EXECUTIVE SUMMARY

Shearon Harris Nuclear Power Plant, Unit 1
NRC Inspection Report 50-400/97-12

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 two regional Reactor Inspectors in the Maintenance area, a regional Senior Project Manager in the Plant Support area, and a Project Engineer in the Operations and Engineering area. Also a team of three inspectors reviewed controls for identifying, resolving, and preventing problems.

Operations

- Operations performance during the period was good. There were no events caused by operations performance errors. End-of-shift critiques were good (Section 01.1).

- The licensee's approach to preparation for adverse weather was more comprehensive than in the past. The approach was more focussed on addressing the root cause for the heat trace and temperature monitoring problems than in the past. The licensee had not adequately forecasted the amount of work involved in repairing the heat trace circuits. Consequently, not all circuits had been repaired prior to the start of cold weather. However, all circuits associated with safety-related equipment were working. (Section 02.2).

- The recognition/identification of problems was identified as a strength. Improper classification of significance and inconsistent trending of adverse conditions has contributed to the recurrence and longevity of some performance issues (Section 07.2).

- The inspector concluded from a sampling of significant condition reports that root cause investigations, if performed, were effective. However, justification of root cause waivers, closure documentation errors, and implementation of corrective actions resulted in missed opportunities to conduct complete and comprehensive reviews. These findings were similar to licensee audit findings (Section 07.3).

- The operating experience feedback program was judged to be adequate (Section 07.4).

- The licensee audit and self-assessment programs were effective in identifying issues at the plant and was a strength. The licensee's identified weaknesses in the cold weather preparations were consistent with the inspectors findings. The licensee's assessments identified improvements in implementation of the corrective action program that were consistent with inspector issues (Section 07.5).

- The off-site and on-site safety review committees provided effective oversight of plant operations. These committees were self-critical and focused on safety. A violation was identified for a Plant Nuclear

Safety Committee meeting conducted without the required quorum membership. A second violation was identified for not designating the written Plant Nuclear Safety Committee membership appointment as a quality assurance record (Section 07.6).

Maintenance

- Maintenance activities were generally completed in a thorough and professional manner. Maintenance personnel were knowledgeable of the assigned tasks. Maintenance procedures were detailed and actively used on the job (Sections M1.1 - M1.5).

- Radiation monitoring was a strength in maintenance activities (Sections M1.2 and M1.3).

- Post maintenance testing of the Emergency Safeguards Sequencer was thorough and professional (Section M1.4).

- One maintenance activity was found deficient in that the craft failed to correctly implement the WR/JO work instructions resulting in a non-cited violation (Section M1.5).

- Each of the five surveillance tests observed were conducted in a thorough and effective manner. Procedures were followed, maintenance and operations personnel performed peer checking to identify potential problems before they impacted plant operations. The inspectors also noted engineers who supported the on-going maintenance activities were very capable and knowledgeable (Section M2.1).

Engineering

- The licensee's procedural controls for computer software development activities failed to ensure that the development activities could not affect quality related software and associated data files installed in the plant. This was identified as a violation of 10 CFR 50 Appendix B Criterion V (Section E1.1).

- Two additional 10 CFR 50 Appendix B Criterion V violation examples were identified for failure to establish and implement engineering procedures. The first additional example was for failure to update EDBS following installation of replacement motor starters in the post accident hydrogen analyzer. The second additional example was for failure to establish a clear time requirement for updating environmental qualification documentation packages to ensure that the packages are maintained current and audit able for installed plant equipment (Section E3.1).

- The licensee's Nuclear Assessment Section evaluation of the Environmental Qualification Program including the line response to the assessment were adequate, however the assessment did not address the inadequate Environmental Qualification Program procedures (Section E3.1).

- A procurement engineering weakness was identified in review of the materials evaluation for a replacement motor starter (Section E3.1).

- Troubleshooting had improved and was at the appropriate level for three of the four examples observed. The synchronization to the grid troubleshooting did not have sufficient initial management attention to ensure success equivalent to the other three. This was mainly due to inadequate communication of expectations down the management chain. The communication aspect was identified as an additional example of the engineering communication weakness from NRC Inspection Report 50-400/97-10 (Section E4.1).

- The assessment of Operations and Engineering support programs was being adequately performed by the PES Unit (Section E7.2).

- The use of industry assessors (Peers) on the PES assessment team was considered a strength (Section E7.2).

- The AFW assessment was performed in accordance with commitments to NRC and deficiencies were documented in the Corrective Action Program for tracking and disposition (Section E7.2).

Plant Support

- The licensee's radiation control program in the areas of radiation surveys, Radiation Work Procedure controls, and pre-job planning and ALARA briefings were implemented effectively and in accordance with procedures (Section R1.1).

- Self assessment activities were identified as a strength of the licensee's radiation control program (Section R1.1).

- Specific radiation controls were effectively implemented with good occupational exposure controls demonstrated during routine power operations. (Section R1.2).

- Some radiation workers interviewed had a minimally sufficient knowledge of RWP requirements and working conditions. Prior to the end of the inspection the affected workers had increased in their RWP knowledge (Section R1.2).

- The licensee's ALARA program was effectively implemented and adequately controlled collective dose (Section R8.1).

- The performance of Security and Safeguards activities was good (Section S1.1).

- 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. The unit maintained approximately 100 percent power for the entire period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

a. Inspection Scope (71707)

The inspectors conducted frequent reviews of ongoing plant operations including shift turnovers, control room operations, log keeping, compliance with technical specification action statements, and crew shift critiques.

b. Observations and Findings

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. The inspector observed several shift critiques that were conducted at the end of each 3 day or 4 day shift cycle (end-of-shift critiques). These critiques went over lessons learned for that cycle and things that could be done better. These were good and provided a good forum for operators to collectively assess their performance including the brainstorming of ways to improve.

One specific example of good performance was observed on November 19, 1997 when the inspector observed a shift crew identify a 6 gallon per minute leak at 3:10 p.m. while trending volume control tank level. The shift had been monitoring this level specifically because the chemical and volume control system cation bed had been placed in service about an hour earlier. The operators quickly responded and found that valve 1CS-62, "B" mixed bed demineralizer drain to the equipment drain system, was slightly open. The valve was shut 17 minutes after the leak was identified. The operators were observed to be following procedure Abnormal Operating Procedure (AOP)-016, Excessive Primary Plant Leakage, Revision 12. The valve was apparently bumped during decon work in the area. Condition report 97-05031 was written to address this issue.

c. Conclusions

Operations performance during the period was good. There were no events caused by operations performance errors. End-of-shift critiques were good.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following ESF systems:

- Hydrogen Analyzer and Electric Recombiner (FSAR section 6.2.5)

Equipment operability, material condition, and housekeeping were acceptable in all cases. Several minor discrepancies were brought to the licensee's attention and were promptly corrected. Procedure reviews associated with this equipment will be completed next inspection period. Some engineering issues were identified and are discussed in section E3.1.

O2.2 Cold Weather Preparation (71714)

a. Inspection Scope

The inspector used Inspection Procedure 71714 to determine whether the licensee had effectively implemented a program to protect safety-related systems against extreme cold weather.

b. Observations and Findings

The inspector reviewed procedure Administrative procedure (AP)-301, Adverse Weather Operations, Revision 17, to ensure that lessons learned from the previous winter were incorporated into guidelines for this winter season. Attachment 1 to this procedure contained various requirements including the verification of properly installed insulation on Refueling Water Storage Tank (RWST) level transmitter sensing lines and associated valves. Other actions included ensuring freeze protection and temperature maintenance systems were operable per Operating Procedures (OP)-161 and OP-161.01. The status of electric unit heaters located throughout the plant were also checked in accordance with AP-301.

The inspector verified that procedure AP-301 had been completed prior to this inspection as required when ambient temperatures had fallen to below 35 degrees Fahrenheit. During this inspection, the inspector walked down applicable portions of the turbine building, emergency service water and emergency diesel generator structures, reactor auxiliary building, and outside areas to verify that instrument sensing lines were well insulated, and heating equipment was functioning. The inspector specifically noted that the RWST level sensing lines had been adequately insulated and that no heat trace cables were exposed. The four safety-related RWST level transmitters were located in box-shaped enclosures with a 1-inch thick rubber-based insulation inside.

Each year prior to the first of November, preventive maintenance is performed on the heat trace circuits to ensure that they are working

properly. The inspector reviewed the AP-301 work ticket list that was generated from performance of the yearly preventive maintenance. The list was large (over 50 work tickets) and represented a substantial amount of work. In some cases the circuits were being flooded from small water leaks. The licensee was taking corrective action on the water problems as well as repairing the heat trace circuits. This work was not complete prior to cold weather arriving. Through discussion with the work control supervisor and through the inspector's walkdown of the plant, the inspector verified that heat tracing and temperature monitoring circuits were in place with deficiencies corrected for all safety-related equipment. Circuits associated with non-safety equipment that were not complete were receiving compensatory measures such as installation of temporary heaters.

A self assessment had been performed by the line organization in this area which is discussed in section 07.5. The self assessment indicated that the licensee started too late for the amount of work that was generated for preventive maintenance. From discussions with the licensee about the extent of corrective actions, the inspector found that the program for this winter was more in-depth in relation to fixing the root cause of the problems than in the past. This indicated the licensee's current commitment to resolving the adverse weather issues. In addition, the inspector found while attending the morning emergent work meetings that licensee management was appropriately focussed on completing the work list and ensuring that equipment was protected.

