U.S. NUCLEAR REGULATORY COMMISSION

REGION II

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License Nos: DPR-67, NPF-16

Report Nos: 50-335/98-11, 50-389/98-11

Licensee: Florida Power & Light Co.

Facility: St. Lucie Nuclear Plant, Units 1 & 2

Location: 6351 South Ocean Drive
Jensen Beach, FL 34957

Dates: November 1 - December 12, 1998

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Reactor Projects Branch 3
Division of Reactor Projects

Enclosure 2

EXECUTIVE SUMMARY

St. Lucie Nuclear Plant, Units 1 & 2
NRC Inspection Report 50-335/98-11, 50-389/98-11

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 inspections by a regional radiation specialist and a regional reactor maintenance inspector.

Operations

- The overall conduct of operations was professional and safety-conscious. Operations control of outage activities was strong (Sections O1.1 - O1.5).

- The power reduction, shutdown, and cooldown for the planned refueling outage were professionally conducted. Supervisors ensured that the control room was maintained quiet. The operators were attentive and knowledgeable of their tasks. Consistent use of three part communications and strong teamwork were observed (Section O1.2).

- Shutdown cooling operations were impacted by seat leakage of the shutdown cooling heat exchanger bypass valves. Operators were attentive to plant conditions and expeditiously identified the reactor coolant system heatup as shutdown cooling flow was decreased during reduced inventory conditions. Recovery actions were appropriately conservative and procedures were adequate. Analyses of the incident were thorough. The final resolution adequately addressed all technical and administrative issues (Section O1.3).

- The reactor startup was well conducted. Supervision maintained quiet conditions in the control room, and a professional attitude was exhibited throughout the critical evolutions. Reactor Engineering interacted frequently with the Reactivity Manager and the Reactor Control Operator. Reactivity manipulations were properly controlled and the expected response was verified by the operator. (Section O1.5)

- On November 9, shortly after shutdown, and on December 7, prior to restart, the inspectors conducted comprehensive tours of Systems, Structures, and Components inside Unit 2 containment. Overall, the containment was clear and clean. The Structures, Systems, and Components appeared to be good condition (Section O2.3).

- Quality Control inspections, surveillances, and spot checks conducted during the refueling outage were proactive and included insightful observations (Section O7.2).

Maintenance

- Maintenance outage activities were conducted professionally. Procedural compliance, worker knowledge, and pre-job briefings were strong. Coordination between different work groups and supervision of testing activities were effective. (Sections M1.1 - M1.7)

- Inservice inspection activities were performed in accordance with requirements with strong licensee direction and oversight of contract personnel. Overall, the licensee's Inservice Inspection program was considered to be a strength. (Section M1.8)

- Quality Assurance Audit QSL-ISI-97-14 was detailed, well performed, and contained meaningful findings. Appropriate corrective actions were taken for adverse audit findings. (Section M1.8)

- A detailed flow accelerated corrosion program was in place and was being implemented in accordance with procedural requirements by knowledgeable licensee personnel. (Section M1.9).

Engineering

- Insufficiently comprehensive inspections during the 1997 Unit 2 refueling outage resulted in a failure to promptly identify and correct conditions adverse to quality. A violation was identified. The inadequate corrective actions resulted in inaccurate information being provided to the NRC in that the sump was not restored to design requirements as was indicated. Initial inspections conducted this refueling outage were not adequate. After additional discrepancies were identified by NRC inspectors and licensee personnel, licensee management recognized that a detailed inspection of the sump was necessary. The licensee consequently identified that the corrective actions had not been adequate. Thorough corrective actions were subsequently completed and a detailed report was submitted. (Section E8.2)

Plant Support

- Health Physics technicians observed by the inspectors were aware of plant status and provided good coverage for the work for which they were responsible, ensuring that personnel exposure was controlled in accordance with the licensee's ALARA (As Low As Reasonably Achievable) program. (Sections R1.1 and R4.1)

- The licensee was properly monitoring and controlling personnel radiation exposure during the Unit 2 Refueling Outage and posting area radiological conditions in accordance with 10 CFR Part 20. The licensee had implemented an effective shutdown chemistry control plan and closely monitored primary coolant chemistry during the shutdown for the Unit 2 Refueling Outage. (Section R1.2)

- Contractor personnel working as senior radiation protection technicians during the Unit 2 outage met or exceeded the qualification requirements specified in the technical specifications and applicable industry standard. (Section R5.1)

- The inspectors met with St. Lucie County officials at the county Emergency Operations Center. No new Emergency Preparedness issues or concerns surfaced during the meeting. (Section P8.1)

Report Details

Summary of Plant Status

Unit 1 operated at essentially full power during the entire report period, except for a brief unplanned downpower to 68 percent power on November 8 when problems with Turbine Cooling Water (TCW) basket strainers caused seashells to accumulate in the 1A TCW heat exchangers. The heat exchanger was cleaned and the strainer problems resolved.

