

The inspection team reviewed PIPs related to maintenance activities to determine if deficiencies were documented and processed in accordance with NRC regulations and licensee QA program commitments and procedures.

#### b. Observations and Findings

The inspection team reviewed PIP 1-098-0493, which was initiated to document a problem with the use of purge paper during welding activities on Unit 1. The inspection team noted that the welding was performed in accordance with maintenance procedure MP/0/A/1810/014, Valves and Piping - Welded - Removal and Replacement - Class A Through F. Revision 26, dated September 18, 1997. The inspection team reviewed the activities for compliance with 10 CFR 50 Appendix B, the Duke Power Company Topical Report (Duke-1-A), the ONS TS, and procedure NSD 208. The inspection team made the following observations:

On January 31, 1998, licensee maintenance personnel used purge paper as damming material to keep condensate water isolated to allow a weld to be completed on a drain line that was connected to the Unit 1 pressurizer surge line. After the weld was completed, attempts to flush the purge paper from the drain line on February 2, 1998, were unsuccessful because the purge paper failed to dissolve as intended. The drain line was subsequently cut to allow retrieval of the purge paper. Failure of the purge paper to dissolve was due, in part, to the excessive amount of purge paper that was used. The inspection team noted that a similar industry event had occurred in the past and was the subject of NRC Information Notice (IN) 93-63, Improper Use of Soluble Weld Purge Dam Material, dated August 11, 1993. The IN indicated that the length of the purge dam material should not be more than one pipe diameter to ensure that the material dissolved completely.

The inspection team noted that the licensee had reviewed this IN through their Operating Experience Program (OEP) and provided corrective actions for the Oconee station via PIP 0-G93-0064 dated September 8, 1993, and PIP 0-095-0200 dated February 9, 1995. Both of these PIPs specified that plant specific maintenance procedures be revised to provide instructions limiting the amount of purge paper to be used. These PIPs were initiated by the licensee's Operating Experience Assessment Section in the General Office to address IN 93-63. The inspection team noted that the ONS maintenance personnel provided a response in PIP 0-095-0200 which stated that no specific corrective actions were required as a result of IN 93-63. Similar events had occurred previously at

Oconee and the respective procedures had been changed to address the appropriate use of purge paper along with guidelines for actions to take if there was a deviation in the use of purge paper. The maintenance response referenced PIP 3-094-0270. During further review of PIP 3-094-0270, the inspection team noted that one such problem with purge paper not dissolving after being used for welding activities had occurred at Oconee Unit 3 in February 1994. The inspection team reviewed maintenance procedure MP/0/A/1810/014 and noted that the corrective actions from PIP 3-094-0270 had been incorporated into the procedure. However, the team noted that procedure MP/0/A/1810/014 did not contain the specific instructions or precautions from PIP 0-095-0200 or the IN on limiting the amount of purge paper to be used as damming material. The inspection team concluded that procedure MP/0/A/1810/014 was inadequate in that it did not provide sufficient limitations on purge paper usage. The team informed the licensee that the procedure did not meet the requirements of ONS TS 6.4.1.e and this issue would be identified as Violation (VIO) 50-269/98-01-02, Maintenance Procedure MP/0/A/1810/014 Provided Inadequate Instructions for the Use of Purge Paper as Weld Damming Material.

During further review of PIP 1-098-0493, the inspection team noted that this PIP was initially screened as a less significant event (LSE) Category 3 PIP by the centralized screening team. This classification was later changed to a more significant event (MSE) Category 2 PIP and the licensee was performing a root cause analysis of the purge paper problem. The root cause analysis had not been completed at the end of the inspection. The inspection team noted that the maintenance representative was not present at the screening committee meeting when this PIP was initially reviewed and screened as a Category 3 PIP. The inspection team considered that this PIP might have been initially classified as Category 2 instead of Category 3 if the maintenance representative had been present at the screening meeting to provide the proper perspective on this problem.