The inspector also reviewed Engineering Service Request (ESR) 9700007, Disable Heat Trace Nuisance Alarms, Revisions 0 through 2. As discussed in NRC Inspection Report 50-400/96-11, section 02.3, the temperature maintenance and heat trace panels feed a common alarm panel in the radwaste control room. Each heat trace panel, which can contain over twenty heat trace circuits, has one alarm on the rad-waste control board. Nuisance alarms can cause the light for a panel to be illuminated, thus masking when a legitimate alarm occurs on another circuit in the panel. This ESR addressed these nuisance alarms. The ESR was not closed at the time of the review and was being revised to include additional problems found during the troubleshooting and preventive maintenance repair process.

c. Conclusions

The inspector concluded that the licensee's approach to preparation for adverse weather was more comprehensive than in the past. The approach was more focussed on addressing the root cause for the heat trace and temperature monitoring problems than in the past. The licensee had not adequately forecasted the amount of work involved in repairing the heat trace circuits. Consequently, not all circuits had been repaired prior to the start of cold weather. However, all circuits associated with safety-related equipment were working. Compensatory measures ie., temporary heaters were used for non-safety equipment heat trace circuits where work was not completed.

07 Quality Assurance in Operations

07.1 General Comments

Using inspection procedure 40500 an inspection was conducted of the licensee's corrective action program, operating experience review, self-assessments, and on-site/off-site safety review committees. Strengths were noted in problem recognition/identification and self-assessments. However, missed opportunities were identified in the implementation of the corrective action program.

07.2 Identification, Classification, and Trending on Nonconforming Issues

a. Inspection Scope (40500)

The inspector reviewed licensee procedures and reports to determine the adequacy of licensee identification and proper classification of degraded or nonconforming conditions of equipment and the proper identification of the root causes for these nonconformances and deficiencies.

b. Observations and Findings

The inspector reviewed a list of the Condition Reports (CRs) initiated from 1996 to present, reports from the repetitive failure program, operability determinations, the unit leak log, and Licensee Event Reports (LERs). The inspector determined that the threshold for CR initiation was low enough to promote recording of nonconforming or degraded conditions. The inspector reviewed selected items from LERs and equipment deficiencies noted in the drip-bag log. The inspector found that those conditions were appropriately dispositioned. Review of selected LERs during 1997 found that all conditions reported were properly identified and classified in accordance with Administrative Procedure AP-615, Condition Reporting. The recognition/identification of problems was identified as a strength.

Inspector review of CRs from 1996 to the present identified adverse trends in several areas including:

- exceeding overtime requirements
- deficiencies in operator logs
- failure to obtain proper dosimetry, both electronic and thermoluminescent dosimetry
- procedural adherence
- errors in control of safety-related software
- exceeding the 14 day requirement for implementation of temporary changes into procedures

Quarterly trend reports for 1996 until June 1997 and the October 1997 monthly corrective action/operating experience reports addressed the procedural adherence and thermoluminescent dosimeter issues. However, trends in the failure to obtain electronic dosimetry, deficiencies in operator logs, exceeding the 14-day requirement for implementation of temporary changes into procedures, and errors in the control of safety-related software were not addressed in the trend report.

Selected CRs were reviewed for proper classification in accordance with the criteria established in AP-615: CRs classified as a level 4 - Improvement Process or Procedural Enhancements, level 3 - Minor Degraded or Nonconforming Conditions, while level 1 - Significant Maintenance Rule Designated Component Failures, Component or Design Issues that Challenge Plant or Personnel Safety, Reports of Adverse Trends, Regulatory Issues, TS Violations, or Required Reports. The inspector determined that most of the CRs reviewed were adequately classified. However, CRs 96-1114, 97-303, 97-814, and 97-2152 were determined by the inspector to have been misclassified as level 3 - minor instead of level 1 - significant. CRs 97-814 and 97-2152 addressed overtime exceeding Technical Specification requirements, while 96-1114 described the failure to notify the NRC within 30 days as a result of a request made to the State of North Carolina for a modification to the NPDES permit and 97-303 described an adverse trend in adequacy of Operations shift staffing.

The inspector attended the daily CR classification meeting. The CRs for the day were listed and the responsible manager/supervisor indicated the severity level classification. During the November 18, 1997 classification meeting, the inspector observed that CR 97-4994 was reviewed and concerned a problem associated with the installation of valves previously installed by operations personnel. The CR was classified as level 3 - minor. The inspector questioned the classification due to potential 10 CFR 50.59 aspects, which are required to be considered as level 1 - significant in accordance with AP-615 criteria. Upon discussion with the licensee about this aspect, the CR was reclassified. The inspector found that the meetings were not always effective in assessing the significance of condition reports. Improper classification can cause a lack of proper management focus on the corrective action to prevent recurrence.

The inspector reviewed implementation of new measures to improve trending of issues. The inspector reviewed visual trending aides and attended a quarterly trend meeting. The inspector observed that one group identified problems and then performed analysis of the cause for the trend. During the trend meeting attended, the inspector noted that the composition of the attendees was appropriate for the purpose and the use of visual aides assisted in group trend identification. However, the inspector noted that the effort addressed the identification of problem areas but did not provide an effective analysis of the causes. The inspector concluded that lack of consistency across the site for implementation of these measures affected the potential benefit of trend identification.

c. Conclusions

The recognition/identification of problems was identified as a strength. Improper classification of significance and inconsistent trending of adverse conditions has contributed to the recurrence and longevity of some performance issues.

07.3 Corrective Action Program

a. Inspection Scope (40500)

The inspector reviewed CRs that were designated significant adverse conditions. The CRs were reviewed to assess the implementation of the corrective action program. This was accomplished by reviewing the CRs for root cause investigation adequacy, corrective action assignment and tracking, and CR documentation control. The inspector reviewed the corrective actions for adequacy and completion.

b. Observations

The inspector reviewed 13 significant adverse condition CRs. The licensee defined a significant adverse condition to be that which is important to the degree that action is necessary to preclude recurrence. The licensee had an extensive list for the criteria which fits these conditions. Review of the licensee's program indicated that CRs which are designated as significant adverse conditions require a root cause investigation per AP-605, Root Cause Investigation. Procedure AP-605, Section 3.3, allows for waiver of a root cause if it is determined by a manager's review that no value will be added. The licensee's CR document has a signature required for final closeout. This signature designates that a manager has reviewed the CR for corrective action completion and the CR is complete. The licensee uses a computer database to track their corrective action program. As each corrective action assignment is completed, the database is updated. When the last action item is complete, the CR is closed out in the database. This database is relied on by the licensee to maintain status of CRs. Eight of the CRs reviewed were identified as closed and five of them were identified as still open. The following is a list of the CRs reviewed:

- CR 96-00008 Unplanned opening of the "A" Reactor trip breaker while performing a maintenance surveillance test.
- CR 96-00278 LI-991 Refueling Water Storage Tank (RWST) level instrument failed high in cold weather.
- CR 96-00283 Two of four RWST instrument sensing lines froze causing inoperability and entrance into TS 3.0.3.
- CR 96-02110 Engineering workload not effectively managed.
- CR 97-02504 Final Safety Analysis Report (FSAR) Seismic qualification of Fire Protection standpipes.
- CR 97-02600 Steam Generator (SG) entry revealed ribs corroded.
- CR 97-01581 Loss of power to radiation monitor should have caused "B" train Control Room isolation signal.

- CR 97-01591 Cause of CR 97-01581 problem not due to equipment failure.
- CR 97-01915 1B-SB battery charger arcing.
- CR 97-01827 1SP-919 failed its local leak rate test.
- CR 97-02840 1SW-3 functional failure related to Emergency Service Water.
- CR 96-00612 Main feed water safety injection procedures.
- CR 96-01646 Loss of Coolant Accident signals and emergency safeguards sequence.

c. Findings

Following review of the above CRs the inspector identified three overall issues with the implementation of the program. The first issue was root cause investigation waivers, second was closure documentation, and third was root cause effectiveness.

Root Cause Investigation Waivers: The inspector found the following three root cause investigations were waived:

- CR 97-01915 The waiver was documented correctly.
- CR 97-02504 Did not have a root cause investigation in the closed out document. No documentation existed for waiving the root cause. Discussion with the licensee indicated this to be an administrative error since an apparent cause was performed according to procedure.
- CR 97-01827 This condition was identified by the licensee as a functional failure. It was evaluated using the Maintenance Rule (MR) vice a root cause investigation. The MR evaluation identified "trash on the seat" as the cause of the failed local leak rate test. The MR evaluation did not, however, evaluate the cause of the trash, nor did it provide corrective action for the condition. A root cause investigation may have investigated this more thoroughly.

CR 97-2600 did not have a root cause performed per AP-605. A root cause was however, performed by an Engineering Service Request (ESR). This root cause did not follow the format of AP-605. Additionally, no documentation on the CR indicated that the root cause was waived or that a root cause was performed for the ESR. There was no evidence that a manager reviewed this deviation from plant procedures.

The inspector identified that four of the thirteen significant adverse condition CRs reviewed, altered from the normal root cause investigation process. One of the CRs had no evidence of a manager's review to waiver the root cause. One CR did not appear to identify the root cause or provide corrective actions. One CR did not have a root cause performed per the root cause procedure and did not provide evidence of manager review for the deviation.

Closure Documentation

The inspector identified four CRs with documentation closeout deficiencies. The following deficiencies were identified by the inspector:

- CR 96-0008 Identified as closed per the database dated July 11, 1996. The inspector located the document in a filing cabinet without the closeout signature. When questioned about the disparity between the document and the database, the licensee found that the document had been placed in the Quality Control vault as a Quality Assurance document without the closure signature. All corrective actions, assigned by the CR, had been completed.
- CR 97-2600 Identified as closed per the database. This document was filed as a Quality Control Document. The CR was not signed as complete. All corrective actions, assigned by the CR, had been completed. The licensee pulled the record and corrected the document.
- CR 97-1581 Identified as closed per the database. The document was provided without completed dispositioning of the CR. This was not a completely filled out document. It was not signed as a completed CR.
- CR 96-2110 Identified as closed per the database. The root cause investigation identified a corrective action to assign a self-assessment to be conducted to evaluate the corrective actions for this problem. A due date of February 27, 1997, was assigned. The licensee was asked to provide the self-assessment. They found that this assessment was scheduled for January 1998. This CR was closed prior to completion of all corrective actions. The inspector found this situation to be similar to a previous Nuclear Assessment Section (NAS) identified issue, where CRs were being closed by initiating ESRs.