Unit 2 operated continuously at full power until November 7, when the unit power was reduced to about 70 percent for main steam safety valve testing. Unit 2 was subsequently shutdown on November 9 for its eleventh refueling outage (SL2-11). The outage lasted slightly more than 30 days, and the unit was returned to full power operation on December 12.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (IP 71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. The overall conduct of operations was professional and safety-conscious. Operations control of outage activities was strong. Specific events and noteworthy observations are detailed in the sections below.

O1.2 Shutdown of Unit 2 For SL2-11

a. Inspection Scope (IP 71707)

During the evening of November 8 and the morning of November 9, the licensee performed a planned shutdown of Unit 2 in preparation for the refueling outage. The inspectors observed pre-job briefings, power reduction, manual trip and recovery, and initial cooldown of the unit.

b. Observations and Findings

The inspectors attended several pre-job briefings for the evolution. The technical brief conducted by the Assistant Nuclear Plant Supervisor (ANPS) was thorough and well organized. Significant industry operating experience was discussed and included site specific precautions to avoid similar problems. The management brief emphasized the need to perform the work safely and according to procedures.

The power reduction began approximately 8:00 p.m. on November 8 and was performed in accordance with NOP 2-0030128, Revision 0, Reactor Shutdown and NOP 2-0030125, Revision 11, Turbine Shutdown - Full Load to Zero Load. The ANPS maintained the control room atmosphere quiet and professional. Unnecessary observers were routinely asked to leave the control room area. Consistent use of three part communications among the operators was observed.

The licensee chose to manually trip the unit at approximately 25 percent power to complete the shutdown. This decision was made to simplify the shutdown. The core had been heavily depleted and Reactor Engineering determined that reactivity control could become difficult at low power if the licensee encountered any significant delays during the shutdown. The inspector discussed the impending trip with several licensed operators and all understood the reasons for tripping the unit.

The unit was tripped at 12:01 a.m. and the inspector observed the operators perform the applicable steps of 2-EOP-1, Standard Post Trip Actions, Revision 17 and 2-EOP-2, Revision 11, Reactor Trip Recovery. The inspectors noted that the each crew member performed his actions as required by procedures.

After stabilizing the unit, the inspectors observed the operators commence the reactor cooldown in accordance with NOP 2-0030127, Revision 16, Reactor Plant Cooldown - Hot Standby to Cold Shutdown. Again, the inspectors observed good teamwork and communications among the operators. Each operator was knowledgeable of the tasks required to perform the evolution.

c. Conclusion

The power reduction, shutdown, and cooldown for the planned refueling outage were professionally conducted. Supervisors ensured that the control room was maintained quiet. The operators were attentive and knowledgeable of their tasks. Consistent use of three part communications and strong teamwork were observed.

O1.3 Unit 2 Reduced Inventory, Midloop, and RCS Refill Operations

a. Inspection Scope (IP 71707)

During SL2-11, the inspectors observed activities on multiple occasions between November 11 and 13 while operators drained down and refilled the reactor coolant system (RCS) as necessary to establish and recover from reduced-inventory and midloop conditions. The inspectors monitored the conduct of Operations and system response during these evolutions. The inspectors also reviewed condition reports (CR), and conducted numerous interviews with responsible operators, engineers, and management regarding problems identified when establishing adequate Shutdown Cooling (SDC) during midloop operation.