The inspection team noted that PIP 1-098-0493 stated that a generic applicability review was not required for this PIP. The inspection team questioned the basis for this statement, given that purge paper was used at the other Duke Energy Corporation nuclear plants (Catawba and McGuire). Licensee personnel indicated that, per procedure NSD 208, the statement regarding no generic applicability review being required was automatically entered for all LSE PIPs. Only MSE PIPs required a review for generic applicability. The inspection team noted that some of the issues documented as LSE Category 3 PIPs had generic implications. PIP 1-098-0493 was an example that was initially screened as a LSE Category 3 PIP which had generic implications applicable to the other two Duke nuclear plants. The inspection team reviewed the licensee's Daily OEA Review of Site and Industry Issues for the period February 2-5, 1998, and observed that PIP 1-098-0493 was not identified as a significant generic issue, even though the purge paper problem had occurred more than once at ONS and each time had resulted in delaying plant startup. The inspection team

concluded that not requiring LSE Category 3 PIPs to be reviewed for generic applicability was a weakness in NSD 208 and the PIP process. The inspection team discussed this issue with licensee SRG personnel who acknowledged that this weakness had been recognized, and stated that NSD 208 was being reviewed for possible resolution of the weakness in the next revision to NSD 208.

#### c. Conclusion

A violation of Technical Specification 6.4.1.e was identified regarding an inadequacy in maintenance procedure MP/0/A/1810/014. Specifically, the procedure did not provide sufficient instructions for limiting the amount of purge paper to be used as weld damming material. As a result, the drain line connected to the Unit 1 pressurizer surge line became blocked. The licensee had previous opportunities to correct this procedural inadequacy from earlier related experiences documented in PIP reports.

The inspection team concluded that not requiring Less Significant Event Category 3 PIPs reports to be reviewed for generic applicability was a weakness in NSD 208 and the problem investigation process.

- M7 Quality Assurance in Maintenance Activities
- M7.1 <u>Recurring Problems with TS Surveillance Completion and Tracking</u>
  - a. <u>Inspection Scope (40500)</u>

The inspection team reviewed the licensee's actions to address recurring problems in the area of TS surveillance requirement tracking and completion. The inspection team reviewed several PIP reports documenting missed surveillances or near-misses, associated corrective actions, and evaluated the licensee's implementation of its surveillance tracking program for overall effectiveness.

#### b. <u>Observations</u> and Findings

The team reviewed PIP reports 2-097-4392. 0-098-0233. K-098-0276, and 2-098-0433; all of which documented either missed surveillances or those whose next due dates would expire before the next available performance date, requiring temporary TS changes. As described in Section 07.1 of this report, PIP 2-097-4392 (generated on December 4, 1997) documented a pending conflict between surveillance due dates and the next available performance window during the planned Unit 2 refueling outage. The inspection team concluded that the PIP was inappropriately screened as category "3-4", given the multitude and complexity of issues surrounding the identified problem. During the inspection, licensee personnel indicated that the PIP would be upgraded to Category 3. Several corrective actions associated with this PIP and others were planned, including reviews of procedures and the work management system database to verify that surveillance requirements were properly flagged. The licensee generated PIP 0-098-0233 on January 15, 1998, after more examples of pending schedule and TS conflicts were identified. This PIP identified that there was not a single group that had the responsibility

for ensuring that all TS surveillances were reviewed to verify compliance. The PIP was screened as Action Category 1 (MSE) requiring a root cause evaluation to be performed to determine the fundamental causal factor for the recurring problems in this area. As indicated by the number of PIP reports, recurring problems in the area of TS surveillance tracking and scheduling have not been resolved through the corrective action program.

The inspection team reviewed the licensee's current program for scheduling and tracking completion of TS surveillance activities. The station's program for controlling surveillance activities was outlined in Oconee Nuclear Site Directive 4.1.1, Duke Power Company - Oconee Nuclear Site - Station Surveillance Program, dated May 8, 1996. The licensee primarily relied on its station Work Management System (WMS) to track and schedule these activities, as delineated in the site directive. TS surveillance requirements were flagged in the WMS to distinguish them from non-TS work activities. Site Directive 4.1.1 indicated that individual group superintendents and managers were responsible for implementation and documentation of surveillance testing assigned to their respective groups as noted in Tables 1 - 6 (of the directive).

