U. S. NUCLEAR REGULATORY COMMISSION

REGION II

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Report No:	50-400/98-06
Licensee:	Carolina Power & Light (CP&L)
Facility:	Shearon Harris Nuclear Power Plant, Unit 1
Location:	5413 Shearon Harris Road New Hill, NC 27562
Dates:	May 24 - July 4, 1998
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Enclosure 2

EXECUTIVE SUMMARY

Shearon Harris Nuclear Power Plant, Unit 1
NRC Inspection Report 50-400/98-06

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection; in addition, it includes the results of announced inspections by regional inspectors and a project manager.

Operations

- Operations performance during the period was generally in accordance with plant procedures and exhibited the appropriate sensitivity to safety (Section O1.1).

- Equipment condition, material condition, and housekeeping were acceptable (Section O2.1).

- During the completion of a quarterly surveillance test, operators followed the applicable procedure, used effective communications, and coordinated test activities well (Section O2.3).

- While hanging a clearance, operators encountered an inconsistency between current procedural requirements and their recollection of procedural requirements. In response to the incident, Operations management appropriately emphasized procedural compliance (Section O2.4).

- The Operations night orders reviewed were determined to be in compliance with applicable procedures. One night order contained guidance which did not reflect current plant conditions (Section O3.2).

- During this period, operator knowledge and performance satisfied both management expectations and procedural requirements (Section O4.1).

- The Plant Nuclear Safety Committee meeting met procedural requirements and was appropriately focussed on safety. The Nuclear Safety Review Committee meeting was attended by the Chief Nuclear Officer and was appropriately focussed on safety. Nuclear Assessment Section Audits and a Performance Evaluation Section Assessment were thorough (Section O7.1).

- A noncited violation was identified for approving Technical Specification Interpretations which allowed the Technical Specifications to be satisfied in ways other than those specified in the Technical Specification, without prior Commission approval (Section O8.1).

Maintenance

- Work observed was performed with the work package present and in active use. Technicians were skillful, experienced and knowledgeable of their assigned tasks. Maintenance activities were thorough and effective (Section M1.1).

- Surveillance tests observed were conducted in a thorough and effective manner. Procedures were followed and independent verification was performed to identify potential problems (Section M2.1).

- Conservative decision making was observed during the performance of a surveillance (Section M2.2).

- One violation was identified for approving procedures which allowed Technical Specification Surveillance Requirements that specified performance "during shutdown" to be performed at power without receiving prior Commission approval (Section M8.5).

Engineering

- Engineering Service Request (ESR) 98-00134, Reactor Coolant Pump Long Term Operability with Reduced Compartment Cooling, Rev. 0, was prepared in accordance with applicable procedures. The ESR describes a valid analysis that concluded that operation of Reactor Coolant Pump "C" is acceptable until the next refueling outage (Section E1.1).

- The licensee's program for complying with 10 CFR 50.59 was consistent with that rule, and with Technical Specification 6.5.2.6. The licensee had established suitable programmatic guidance to ensure that the regulatory requirements of 10 CFR 50.59 would be met, and the information necessary for preparing adequate safety evaluations was available to licensee personnel (Section E3.1).

- For 19 safety evaluation forms reviewed, the licensee's determinations that a unreviewed safety question determination was not required were considered correct, although the bases for those determinations were typically weak. Similarly, the bases for unreviewed safety question determinations were weak in some cases. The inspector's findings in this regard were consistent with the findings described in a recent Nuclear Assessment Section assessment of this program (Section E3.2).

- For 15 of 16 unreviewed safety question determinations reviewed, the licensee's determination that the corresponding changes did not involve an unreviewed safety question were considered correct. An unresolved item was opened with respect to unreviewed safety question determinations as described in the safety evaluation for the Cycle 6 Reload (Section E3.2).

- A violation was identified for failing to follow the approved corrective action program in not initiating a condition report during the 1997 refueling outage for a deviation from the approved design in relation to brackets on the containment sump suction pipes. The root cause investigation for the containment sump bracket issue was thorough (Section E4.1).

- The licensee's training for qualification of engineering personnel on 10 CFR 50.59 requirements was effective and complied with NRC requirements (Section E5.1).

- A weakness was identified for the increase in the backlog of work in the Engineering section since 1996. However, at the present time, safety has not been impacted by the increase in work backlog (Section E6.1).

- The licensee's planning and project management for the steam generator replacement project appeared to be comprehensive and well organized (Section E6.2).

- The Nuclear Assessment Section assessments and the self-assessments performed by Engineering section personnel were effective in identifying engineering performance deficiencies, and were useful in providing insights to management. Corrective actions in response to the findings were generally acceptable. This was a positive observation (Section E7.1).

Plant Support

- Participant performance in the July 9, 1998, drill demonstrated an acceptable ability to respond to emergencies (Section P4.1).

- The protected area barrier was observed to be in good condition. Isolations zones were of sufficient size and were free of objects (Section S2.1).

- Fire Protection activities were being adequately conducted (Section F1.1).

Report Details

Summary of Plant Status

Unit 1 began this inspection period at 100 percent power, and remained at 100 percent power throughout the period.

I. Operations

01 Conduct of Operations

01.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations including control room tours and shift turnovers. In general, the conduct of operations was professional and safety-conscious. Routine activities were adequately performed. Operations shift crews were appropriately sensitive to plant equipment conditions and maintained a questioning attitude in relation to unexpected equipment responses. Operations performance during the period was generally in accordance with plant procedures and exhibited the appropriate sensitivity to safety.

02 Operational Status of Facilities and Equipment

02.1 General Comments (71707)

The inspectors conducted frequent tours of the facility to verify equipment condition and housekeeping. The inspectors found that equipment condition, material condition, and housekeeping were acceptable.

02.2 Engineered Safety Feature System Walkdowns (71707)

The inspectors walked down accessible portions of the control room ventilation system. The inspectors found that equipment operability, material condition, and housekeeping were acceptable, and that the operational status of this system was in accordance with Technical Specification (TS) requirements and applicable procedures.

02.3 Surveillance Testing

a. Inspection Scope (71707)

The inspectors observed both licensed and non-licensed operators performing parts of OST-1124, 6.9 KV Emergency Bus Undervoltage and Underfrequency Trip Actuating Device Operational Test Quarterly Interval Modes 1-2-3-4-5, on June 12, 1998.

b. Observations and Findings

The pre-job briefing was comprehensive and effective. The operators referred to and followed the procedure, and gave adequate answers to the

inspectors' questions. Participants' communications were clear, concise, formal, prompt, and in compliance with licensee administrative procedures (AP)s. Test activities were well-coordinated. Test results were acceptable, and neither test participants nor the inspectors identified any related plant deficiencies.

c. Conclusions

During the completion of a quarterly surveillance test, operators followed the applicable procedure, used effective communications, and coordinated test activities well.

02.4 Clearances

a. Inspection Scope (71707)

The inspector observed operator performance during hanging of clearance 98-00650.

b. Observations and Findings

During the hanging of clearance 98-00650, the inspector observed that the operators who racked out the breaker for Chilled Water Circ Pump 1A-SA followed instructions in procedure OP-156.02, AC Electrical Distribution, Rev. 16. Step 5 of section 7.11.2 of this procedure required the operators to "Store the Control Power Fuses inside the cubicle". When the operators encountered this step, they informed the inspector that the traditional practice was to tie-wrap the Control Power Fuses with the Clearance Tag to a bracket on the front of the breaker. However, after some discussion with the inspector and on-shift Operation's management, the operators completed the procedure as written. One of the operators subsequently initiated Condition Report (CR) 98-01729 to document the apparent inconsistency between procedural requirements and traditional operator practice.

The inspector subsequently discussed this inconsistency with two Shift Operations Superintendents (S-SOs) and the Operations Manager. All three informed the inspector that operators are expected to complete procedural steps as written, and that when operators encounter such inconsistencies, they should contact an S-SO for guidance. The Operations Manager issued a night order, dated July 2, 1998, that described this incident and emphasized "following the procedure as written."

Those discussions also revealed that the "traditional operator practice" to which the operators referred was based on requirements that had been included in earlier revisions of a Harris Nuclear Plant (HNP) procedure for racking out breakers, and that those requirements had been changed when that procedure was replaced by a corporate-level procedure. Specifically, the requirement for hanging the fuses on the front of the breaker had been in an earlier HNP procedure, but had not been incorporated into the corporate-level procedure, because not all of the

company's nuclear stations had breaker hardware that enabled that practice. Thus, the HNP operators involved in the subject incident apparently remembered requirements that had once been in their procedures, and were not fully aware that those requirements were not in the current procedures, and thus no longer applied to them.

c. Conclusions

While hanging a clearance, operators encountered an inconsistency between current procedural requirements and their recollection of procedural requirements. In response to the incident, Operations management appropriately emphasized procedural compliance.

03 Operations Procedures and Documentation

03.1 General Comments (71707)

The inspectors conducted frequent reviews of operations logs and procedure usage, and found that procedures were appropriately followed.