The inspector found four CRs to have closure documentation deficiencies of the eight documents which were identified as closed. Two CRs were found to be Quality Control documents which required the licensee to pull the documents from the vault and properly close the CR. Additionally, CR 97-5029 was generated, by the licensee, identifying the documentation problems. One CR was found to be an incomplete document though the corrective action program database indicated it to be closed. One CR was closed prior to all actions being complete and was similar to a previous NAS finding.

Root Cause Investigation Effectiveness

The inspector reviewed CR 96-0283 which identified a significant condition in which two RWST level transmitters froze requiring an entry into TS action statement 3.0.3.

The inspector found the root cause investigation to be thorough and comprehensive. The investigation took into account the previous four times that the level transmitters froze. The root cause investigation provided the apparent root cause of the RWST level transmitter freezing problem and provided necessary corrective actions. The investigation made changes to the site freeze protection procedure (AP-301), regarding the RWST system, and included broader scope changes to other site systems.

The inspector reviewed the operator work-around status log for November 18, 1997, and found an entry which indicated problems with freeze protection systems. The inspector identified that the corrective actions and concerns for site freeze protection, implemented in 1996, did not appear to have been carried through to 1997, thus the long-term effectiveness of corrective actions in this area was not strong.

The inspector found the root cause investigations for the significant CRs reviewed to be generally good. They were thorough and comprehensive. The inspector found two root cause investigations to have minor deficiencies.

d. Conclusions

The inspector concluded from a sampling of significant CRs that root cause investigations, if performed, were effective. However, justification of root cause waivers, closure documentation errors, and implementation of corrective actions resulted in missed opportunities to conduct complete and comprehensive reviews. These findings were similar to licensee audit findings.

07.4 Review of Operating Experience Feedback (OEF) Program

a. Inspection Scope (40500)

The inspector examined the OEF Program to evaluate the adequacy of the licensee's ability to assess, inform and to initiate corrective action for Operating Experience items. Documents reviewed included ten OEF evaluations, the OEF database for the past 2 years, OEF monthly trend data, and two Self-Assessment reports. Applicable requirements included FSAR Appendix TMI-13, Feedback of Operating Experience (I.C.5), Amendment 43, 10 CFR 50 Appendix B, and Administrative Procedure AP-031, Operating Experience Feedback, Revision 7.

b. Observations and Findings

The inspectors found that an organization was in place for dissemination and review of operational experience feedback information by the plant. Information being screened and evaluated was noted to be consistent with the program procedures. Items such as LERs, vendor information, NRC Information Notices, Nuclear Network items, and etc. were being reviewed. The backlog of open OEF items was noted to be stable. The evaluations for 10 OEF items were reviewed and found to be acceptable.

Two recent licensee self-assessment reports of the OEF Program were reviewed and found to be adequate. The assessments were effective in identifying problems and the issues and weaknesses identified have been included in the corrective action program. The inspector noted two recent examples of good Operating Experience Feedback in response to problems identified at McGuire and Catawba involving inadequate testing of a memory circuit and a problem identified at Brunswick involving temporary changes to procedures. The issues were found to be applicable to Harris and appropriate corrective actions were taken to resolve the items.

c. Conclusions

The OEF Program was judged to be adequate.

07.5 Self-Assessment Activities

a. Inspection Scope (40500)

The inspector reviewed the licensee self-assessment activities including audits by NAS and Plant Evaluation Section (PES).

b. Observations and Findings

Self-Assessments

The licensee conducted numerous self-assessments during the 1997 year. The inspector reviewed a list of completed assessments for 1997 and there were 64 completed. These assessments were conducted in accordance with plant procedure PLP-003, Self-Assessment, Revision 5. Also, 39 additional assessments were scheduled to be completed by the end of 1997. However, from discussion with the self-assessment coordinator the remaining assessments would not be completed. This was based on an outside agency comment that there was too much emphasis on performing a large number of self-assessments and that more attention needed to be placed on corrective action or fixing problems identified from the self assessments performed. This information was communicated to site employees in a Harris Plant News Bulletin dated November 14, 1997. This bulletin stated that any new assessments for 1997 would be postponed until January 1998. There were several major self-assessments in progress on auxiliary feedwater, engineering programs, and the surveillance test programs.

The inspector noted the quality of the assessments was good. An example of this was an assessment concerning freeze protection preparation. The inspector noted that the night of November 17, 1997, temperatures dropped into the twenty degree range. However, by attendance at the daily scheduling meeting, the inspector noted that there still were 42 open work orders concerning cold weather preparations. An operator work around stated the following:

- AP-301 Attachment 2 (cold weather) included numerous work-arounds and excessive operator actions on sometimes a daily basis. Included are verification that caution tagged heaters are in place. Placing HT-18401 A in manual operation since auto does not work. Monitoring of Heat Trace-Freeze Protection systems that are continually in alarm.

The inspector questioned why all of these issues were not completed in time for the sub-freezing temperatures. The licensee stated that a team had been formed to complete the preparations, however, not all items were completed. A self-assessment was performed on the heat trace and insulation plan for equipment listed in the AP-301 plan. The assessment identified a strength for the team work activities and methods used to complete the work. The self assessment identified as a weakness that they waited too long to start on the activities. The work should be considered for year round work or until the work was done. There was not enough committed resources to the project at the beginning. Identified problems were not resolved in a manner that ensured meeting the plant requirements for protecting the equipment. Insulation damage should have been identified earlier, this damage caused rain water to seep into the insulation and soak the heat trace. In some cases electrical boxes were found to have water in the boxes.

Further discussion with the licensee determined that some tents with temporary heaters were put into place to provide some protection in a timely manner. In CR 96-00283 dated February 5, 1996, it was stated that two refueling water storage tank level instruments sensing lines froze and the plant entered TS 3.0.3 because of inoperable instruments. The CR discussed a history of cold weather problems at the site. An independent assessment of licensee implementation of cold weather protection is in Section 02.2.

Nuclear Assessment Section Assessment

The inspector reviewed the following NAS assessments:

•	March 7,1996	H-CA-96-01	Harris Plant Corrective Action Program Assessment
•	October 6, 1997	H-CA-97-01	Harris Plant Corrective Action Program Assessment
•	August 14, 1997	H-PRO-97-01	Biennial Procedures Review

Audit H-CA-96-01 found that the Corrective Action Program (CAP) was effective in support of the plant, however significant problems with the use of the CAP by the line organizations were identified in recent NAS assessment reports.

Audit H-CA-97-01 found the CAP to be satisfactory, especially the plant's willingness to identify deficiencies, and implementation of corrective actions. However, issues were identified with performance

that was at the core of effective implementation of the CAP; effectiveness of corrective actions to prevent recurrence, and trending. The issues were as follows:

- Actions to resolve previously identified deficiencies had been ineffective in preventing recurrence. Additionally, some CRs were being closed out prior to completion of corrective actions.

- Trending of CR data by CAP/OE and subprograms was not being effectively implemented.

- Management had determined that repetitive failure should be identified in the Maintenance Rule Program. However, the existing program had not been deleted nor was it being implemented in accordance with the program requirements.

Audit H-PRO-97-01 identified that the program was ineffective. These NAS audits were effective in identifying problems. NAS was not reluctant to call a program ineffective.

PES

The inspector reviewed two assessments conducted by PES. The audits were as follows:

- November 1, 1997 97-07-QA-H Harris Nuclear Assessment Section

- November 14 ,1997 97-10-MA-H Harris Maintenance Assessment

Audit 97-07-QA-H found that NAS had accomplished the regulatory requirements outlined in FSAR Section 17.3. However, improvement was needed in performance of NAS and PES. Three issues and two weaknesses were identified. The identified items were related to oversight of the CAP.

Audit 97-10-MA-H found that maintenance was effective but work management oversight could be improved.

c. Conclusions

The licensee audit and self-assessment programs were effective in identifying issues at the plant and was a strength. The licensee's identified weaknesses in the cold weather preparations were consistent with the inspector's findings. The licensee's assessments identified improvements in implementation of the CAP that were consistent with inspector issues.

07.6 On-Site/Off-Site Committees

a. Inspection Scope (40500)

The inspector reviewed the on-site safety committee and off-site committee activities that were available during the period.

b. Observations and Findings

Off-site

The inspector reviewed the Nuclear Safety Review Committee meeting minutes for February 16, May 28, August 20, and November 19, 1996; and February 28 and June 17, 1997. From the meeting minutes it was apparent that the committee provided effective oversight of plant operations. The June 17, 1997, meeting provided a thorough discussion of the problems that occurred during refueling outage seven. This discussion lead to the initiation of the Near Term Improvement Plan. The organization was challenged on many other plant issues.

On-site

The inspector attended a PNSC meeting conducted November 17, 1997. This was the monthly regularly scheduled meeting covering a number of Technical Specification (TS) required topics and a number of special presentations. All of the agenda items were distributed before the meeting for member review. The meeting provided a thorough discussion on the items, good discussion of root cause, and corrective actions. The Chairman provided effective oversight and focus on safety during the meeting.

The comments and discussion were effective except for a discussion of TS Interpretations. Regulatory Affairs discussed that a Senior Management goal to eliminate 29 TS Interpretations would be met except for seven items that were tied to NRC approval of TS Amendments. The inspector later discussed this issue with Regulatory Affairs and discussed Information Notice 97-80. The inspector pointed out that the licensee should comply with the existing TS regardless of whether TS Interpretations exist. Disposition of TS Interpretations should not be dependent on NRC actions.