The inspection team selected several surveillance requirements listed in Table 4, "Radiation Protection Responsibility", and checked the WMS to verify their completion. The team identified a monthly TS surveillance requirement for radiation instrument checks that had not been updated since November 1997. A semi-annual requirement to perform a radioactive sealed source leakage test had not been updated as having been performed since May 1997. Another procedure listed in Table 4 was listed in WMS as having been suspended since January 1993. The inspection team was later provided documentation demonstrating that the surveillance requirements of concern had been completed, and that the above-identified omissions were merely clerical errors. In the radiation protection area, surveillances were primarily being tracked using task sheets contained in Procedure HP/O/B/1000/54. Duke Power Company - Oconee Nuclear Station - Plant Radiological Status, which outlined the major duties and responsibilities of the radiation protection shifts. This system appeared to compensate for the tracking errors identified by the inspection team.

Other work groups, including the Chemistry organization, also relied on other means (besides the WMS) to effectively track and schedule surveillance activities. The inspection team considered the methods available to licensee personnel to track and schedule TS requirements to be numerous and could potentially be a major contributor to problems the licensee is having in this area. As mentioned above, the licensee had identified this concern as a factor in PIP 0-098-0233 for which a root cause investigation was pending at the end of the inspection.

#### c. Conclusion

Continuing problems in the area of Technical Specification surveillance tracking and scheduling have not been resolved through the corrective action program. The inspection team identified a number of clerical errors and the licensee has documented problems with the tracking or

completion of surveillance activities in a number of problem investigation process reports. Accordingly, more licensee management attention is warranted in this area.

#### III. Engineering

### E2 Engineering Support of Facilities and Equipment

### E2.1 Failure Analysis and Trending (FAT) Program

#### a. Inspection Scope (40500)

The inspection team reviewed Equipment History Trend Reports to assess the adequacy and effectiveness of the licensee's FAT program implementation.

#### b. <u>Observations and Findings</u>

The FAT Program was a tool used by engineering to identify repetitive equipment failures. The FAT program used equipment modification and maintenance records to identify problem equipment. It also provided details and processes for documenting and reviewing equipment failures.

The FAT group generated semi-annual Equipment History Trend Reports over an 18-month period from the Work Management System (WMS) based on three criteria, as listed below; reviewed the report; and sorted the items needing engineering reviews, forwarding them to the accountable engineers for review. If necessary, the accountable engineers would generate a PIP for further evaluation. The FAT group then collected the engineering responses (complete with engineering evaluation and proposed problem resolution) and added the engineering review comments to the trend report.

The inspection team reviewed Oconee Nuclear Station Units 1, 2, and 3 Equipment History Trend Reports for a period from January 1, 1996, to June 30, 1997. The reports were generated based on the plant equipment qualification (EQ) or identification numbers. The three criteria used to sort the equipment failures for review are as follows:

<u>Criteria A</u>	<u>Criteria B</u>	<u>Criteria C</u>
AFFR > .25	Increasing Failure	2 3 corrective W/Os
#W/Os> 10	Rate Over Last 2	Originated During the
# Hours >200	Trend Periods	Trend Period

Notes:

AFFR - Average Failure Frequency Ratio # W/Os - Numbers of Work Orders # Hours - Numbers of Hours Spent (Repair)

During the above review period, there were 253 items which exceeded at least one of the three criteria. The majority of them were from Criteria C. After reviewing all the items, the FAT group determined that 114 items were valid and required further engineering review.

Eighty-four items were already being addressed by a PIP or were resolved by other means or programs. Two items required further review per the FAT group. PIPs 0-97-2949 and 0-97-3323 had been issued for further evaluation of these two items. The balance was determined by the licensee to be insignificant for trending.