03.2 Source Range Monitor Night Order

a. Inspection Scope (71707, 37551)

On June 15, 1998, the inspector performed a review of the current Operations "night orders" for compliance with TS Section 6, Administrative Controls, as implemented through procedure Operations Management Manual OMM-009, Shift Communications, Rev. 9, and American Nuclear Standard Institute (ANSI) N18.7-1976, Administrative Controls and Quality Assurance for Operational Phase of Nuclear Power Plants.

b. Observations and Findings

The inspector selected several night orders for review and found, in general, the night orders were adequate. One observation is discussed below.

A night order dated December 2, 1997, contained instructions for the performance of a uniform channel check for source range monitor NI-31. The inspector observed that the current plant configuration was different from the configuration assumed for the night order's guidance. The power fuses for the source range instrumentation had been replaced in April 1998, however, the night order guidance assumed the fuses were not installed. The inspector discussed this observation with the Operations Manager, who indicated that the December 2, 1997 night order would be reviewed and updated to reflect current plant configuration. In addition, simulator training would be performed to address expected plant indications with the source range instruments inoperable and those actions to be taken in the event of abnormal indications. The inspector determined that these actions were appropriate to address the observation.

The inspector discussed night orders in general with the Operations Manager who indicated that a management review of all night orders was already in progress. His intent was to use night orders as a communication tool only. The night orders would not be used to supersede any guidance provided by procedures. Proposed changes to the process included establishing a set duration for the guidance upon initiation and periodic supervisor review to ensure that no guidance provided supersedes a procedure.

c. Conclusion

The Operations night orders reviewed were determined to be in compliance with applicable procedures. One night order contained guidance which did not reflect current plant conditions.

04 Operator Knowledge and Performance

04.1 General Comments

a. Inspection Scope (71707)

During frequent control-room tours, the inspectors observed both licensed and non-licensed operators performing a variety of tasks. The inspectors observed auxiliary operators performing parts of OST-1124, 6.9 KV Emergency Bus Undervoltage and Underfrequency Trip Actuating Device Operational Test Quarterly Interval Modes 1-2-3-4-5, on June 12, 1998. (For other observations regarding that test, see section 02.3.)

b. Observations and Findings

The inspectors noted no distractions in the control room to prevent the operators from performing their duties. Control-room operators and auxiliary operators consistently were able to satisfactorily answer inspectors' questions regarding plant and equipment status, operability issues, and compensatory measures implemented. Communications between control-room operators and between auxiliary operators and control-room operators was consistently clear, concise, formal, prompt, and in compliance with licensee administrative procedures.

c. Conclusions

During this period, operator knowledge and performance satisfied both management expectations and procedural requirements.

06 Operations Organization and Administration

06.1 General Comments (71707)

The inspectors observed control room staffing and found that it met TS requirements. The inspectors reviewed the field notes for the assessments performed by the Institute of Nuclear Power Operations (INPO) and the World Association of Nuclear Operators (WANO) in April-

May 1998. The inspectors found that there were no safety significant issues identified in the field notes which required immediate corrective action, and that the INPO and WANO findings were similar to NRC findings.

07 Quality Assurance in Operations

07.1 General Comments

a. Inspection Scope (40500, 71707)

During the inspection period, the inspectors reviewed multiple licensee quality assurance activities, including:

- Condition Reports;
- Nuclear Assessment Section (NAS) Audits on Station Blackout Program Assessment (HNAS 98-069), Technical Specification and Operating License Assessment (HNAS 98-066), and Material Control Assessment (98-081);
- Plant Nuclear Safety Committee (PNSC) meeting conducted on May 27, 1998;
- Nuclear Safety Review Committee (NSRC) meeting conducted on June 2, 1998;
- Performance Evaluation Section Assessment on Corporate QA Program Compliance (98-09-QA-C)

b. Observations and Findings

The PNSC meeting met the TS quorum requirements. Discussions were thorough, probing, and appropriately addressed the issues on the agenda. The NSRC meeting was attended by corporate management including the Chief Nuclear Officer. The discussions were thorough and probing. NAS and PES audits and assessments were probing and found good issues.

c. Conclusions

The PNSC meeting met procedural requirements and was appropriately focussed on safety. The NSRC meeting was attended by the Chief Nuclear Officer and was appropriately focussed on safety. Nuclear Assessment Section Audits and a Performance Evaluation Section Assessment were thorough.

08 Miscellaneous Operations Issues (92700, 92901)

08.1 (Open) LER 50-400/98-005-00: Technical Specification verbatim non-compliance. This LER reported non-compliance with surveillance requirements containing the restriction that they be performed "during shutdown" and Technical Specification Interpretations (TSI)s that contradicted the Technical Specifications. The "during shutdown" issue is addressed in Section M8.5.

Technical Specification Interpretations

The inspector reviewed LER 50-400/98-005 to determine the relationship between the other items reported and the "during shutdown" issue. The other items related to TSIs which contradicted TS requirements. The licensee identified problems with TSIs after an operator had identified a problem with TSI 89-003 (Inspection Report 50-400/96-03, Section 04.1). The operator's sensitivity to this issue was due to the statement in the NRC SALP Report 50-400/98-99, which indicated that management and operators did not understand TS. Licensee management reviewed TSI 89-003 and agreed with the operator. The licensee reviewed the remaining TSIs and found nine TSIs that contradicted TS requirements, of which four had been implemented and resulted in a failure to comply with the Technical Specifications. These included:

1. TSI 91-004, Metal Impact Monitoring System Channel Definition, provided a change to the definition of channel in TS 3/4.3.3.9. The changed definition was based on guidance described in Regulatory Guide 1.133, but was not consistent with the corresponding definition in the Technical Specification. This resulted in a violation of Technical Specifications on July 19, 1997.

2. TSI 96-002, Loss of Off-Site Power, provided new action requirements for TS 3.3.2 Table 3.3-3. The new action requirements allowed more than one primary and/or secondary 6.9 KV emergency bus undervoltage relay to be inoperable per bus, if the associated emergency bus was declared inoperable and its associated action requirements were met. The new definition was not consistent with Technical Specifications which required complying with the action requirements of TS 3.0.3. This resulted in violations of Technical Specifications during 1996, 1997, and 1998.

3. TSI 89-003, Requirements for OPERABLE Emergency Power Sources, defined those components that would be "required features" for TS 3/4.8.1.b.4, but excluded required features that were powered from DC busses or the inverters, or which could perform their function without AC power, and also excluded components whose individual TSs would be less restrictive with both trains inoperable. This was not consistent with TS 3.8.1.1.b.4, and resulted in a violation of that TS on August 13, 1997.

4. TSI 95-004, Personnel Airlock Interlock Operability, provided a new action requirement specific to the Personnel Airlock interlock for TS 3.6.1.3. The new action requirement allowed continued airlock operability with the electrical interlock inoperable, provided specific actions were taken. The new action requirement was not consistent with TS 3.6.1.3 and resulted in a violation of that TS on July 26, 1997.

5. TSI 87-002, HVAC Operability Requirements, provided guidance to determine the effect of out-of-service ventilation units powered by the safety busses on equipment required by TSs. The guidance for the switchgear room air handling units (AH-12 and AH-13) allowed a 72-hour action which was less restrictive than the most limiting TS action requirement for equipment supported by the air handlers such as the emergency batteries and chargers (TS 3.8.2.1 of 2 hour) or the safeguards sequencer (TS 3.8.1.1.h of 24 hour). The guidance was not consistent with the requirements of the TS.

6. TSI 87-006, Gaseous Waste Processing System - Recombiner Instrumentation, allowed compensatory grab samples to be performed once per 24 hours as compared to once every 12 hours as required by TS 4.11.2.5.

7. TSI 89-005, Sequencer and Solid State Protection System (SSPS), provided guidance on the SSPS and the emergency safeguards sequencer which allowed application of the action statement for the specific TS component affected by the inoperable SSPS relay instead of the specific minimum requirements and action statements of TS 3.3.2.

8. TSI 95-002, Post-Maintenance Leak Testing of RCS Pressure Isolation MOVs, provided guidance on what types of maintenance activities warranted performance of a subsequent leak test and allowed a seat leak test to be waived for a valve packing adjustment if an engineering evaluation indicated seat leakage was unaffected. The guidance conflicted with TS 4.4.6.2.2.c which required a leak test to be done for maintenance, repair, or replacement work on the valve.

9. TSI 95-003, Ultimate Heat Sink, changed the limiting condition for operation values of main reservoir temperature and level, to be consistent with the design basis of the plant, after the design basis was changed as a result of a licensee-conducted service water operational performance inspection. (This TSI was the subject of Violation 50-400/96-10-01.)

CR 98-01014 addressed the TSI issue. The inspector reviewed the root cause investigation for this issue and the LER, and discussed these with members of the root cause investigation team. The root cause investigation identified three root causes:

1. Some TS are conflicting or ambiguous.

2. HNP personnel believed that TSIs were appropriate, and relied on the inferred intent of TSs, which resulted in changing the literal words of the TSs.