The inspector reviewed the meeting minutes for September and October 1997. The typed meeting minutes were thorough and timely. For the meeting, 97-59, conducted October 29, 1997, the inspector identified that the requirements of TS 6.5.2 for a quorum were not being followed. TS require that members be designated in writing by the Plant General Manager. A quorum must consist of a Chairman or alternate and four members including alternates. No more than two alternates shall participate as voting members in PNSC activities at any one time.

The members shall represent the engineering, operations, maintenance, health physics/chemistry, nuclear assessment, and regulatory affairs

functions. Additional areas had been designated by plant memorandum that were outside those required by TS. These were Training, Outage, and Scheduling. For the purpose of quorum and voting the inspector did not consider these areas as valid since they were not areas defined by the TS. For the meeting there was a Chairman, primary member for operations, maintenance was absent, and alternates from the other required functions. Thus, there was more than the two permitted alternates making up the quorum. Accordingly, this was identified as a violation of TS 6.5.2. This violation is identified as 50-400/97-12-01, PNSC Meeting Without Required Quorum Membership.

This violation occurred because the licensee misinterpreted the Technical Specifications after a change was made to this section several years ago. Part of the confusion resulted from wording the NRC wanted added at the time of the change. The two additional functional areas were added internally at that time in order to maintain the 7-9 members described in the TS. This was done without an additional TS change or without linking the additional functional areas to the existing TS described functions. The licensee took the following corrective actions:

- Immediately eliminated the additional functions (Training, Outage, and Scheduling) from PNSC membership by not allowing them to vote or count at the observed meeting described above. The licensee redesignated in writing along the TS functional areas on November 26, 1997 by a new memorandum that appoints the PNSC members. This memorandum was restricted to the six TS described functional areas.

- Revised procedure AP-13, Plant Nuclear Safety Committee, to be consistent with the TS while allowing also for non-voting/non-quorum members (Revision 17). A new memorandum was issued on December 18, 1997, after the inspection period by the Plant General Manager to implement this change.

The inspector reviewed these actions and concluded that they were acceptable to resolve the violation when fully implemented.

The inspector found that TS 6.5.2 required that members be appointed in writing. This was done using a memorandum from the plant manager to the primary and alternate PNSC members. This document was not listed on the QA records index as a QA document and was not designated as such. 10 CFR 50 Appendix B Criterion XVII Quality Assurance Records requires that sufficient records shall be maintained to furnish evidence of activities affecting quality. Carolina Power and Light Corporate Quality Assurance Plan, Revision 18, Section 14.2, QA Records states that collection, storage, and maintenance of records shall be in accordance with commitments to Regulatory Guide 1.88 and/or ANSI N45.2.9 and the plant Technical Specifications. ANSI N45.2.9 - 1974, Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants, requires that the licensee maintain a records index of quality assurance records. This TS required activity affects

quality since the quorum and qualification of members can only be obtained once the membership is designated. The failure to designate this record on the QA records index list as a quality assurance record is identified as violation 50-400/97-12-02, PNSC Membership Appointment Not Designated as Quality Assurance Record.

This violation occurred because the licensee had not captured this memorandum as a QA record and it was not designated as such by the procedure. In response, the licensee initiated CR 97-05044 to convert PNSC Composition Memos to QA record type T0765 records (PNSC) and to revise procedure AP-13, Plant Nuclear Safety Committee (Revision 17), to state that the PNSC Composition memo is a QA record. The licensee also added an action item to CR 96-01821, which addressed QA records problems, to review TS section 6 for other statements that discuss conducting activities in writing. This review was to determine the extent of condition.

The inspector reviewed the CRs and assigned action items, and confirmed that the licensee was conducting these tasks as described in the CRs. The inspector reviewed transmittal number 28690 to confirm that PNSC Composition memos were being transferred to QA record type T0765. The transmittal was for an October 21, 1997 PNSC Composition memo and made the proper designation. This action was expected to be completed by January 1, 1998. An additional CR (97-05239) was generated from the TS section 6 review which had identified several additional records that also should be QA records. The extent of condition review was expected to be complete by December 31, 1997 and the records changes were expected to be complete by January 15, 1998. The inspector concluded that these actions were acceptable to resolve the violation when fully implemented.

c. Conclusions

The off-site and on-site safety review committees provided effective oversight of plant operations. These committees were self-critical and focused on safety. A violation was identified for conducting a PNSC meeting without the required quorum membership. A second violation was identified for not designating the written PNSC membership appointment as a quality assurance record.

08 Miscellaneous Operations Issues (92700, 90712)

08.1 (Open) LER 50-400/97-002-00: Inoperable Main Feedwater Isolation Valves caused by cold weather. This event was addressed in NRC inspection report 50-400/97-03 and related to the operation of the steam tunnel ventilation system. The inspector reviewed the corrective action for this event and reviewed several recent occurrences where main feedwater isolation valve temperature was recorded as below 60 degrees Fahrenheit causing the valve to be declared inoperable. The inspector found that the corrective action as described in the LER had been performed as described. The inspector verified during tours that temporary heaters were in the steam tunnel. The inspector verified that Operations was

logging feedwater isolation valve temperature once per shift when outside temperature was below 65 degrees in procedure OST-1021, Daily Surveillance Requirements Daily Interval Mode 1,2, Revision 17. However, the inspector also found that the operations organization was doing more than what was described. Operations was plotting feedwater isolation valve temperature and reducing the frequency of logging as valve temperature got close to 60 degrees Fahrenheit. The inspector found this to be good and also necessary to ensure the MFIVs remained operable. The inspector determined that once every twelve hours, as described in the LER corrective actions, would not be sufficient at low temperatures and that the operations practice was proactive.

The inspector reviewed the engineering investigation of the event and the subsequent corrective actions. The investigation concluded that automatic operation was the design basis for the steam tunnel ventilation system. When manual actions are taken by the operators, the automatic start and stop control function of the fans can be affected. The investigation concluded that one of the fans did not secure at 30 degrees Fahrenheit in the LER event due to prior manual actions. The corrective actions included a setpoint change and procedure changes. The high temperature fan start setpoint was changed from 90 to 70 degrees Fahrenheit to reduce the need for operator action. During this period a steam tunnel fan controller relay failed. The failure was diagnosed to be due to the continual starting and stopping of the second fan and was attributed to the location of the temperature sensing probe which was directly adjacent to the fan discharge.

The procedures were revised to address manual operations. The inspector reviewed system description SD-172, Reactor Auxiliary Building HVAC System, Revision 10 and procedures associated with this issue which included Procedures OP-172, Reactor Auxiliary Building HVAC System, Revision 13, and APP-ALB-023, Auxiliary Equipment Panel No. 1, Revision 13. The inspector found that the changes in SD-172 were good and described the precautions associated with manual operation. These precautions were not mirrored in procedure OP-172, although the steps for checking for proper logic were appropriately included. These steps appeared to be for recovery from manual operations as opposed to steps for how to operate the fans in manual. A change in alarm response procedure APP-ALB-023 had added a step that when the high temperature alarm cleared, the Auto-start logic for the fans should be checked to ensure proper operation per OP-172. This was the only alarm response procedure that the inspector or operators questioned could think of that contained an action to be performed when the alarm cleared. Normally alarm response procedure actions are for when an alarm annunciates, not when it clears.

The licensee was in the process of revising the procedures to address the inspector's observations. A night order was put in place to caution the operators about manual operation of the steam tunnel fans. The licensee was finishing design of a modification to move the temperature sensing point location. The licensee intends to provide a supplement to

this LER that will update their corrective actions. This item remains open pending review of the supplement.

08.2 (Closed) Licensee Event Report 50-400/97-18: Operation with procedures not properly reviewed and approved. A licensee investigation instituted on July 1, 1997 determined that over 100 procedures had temporary handwritten changes outstanding for longer than the TS required 14 days. In addition, the changes were used to operate the plant without receiving the required TS 6.8.3.c review and approval. On April 22, 1997, a manager informed licensee management that the 14 day requirement contained in Administrative Procedure AP-006, Procedure Review and Approval, would not be met. The inspector attended the PNSC meeting where this item was discussed. A communication breakdown occurred in that the manager thought he had gotten approval to exceed the time limits, while management believed that they had told him to meet the timeliness requirements. Licensee management did not initiate any actions at the time to address the potential nonconformance. A report to the NRC was made in accordance with 10 CFR 50.73 and Condition Report 97-2829 was issued.

By August 15, 1997, the licensee had performed proper review and approval of the outstanding changes. Site management was counseled on allowing the nonconforming condition to exist without taking prompt actions for correction, expectations for temporary change usage was communicated sitewide, a revision to the administrative procedure was issued to clarify the requirement, and the supervisor who allowed the nonconformance to persist was disciplined. TS 6.8.3.c states, in part, that temporary changes to procedures may be made provided that the change is documented, reviewed in accordance with TS 6.5.1, and approved within 14 days of implementation by the Plant General Manager, or by the Manager of the functional area affected by the procedure. This requirement is implemented through adherence to procedure AP-006. The inspector noted the large number of nonconformances and management failure to promptly address those nonconformances. These failures to document, review, and obtain management approval for 128 temporary changes in accordance with TS 6.8.3© and procedure AP-006 is a violation. 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 and is identified as NCV 50-400/97-12-03, Greater Than 100 Outstanding Temporary Procedure Changes.