The inspection team reviewed the FAT group and engineering review comments and discussed them with cognizant plant personnel. The inspection team considered that the trending reports, evaluation, and resolutions were adequate reflections of equipment conditions.

During the trend report reviews, the team found that Feedwater Pump 1A, Feedwater Pump 1B, and Feedwater Pump 3B had identical responses from the same engineer. The response stated that some equipment was removed from the pumps because the equipment was not needed or no longer required for service. The inspection team reviewed descriptions of associated work orders for the pumps, but could not find where any equipment had been removed from the pumps. The FAT group personnel talked to the accountable engineer and found a minor modification that had removed the equipment from one of the three pumps. The other two pumps did not have any equipment removed during the failure analysis trending period. The FAT group personnel explained, after discussions with the accountable engineer, that the response actually applied to one pump and no written engineering responses had been provided for the other two. The accountable engineer stated that he had previously informed the FAT group personnel that the trends for the other two pumps were insignificant and that no response would be provided. However, the FAT group personnel erroneously documented the same response for the other two pumps as they had for the first, because they did not have the associated required written responses from accountable engineers.

The inspection team considered the FAT group's practices to be poor in this case because they did not obtain actual written responses from the accountable engineers to support statements annotated in the trend report for the other two pumps. The team was concerned that potentially inadequate failure trending report reviews and responses from accountable engineers could impact the trending accuracy and the benefit provided by the failure trending program would be lost. The inspection team discussed this with FAT group personnel, who agreed that it was important to obtain review/evaluation comments for each item from the accountable engineers and input them appropriately into equipment failure trend reports. More attention to detail may be warranted in this area.

#### c. <u>Conclusion</u>

The Failure Analysis and Trending Program and Equipment History Trend Reports for the evaluation of equipment performance were adequate. However, the inspection team identified examples of incorrect documentation of engineering responses regarding failure analysis of certain equipment. Accordingly, more attention to detail is warranted in compiling engineering review comments in this area.

### E7 Quality Assurance in Engineering Activities

#### E7.1 <u>Review of Licensee's UFSAR Review Project Phase 1</u>

#### a. <u>Inspection Scope (40500)</u>

The inspection team reviewed the licensee's activities for the Updated Final Safety Analysis Report (UFSAR) Review Project, Phase 1, to verify the adequacy of the licensee's review and to determine if identified deficiencies were being captured in the licensee's corrective action program.

### b. <u>Observations and Findings</u>

The licensee voluntarily performed the UFSAR Review Project in order to identify and correct any inadequacy and inconsistency between the UFSAR, the current plant design, and plant design documents. This activity was being conducted in accordance with the licensee's response to Federal Register 61 FR54461 on NRC NUREG-1600, "Policy and Procedure for Enforcement Actions Departures From FSAR," published on October 18, 1996. The summary in the Federal Register on this subject stated that the Nuclear Regulatory Commission (NRC) is amending its general statement of Policy and Procedure for Enforcement Actions (Enforcement Policy) to address issues associated with departures from the Final Safety Analysis Report (FSAR).

The main purpose of this Federal Register was to grant a two-year period, starting from October 18, 1996, to encourage reactor operation licensees to conduct a detailed review and make amendments to their FSAR or UFSAR to accurately reflect the plant design and operation conditions and comply with the licenses.