3. HNP management didn't believe that TS changes were always necessary or required, because:

- TSIs had historically been used by the licensee;
- the licensee believed that TSIs had historically been accepted by the NRC;
- the licensee believed that the NRC would not entertain TS changes because they were too minor;
- implementation of Improved Technical Specifications would correct ambiguous wording in the TS; and
- TS changes would not be cost-effective.

The inspector found that on October 29, 1997, the licensee had submitted a TS change to incorporate into the TSs the change that had been implemented in TSI 89-003, but continued to keep the TSI active for use while the TS change was being processed. This was identical to the situation for the "during shutdown" issue described in Section M8.5, in that neither the root cause nor the LER explained why the TSI was available for use after recognition that a TS change was needed. The licensee explained to the inspectors that, at the time, the TS changes were viewed as wording clarifications to make the TSs agree with their perception of the NRC's intent with respect to the affected TSs. The licensee deduced NRC's intent by reviewing Generic Letters; Regulatory Guides; NUREG 0452, Westinghouse Standard Technical Specifications; and NUREG 1431, Improved Technical Specifications; and industry practice.

The licensee missed a number of opportunities to identify these discrepancies. These included:

- The licensee's receipt of and response to violation 50-400/96-10-01, which identified the use of a TSI to change a TS Limiting Condition for Operation value. In response to this violation, the licensee reviewed the TSIs and developed several TS change requests. In addition, the licensee developed and began implementation of a plan to reduce the number of TSIs in use. The plan relied on the upgrade to Improved TS to incorporate a number of TSIs. Two prior LERs were generated as a result of the TSI reviews (97-008 and 97-011).
- The licensee's receipt, review, and disposition of Information Notice 97-80, which identified industry problems with the misuse of TSIs.
- The licensee's receipt of Inspection Report 50-400/97-12, which contained a comment regarding waiting to cancel TSIs until TS changes were received.

The inspectors found that TSIs had been used at the Harris Plant since 1986, and that the last one had been issued in 1996. All TSIs were approved by plant management and were reviewed by the PNSC. Procedure AP-107, Technical Specification Interpretations, Rev. 12 was the current governing procedure for TSIs. The inspector found that AP-107 had been revised twice since the issuance of violation 50-400/96-10-01.

Revisions prior to Rev. 11 did not discuss performing safety reviews of the TSIs. However, Rev. 12, paragraph 5.1 and 5.2 identified that a safety review should be attached and sent to the PNSC for review and approval. Although the TSIs had not received a formal safety review under 10 CFR 50.59, the inspector found from previous observation at PNSC meetings that PNSC and management reviews constituted safety reviews. The inspectors found that TSIs were treated like extensions of the TS, and that TS pages were annotated with the TSI number.

The licensee's corrective actions, as described in the LER, had been to issue a night order on May 8, 1998, to prevent the use of the TSIs which conflicted with TSs. The conflicting TSIs were canceled by May 20, 1998, and the remaining TSIs were canceled by May 29, 1998. Procedures AP-013, Plant Nuclear Safety Committee, and AP-107, Technical Specification Interpretations, were revised to clarify TS verbatim compliance requirements. The licensee also stated that training will be conducted for all site personnel in the area of TS verbatim compliance.

The inspectors found from review of Attachment 1 to the root cause investigation, TSI Disposition Summary, that some of the information in the canceled TSIs were placed in plant procedures. The licensee indicated that the information placed in the plant procedures was carefully screened to ensure it did not contradict TS. The affected procedures will be reviewed during closure of this LER.

Safety Significance

The inspectors determined that the TSI issues were not significant with respect to safety, because:

- TS changes were approved which made the TS consistent with the actions defined for TSI 96-002 (June 3, 1998) and TSI 89-003 (May 22, 1998).

- The licensee's positions as represented in the other TSI issues described above were generally consistent with published NRC positions in various generic letters and NUREGs. Furthermore, the licensee plans to submit TS changes for many of those in the near future.

Eight of the items reported in LER 50-400/98-005-00 resulted in violations of TS. Six of the eight have been corrected by NRC approved TS changes. Because the NRC has already approved TS changes required to implement the licensee's positions with respect to some of the issues described above, and because the licensee's positions with respect to the other issues were generally consistent with published documents, the inspector concluded that little safety significance was associated with these issues.

Regulatory Significance

TS 6.5.1 requires that the 10 CFR 50.59 safety review program be implemented for TS 6.8 procedures. Specifically, TS 6.5.1.1.1 requires that safety and technical reviews be performed for all procedures and programs required by Specification 6.8, other procedures that affect nuclear safety, and changes thereto. TS 6.5.1.4 requires that safety evaluations prepared in accordance with TS 6.5.1.1.1 shall include a written determination, with basis, of whether or not the procedures or changes thereto, constitute an unreviewed safety question (USQ) as defined in 10 CFR 50.59, or whether they involve a change to the Final Safety Analysis Report, the Technical Specifications, or the Operating License. TS 6.5.1.4.3 requires that a safety evaluation and subsequent review that conclude that the subject action may involve a USQ, a change to the Technical Specifications, or a change to the Operating License, be referred to the PNSC for their review in accordance with TS 6.5.2.6. It further requires that if the PNSC recommendation is that an item is a change to the TS, or Operating License, the action will be referred to the Commission for approval prior to implementation.

10 CFR 50.59 states, in part, that the holder of a license authorizing operation of a production or utilization facility may make changes in the procedures as described in the safety analysis report, without prior Commission approval, unless the proposed change involves a change in the Technical Specifications incorporated in the license or a USQ. A licensee who desires (1) a change in Technical Specifications or (2) to make a change in the procedures described in the safety analysis report which involve a USQ or a change in Technical Specifications, shall submit an application for amendment of his license pursuant to § 50.90.

The nine TSI instances all involved written interpretations of the Technical Specifications implemented through AP-107 addressed under TS 6.8, and all involved a change from the TS. Because these instances all involved TS changes, all should have been implemented only after obtaining prior Commission approval of the changes. However, the inspector found that prior to April 10, 1998, the licensee had failed to obtain prior Commission approval of these changes. The first eight TSI instances listed above were, therefore, considered multiple examples (8) of a violation of TS 6.5.1 and 10 CFR 50.59, in that these instances involved changes to procedures that directed actions which were contrary to TS requirements. This non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. This violation is designated NCV 50-400/98-06-01, Use of TSIs for TS Changes. The ninth TSI instance is not included in the violation because it was previously cited in Violation 50-400/96-10-01.

Conclusions

A noncited violation was identified for approving Technical Specification Interpretations which allowed the Technical Specifications

to be satisfied in ways other than those specified in the Technical Specification without prior Commission approval.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62700, 62707)

The inspector observed all or portions of the following maintenance work activities:

- WR/JO 97-AKWC1 Replace Intercooler on 1CO-E027 Rotary Air Compressor (RAC).
- WR/JO 98-ADPU1 Adjust Reducer Valve for the Inlet Throttle Valve on 1-CO-E027 RAC to obtain an Intercooler Pressure of -8 to -10 in. Hg (Corrective Maintenance Procedure No. CM-M0194, Rev. 6).
- AFUV-003-1 Inspection/Lubrication of Limitorque Operators (3SW-901 WC-3 Chiller Condenser Service Water Inlet Header MOV) In accordance with Preventive Maintenance Procedure No. PM-M0014.
- WR/JO 98-ACSKI Test Power Range Detectors Per Corrective Maintenance Procedure No. CM-I0019.

b. Observations and findings

Work observed was performed with the work package present and in active use. Technicians were skillful, experienced and knowledgeable of their assigned tasks. With the exception of the corrective maintenance performed on the RAC (WR/JO 98-ADPU1) the inspectors found maintenance activities to be thorough and effective. On June 3, 1998, the inspector observed corrective maintenance delineated in WR/JO 98-ADPU1 which required that the reducer valve for the inlet throttle valve on the RAC be adjusted to obtain an intercooler pressure of -8 to -10 in. Hg. The work as delineated in procedure CM-M0194 was completed and an intercooler pressure reading of -8 was obtained in the unloaded condition. However, when the RAC was loaded, the reading changed and ranged between + ½ to + 3. On June 4, 1998, the system engineer noted that the RAC intercooler was again reading a positive pressure of +6 in. Hg. This was the same condition that initiated the corrective maintenance. On June 5, 1998, the licensee contacted the vendor representative and was informed that a procedure change would be required to determine the actual dimensions of the gap on the throttle valve disk in order to ensure the correct centering of the disk. In addition, the throttle valve piston and piston spring should be replaced. The vendor also stated that RAC 1-CO-E027 has a capacity of

1500 cfm, and is oversized for its current application. Therefore, it cycles on and off in-lieu of remaining on (loaded). The vendor concluded that under this condition the positive pressure would not adversely affect the operation of the compressor when used until replacement parts and procedural documentation arrived. It should be noted that there are four other air compressors on line and available for use at Shearon Harris.

c. Conclusions

Work observed was performed with the work package present and in active use. Technicians were skillful, experienced and knowledgeable of their assigned tasks. Maintenance activities were thorough and effective.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Surveillance Observation

a. Inspection Scope (62700, 61726)

The inspectors observed all or portions of the following maintenance surveillance tests (MST)s:

- MST-I0149 Steam Generator C Narrow Range Level Loop (L-0494) Operational Test
- MST-I0190 Reactor Coolant System Wide Range Pressure (P-0402) Operational Test of Train A CVCS Miniflow Circuits
- MST-E0010 Battery Weekly Test

b. Observation and Findings

The inspector found that test equipment was properly calibrated, test procedures were followed, technicians were skillful, and testing was performed satisfactory.

c. Conclusion

Surveillance tests observed were conducted in a thorough and effective manner. Procedures were followed and independent verification was performed to identify potential problems.