b. Observations and Findings

On November 9, while setting Unit 2 conditions for SL2-11, operators placed the Shutdown Cooling System (SDC) in service as part of a routine unit shutdown and cooldown. After cooling down the RCS to Mode 5 conditions, operators began draining the RCS on November 11 to establish midloop conditions for removing steam generator (SG) primary-side manways and installing nozzle dams. An inspector observed operators reduce RCS level in the pressurizer and reactor vessel (RV) head in accordance with 2-NOP-01.03, Revision 1, Draining The RCS. The RCS draindown was suspended several times because the draindown rate used by the operators was limited

by the capability of the RV head vent path. Several delays occurred as the operators waited for RCS level indicators to stabilize. Once RCS level was reduced to 33 feet, approximately three feet below the top of the RV flange, operators entered "reduced-inventory" conditions and began to use 2-NOP-01.04, Revision 1, RCS Reduced Inventory and Mid-loop Operation. The inspectors had previously reviewed this procedure. As operators prepared to enter "mid-loop" conditions, the inspectors verified compliance with selected procedural prerequisites, and precautions and limitations. Furthermore, the inspector verified that 2-NOP-01.03 was satisfactorily completed prior to continued RCS draindown.

Late on November 11, the operators drained the RCS to 31' 3" and entered mid-loop conditions with RCS temperature stable at 108 °F. Mid-loop conditions involve reactor levels less that 31' 3" which corresponds to the elevation of the top of the reactor coolant hot leg piping. Shortly thereafter, SDC flow was reduced from about 6000 to 3500 gpm per procedure and RCS temperature began to increase. Operators promptly recognized the increasing temperature and quickly restored SDC flow and increased RCS level to above 32' while the problem was investigated. RCS temperature peaked at approximately 121°F before the operators were able to begin cooldown again. This incident occurred about 72 hours after reactor shutdown. Subsequent review of plant conditions by the licensee determined that the SDC bypass control valves (V3301 and V3306) had excessive seat leakage adversely affecting SDC heat exchanger (HX) performance. Indications of this condition were not obvious during the higher SDC flow rates. During actual midloop conditions, SDC flow is reduced to prevent possible vortexing of the LPSI pumps. At the reduced flowrates, the heat exchanger performance issue became clear. Thus in order to preclude RCS heatup while in reduced SDC flow conditions at mid-loop, the licensee implemented several actions to address the degraded SDC loop performance: 1) Procedure 2-NOP-01.04 was changed to allow SDC flows up to 4400 gpm (i.e., 2200 gpm per loop); 2) FCV-3301 and 3306 were manually hard-seated closed in an attempt to reduce leakage (this proved to be unsuccessful, and the valves were restored); and, 3) Procedure 2-NOP-03.05, SDC Operation, was changed to throttle LPSI cold leg injection valves to reduce the pressure differential across V3301 and V3306 and thereby reduce bypass flow (this proved to be successful). Once SDC capability was verified, operators were then able to reduce RCS level to 29'8" (elevation of hot leg centerline), and maintain control of RCS temperature.

Midloop conditions at 29'8" were established for SG nozzle dam installation on November 12, approximately 84 hours after reactor shutdown. The inspectors reviewed the procedure changes discussed above, observed implementation of the new operating instructions by the operators, and walked down the SDC system. On November 13, SG nozzle dams were installed without incident, and RCS level was raised to re-establish reduced-inventory conditions prior to Mode 6 entry. The original schedule had called for Mode 6 entry while in midloop. Engineering analysis by the licensee concluded that one loop of SDC (assuming the other loop failed) would not be sufficient to maintain RCS temperature less than the TS limit of 140°F at the reduced flow conditions and degraded SDC loop performance. Consequently, the licensee conservatively decided to increase RCS level above midloop so that SDC flows could be increased without vortexing.

The inspectors reviewed the applicable condition reports (98-1749, 98-1707, 98-1708, 98-1711, 98-1713, 98-1715, 98-1720, and 98-1725). The root cause analyses were thorough with numerous significant specific and generic corrective actions recommended. Regarding the described incident, Engineering recommended and Operations implemented appropriate changes to the procedures to address the SDC system problems until corrective maintenance could be performed. Engineering was also assigned action items to determine permissible maximum temperatures for initiating drain down for mid-loop operations, to evaluate the cavitation threshold for the SDC flow control and flow bypass valves, and to determine testing requirements for bypass leakage rates prior to use in shutdown cooling.