The licensee submitted a response dated June 16, 1997, to the NRC. The submittal included scope, methods of verification for accuracy and completeness, resolution of discrepancies to be found, and schedule for review and implementation of the incorporation or modification. A supplemental licensee response was submitted on January 4, 1998, regarding the latest schedule for its planned completion of the review. The team reviewed Oconee Nuclear Station UFSAR Review Project Phase 1. UFSAR Chapter 5 Review, dated November 6, 1997. Chapter 5 was the only chapter reviewed during Phase 1 in order to determine the feasibility of the schedule; evaluate time and resource expenditures; and determine thoroughness, accuracy, and completeness for lessons learned to be applied during future reviews on other chapters. The review was performed by Duke Engineering and Service (DE&S), Atlanta, Georgia, a subsidiary of Duke Energy Corp. The Phase 1 documentation review included scope, methodology, evaluation, problem areas/lessons learned, and Appendix A to D. These actions met the response outlines submitted by the licensee to the NRC. The processes used for the licensee's review were as follows:

 Divided statements, tables, or figures contained in the UFSAR Chapter into a single sentence, set of sentences, a paragraph, set of paragraphs, a table, or a figure; as convenient or if related; into "review units."

- Assigned an identification number called "review unit number" for each unit.
- Verified those review units with the applicable documents such as calculations, drawings, procedures, and specifications including Technical Specification.
- Resolved the discrepancies through the corrective action program by generating PIPs to document and track either closing out the discrepancies or for further review to resolve the discrepancies.
- Revised the UFSAR or other documents.

The inspection team concentrated on the licensee's methods used to verify the accuracy, resolution of the discrepancies, and proper documentation of the closed items or items for further review. Overall, the team considered that the review performed by the licensee was good.

The inspection team found in some cases that the licensee used the original FSAR, NRC Safety Evaluation Report (SER), or various correspondence between the licensee and the NRC as a method for verification of the accuracy of the UFSAR statements, without comparing the review units to actual design documents, calculations, or current plant configuration. After discussions with the inspection team, the licensee recognized that the contents in the original FSAR itself may not be accurate, and that the SER and letters from the NRC normally reflected what the licensee recognized that in some cases, comparing the UFSAR to statements contained in these documents may not provide for a thorough review and indicated that it would revise the methods used to verify the accuracy of the UFSAR by reviewing current design documentation, calculations, procedures, or technical specifications as indicated in its response to the Federal Register notice.

The inspection team found 13 discrepancies not identified by the licensee's engineers during its review of Phase 1 of the UFSAR review. The licensee either revised existing PIPs 97-3723 and 97-3724, or generated new PIP 98-0561 to incorporate the discrepancies found by the inspection team.

During the Phase 1 review, the inspection team found that review item 05.T5-2 shown on the evaluation summary was for Table 5-2, "Transient Cycles for RCS [Reactor Coolant System] Components Except Pressurizer Surge Line." The transient cycles were stated in Specification No. 18-1130828-04, "Reactor Coolant System for Oconee Units 1, 2, and 3." Babcock and Wilcox (B&W), the plant's nuclear steam supply system vendor, originated this specification during the plant's initial fuel operating cycle and issued Revision 4 to the licensee on February 22, 1991, to delete transient number 13 and add transient number 23 to the specification. The vendor listed the transient deletion and addition as an open item for the licensee to include transient number 23 in fatigue analyses for impacts of the specification on licensees. However, current licensee calculations OSC-6647 and 1815 were not updated to include transient number 23 in their fatigue analyses. Transient number

23 was for temperature changes on the RCS during startup. Transient number 23 was not considered in the original specification. The licensee was requested to evaluate transient number 23 and update the related calculations. Pending the licensee's actions and further review by the NRC, this item is identified as Inspector Followup Item (IFI) 50-269,270,287/98-01-03, Reactor Coolant System Transient Number 23 Resolution.

#### c. Conclusion

The inspection team concluded that the licensee conducted good reviews during Phase 1 of the voluntary UFSAR Review Project. The licensee appropriately captured the majority of identified UFSAR discrepancies into its corrective action program and added those that were identified by the inspection team. One inspector followup item was identified for further evaluation of startup thermal transient number 23 associated with the reactor coolant system, and incorporation of the related calculations into fatigue analyses.

#### E7.2 Quality Assurance Audits and Assessments

#### a. Inspection Scope (40500)

The inspection team reviewed the licensee's high pressure injection (HPI)/low pressure (LPI) self-initiated technical audit (SITA) review and the HPI reliability study to determine whether these activities were performed in accordance with the licensee's quality assurance (QA) program commitments and procedures. The findings from these assessments were reviewed to determine whether or not they were appropriately captured by the licensee's corrective action program.