M2.2 Main Steam Line Pressure Channel Calibration

a. Inspection Scope (61726)

The inspector observed portions of the performance of maintenance surveillance test MST-I0010, Main Steam Line Pressure, Loop 2 (P-0484) Channel Calibration, Rev. 4. The P-0484 provides input to the main steam isolation valves isolation logic.

b. Observations and Findings

On June 15, 1998, the inspector observed parts of the performance of MST-I0010. The inspector noted that the procedures in use were properly verified and the sections that were not scheduled to be performed were designated as not applicable. The technicians used good self-checking and the procedure was present and in use at all times. The inspector observed good use of conservative decision making when one component was found to marginally meet the acceptance criteria. The technician stopped work and contacted a supervisor. After obtaining permission from the supervisor, the marginal component was recalibrated in accordance with the procedure. Communication between test locations was adequately established and maintained.

The inspector observed the technicians, use concurrent verification at one location and not at the other upon initial removal of the associated component from service. The inspector questioned the licensee regarding the inconsistent use of concurrent verification. Review of the test procedure revealed that no verification, independent or concurrent, was required during the removal of the safety-related component from service. However, independent verification of the calculations performed and the subsequent return of the component to service was required. The inspector reviewed Plant Program PLP-702, Independent Verification, Rev. 11. The inspector noted that concurrent verification was presented as a preference and not a requirement. After discussions with the inspector, the licensee indicated that enhancements should be made to the procedure to require the use of concurrent verification for the removal of safety-related components during testing.

c. Conclusion

Conservative decision making was observed during the performance of a surveillance.

M8 Miscellaneous Maintenance Issues (92700, 92902)

M8.1 (Closed) Inspection Follow-Up Item 50-400/97-07-02: Follow up on performance monitoring of the condensate makeup system. At the time of the Maintenance Rule Team inspection the database for the condensate makeup system indicated that condition monitoring was the appropriate performance criterion to preclude functional failures. The database discussed observing the structural integrity of the condensate storage tank (CST) and inspecting the nozzle welds as the extent of the condition monitoring. The database did not discuss the valves and piping section from the CST nozzle weld to the suction of the auxiliary feedwater (AFW) pumps, the bladder within the tank or the valve and section of piping between the hotwell and the condensate storage tank.

The condition monitoring criteria now states that the CST will be inspected in accordance with procedure EGR-NGGC-351. This procedure defines the conditions to be monitored and the performance standards. Operation's rounds and walkdowns provide a means of ensuring system

integrity by checking for lost inventory through leaks or component malfunction. Inservice inspections (ISI) are conducted on the tank nozzles during refueling outages. Diaphragm integrity is monitored by trending the dissolved oxygen levels in the CST. The piping for the CST to the condenser hotwell is monitored for integrity during quarterly system walkdowns. The piping from the CST to the AFW pump is covered by the ASME Section XI pressure testing program, which requires an ISI pressure test each ISI period . The inspector reviewed the documentation for the last ISI system pressure test (dated May 7, 1996) for the piping from the CST to the AFW pump suction. The inspector considered the clarifications documented in the condition monitoring criteria appropriate and this item is considered closed.

M8.2 (Closed) Violation 50-400/97-07-03: Failure to effectively monitor the performance or condition of the normal service water (NSW) system. This item identified that unavailability amounting to 15 hours and 44 minutes had been omitted from the accumulative unavailability documented in the maintenance rule data base for the B NSW. The cause of this failure was due to an oversight during the data base development. The electronic report used to query the data base would not recognize data entries which did not contain either a "work order number" or "reason for clearance." Due to the nature of the work performed, this particular clearance did not require these fields to be completed. Corrective actions taken by the licensee for this violation included the following: (1) unavailability time was entered into the data base; (2) use of the flawed query was suspended and a previous manual method for accounting for clearance time was re-initiated; and (3) a review of other systems unavailability time was conducted with two additional examples found. The inspector reviewed the unavailability log data base for the NSW system and verified that the reported unavailability for the NSW had been properly documented. This item is considered closed.

M8.3 (Closed) Violation 50-400/97-07-04: Failure to effectively demonstrate performance of the steam dump system and the "C" charging safety injection pump. This violation consisted of two examples where the licensee failed to monitor the performance or condition of certain SSC's against licensee-established goals pursuant to the requirements of Section (a)(1) of the maintenance rule.

The inspector reviewed the reasons for the violation, the corrective actions taken and the steps taken by the licensee to prevent reoccurrence as delineated in their letter of response dated September 18, 1997. In addition, the inspector reviewed documentation supporting the licensee's response including the maintenance rule event log to verify that the reported functional failure had been documented against the steam dump system and that the 10.75 days of unavailability for the charging safety injection pump had been documented against the chemical and volume control system. This item is considered closed.

M8.4 (Open) LER 50-400/98-006-00: Failure to perform inspections and preventive maintenance on molded case circuit breakers as required by TS. This LER was initiated because on May 8, 1998, the licensee

determined that, contrary to TS surveillance requirement 4.8.4.1.b, the licensee had failed to cycle nine pressurizer heater bank 480 volt molded-case circuit breakers during the 60-month testing interval. The LER reported that immediate corrective actions included testing the subject breakers by cycling them as required by TS 4.8.4.1.b, and that no problems were encountered during this testing.

This LER will remain open pending further review and subsequent verification of corrective actions.

M8.5 (Closed) URI 50-400/98-04-03: Technical Specification Literal Compliance. This item related to performing TS surveillance requirements at power that contained the words "during shutdown." The item was opened to review the associated root cause investigation (CR 98-01044), LER 50-400/98-005 which reported this issue, the relationship of this issue to the multiple other issues reported in the LER, and subsequent determination of safety and regulatory significance.

The inspectors found that the issues described in LER 50-400/98-005 could be grouped into two major areas. The first of these areas included the issues associated with "during shutdown" surveillance testing, and the second included the issues associated with inadequate TSIs. The TSI issue was addressed in Section 08.1.

"During Shutdown" Surveillance Testing

LER 50-400/98-005 identified four instances in which procedures were issued which allowed "during shutdown" surveillance requirements to be satisfied while at power. The first example was identified by the inspectors and the other three were identified by the licensee. The four instances were:

1. Procedures MST-I0178, Component Cooling Surge Tank - Tank 1 (L-0670) Calibration, and MST-I0179, Component Cooling Surge Tank - Tank 2 (L-0676) Calibration, test the ability of the Component Cooling Water valves to the Gross Failed Fuel Detector to isolate on low surge tank level to implement Technical Specification Surveillance Requirement 4.7.3.b.3, which required such testing to be completed "during shutdown". The licensee did not place procedural requirements in the procedure to fully implement this requirement, but instead allowed the procedure portion for that TS section to be performed at power prior to September 1996 for MST-I0178, and prior to refueling outage 7 for MST-I0179.

2. Procedure OST-1825, Safety Injection: ESF Response Time, Train A 18 Month Interval, was revised to remove the requirement to verify that both emergency diesel generators start on a safety injection test signal and operate in standby for at least 5 minutes to satisfy TS Surveillance Requirement 4.8.1.1.2.f.5 which required such testing to be completed "during shutdown". The licensee then placed this requirement in procedure OST-1085, 1A-SA Diesel Generator Operability Test, which allowed TS Surveillance Requirement 4.8.1.1.2.f.5 to be

satisfied while at power on August 30, 1995, just prior to refueling outage 6.

3. Procedure OST-1087, Motor Driven AFW Pumps Full Flow Test Quarterly Interval Mode 1, was revised to test the AFW Pressure Control Valves in accordance with TS Surveillance Requirement 4.7.1.2.1.b.1, which required such testing to be completed "during shutdown". The licensee did not place procedural requirements in the procedure to fully implement this requirement, but instead allowed the procedure portion for that TS section to be performed at power on April 1, 1997, just prior to refueling outage 7.