The inspector reviewed the LER, unit affirmations of compliance with TS 6.8.3.c, related procedures, root cause investigation, CRs, and the temporary change process review, based on completion of the licensee corrective actions and issuance of the above violation, this item is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following work activities:

Maintenance

- WR/JO 97-AKJC1 Emergency Diesel Jacket Water Standpipe Drain pump. Disassemble, inspect and repair or replace.
- WR/JO 97-ALIB-002 Replace voltage dropping resistor in voltage supply circuit to EGM for the turbine driven auxiliary feedwater pump resistor R-5.
- WR/JO 97-AJRW1 Inspect in accordance with Surveillance Instruction (SI) No. 2180 for loose connections and calibrate in accordance with MST-I0192.
- WR/JO 97-ABEM-002 Perform Check List (CL) No. I0030: Inspect and adjust pressure & pressure differential switches.
- WR/JO 97-AFYM-002 Perform limitorque inspection and lubrication for auxiliary feedwater pump (AFWP) turbine stop valve in accordance with PM-M0014.
- WR/JO 97-VIB Engineering perform vibration readings on turbine driven auxiliary feedwater pump (TDAXFP) while running Operations Surveillance Test (OST) 1411.

b. Observations and Findings

In general the inspectors found the work performed under these activities to be professional and thorough. All work observed was performed with the work package present at the job and in active use. The work packages reviewed by the inspectors provided detailed instructions and addressed all aspects of the job at hand. Technicians were experienced and knowledgeable of the assigned tasks. The inspectors frequently observed that supervisors and system engineers monitoring job progress and quality control personnel were present when required. When applicable, appropriate radiation control measures were in place.

In addition, see specific discussions of maintenance under Sections M1.2-M1.5 below.

M1.2 Replacement of Post Accident Sampling System Valve 1SP-952

a. Inspection Scope (62707)

During the period November 4-6, 1997, the inspectors observed partial performance of the replacement of valve 1SP-952, an existing Target Rock solenoid operated valve, with an Anchor Darling Dual Disk Type air operated Gate Valve in accordance with Engineering Service Request (ESR) 97-00669, Rev. 4 and WR/JO 97-AJNU1. This modification was implemented due to repetitive maintenance necessary to prevent leakage by the existing valve.

b. Observations and Findings

This job involved pre-fabrication of valve supports, relocation of some existing supports, installation of instrument air tubing and supports, removal of the existing valve and welding in the new larger valve and supports.

The valve was located in a radiation area. Consequently, as much pre-fabrication work as possible was done in the shop. The inspectors observed the pre-fabricated unit including the new valve and support structure in the shop and considered that the job had required careful planning and attention to detail.

The inspectors observed the cutting out of the existing valve and the installation of the new valve and support structure. A burning permit was posted, foreign material exclusion was established, and radiation controls were in place. The inspectors noted that radiation control was thorough and that the job was surveyed and preplanned. The lowest radiation fields were identified for observers, exclusion area was established around the valve site and a technician continually monitored the work area for any changes. When the potentially radioactive system was breached, the technician had established a catch basin, a radiation monitor, and an air monitor at the point of the breach. For this modification, the inspector considered the health physics controls a strength in the licensee's maintenance program.

M1.3 Gross Failed Fuel Detection System Flow Control Valve (FCV) 1SP-956

a. Scope of Inspection (62707)

The inspectors observed portions of the repair of the Gross Failed Fuel System Flow Control Valve (FCV) 1SP-956 under WR/JO 97-AJEA1 on November 5, 1997, including cleanliness control and radiation monitoring.

b. Observations and Findings

The inspectors noted that FCV 1SP-956 had been tagged out of service, depressurized and drained prior to disassembly. The emphasis on this job was cleanliness due to small orifices and tight tolerances of the valve. Access control to the work area and a level B clean area were established and maintained. Tools and spare parts were properly staged. The procedure was present and followed in step sequence. New parts were installed, checked for fit, and the valve reassembled with new gaskets. Health physics technicians monitored the job continuously and assisted in maintaining the clean work area. The work was thorough and professional.

M1.4 Safeguards Sequencer Test

a. Scope of Inspection (61726)

On November 4, 1997, the inspectors observed the post maintenance testing of the Safeguards Sequencer Panel per Engineering Periodic Test (EPT) 033, Emergency Safeguards Sequencer System Test, Rev 17. The test was performed to verify operability of the newly installed pre-calibrated relays under WR/JO 97-AKHH1, WR/JO 97-AKHI1, WR/JO 97-AKHJ1, WR/JO 97-AKHK1, WR/JO 97-AKHL1, and WR/JO 97-AKHM1.

b. Observations and Findings

EPT-033 was developed to verify that the safeguards sequencer panel operated as designed. In the test position the sequencer activates the relays at preset intervals without energizing the equipment. The panel lights were observed to verify relay activation at the proper times. The sequence was run through twice with two observers checking the light sequence and times. Additionally, the light sequence and times were video taped and subsequently verified by the system engineer prior to returning the equipment to service.

The procedure, which identified the proper sequences, was used throughout the test. The work site access was controlled and adequate resources were available.

M1.5 Replacement of Channel Test Card 1PIC-03-0821

a. Inspection Scope (62707)

The inspector reviewed the maintenance activities to verify that procedures and work instructions were followed. Carolina Power & Light Company, Standard Procedure No. ADM-NGGC-0104, Revision 1, Work Management Process, was applicable to work document WR/JO 97-ALTC1.

b. Observations and findings

On November 17, 1997, the inspectors observed corrective maintenance delineated in WR/JO 97-ALTC1, which required that channel test card

1PIC-03-0821 be replaced. The work instructions also required verification that the jumper arrangement of the new card match the jumper position of the original card. This verification was inadequately performed, as revealed when the new channel test card also failed to operate after it was installed in the cabinet. The system engineer for the reactor coolant system was subsequently notified and his review of drawing No. 1364-46576 S03 and both channel test cards revealed that, although both cards had the same part number they were not configured the same. The old channel test card had an installed jumper and the new generic card did not. Condition Report (CR) 97-05009 was issued on this discrepancy. As part of the permanent corrective action for CR 97-05009 the licensee was investigating why the craft missed the jumper configuration on the old card and the drawing. Harris Technical Specification 6.8.1.a requires written procedures to be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Revision 2, dated February 1978. Regulatory Guide 1.33 references in part procedures for performing maintenance. Carolina Power & Light Company, Standard Procedure No. ADM-NGGC-0104, Revision 1, Work Management Process, paragraph 9.15.7 requires work to be performed per the work instructions provided in the WR/JO. 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 and is designated NCV 50-400/97-12-04, Failure to Follow WR/JO Work Instructions When Performing Maintenance Activities.

M1.6 Conclusions of Maintenance

Maintenance activities were generally completed in a thorough and professional manner. Maintenance personnel were knowledgeable of the assigned tasks. Maintenance procedures were detailed and actively used on the job (Sections M1.1-M1.5).

Radiation monitoring was a strength in maintenance activities (Sections M1.2 and M1.3).

Post maintenance testing of the Emergency Safeguards Sequencer was thorough and professional (Section M1.4).

One maintenance activity was found deficient in that the craft failed to correctly implement the WR/JO work instructions resulting in a non-cited violation (Section M1.5).

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Surveillance Observation

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillance tests:

- MST-I0146 Steam Generator 1B Narrow Range Level Loop (L-0484) Protection Set I Operational Test
- MST-I0270 Lo-Lo Tavg. P-12 Interlock (T-0432) Protection Set III Operational Test
- MST-I0206 Refueling Water Storage Tank Liquid Level Channel III (L-0992) Operational Test
- MST-I0238 Containment Pressure (P-0952) Protection Set III Operational Test
- OST-1411 Auxiliary Feedwater Pump 1X-SAB Operability Test

b. Observations and findings

The inspector found that test equipment were properly calibrated, test procedures were followed and testing was adequately performed. While performing Maintenance Surveillance Test (MST)-I0270, Lo-Lo Tavg P-12 Interlock (T-0432) Protection Set III Operational Test, the bistable on the NTC card did not reset. After a fuse was replaced in the NTC card, MST-I0270 was successfully completed.

During MST-I0206 the as-found calibration revealed that L-0992 was in calibration, but was reading on the high side. Therefore, during the procedural calibration process for the signal comparator (LS-01CT-0992CW) adjustments were made which put the level indicator's as-left calibration in a more acceptable range.

During the Auxiliary Feedwater Pump 1X-SAB Operability Test the inspectors focused specifically on the pump vibration readings taken by engineering and operations. These readings were carefully taken because readings taken by several sources the previous month indicated that the pump may be experiencing bearing problems. Contingent corrective maintenance plans had been taken to repair the pump if the vibration data deemed it necessary. Both the readings taken by operations and engineering at the pump operational base line of 3700 RPMs were well within the approved acceptance criteria. The inspectors held several discussions with the engineer who took the vibration readings and his supervisor to determine how the data was evaluated and to review historical data for the turbine driven auxiliary feedwater pump (TDAFWP). The inspectors found through these conversations that the engineers were very knowledgeable on the operating characteristics of the TDAFWP and how to evaluate the vibration data.

c. Conclusion

Each of the five surveillance tests observed were conducted in a thorough and effective manner. Procedures were followed, maintenance and operations personnel performed peer checking to identify potential problems before they impacted plant operations. The inspectors also

noted engineers who supported the on-going maintenance activities were very capable and knowledgeable.

III. Engineering

E1 Conduct of Engineering

E1.1 Safety-Related Software Configuration Management

a. Inspection Scope (37551)

The inspector reviewed the circumstances surrounding four Condition Reports (CRs) concerning errors in the management of the POWERTRAX and related subfiles and software programs. POWERTRAX is the system used to integrate the Core Operating Limits Report (COLR) inputs with the actual plant conditions to assist with the accomplishment of Technical Specification functions such as the core flux mapping analysis, reactivity calculations, shutdown boron requirements, and the estimated critical position. The CRs reviewed were 97-4932, 97-3915, 97-4276, and 97-4470. Procedures CSP-NGGC-2501, Control and Use of Engineering Software, Revision 1, CSP-NGGC-2502, Software Quality Assurance Configuration Control and Life Cycle, Revision 1, and CSP-NGGC-2503, Nuclear Fuels Management and Safety Analysis Computer Software Quality Control, Revision 2, were applicable to computer software activities.

b. Observations and Findings

Condition Report 97-4932 described the discovery by the licensee on November 11, 1997 that the wrong cycle data input V(z) file was contained in the POWERTRAX system in one location. This had no safety impact on the quality related activities performed by the software. Two other activities described in CRs 97-4276, MB-P Calculated Detector Resp. and 97-4470, Isotopic File content, were reviewed by the inspector. CR 97-4276 described a technical error in the code, while CR 97-4460 dealt with a weakness in the software configuration management of values used for special nuclear material reporting. The inspector had no specific questions concerning the licensee's actions on these three CRs.