#### b. <u>Observations and Findings</u>

The inspection team reviewed audit SA-97-10(ON)(SITA)(HPI/LPI), Self Initiated Technical Audit High Pressure Injection and Low Pressure Injection. This SITA was performed during the period from November 10, 1997, through December 11, 1997. The SITA was performed by the Regulatory Audit Group of the Nuclear Assessment and Issues Division in the General Office. The purpose of this SITA was to assess the operational readiness and functionality of the HPI and LPI systems, including interconnecting systems. The inspection team noted that the SITA identified 41 findings and 7 recommendations. The audit findings were documented through the ONS PIP process. Some of the SITA findings indicated that the corrective action program, including operating experience, was ineffective in preventing recurrence of several equipment and programmatic issues. The SITA concluded that, although numerous findings were identified, the HPI and LPI systems were operated consistent with their design bases and were capable of performing their safety functions. The inspection team determined that the HPI/LPI SITA was performed in accordance with licensee procedures NSD 208 and NSD 607.

The HPI system reliability study was completed in December 1997 following several system operational issues in 1997. The study was performed to incorporate new insights regarding the system's operation

(including lessons learned from previous events, operating experience program, and revised failure statistics) into a probabilistic risk assessment model. The study was comprehensive and generated three recommendations for plant consideration. All three were documented in PIP 0-097-4546 with corrective actions assigned for each. Corrective action number 1, to continue monitoring the system's performance against goals for unavailability and reliability was actively performed under the licensee's system health and Maintenance Rule programs; therefore, no further actions were required for that item. The team concluded that the recommendations from the reliability study were appropriately captured in the licensee's corrective action program.

### c. <u>Conclusion</u>

The SITA and the HPI System Reliability Study were thorough and detailed efforts that effectively identified equipment and programmatic issues. as well as provided pertinent recommendations. These issues and recommendations were appropriately captured in the licensee's corrective action program.

#### E7.3 Operating Experience Program

#### a. <u>Inspection Scope (40500)</u>

The inspection team reviewed the licensee's operating experience program (OEP) in order to determine if the program was being implemented in accordance with licensee commitments and procedures.

#### b. <u>Observations and Findings</u>

The licensee's OEP is described in procedure NSD 204, Operating Experience Program Description. The purpose of the program is to ensure that operating experience information is effectively collected; communicated to those areas affected by the information: evaluated for applicability to Duke Nuclear units with the resulting corrective actions tracked to completion; and considered in problem solving and/or preventive measures. The Operating Experience Assessment (OEA) Section of the Nuclear Assessments and Issues Division in the General Office was responsible for the receipt, evaluation, and resolution of in-house and industry OEP documents.

The inspection team reviewed selected NRC Generic Letters, Bulletins, Information Notices (IN), and other industry OEP documents. The team verified that the documents were included in the licensee's operating experience data base (OEDB) and the items had either been evaluated or were assigned to OEA Section personnel for evaluation. The inspection team also verified that in-house OEP documents such as PIPs were included in the OEDB and were being tracked. The team verified that issues were documented in PIPs in accordance with NSD 208 and included in the corrective action program. The inspection team noted that NRC IN 93-63 and the related PIPs (discussed in Section M3.1 of this inspection report) were included in the OEDB. However, the inspection team noted in Section M3.1, not all of the corrective actions identified in PIP reports through the operating experience program reviews were being implemented by the Oconee site. The inspection team also reviewed the

licensee's Daily Operating Experience Significant Items Report for selected dates in January 1998 and February 1998. This report was part of the Daily OEA Review of Site and Industry Issues. As discussed in Section M3.1 of this inspection report, the inspection team observed that PIP 1-098-0493 was not identified as a significant generic issue in the Daily Operating Experience Significant Items Report that was prepared by the OEA Section, even though the purge paper problem had occurred more than once at ONS and each time had delayed plant startup; and purge paper was also used at the other two Duke Power nuclear plants. The inspection team also reviewed assessments SA-97-30(ON)(SRG) and SA-97-62(ALL)(PA) that were performed to review OEP activities. Findings from these assessments were documented in PIPs in accordance with NSD 208.