4. Procedure OST-1214, Emergency Service Water System Operability Train A Quarterly Interval Modes 1-2-3-4, was revised to properly test Emergency Service Water Screen Wash Valve 3SC-41 in accordance with TS Surveillance Requirement 4.7.4.b.1, which required such testing to be completed "during shutdown". The licensee did not place procedural requirements in the procedure to fully implement this requirement, instead allowing the procedure portion for that TS section to be performed at power prior to April 10, 1998.

The root cause investigation for CR 98-01044 concluded that the root cause of these instances was an incorrect interpretation of TS related to "during shutdown" requirements. The inspector reviewed the investigation along with LER 50-400/98-005, and discussed the findings with the root cause investigation team members. The inspector found that a TS change (94-09) had been initially prepared to remove the "during shutdown" requirement, was approved by the licensee's Plant Nuclear Safety Committee (PNSC) on February 1, 1995, but was rejected by the Site Vice President. The rejection was based on industry practice at other plants where 18 month "during shutdown" surveillances were performed at power as long as they were within the 18 month interval, were consistent with safe plant operation, and plant conditions would allow satisfactory test completion. It was also considered acceptable in some cases to satisfy the "during shutdown" requirement if the last test or portion of testing was completed while the plant was in a shutdown.

LER 50-400/98-005 indicated that the philosophy of satisfying "during shutdown" surveillance requirements by completing testing at power was implemented by development of procedure OST-1844, Slave Relay Component Operability Verification. This procedure implemented a verbal technical specification interpretation by licensee senior management which allowed portions of surveillance requirements for 18 month surveillances to be completed at power when their associated TSs required the testing to be performed during shutdown.

The inspector found that the PNSC approved this approach on August 16, 1995, when it approved procedures OST-1844 and OST-1825, even after staff-prepared safety evaluation reports for these procedures had determined that their implementation involved unreviewed safety questions. (Safety and technical evaluations of procedures required by

TS 6.8 are addressed in TS 6.5.1, Safety and Technical Reviews. The PNSC reviews were required by TS 6.5.1.4, Safety Evaluations and Approvals. Specifically, TS 6.5.1.4.3 requires that PNSC review all safety evaluations which conclude that the subject action may involve a USQ, a change to the Technical Specifications, or a change to the Operating License.) The August 16, 1995, PNSC action contradicted the PNSC recommendation and action taken on February 1, 1995 to go forward with the TS change, and thus reflected an inadequate PNSC evaluation and determination under TS 6.5.1.4.3.

On March 17, 1997, the licensee submitted a TS change to remove the "during shutdown" words from a number of TSs. The licensee indicated that the submittal was due to a changing regulatory environment towards absolute literal compliance. However, the licensee continued to implement the previous philosophy of performing the "during shutdown" TS surveillance requirements at power until April 10, 1998, when the inspectors presented their findings in this area. Licensee implementation of this philosophy included the use of procedures OST-1087, Motor Driven AFW Pumps Full Flow Test Quarterly Interval Mode 1; OST-1214, Emergency Service Water System Operability Train A Quarterly Interval Modes 1-2-3-4; MST-I0178, Component Cooling Surge Tank - Tank 1 (L-0670) Calibration; and MST-I0179, Component Cooling Surge Tank - Tank 2 (L-0676) Calibration, which were reported in LER 50-400/98-005.

Neither the root cause investigation nor the LER explained why the incorrect interpretation was continued after recognition that a TS change was needed. The licensee explained to the inspectors that the TS changes were viewed as wording clarifications, at that time, to make the TS agree with the perceived intent (a further discussion of perceived intent is contained in section 08.1). However, Generic Letter 91-04 (upon which the TS change was based) specifically referred to a TS change being needed to remove the mode restriction and that a bases change was needed. That fact was apparently missed by the licensee.

Prior to NRC identification of the "during shutdown" issue, the licensee missed a number of opportunities to identify this discrepancy, including:

- The licensee's TS change cancellation in 1995 should have included a review of Generic Letter 91-04 which specifically addressed the issue and provided guidance that a TS change was needed;

- The licensee's receipt of Brunswick LER 50-325,324/1-97-010 through the operating experience review program on October 30, 1997 which addressed performing a shutdown surveillance at power. The licensee's response was that a TS change had already been submitted;

- The licensee's receipt and internal distribution of a Nuclear Events Newsletter on February 9, 1998 which informed the site of another

site that had incorrectly performed "during shutdown" surveillances while at power. The licensee felt they had already submitted a TS change;

- The licensee was also performing a TS surveillance review project as part of corrective action for LER 50-400/95-07 and several subsequent related LERs. Prior to April 10, 1998 this effort had completed review of two of the TSs which required "during shutdown" testing, but did not identify that the surveillance procedures did not adequately implement the surveillance requirements.

The licensee's corrective actions for this issue were to request that the TS change submitted March 17, 1997 receive expedited approval. The delay had been due to the fact that the licensee had not yet responded to a request for additional information (RAI). The RAI was immediately responded to and the TS change was issued on April 14, 1998, four days after the inspector had identified this problem. The LER committed to revising procedure OST-1825 to ensure proper testing during refueling outage 8 in October 1998.

Safety Significance

The inspectors determined that the "during shutdown" issue was not significant with respect to safety, because the NRC approved the TS change to remove the "during shutdown" requirements on April 14, 1998, which made TS requirements consistent with the licensee's actions.

Regulatory Significance

10 CFR 50.59 states, in part, that the holder of a license authorizing operation of a production or utilization facility may make changes in the procedures as described in the safety analysis report, without prior Commission approval, unless the proposed change involves a change in the Technical Specifications incorporated in the license or a USQ. A licensee who desires (1) a change in Technical Specifications or (2) to make a change in the procedures described in the safety analysis report which involve a USQ or a change in Technical Specifications, shall submit an application for amendment of his license pursuant to § 50.90.

TS 6.5.1 requires that the 10 CFR 50.59 safety review program be implemented for TS 6.8 procedures. Specifically, TS 6.5.1.1.1 requires that safety and technical reviews be performed for all procedures and programs required by Specification 6.8, other procedures that affect nuclear safety, and changes thereto. TS 6.5.1.4 requires that safety evaluations prepared in accordance with TS 6.5.1.1.1 shall include a written determination, with basis, of whether or not the procedures or changes thereto, constitute a USQ as defined in 10 CFR 50.59, or whether they involve a change to the Final Safety Analysis Report, the Technical Specifications, or the Operating License. TS 6.5.1.4.3 requires that a safety evaluation and subsequent review that conclude that the subject action may involve a USQ, a change to the Technical Specifications, or a change to the Operating License, be referred to the PNSC for their

review in accordance with TS 6.5.2.6. It further requires that if the PNSC recommendation is that an item is a change to the TS, or Operating License, the action will be referred to the Commission for approval prior to implementation.

TS 6.5.2, Plant Nuclear Safety Committee (PNSC), contains the TS requirements for the PNSC. Specifically, TS 6.5.2.6 states that the PNSC shall be responsible for review of proposed procedures or changes thereto that have been initially determined to constitute a USQ or involve an unreviewed change to the Technical Specifications. TS 6.5.2.7 states that the PNSC shall render determination in writing with regard to whether or not each item considered under TS 6.5.2.6 constitutes a USQ.

The four "during shutdown" instances described above and the issuance and use of procedure OST-1844, all involved verbal interpretations of the technical specifications implemented through various procedures addressed by TS 6.8, and all involved a change from the TS. Because these instances all involved TS changes, all should have been implemented only after obtaining prior Commission approval of the changes. However, the inspector found that prior to April 10, 1998, the licensee had failed to obtain prior Commission approval of these changes. Collectively, the four "during shutdown" instances and the implementation of procedure OST-1844 constituted five examples of a violation of TS 6.5.1 and 10 CFR 50.59, in that these instances involved changes to procedures that directed actions which were contrary to TS requirements and were approved for use without prior Commission approval. This violation is designated violation 50-400/98-06-02, Performance of "During Shutdown" Surveillances at Power.

Conclusions

One violation was identified for approving procedures which allowed Technical Specification Surveillance Requirements that specified performance "during shutdown" to be performed at power without receiving prior Commission approval. This unresolved item is closed.

M8.6 (Open) LER 97-21-02: Technical Specification Surveillance Procedure Review Project Identified Deficiencies.

The inspectors evaluated the status of this Licensee Event Report (LER) by examining the licensee's TS Surveillance Procedures Review Project. The inspector reviewed the June 1998 revision of the project plan, and examined the documentation packages for several procedure reviews to evaluate the quality of the reviews and the significance of problems discovered during the review. The inspectors determined that the licensee's TS Review Project appeared to be very comprehensive, but that some of the review packages were not conducive to an independent review.

During the course of the review, the inspectors were informed that the licensee was processing a revision to the LER. The licensee had discovered that the commitment to submit a spent fuel pool level TS

change request by June 1, 1998, had not been met due to an administrative/communications error. In that other LER commitments had commitment due dates of "June 30, 1998," and "...prior to the next fuel offload," this LER remains open pending additional review prior to, or during the Fall 1998 refueling outage.