Condition Report 97-3915, PTRAX Inadvertent File Change, described an event that occurred on August 15, 1997. During qualification of a new version of POWERTRAX on the test system, the online production auxiliary input file was improperly modified. An error was identified by Harris Plant Engineering personnel when the POWERTRAX system failed to execute on August 16, 1997. The inspector discussed this issue with the licensee and found that the software development and testing process had inadvertently corrupted the in-plant data file. The licensee had not adequately controlled access to quality related software and associated data files which resulted in the POWERTRAX program being unable to work. The licensee indicated that the ability to access and/or modify the production code from the test system was unacceptable. The deficiency

was corrected by making the production directories read-only on the test system.

The inspector reviewed procedures CSP-NGGC-2501, Control and Use of Engineering Software, Revision 1, CSP-NGGC-2502, Software Quality Assurance Configuration Control And Life Cycle, Revision 1, and CSP-NGGC-2503, Nuclear Fuels Management and Safety Analysis Computer Software Quality Control, Revision 2, and found that they were the controlling procedures for computer software activities. Procedure CSP-NGGC-2501 addressed control and use of software but did not address the development process. Procedure CSP-NGGC-2502 addressed configuration control and in section 18.3.3 had a very brief discussion on the coding and generation phase. Procedure CSP-NGGC-2503 section 9.3, Software Modification, discussed the development phase. Section 9.3.6 indicated that one of the first steps was to make a working copy of the source code prior to changes. The development process was similar to that of an engineering modification and included bench testing of source code and safety reviews prior to installation. The inspector did not find any procedural guidance related to the problems associated with CR 97-3915 where an existing in-plant data file was allowed to be corrupted during the development process. All safety reviews were conducted after the development process was complete. Specifically, none of the three procedures adequately addressed assessing the consequences of development activities on the installed software and associated data files in the plant. Although the licensee's actions for the CR addressed making data files read only, procedural requirements to ensure that software development activities can not corrupt installed software and associated data bases were lacking. The licensee generated CR 97-5163 to address this problem.

The inspector learned that corporate Nuclear Fuels also has guidelines or desk top guides that are not considered to be procedures under the Quality Assurance program. The purposes of some of these guidelines (NFGs) included balance of cycle initialization of the POWERTRAX core monitoring system and the implementation of data files and computer programs into a controlled library. After review of the events captured in the CRs mentioned previously and review of selected NFGs, the inspector determined that processes contained in the guidelines had the capability to affect quality related software installed at the plant.

10 CFR 50 Appendix B, Criteria, V, Instructions, Procedures, and Drawings, requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. The inspector determined that software development activities were being conducted without adequately prescribed and documented instructions that would prevent these activities from affecting quality related software and associated data files installed in the plant. This is considered a violation of 10 CFR 50 Appendix B, Criteria V, and is designated example 1 of violation 50-400/97-12-05, Failure to Establish and Implement Engineering Procedures.

c. Conclusion

The licensee's procedural controls for computer software development activities were not adequate to ensure that the development activities could not affect quality related software and associated data files installed in the plant.

E3 Engineering Procedures and Documentation

E3.1 Environmental Qualification Program

a. Inspection Scope (37551)

The inspectors reviewed Environmental Qualification (EQ) documentation associated with the post accident hydrogen system and reviewed the Nuclear Assessment Section (NAS) EQ assessment, including the engineering response, to determine if recent EQ program problems at Brunswick Steam Electric Plant were occurring at Harris.

b. Observations and Findings

The inspectors reviewed EQ Documentation Package (EQDP) 1301 for the hydrogen analyzer panel. The Nuclear Records Control System (NRCS), the site document status control database, indicated that EQDP 1301 was affected by Engineering Service Request (ESR) 9400116. This ESR had been posted against EQDP 1301 in NRCS but had not been incorporated into the EQDP. ESR 9400116 was an engineering evaluation (EE) type ESR which evaluated an alternate Westinghouse motor starter as a qualified replacement for the original equipment General Electric (GE) motor starter, which was obsolete. The panel vendor, Whittaker, had performed EQ testing of the Westinghouse starter and the test data had been accepted in the review which was contained in the ESR. ESR 9400116 was approved on June 28, 1996 and new Westinghouse motor starters were installed as plant equipment numbers 1SP-134:003 and 1SP-136:003, which were the motor starters for the hydrogen analyzer sample pumps, train A and B respectively.

The inspectors reviewed the ESR, the Whittaker test data, work tickets for the ESR implementation and performed a walkdown of the panels. Review of maintenance records revealed that the motor starters had been installed in 1SP-134:003 on September 2, 1997, and in 1SP-136:003 on September 16, 1997 respectively. Review of the EQ master list and the Equipment Database System (EDBS) showed that the original General Electric motor starters were still installed. Review of the Surveillance Test Scheduling System showed that the replacement frequency for the motor starter still reflected the GE item replacement frequency. The inspectors verified by walkdown that the new Westinghouse motor starters were installed in the plant and that the new starters' installation configuration and nameplate data matched the test data. Once notified by the NRC of these discrepancies on December 2, 1997, with the implementation and document update process for ESR 9400116, the licensee initiated document update forms to update the EDBS

and STSS to correctly reflect the actual configuration in the plant. Condition Report 97-05150 was initiated to resolve this issue. The failure to update EDBS following installation of ESR 9400116 and to maintain configuration control is identified as example number 2 of violation 50-400/97-12-05, Failure to Establish and Implement Engineering Procedures.

The inspectors reviewed the procedure for control of the EQ program, EGR-NGGC-156, Environmental Qualification of Electrical Equipment Important to Safety, Revision 4, and the procedure for controlling design documents, EGR-NGGC-0007, Maintenance of Design Documents, Revision 2 which were both corporate procedures applicable to all Carolina Power and Light (CP&L) sites. This procedure specified classifications for different types of design documents and each different class had different update frequencies following changes to the documents. The inspectors determined that procedure EGR-NGGC-0007 did not provide any classification for the Environmental Qualification Documentation Packages. Procedure EGR-NGGC-156, section 9.6 provided the guidance regarding maintaining EQ documentation packages. This procedure did not specify a clear time requirement for EQDP updates following changes which affect the EQDP. The procedure allowed changes to be posted against the EQDPs in the NRCS database to alert users that these documents affected the EQDP. The inspectors considered this to be an alert to users that the EQDP was not up-to-date.

10 CFR 50.49 requires that environmental qualification information for electrical equipment important to safety be contained in a qualification file. It further requires that the licensee shall keep the EQ list and the information in the file current and retain the file in auditable form for the entire period which the covered item is installed in the nuclear power plant or is stored for future use. The inspectors discussed this issue with Engineering and determined that Engineering was performing EQ work as ESRs and posting changes against the affected EQDPs in NRCS as allowed by the procedure. No timely updates were being performed. Over time this could lead to the EQDP becoming unauditable. The inspectors considered that the program, as defined in the procedures, allowed all documents in the EQDP to have been superseded by ESRs. This was of concern because the EQDP would have to be rebuilt from ESRs prior to use. The licensee indicated that currently 55 out of 71 EQDPs were affected by 12 ESRs.

10 CFR 50 Appendix B, Criteria V, Instructions, Procedures, and Drawings, requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Carolina Power and Light Corporate Quality Assurance Plan, Revision 18, Section 6.3, Procedures and Drawings, implements this requirement. The inspectors found that the licensee's procedures for the implementation of 10 CFR 50.49 associated with the environmental qualification of equipment were inadequate in that they did not establish a clear time requirement for updating environmental qualification documentation packages to ensure

that the packages are maintained current and auditable for installed plant equipment. This failure to prescribe adequate instructions on timeliness of EQDP updates was considered a violation of 10 CFR 50, Appendix B, Criterion V, and is identified as example 3 of violation 50-400/97-12-05, Failure to Establish and Implement Engineering Procedures.

During review of ESR 9400116 the inspectors determined that the replacement motor starters were procured from Westinghouse and dedicated in accordance with procedure MCP-NGGC-0401, Material Acquisition (Procurement, Receiving, and Shipping), Revision 3. Material Evaluation 002084.02 documented the evaluation. The inspectors reviewed the evaluation and noted that the coil and any lubricants were not considered. The licensee determined that the starters did not contain lubricants which resolved this question. The licensee obtained certification from Westinghouse which demonstrated that the design and materials of the coils for the tested starters and the starters procured by CP&L were not changed. The certificate of compliance resolved the concern regarding the starters, however the failure to consider the coils in the original materials evaluation is considered a procurement engineering weakness. The licensee initiated condition report 97-05151 to document and resolve this issue.

The inspectors reviewed the NAS EQ Program Assessment and the response. The assessment team included a nuclear industry EQ consultant who was familiar with the Brunswick EQ Program Issues. The use of the EQ consultant familiar with Brunswick EQ problems was good. The assessment focussed on compliance with the corporate EQ program procedure EGR-NGGC-156. The assessment identified 2 issues and one weakness. The first issue was that training on EQ program requirements had not been maintained. The second issue was that the Harris EQ program was not in full compliance with the corporate EQ procedure regarding formal training, environmental zone maps, trending EQ component failures, and annual EQ reports. The identified weakness related to a backlog of identified EQ program deficiencies and program improvements which had developed due to insufficient program resources. However, the NAS assessment failed to recognize the inadequate program requirements that allowed EQDPs not to be updated, which the inspectors considered to be the root cause of why appropriate resources were not being applied to this program. The inspectors reviewed the response to the assessment and noted that the corrective action addressed the deficiencies identified in the assessment.