#### c. Conclusion

The inspection team concluded that operating experience information reviewed by the team was being processed in accordance with the licensee's procedures. However, as indicated by the violation identified in Section M3.1 of this inspection report, not all of the corrective actions identified through the operating experience program reviews were being implemented by the Oconee site. Findings from assessments of the operating experience program were documented and tracked in the licensee's corrective action program.

#### V. Management Meetings

#### X1 Exit Meeting Summary

The inspector team presented the inspection results to members of licensee management at the conclusion of the inspection on February 5, 1998. The licensee acknowledged the findings presented.

The inspection team asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

#### Partial List of Persons Contacted

#### Licensee

- R. Bond, Safety Review Group E. Burchfield, Regulatory Compliance Manager
- T. Coutu, Scheduling Manager D. Coyle, Mechanical Systems Engineering Manager T. Curtis, Operations Superintendent B. Dobson, Mechanical/Civil Engineering Manager

- W. Foster, Safety Assurance Manager
- R. Henderson, System Engineer
- D. Hubbard, Maintenance Superintendent C. Little, Electrical Systems/Equipment Engineering Manager
- W. McCollum, Vice President, Oconee Site
- M. Nazar, Manager of Engineering
- A. Park, System Engineer

B. Peele, Station Manager
E. Price, Licensing Engineer
J. Smith, Regulatory Compliance
J. Twiggs, Manager, Radiation Protection

Other licensee employees contacted during the inspection included technicians, maintenance personnel, and administrative personnel.

### NRC

C. Ogle M. Scott

#### INSPECTION PROCEDURES USED

Effectiveness of Licensee Controls In Identifying and Preventing IP. 40500 **Problems** 

IP 71707 -Plant Operations

### Items Opened, Closed, and Discussed

Opened

50-269	,270,	.2877	98-	01-	01	URI
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50-269/98-01-02 VIO NSRB Review of 10 CFR 50.59 Safety Evaluations (Section 07.4)

Maintenance Procedure MP/0/A/1810/014 Provided Inadequate Instructions for the Use of Purge Paper as Weld Damming Material (Section M3.1)

50-269,270,287/98-01-03 IFI

Resolution of Reactor Coolant System Transient Number 23 (Section E7.1)

### LIST OF ACRONYMS

CFR CCW	Code of Federal Regulations Condenser Circulating Water
CKDM	Control Rod Drive Mechanism
DGA	Diesel Generator "A"
DGB	Diesel Generator "B"
EDM	Engineering Directives Manual
FSAR	Final Safety Analysis Report
HVAC	Heating Ventilation and Air Conditioning
ICS	Integrated Control System
IFI	Inspector Followup Item
INPO	Institute for Nuclear Power Operations
TR	Inspection Report
КНР · · ·	Keowee Hydro-electric Plant
I SF	Less Significant Events
MEPR	Major Equipment Problem Resolution
MM	Minor Modification
1.0.1	

MSF
NRC
NSM
NSD
NSRB
ONS
PD
PDR
PIP
SER
SG
SITA
SRG
SSF
TEPR
UFSAR
URI
VIO
WR

MPFF

Maintenance Preventable Functional Failure More Significant Events Nuclear Regulatory Commission Nuclear Station Modification Nuclear System Directive Nuclear Safety Review Board Oconee Nuclear Station Problem Deficiency Public Document Room Problem Investigation Process Safety Evaluation Report Steam Generator Self-Initiated Technical Audit Safety Review Group Safe Shutdown Facility Top Equipment Problem Resolution Updated Final Safety Analysis Report Unresolved Item Violation Work Request