III. Engineering

E1 Conduct of Engineering

E1.1 Engineering Service Requests

a. Inspection Scope (37551)

The inspectors reviewed Engineering Service Request (ESR) 9800134, Rev. 0, RCP Long Term Operability with Reduced Compartment Cooling, to determine whether procedure EGR-NGGC-005, Engineering Service Requests, Rev. 8, was being followed.

b. Observations and Findings

ESR 9800134, Rev. 0, was initiated to determine whether operation of Reactor Coolant Pump (RCP) "C" is acceptable until RFO-8, with pump compartment cooling being provided not by the associated Containment Fan Coil Units (CFCUs) AH-39A&B, but instead by AH-1 & AH-3 Containment Fan Coolers. This ESR evaluated the potential temperature increase in the area of the RCP compartment; determined the effects of that increase on RCP motor windings, structural components, and environmentally-qualified components in the area of the compartment; assessed those effects; and developed related operational recommendations. The ESR concluded that operation of RCP "C" is acceptable until RFO-8, but that the increased temperatures in the area would shorten by a slight amount the environmentally-qualified lifetimes of 4 components.

The inspector found that the ESR described a reasonable approach, valid assumptions and data, and valid analytical methods. The ESR contents are consistent with the requirements of EGR-NGGC-005, Rev. 8.

c. Conclusions

ESR 9800134, RCP Long Term Operability with Reduced Compartment Cooling, Rev. 0, was prepared in accordance with EGR-NGGC-005, Rev. 8. The ESR describes a valid analysis that concluded that operation of RCP "C" is acceptable until RFO-8.

E3 Engineering Procedures and Documentation

E3.1 Procedures for Compliance with 10 CFR 50.59

a. Inspection Scope (37001, 9900)

The inspectors reviewed the licensee's procedures for meeting the regulatory requirements of 10 CFR 50.59. Those procedures included AP-011, 10 CFR 50.59 Safety Evaluations, Rev. 13, and AP-603, FSAR Revisions, Rev. 12. The inspectors also reviewed EGR-NGGC-0005, Engineering Service Requests, Rev. 8, and AP-006, Procedure Review and Approval, Rev. 34.

b. Observations and Findings

AP-011 provides specific guidance for completing safety evaluations in compliance with 10 CFR 50.59. EGR-NGGC-0005 and AP-006 specify when a safety evaluation is required, and both refer the reviewer to AP-011 for guidance in preparing the safety evaluation.

In addition to providing guidance for preparing safety evaluations, the procedures also provide guidance for updating the FSAR as a result of changes within the scope of 10 CFR 50.59, maintaining records required by 10 CFR 50.59, and formally reporting changes, tests, and experiments to the NRC as required by 10 CFR 50.59. Also, the procedures clearly define responsibilities for administering the 10 CFR 50.59 program.

The process described in AP-011 includes two distinct steps. The first step is a "screening" step to determine whether an unreviewed-safety-question determination (USQD) must be made, and the second step is preparation, review, and approval of USQDs. To complete the screening step, a reviewer must answer questions about the nature of the change, and to complete the USQD, a reviewer must answer questions about the effects of the change. The screening questions correspond well to the descriptions in 10 CFR 50.59 (a)(1) of the changes that are within the scope of the rule, and the USQD questions correspond well to the descriptions in 10 CFR 50.59 (a)(2) of the criteria for determining whether a proposed change involves a USQ. For each question, the procedure requires not only a Yes/No answer, but an adequate discussion of the bases for each answer, with references to documents that were used to determine the answers. For every USQD that identifies a potential USQ, the procedure requires review and approval by the Plant Nuclear Safety Committee. That requirement is consistent with TS 6.5.2.6.

The inspector noted that the procedures do not provide a list of sources or locations for the Harris Safety Evaluation Report, NRC safety evaluations, or NRC generic letters or bulletins. However, examinations of completed safety evaluations and interviews with preparers of safety evaluations indicate that most preparers appropriately reference those documents in safety evaluations.

c. Conclusions

The licensee's program for complying with 10 CFR 50.59 was consistent with that rule, and with TS 6.5.2.6. The licensee had established suitable programmatic guidance to ensure that the regulatory requirements of 10 CFR 50.59 would be met, and the information necessary for preparing adequate safety evaluations was available to licensee personnel.

E3.2 Implementation of Procedures for Compliance with 10 CFR 50.59

a. Inspection Scope (37001, 9900)

The inspector reviewed 19 completed safety evaluation forms for changes, tests, and/or experiments (CTEs) that the licensee determined did not satisfy the requirements for performing a USQD, and 16 safety evaluations that included USQDs. The inspector also examined Nuclear Assessment Section (NAS) Assessment HNAS 98-015, HNP 10 CFR 50.59 Safety Evaluations Special Assessment Report, dated February 5, 1998.

b. Observations and Findings

For each of the 19 completed safety evaluation forms for CTEs that the licensee determined did not satisfy the requirements for performing a USQD, only the five screening questions were answered. Among this group, the inspector did not identify any CTE that was improperly screened for USQD. However, the inspector noted that for some of the safety evaluation forms, the bases provided for the screening questions were typically very brief, and often incomplete. In one case, the basis provided was not relevant to the question, and in another case, the screen failed to include a list of references as required by AP-011. The inspector also noted that the bases provided for many of the answers in USQDs provided only a minimal level of detail. In particular, for Safety Evaluation Report 97-347, the inspector observed that the summary description and the safety evaluation itself lacked sufficient detail to fully explain the licensing basis for the subject change. Consequently, additional research was required to assess the adequacy of the USQD described in that report.

The inspector found that these findings were generally consistent with the findings described in NAS Assessment HNAS 98-015, and that the corrective actions taken in response to that assessment included the procedure changes described in section E5.1.

For 15 of the 16 safety evaluations reviewed, the inspector did not identify any CTE that involved a USQ. However, differing views were developed regarding one of the safety evaluations, as discussed below.

When the licensee converted from Westinghouse to Siemens fuel during fuel cycle 6, many of the FSAR Chapter 15 events were re-analyzed by Siemens. For the Cycle 6 fuel reload, the licensee prepared an unnumbered safety evaluation dated 4/25/94 and titled HNP Cycle 6 Safety

Evaluation. That safety evaluation concluded that use of the new fuel did not constitute a USQ, even though the safety evaluation identified that use of the new fuel would result in an increase in the offsite doses calculated for several postulated accidents, when compared to the corresponding doses for the Cycle 5 reload. The safety evaluation concluded in part that because the recalculated doses were below the acceptance criteria established in the NRC Standard Review Plan, use of the new fuel did not constitute a USQ.

The table below summarizes the cycle-5 and cycle-6 doses as reported in the HNP Cycle 6 Safety Evaluation:

Postulated Accident	*Dose Location*	*Cycle-5 Dose* (rem)*	*Cycle-6 Dose* (rem)*	*Relative Change*
Loss-of-Coolant Accident	Exclusion Area Boundary	2.60	2.69	+ 3%
	Control Room	0.60	0.61	+ 1.7%
Main Steam Line Break with a stuck control rod	Exclusion Area Boundary	0.3	1.95	+ 550%
		76*	145*	+ 90%
	Low Population Zone Boundary	0.28	1.8	+ 540%
		53*	130*	+ 145%
Main Steam Line Break without a stuck control rod	Exclusion Area Boundary	2.6*	8.8*	+ 238%
	Low Population Zone Boundary	2.6*	16.1*	+ 519%

* Doses marked with an asterisk are thyroid doses; all others are whole-body doses.

The inspector confirmed that prior to the Cycle 6 reload (i.e., prior to amendment 45), the "Cycle-5" doses shown in the table above for the three named accidents were in the FSAR tables 15.6.5-6 (for the Loss-of-Coolant Accident) and 15.1.5-4 (for the Main Steam Line Break Accidents). The inspector also confirmed that after the Cycle 6 reload (i.e., after amendment 45), the "Cycle-6" doses shown in the table above were in FSAR tables 15.6.5-12 and 15.1.5-6, respectively.

In contrast to the licensee's position, the inspector considered that because the Cycle-6 calculated doses are higher than the Cycle-5 calculated doses, use of the new fuel increased the consequences of an accident previously evaluated in the safety analysis report, and thus necessarily involves a USQ. Further review is required to reconcile these differing views.

Pending further review to reconcile the differing view described above, and subsequent assessment of the adequacy of the licensee's USQD in this

case, this is identified as an unresolved item, URI 50-400/98-06-01, USQ Determination Related to Cycle 6 Reload.

c. Conclusions

For 19 safety evaluation forms reviewed by the inspector, the licensee's determinations that a USQD was not required were considered correct, although the bases for those determinations were typically weak. Similarly, the bases for USQDs were weak in some cases. The inspector's findings in this regard were consistent with the findings described in HNAS 98-015.