The inspectors reviewed the Operating Experience Feedback Evaluation of the Brunswick EQ violations. This evaluation referred to a self assessment of the Harris EQ program which determined that the deficiencies in the Brunswick EQ program were not common to the Harris EQ program. The inspectors noted that neither the self assessment nor the NAS assessment identified that the corporate procedures for implementation of the Environmental Qualification program were inadequate in that they allowed EQDPs not to be updated for equipment installed in the plant.

c. Conclusions

Two violation examples were identified for failure to establish and implement engineering procedures related to the Harris EQ program. The first example was for failure to update EDBS following installation of replacement motor starters in the post accident hydrogen analyzer. The second example was for failure to establish a clear time requirement for updating environmental qualification documentation packages to ensure that the packages are maintained current and auditable for installed plant equipment. The licensee's Nuclear Assessment Section evaluation of the Environmental Qualification Program including the line response to the assessment were adequate, however the assessment did not address the inadequate Environmental Qualification Program procedures (Section E3.1). A procurement engineering weakness was identified during the review of the materials evaluation for a replacement motor starter.

E4 Engineering Staff Knowledge and Performance

E4.1 Troubleshooting

a. Inspection Scope (37551)

The inspector reviewed troubleshooting activities conducted during the period to evaluate whether the weakness identified in NRC Inspection Report 50-400/97-09 had improved. These included activities associated with a rod drive non-urgent failure alarm, the source range N-31 noise problems, stroke time problems/containment isolation problems associated with service water valve 1SW-98, and troubleshooting of the synchronization to the grid problems described in Inspection Report 50-400/97-09.

b. Observations and Findings

The inspector found that the troubleshooting of the rod drive non-urgent failure alarm, source range noise problems, and service water containment isolation valve 1SW-98 were well handled. In these three cases specific managers were assigned responsibility for the troubleshooting and a technical lead was also assigned. The manager took charge of the troubleshooting session and problems were charted out on a marking board in a conference room with the troubleshooting team. The things that were known about the problem were identified and those that were not known but desirable were also identified. A troubleshooting plan was then drafted to obtain the necessary data to determine the cause of the problem. The rod drive non-urgent failure alarm and 1SW-98 plan was successfully completed. The N-31 plan implementation was not complete at the end of the period.

The troubleshooting of the synchronization to the grid problems were not as well handled. This item was assigned to Engineering at a PNSC meeting on September 25, 1997 after considerable discussion about why the plant and the simulator did not match for synchronization to the grid. The assignment appeared to be in relation to steam dump

performance. However, the discussion at the PNSC included the collective control systems (feedwater, steam dump, and rod control) and operating philosophy related to this evolution. The inspector discussed this item with the engineering organization early in the period. The inspector found that a specific manager had not been assigned responsibility for conducting troubleshooting or if assigned did not feel responsibility for being personally involved. The inspector discussed the issue with the training manager and with the technical person assigned responsibility for this item. The inspector found that the technical individual was unaware of the extent of discussion at the PNSC meeting and unaware that actions were ongoing in the training organization. The inspector considered this an example of the engineering communications weakness discussed in NRC Inspection Report 50-400/97-10, section E7.2.

After discussing these observations with site management, changes were made and a manager assigned. The inspector found that the changes included assigning a team that included representatives of operations, engineering, and training. In discussion with several team members the inspector learned that initially the team had met but no board session was held to chart out the knowns and unknowns and a manager was not present. This again was different from that observed for the rod drive non-urgent failure alarm, N-31 noise, and 1SW-98 issues. The inspector confirmed with site management what was expected and was told that the board session was expected of the team with the manager present. The inspector attended the first board session conducted on November 18, 1997 with the manager assigned conducting the session. The format used at the N-31 session and the 1SW-98 session was passed out but not used. A different format was used. The inspector considered the discussion adequate with participation from all parties. Responsibilities were delineated by the manager assigned. However, questions such as, "what was the correct reactor power level to synchronize at for a smooth transfer, with the plant performing as designed," were asked, left unanswered, and not listed as an unknown.

c. Conclusions

The inspector concluded that for three of the four examples observed, troubleshooting had improved and was at the appropriate level. The synchronization to the grid troubleshooting did not have sufficient initial management attention to ensure success equivalent to the other three. This was mainly due to inadequate communication of expectations down the management chain. The communication aspect was identified as an additional example of the engineering communication weakness from NRC Inspection Report 50-400/97-10.

E7 Quality Assurance in Engineering Activities

E7.1 Special FSAR Review (37551)

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description

highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the FSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the FSAR that related to the areas inspected. The inspectors did not find any additional discrepancies other than those identified by the licensee.

E7.2 Review of Licensee Self-assessment Activities

a. Inspection Scope (IP 40500)

The inspectors reviewed activities associated with the recently completed Engineering vertical slice assessment of the Auxiliary Feedwater (AFW) system and the assessment of Operations and Engineering Support that was being performed by PES. Applicable regulatory requirements included 10 CFR 50 Appendix B, licensee procedures, FSAR commitments, and the licensee's Quality Assurance program. The inspection included a review of the licensee's self-assessment plans, procedures, previous assessment report findings in the areas being assessed, interviews, attendance at PES assessment team meetings, walkdown of the AFW system, review of assessment debrief notes, review of Condition Reports, and observations of assessor performance.

b. Observations and Findings

During the period from November 10 to 21, 1997, the licensee performed a vertical slice review of the AFW system. The AFW assessment was performed in accordance with commitments made to NRC in a response to a notice of violation (see CP&L Letter HNP-97-078). One of the objectives of the assessment was to verify that the UFSAR was complete and accurate in describing the AFW system. The inspector reviewed the assessment plan and the draft assessment results and found them to be acceptable. The inspector noted that the plan included lessons learned from the recent NRC design inspections at the H. B. Robinson and St. Lucie plants. The assessment had been completed and the final report was scheduled to be issued by December 31, 1997. The licensee indicated that the assessment confirmed that the AFW system was installed and operated in accordance with design and licensing basis, and that the FSAR and design documents were adequate. The inspectors noted that several Condition Reports (CRs) had been identified and entered into the Corrective Action Program (CAP) for tracking and resolution, however, none were considered operability concerns. One Condition Report (CR) documented a discrepancy between the as-built plant and the FSAR related to the failure to list AMSAC in FSAR Section 15.2.6 as one of the autostarts of the AFW pumps. A walkdown of the AFW system was performed and no significant issues were identified.

The Performance Evaluation Support Unit was leading an assessment of the Operations and Engineering Support programs which also included a review of the work load management and corrective action programs. The assessment was in-process and was scheduled to be completed by December 12, 1997. The assessment was a performance based assessment of

Operations, Engineering Support, and work control. The assessment was performed by a team of both licensee and peer assessors. The use of peer assessors on the team was considered a strength. Observations of team meetings, interviews, and review of assessment findings confirmed that the team was focusing in areas where problems had previously been identified by the licensee and where corrective actions have not always been effective. For example, a Nuclear Assessment Section assessment of Engineering identified that the engineering workload was not being effectively managed and that corrective actions have been untimely and/or ineffective. The PES assessment was reviewing the adequacy of the identified corrective actions for this issue. The inspector noted that there was synergism in the team meetings and appropriate followup was being assigned to issues. The inspector noted that the team had identified several issues for followup during the final week of the assessment.

c. Conclusions

The assessment of Operations and Engineering support programs was being adequately performed by the PES Unit. The use of industry assessors (Peers) on the PES assessment team was considered a strength. The AFW assessment was performed in accordance with commitments to NRC and deficiencies were documented in the CAP for tracking and disposition.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Radiation Control Program and Self Assessment Activities

a. Inspection Scope (83750)

The inspector evaluated the licensee's radiation control program in the area of occupational exposure controls during power operations consistent with the requirements of 10 CFR Part 20. Areas evaluated included adequacy of pre-job radiation control planning, As Low As Reasonably Achievable (ALARA) pre-job briefings, effectiveness of the Radiation Work Permit (RWP) process, and adequacy of radiation surveys to support ongoing work activities. The licensee's program for self assessment in environmental and radiation controls areas was also evaluated to determine adequacy of self identification and corrective actions for deficiencies.

b. Observations and Findings

The inspector reviewed select RWPs utilized to control ongoing work within the radiation control area (RCA) and noted that the radiation controls observed were appropriate for described tasks and radiological conditions. Several specific Harris Nuclear Plant (HNP) RWPs were reviewed to determine if supporting radiation survey data was current and sufficient to support work to be conducted under the RWP. RWPs

reviewed included those developed for residual heat removal system work, ongoing painting work, and general maintenance activities. Radiological control requirements specified for the specific RWPs reviewed were determined to be adequate for the work scopes identified. Based on the inspector's review of these RWPs and discussions with licensee personnel, the inspector determined that the radiation work permits being utilized were appropriate and adequate for the tasks permitted under these RWPs. No discrepancies in implementation of the licensee's RWP procedure or with regulatory requirements were identified.

The inspector observed pre-job ALARA planning and radiation control briefings that were thorough, indepth, and sufficient to minimize unnecessary exposures and to identify radiological risks to radiation workers. Observed during these briefings was good specific planning as to how to minimize personnel exposure as well as full consideration of ALARA objectives with no procedural discrepancies identified.

The inspector selected at random a sample of radiation surveys in the reactor building, auxiliary building, and waste processing building. Each of the selected surveys was determined to be in compliance with the licensee's procedure with respect to being up to date, of adequate detail and completeness per procedure to fully characterize radiation hazards, and sufficient to support work planning needs with no discrepancies noted.

The inspector evaluated three specific licensee self assessments in E&RC areas completed in 1997: Environmental and Radiation Control Assessment, H-ERC-97-01; Harris Environmental and Radiation Control Performance Evaluation Support Assessment, 97-05-ERC-H; and Radwaste Shipping, H-SP-97-04. The assessments satisfied regulatory and licensee procedural audit requirements and were determined to be thorough and indepth with all identified program deficiencies tracked for completion of corrective actions. Deficiencies were noted to be consistently identified at a low threshold of safety significance. A sample of closeout actions for identified deficiencies found them timely and sufficient. Overall, the licensee's self assessment activities were a strength of the licensee's radiation control program.

c. Conclusions

The licensee's radiation control program in the areas of radiation surveys, RWP controls, and pre-job planning and ALARA briefings, was determined to be implemented effectively and in accordance with procedures. Self assessment activities were identified as a strength of the licensee's radiation control program.

R1.2 Specific Radiation Controls

a. Inspection Scope (83750)

Specific radiation controls evaluated in accordance with the requirements of 10 CFR Parts 19 & 20 included internal and external

exposure controls, locked high and very high radiation area controls, hot spot controls, radiation area and contaminated area posting, general contamination controls to include drip containments, effectiveness of radiation worker training for radiation hazards, spent fuel pool controls, and labeling of radioactive material.

The inspector made frequent tours of the radiation control area, observed compliance of licensee personnel with radiation protection procedures for routine work evolutions, and conducted interviews with licensee personnel with respect to their knowledge of radiation controls and specific radiological working conditions.

b. Observation and Findings

During plant walkdowns within the Radiation Control Area (RCA), the inspector conducted brief interviews at random with radiation workers in order to determine the level of understanding of RWP requirements and of radiation hazards/working conditions. All of the workers interviewed were verified to have signed onto an RWP, were wearing dosimetry appropriate to their work activities within the RCA, and were performing specific work activities on appropriate RWPs. The questions asked included the RWP number of the RWP signed in on, electronic dosimetry alarm setpoints for dose and dose rate limits, and general radiological working conditions for the areas worked in. For some of the workers interviewed a minimally sufficient knowledge of specific RWP requirements and of radiation hazards and working conditions generally was evident. The licensee promptly conducted a stand down meeting with the workers affected to emphasize the importance of basic radiation worker and RWP knowledge requirements and initiated an adverse condition report requiring followup. Prior to the end of the period of inspection the inspector verified that affected radiation workers had increased in their knowledge of RWP requirements and working conditions.

The inspector reviewed radiation exposures for all radiation workers at the site and determined that all personnel exposures assigned since the beginning of 1997 through October 30, 1997 were within 10 CFR Part 20 limits. A review of licensee personnel exposure records indicated the following maximum individual exposures at the plant during this period: Total Effective Dose Equivalent (TEDE): 1002 mrem; Committed Effective Dose Equivalent (CEDE): 27 mrem; and Shallow Dose Equivalent (SDE): 3060 mrem. The inspector determined the licensee had adequately monitored and tracked individual occupational radiation exposures in accordance with 10 CFR Part 20 requirements and that all doses reported were at a small percentage of applicable regulatory limits.

The inspector reviewed and discussed with licensee representatives the program for controlling access to high radiation areas (HRAs) and locked high radiation areas (LHRAs). These areas were inspected during tours for proper posting and access controls. No HRAs or LHRAs were identified where required posting was needed but not posted. Areas controlled as LHRAs were inspected and found locked in accordance with licensee procedure.

An inspection of controls for materials stored in the spent fuel pool was conducted to ensure that no highly radioactive material stored in the pool could be inadvertently raised out of the fuel pool thereby risking exposures to workers. The inspector also reviewed the licensee's fuel handling building material storage log which provided a record of all materials stored in the pool as well as dates of storage or removal. No discrepancies were found between what was actually in the fuel pool and what was indicated by the fuel handling building material storage log. The inspector also reviewed the licensee's training records for individuals involved in handling and receipt of spent fuel in accordance with procedure CM-M0300, Rev. 21, Spent Fuel Cask Handling and for those individuals involved in the preparation of the fuel cask for shipment in accordance with procedure HPP-880, Rev. 12, Spent Nuclear Fuel Shipping and Receipt. The training of workers involved in the receipt of spent fuel and the shipment of fuel casks was determined to current.

A sample of survey instruments and respirators available for issuance was inspected and determined to have current calibration dates. Radiation workers during high traffic periods were observed exiting the RCA in accordance with procedures for frisking out of the RCA to include properly clearing small articles with the small articles monitors. Contamination smears for detection of unfixed radioactive material in non contaminated areas were taken, counted, and determined to be less than the licensee's contamination control limit for areas required to be controlled as contaminated. The inspector noted that the number of drip bags throughout the facility had increased significantly since the end of 1996 and was concerned that they represented a potential for spread of contamination. The licensee acknowledged the increase and was working on reducing the number of outstanding drip bags & catch containments due to deferred maintenance. During inspection of the tool issuance rooms, good controls were noted for slightly contaminated purple painted tools inside the RCA; and for clean tools outside the RCA.

c. Conclusions

Specific radiation controls were effectively implemented with good occupational exposure controls demonstrated during routine power operations. Some radiation workers interviewed had a minimally sufficient knowledge of RWP requirements and working conditions. Prior to the end of the inspection these radiation workers had increased in their knowledge of RWP requirements.

R8 Miscellaneous RP&C Issues (83750, 86750)

R8.1 ALARA Program Effectiveness

a. Inspection Scope (83750)

Part 20 to the Code of Federal Regulations requires that licensees use, to the extent practicable, procedures and engineering controls based

upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are As Low As Reasonably Achievable. The ALARA area was evaluated to determine whether the licensee was establishing and tracking performance against ALARA goals, whether continuing ALARA initiatives are ongoing to reduce dose, and to evaluate the overall effectiveness of the ALARA program.

b. Observations and Findings

Through October 29, 1997, the licensee had incurred an actual dose of 146.591 rem which exceeded the 1997 annual dose goal of 143.872 rem. The overall RFO-7 outage dose goal of 121.4 rem was exceeded by approximately 12.4 rem or in excess of ten percent. The inspector evaluated dose performance during the outage to determine if actual dose exceeded dose goals due to inadequate ALARA planning or due to unplanned emergent work and unforeseen outage extension. For the specific high dose work evolutions reviewed, the inspector did not identify evidence of poor ALARA work planning or inadequate radiation controls for jobs undertaken and concluded that emergent work and the extended work scope of the outage were the main reasons dose goals were exceeded. The inspector reviewed with the licensee current and planned ALARA initiatives. During 1997, the licensee has undertaken several dose reduction initiatives which included installation of a permanent cavity seal ring in the reactor cavity, reduced weld inspections for heat exchangers, reduced reactor head stud tensioning surveillance requirements, increased water shields and cameras for core barrel lift, use of mock ups and scenario training, and use of cameras for spent fuel annual inspections. Other potential dose saving ALARA initiatives originally planned but which were deferred for 1997 due to budget considerations included sub micron filtration, steam generator platform handrail modification, and a reactor head cono-seal upgrade. Overall, the inspector determined that collective dose is being adequately controlled and effectively reduced.

c. Conclusions

The licensee's ALARA program was effectively implemented and adequately controlled collective dose.

R8.2 (Closed) VIO 50-400/97-08-05: Failure to Conduct Hazmat General Awareness Training Using Current Training Materials. The licensee has revised applicable training materials and retrained personnel who were trained with the out of date training materials. Five function specific DOT Hazmat lesson plans and an associated General Awareness lesson plan were updated to reflect the new requirements of the transportation rule as revised. Employees who were trained with the out of date lesson plans were retrained with all corrective actions completed October 31, 1997. The completed corrective actions in response to the original violation are sufficient and, on this basis, Violation 97-08-05 is closed.

S1 Conduct of Security and Safeguards Activities

S1.1 General Comments

a. Inspection Scope (71750)

The inspector observed security and safeguards activities during the conduct of tours and observation of maintenance activities.

b. Observations and Findings

The inspector found the performance of these activities was good. Compensatory measures were posted when necessary and properly conducted.

c. Conclusions

The performance of Security and Safeguards activities were good.

F1 Control of Fire Protection Activities

F1.1 General Comments

a. Inspection Scope (71750)

The inspector observed fire protection equipment and activities during the conduct of tours and observation of maintenance activities.

b. Observations and Findings

The inspector found the fire protection activities to be acceptable.

c. Conclusions

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 December 12, 1997. 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
W. Gurganious, Superintendent, Environmental and Chemistry
M. Keef, Manager, Training
B. Meyer, Manager, Operations
K. Neuschaefer, Superintendent, Radiation Protection
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

NRC

V. Rooney, Harris Project Manager, NRR
M. Shymlock, Chief, Reactor Projects Branch 4

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 83750:	Occupational Radiation Exposure
IP 86750:	Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 90712:	In-office Review of LERs
IP 92700:	Onsite Followup of Events
IP 71714:	Cold Weather Preparations

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-400/97-12-01	VIO	PNSC meeting without required quorum membership (Section O7.6).
50-400/97-12-02	VIO	PNSC membership appointment not designated as quality assurance record (Section O7.6).
50-400/97-12-03	NCV	Greater than 100 outstanding temporary changes (Section O8.2).
50-400/97-12-04	NCV	Failure to follow WR/JO work instructions when performing maintenance activities (Section M1.5).
50-400/97-12-05	VIO	Failure to establish and implement engineering procedures; 3 examples (Sections E1.1 and E3.1).

Closed

50-400/97-12-03	NCV	Greater than 100 outstanding temporary changes (Section O8.2).
50-400/97-12-04	NCV	Failure to follow WR/JO work instructions when performing maintenance activities (Section M1.5).
50-400/97-08-05	VIO	Failure to conduct Hazmat General Awareness Training using current training materials (Section R8.2).
50-400/97-18-00	LER	Operating with procedure not properly reviewed and approved (Section O8.2).

Discussed

50-400/97-002-00	LER	Inoperable main feedwater isolation valves caused by cold weather (Section O8.1).