For 15 of 16 USQDs reviewed by the inspector, the licensee's determination that the corresponding changes did not involve a USQ were considered correct. An unresolved item was opened with respect to the Unreviewed Safety Question Determination described in the safety evaluation for the Cycle 6 Reload.

E4 Engineering Staff Knowledge and Performance

E4.1 Containment Sump Loose Parts

a. Inspection Scope (37551)

The NRC identified to the licensee on January 27, 1998 that there could potentially be loose bolting material in the containment sumps. The licensee initiated CR 98-00295 to investigate and address this condition. The inspector reviewed the root cause investigation.

b. Observations and Findings

A short term operability determination was performed and was documented in ESR 98-00042. NRC Inspection Report 50-400/98-01, Section E1.2, Containment Sump Concerns, reviewed the short term operability determination. The licensee found that the bolting material was a bracket for foreign material exclusion (FME) covers that were put in place for the plant construction process. They were not shown on any drawings and, therefore were not permanent plant equipment. They were not removed at the end of plant construction in 1986 as they should have been. The licensee found that during refueling outage 7 (RF07), workers and engineers who were working on containment sump leaking problems observed a bracket on the sump suction pipe that was loose. An engineer removed the portion of the bracket that was loose. The remaining brackets were hammer tested and found to still be soundly attached to the pipe with tack welds. The licensee concluded in the ESR 98-00042 that the sumps were operable with the parts left in place. The NRC concluded that the operability evaluation was adequate.

The licensee performed a root cause evaluation for CR 98-00295. The cause of the brackets being left in the sump was that they were not recognized as a deviation from design during system and area turnovers during construction walkdowns in 1986. The reason they were left in the

sump after RF07 was that the condition was not documented in the corrective action program as required. This was contrary to 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and the approved corrective action program described in Procedure AP-615, Condition Reporting, Rev. 23. Procedure AP-615, Section 3.7 requires that personnel document potential adverse conditions via the Electronic Condition Report or on Attachment 1. The failure to document the containment sump foreign material exclusion bracket design deficiency in the corrective action program was a violation of 10 CFR 50 Appendix B, Criterion XVI and is designated violation 50-400/98-06-03, Containment Sump FME Bracket Design Deficiency.

The licensee's immediate corrective action was to perform the operability evaluation which was found to be adequate in Inspection Report 50-400/98-01. Long term corrective action was to remove the brackets in October 1998 during the next refueling outage. Work requests 98-AATW1 and 98-AATX1 were written to accomplish that task. Real Time training was being provided to Engineering personnel stressing the importance of documenting plant conditions which conflict with the approved design in accordance with the site corrective action program. The licensee conducted a review of CRs back to 1988 and concluded that in general CRs were being initiated when deviations from approved design documents were identified. The inspectors found the root cause investigation was thorough and the identified corrective actions addressed the root cause of the issue.

c. Conclusions

A violation was identified for failing to follow the approved corrective action program in not initiating a TS during the 1997 refueling outage (RF07) for a deviation from the approved design in relation to brackets on the containment sump suction pipes. The root cause investigation for the containment sump bracket issue was thorough.

E5 Engineering Staff Training and Qualification

E5.1 10 CFR 50.59 Training

a. Inspection Scope (37550)

The inspectors observed training provided to engineering managers and personnel on the licensee's revised procedure for performance of 10 CFR 50.59 safety evaluations.

b. Observations and Findings

The inspectors reviewed CP&L procedure REG-NGGC-0002, 10 CFR 50.59 and Other Regulatory Evaluations, Rev. 1. This procedure provides instructions for performing safety evaluations of temporary or permanent changes in accordance with 10 CFR 50.59, and other regulatory requirements such as fire protection, security, and emergency preparedness. The procedure requires that all personnel (managers,

screeners, and evaluators of changes) be trained and qualified in accordance with the procedure.

The inspectors observed the training provided to site management personnel on June 9, 1998. A change to the licensee's requirements for performance of safety evaluations is for each evaluation to have the review and approval of the cognizant manager. All evaluations will be completed by the originator, independently verified by another qualified individual, and reviewed and approved by a manager. Sufficient detail is required in the response to each question in safety screens and USQDs to permit review by another qualified reviewer without the need to obtain input or guidance from the originator. The procedure requires screeners and evaluators to obtain assistance from other knowledgeable personnel when performing interdisciplinary reviews. Answering a question simply "YES" or "NO", or simply restating the question is not acceptable. An explanation of the basis for the response to each question is required, including listing of references reviewed. The training included an example of a completed safety evaluation. At the completion of the training, the managers provided several suggestions on methods to improve the training. These included preparation of a list of subject matter experts for reviewers and evaluators to contact to obtain additional specific information for performance of safety screens and evaluations, preparation of a list of references, and providing a better example of an acceptable safety evaluation.

The inspectors observed a training class conducted on June 10, 1998 for approximately 15 screeners and evaluators. The inspectors noted that comments provided by managers at the training conducted on June 9 were for the most part incorporated in the training conducted on June 10. A revised sample of a completed safety evaluation was included in the June 10, 1998 training. This sample evaluation was more realistic of the type normally prepared by licensee engineers.

c. Conclusions

The licensee's training for qualification of engineering personnel on 10 CFR 50.59 requirements was effective and complied with NRC requirements.

E6 Engineering Organization and Administration

E6.1 Engineering Backlog (37550)

a. Inspection Scope

The inspector reviewed the backlog of open items in the Harris Engineering Support Section.

b. Observations and Findings

The backlog of items in the Harris Engineering Support Section (HESS) includes ESRs, temporary modifications, document changes, and other open engineering items, including open CRs. Documents include vendor

manuals, procedures, and drawings with outstanding changes. The licensee's performance report for April 1998, showed approximately 590 open ESRs, 150 documents, 400 CRs, and 15 temporary modifications. The number of document changes has declined since January 1998, while open ESRs and CRs has increased slightly. In comparison with 1996 HESS performance indicators, the engineering backlog has shown a considerable increase. The inspectors reviewed the work items in the backlog to determine if plant safety was being compromised by delaying implementation of safety significant engineering activities. This review disclosed that work activities have been prioritized, with safety significant items being completed on schedule. Work delayed from the Spring 1997 outage did not present a safety concern.

Review of the engineering organizational structure since August 1996, showed numerous staffing changes and reassignments, reorganizations, and changes in functions. Another reorganization was scheduled to be performed in late June 1998. The total staffing level in HESS, including the design control unit, was approximately 106 in August 1996, increasing to approximately 112 in March - May 1997, with a decrease to the current level of 101. Part of this reduction was the re-assignment of some HESS personnel to the major projects organization. This organization, which reports to the Vice-President, Engineering, was formed in November 1997 to manage several major projects, including steam generator replacement and power uprate. While the number of personnel in HESS has remained relatively constant, approximately 25 new personnel have been hired since 1996. Approximately 20 of the 25 are new to HESS since May 1997. Several of these changes were in key HESS management positions. The resulting vacancies which occurred when personnel departed from HESS were usually unfilled for several months. Therefore, the departure of 20 personnel from HESS in the last year resulted in a significant reduction in full time equivalent positions in HESS in the 1997 - 1998 period. Three of the current positions in HESS are staffed by contractors.

The approximate 20 percent turnover which occurred in the last 12 months has contributed to the increased backlog. The inspectors discussed the backlog reduction plans with the HESS engineering manager. These discussions disclosed that the licensee has an action plan to reduce the backlog which includes some reassignment of work, changes to procedures to simplify work, and maintaining stability in the organization. Scheduled overtime is not currently being used to reduce the backlog in consideration of the upcoming Fall 1998 refueling outage. The engineering work required to be completed by the outage is on schedule. Progress has been shown in reduction of the overall backlog since January 1998. The inspectors also reviewed the backlog and the assigned engineers to complete the various items to determine if work activities were assigned to individuals no longer assigned to HESS. With the exception of a few backlog items which were identified to the HESS manager, the backlog was assigned to individuals currently in HESS.

c. Conclusions

A weakness was identified for the increase in the backlog of engineering work in HESS since 1996. However, at the present time, safety has not been impacted by the increase in work backlog.

E6.2 Steam Generator Replacement Project

a. Inspection Scope (50001)

The inspectors reviewed the status of planning for the steam generator replacement project.

b. Observations and Findings

The inspectors met with steam generator replacement project personnel to review the status of the project. The scope of the project management process was reviewed, and the methodologies for determining project milestones and assigning completion dates were discussed. The inspectors also reviewed the licensee's plans for integrating other major modifications, (e.g., main condenser retubing and spent fuel pool modifications) into the steam generator replacement outage.

One of the upcoming milestones discussed, was the expected arrival of the replacement steam generators in August or September 1998. The inspectors were briefed on the status of the licensee's program for assurance that fabrication documentation for the replacement steam generators was completed, and accepted, prior to release for shipment to the site. (The licensee informed the inspectors that the licensee's contract requires that the steam generators cannot be shipped prior to acceptance of the fabrication documentation.)

c. Conclusions

The licensee's planning and project management for the steam generator replacement project appeared to be comprehensive and well organized.

E7 Quality Assurance in Engineering Activities

E7.1 Quality Assurance Assessment and Oversight

a. Inspection Scope (37550)

The inspector reviewed assessments performed by NAS of engineering activities and a self assessment performed by the Harris Engineering Support Section.

b. Observations and Findings

NAS Assessments

The NAS assessments are part of the overall CP&L quality assurance program at Harris. The inspectors reviewed CP&L procedure NUA-NGGC-1510, Nuclear Assessment Process, Rev. 6, which provides the instructions for planning, preparing, performing, reporting, and following up on NAS assessments. Findings from these assessments are categorized as strengths, issues, or weaknesses. The NAS assessments reviewed by the inspectors were as follows: Assessment numbers H-NED-97-01, Harris Engineering Support Section Assessment; H-ISI-98-01, Harris Inservice Inspection Assessment; and H-SBO-98-01, Station Blackout Program Assessment. The inspectors verified that issues and weaknesses were documented as required under the licensee's corrective action program.

Self Assessments

Self-assessments performed within line organizations are also part of the overall CP&L quality assurance program at Harris. The objectives of self-assessments are to improve quality and performance of the individual organizations, to identify and correct early indications of declining performance, and to identify areas where increased management attention is required. The inspectors reviewed CP&L procedure PLP-03, Self-Assessment, Rev. 5. This procedure provides the instructions for performing and documenting results of self-assessments. The results of self-assessments are also categorized as strengths, issues, weaknesses, or items for management consideration. The inspectors reviewed the following self-assessments:

- ENG-D-97-004, Q List;
- ENG-E-97-002, Safe Shutdown Analysis in Case of Fire at HNP;
- ENG-E-97-004, Safety AC Power; and
- ENG-M-97-007, AFW System Vertical Slice Review.

The inspectors verified that CRs were initiated as appropriate for self-assessment findings. Corrective actions were in progress.

c. Conclusions

The NAS assessments and the self-assessments performed by HESS personnel were effective in identifying engineering performance deficiencies and were useful in providing insights to management. Corrective actions in response to the findings were generally acceptable. This was identified as a positive observation.

E8 Miscellaneous Engineering Issues (92700, 92903)

E8.1 (Open) Violation 50-400/97-12-05: Failure to Establish and Implement Engineering Procedures. The licensee responded to this violation in a letter dated January 28, 1998. This violation involved three examples of failure to establish and implement procedures in performance of engineering activities. The licensee's corrective actions for examples two and three are discussed below:

Example 2 - The cause of this violation example was a deficiency in the document update process. The licensee's corrective actions included revision to the process, specifically the computer software, which is used to identify documents affected by design changes. The licensee updated the documents affected by the ESR identified in the violation example. The licensee also reviewed other ESRs and identified four additional ESRs which were reviewed to identify documents which required updating. The inspectors reviewed the document update forms associated with the five ESRs and verified affected documents were appropriately revised.

Example 3 - The cause of this violation example was the failure to include a specific time requirement in design control procedures for updating environmental qualification data packages (EQDPs). The licensee's corrective actions included revision of procedures EGR-NGGC-0007, Maintenance of Design Documents, and EGR-NGGC--0156, Environment Qualification of Electrical Equipment Important to Safety, to require that EQDPs be updated within 90 days of ESR implementation. Additional corrective actions included updating of EQDPs which had outstanding ESRs posted against them. A total of 51 EQDPs were identified with unincorporated (outstanding) ESRs. Updating of the EQDPs was recently completed. The inspectors reviewed Rev. 3 of procedure EGR-NGGC-0007, dated February 27, 1998, and Rev. 5 of procedure EGR-NGGC-0156, dated February 27, 1998, and verified that the procedures had been revised to require that EQDPs be updated within 90 days of ESR implementation. The inspectors discussed the updating of EQDPs with the site EQ engineer and reviewed randomly selected EQDPs to verify that they had been updated to incorporate completed ESRs.

This item remains open pending review of the corrective actions for example 1.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Comments (71750)

The inspector observed radiological controls during the conduct of tours and observation of maintenance activities. The inspector found radiological controls to be acceptable. The general approach to the control of contamination and dose for the site was good. Teamwork

between the various departments continued to be a major contributor to the good control of dose.

P4 Staff Knowledge and Performance in EP

P4.1 Emergency Preparedness Drill

a. Inspection Scope (71750)

The inspector observed licensee participation in the July 9, 1998, full-scale drill.

b. Observations and Findings

The drill included full staffing and activation of the Technical Support Center (TSC), Operational Support Center (OSC), and Emergency Operations Facility (EOF), but only simulated participation of the Control Room staff, the Joint Information Center, and several off-site agencies. The TSC, OSC, and EOF were fully staffed in a timely manner. Participants maintained a good focus on plant conditions, which enabled them to respond well to changing scenario conditions. Communications among participants were both frequent and effective. No deficiencies were noted.

c. Conclusions

Participant performance in the July 9, 1998, drill demonstrated an acceptable ability to respond to emergencies.

S1 Conduct of Security and Safeguards Activities

S1.1 General Comments (71750)

The inspector observed security and safeguards activities during the conduct of tours, observation of maintenance activities, and the emergency preparedness drill. Activities were being conducted in accordance with required procedures and the security plan.

S2 Status of Security Facilities and Equipment

S2.1 Protected Area Barrier Walkdown

a. Inspection Scope (71750)

The inspector conducted a walkdown of the main protected area (PA) barrier.

b. Observations and Findings

On June 19, 1998, the inspector performed a walkdown of the main PA barrier. The fence was in good condition, and no openings or signs of degradation were observed. Isolation zones were observed to be of

sufficient size and free of objects. No evidence of barrier erosion at the base of the barrier was evident.

c. Conclusion

The protected area barrier was observed to be in good condition. Isolations zones were of sufficient size and were free of objects.

F1 Control of Fire Protection Activities

F1.1 General Comments

The inspector observed fire protection equipment and activities during the conduct of tours and observation of maintenance activities. Fire Protection activities were being adequately conducted.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on July 2, 1998. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Batton, Superintendent, On-Line Scheduling
D. Braund, Superintendent, Security
B. Clark, General Manager, Harris Plant
A. Cockerill, Superintendent, I&C Electrical Systems
J. Collins, Manager, Maintenance
J. Cook, Manager, Outage and Scheduling
J. Donahue, Director Site Operations, Harris Plant
J. Eads, Supervisor, Licensing and Regulatory Programs
G. Kline, Manager, Harris Engineering Support Services
M. Keef, Manager, Training
R. Moore, Manager, Operations
K. Neuschaefer, Manager, Environmental & Radiation Control
W. Peavyhouse, Superintendent, Design Control
W. Robinson, Vice President, Harris Plant
S. Sewell, Superintendent, Mechanical Systems
D. Tibbitts, Manager, Nuclear Assessment
C. VanDenburgh, Manager, Regulatory Affairs
M. Wallace, Senior Analyst, Licensing

INSPECTION PROCEDURES USED

IP 37001: 10 CFR 50.59 Safety Evaluation Program
IP 37550: Engineering
IP 37551: Onsite Engineering
IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 50001: Steam Generator Replacement Inspections
IP 61726: Surveillance Observations
IP 62700: Maintenance Implementation
IP 62707: Maintenance Observation
IP 71707: Plant Operations
IP 71750: Plant Support Activities
IP 92700: Onsite Followup of Events
IP 92902: Followup - Maintenance
IP 92903: Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-400/98-06-01	NCV	Use of Technical Specification Interpretations for TS Changes (Section 08.1).
50-400/98-06-02	VIO	Performance of "During Shutdown" Surveillance at Power (Section M8.5).
50-400/98-06-03	VIO	Containment Sump FME Bracket Design Deficiency (Section E4.1).

Closed

50-400/98-06-01	NCV	Use of Technical Specification Interpretations for TS Changes (Section 08.1).
50-400/97-07-02	IFI	Followup on Performance Monitoring of the Condensate Makeup System (Section M8.1).
50-400/97-07-03	VIO	Failure to Effectively Monitor the Performance or Condition of the Normal Service Water System (Section M8.2).
50-400/97-07-04	VIO	Failure to Effectively Demonstrate Performance of the Steam Dump System and the C Charging Safety Injection Pump (Section M8.3).
50-400/98-04-03	URI	Technical Specification Literal Compliance (Section M8.5).

Discussed

50-400/98-005-00	LER	Technical Specification verbatim non-compliance (Section 08.1)
50-400/98-006-00	LER	Failure to perform inspections and preventive maintenance on molded case circuit breakers as required by Technical Specifications (Section M8.4).
50-400/97-021-02	LER	Technical Specification Surveillance Procedure Review Project Identified Deficiencies (Section M8.6).
50-400/97-012-05	VIO	Failure to Establish and Implement Engineering Procedures (Section E8.1).