The licensee determined that even with the bypass valve leakage, the SDC system was fully capable of maintaining the RCS in Mode 5. The licensee's review also determined that the SDC system would not have been able to maintain Mode 6 temperature bands without the procedural revisions or operator actions. The licensee satisfactorily controlled the operational mode of the unit and therefore concluded that the SDC system was operable. The licensee also determined that the event was not reportable under 10 CFR 50.72 or 50.73. The inspectors reviewed the licensee's actions and analysis and concluded they were adequate.

c. Conclusion

Shutdown cooling operations were impacted by seat leakage of shutdown cooling heat exchanger bypass valves. This delayed entering midloop and subsequently Mode 6. Operators were attentive to plant conditions and expeditiously identified the reactor coolant system heatup as shutdown cooling flow was decreased during reduced inventory conditions. Recovery actions were appropriately conservative and procedures were adequate. Analyses of the incident were thorough. The final resolution adequately addressed all technical and administrative issues.

O1.4 Unit 2 Refueling Operations (IP 71707, 60710)

The inspectors observed portions of the Unit 2 refueling activities during SL2-11. The movement of fuel assemblies to and from the spent fuel pool (SFP), and fuel assembly shuffling in the reactor core, were monitored by the inspectors from inside containment, fuel handling building, and refueling center in the Unit 2 control room. The inspectors reviewed applicable refueling and fuel handling procedures as they were being used and upon completion of all refueling activities. Licensee and contractor personnel involved were familiar with the procedural requirements. Consistent use of proper three part communications to ensure accuracy during the refueling procedure implementation was observed. The inspectors also observed that adequate supervisory oversight was present at all of the locations involved with the refueling process.

O1.5 Unit 2 Restart From SL2-11

a. Inspection Scope (IP 71707, 71711)

The inspectors observed the licensee's preparations for initial criticality following the refueling outage, the dilution to criticality, and portions of the power ascension program.

b. Observations and Findings

On December 8, the licensee performed a reactor startup. The inspector verified that the licensee had certified that all surveillances and prerequisites for Modes 2 and 1 as required by NOP 2-0030122, Revision 10, Reactor Startup were completed prior to entering those modes. The startup was conducted in accordance with approved procedures and met all Technical Specification requirements.

The inspectors monitored control room activities during the startup. Both the ANPS and NPS maintained command of the control room. Extraneous personnel were kept out of the area, and the oncoming shift was diverted to the Technical Support Center for the turnover pre-brief. Reactor Engineering was observed to interact frequently with the Reactivity Manager and the Reactor Control Operator. Reactivity manipulations were deliberately performed and the expected response was verified by the operator.

Generally, the inspectors found all Operations and Reactor Engineering personnel were knowledgeable of plant conditions. A minor deficiency was identified by the inspectors on successive shifts. The licensee replaced the 'D' linear range nuclear instrument during the outage. Four bistables were placed in trip prior to Mode 2 since the licensee considered the instrument inoperable until it could be calibrated (at approximately 25 percent power). On both occasions, the desk operators were unaware of the reason that these trip bistables were bypassed. The knowledge deficiencies were immediately corrected by the ANPS, and the Assistant Operations Supervisor issued himself an action item to ensure that important information is given to all operators prior to their assuming the shift.

c. Conclusion

The reactor startup was well conducted. Supervision maintained quiet conditions in the control room, and a professional attitude was exhibited throughout the critical evolutions. Reactor Engineering interacted frequently with the Reactivity Manager and the Reactor Control Operator. Reactivity manipulations were properly controlled and the expected response was verified by the operator.

O2 Operational Status of Facilities and Equipment

O2.1 General Plant Tours (IP 71707)

O2.2 Engineered Safety Feature System Walkdowns (IP 71707)

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

- 2A and 2B High Pressure Safety Injection Systems
- 2A and 2B Low Pressure Safety Injection Systems
- 2A and 2B Containment Spray Systems
- 2A, 2B, and 2C Auxiliary Feedwater Systems

Equipment operability, material condition, and housekeeping were acceptable in all cases. Several minor discrepancies were brought to the licensee's attention and were corrected. The inspectors identified no substantive concerns as a result of these walkdowns.

O2.3 Unit 2 Initial and Closeout Containment Tours

On November 9, the inspectors conducted a comprehensive walkdown of systems, structures and components (SSCs) inside Unit 2 containment shortly after shutdown for SL2-11. The unit was in Mode 3 and cooling down. Overall, the SSCs in containment were in sound condition. About a dozen very minor leaks were identified, primarily packing leaks, which were reported to the licensee. Subsequent discussions with outage planning personnel determined that all these leaks had been previously identified by the licensee during their containment tours and incorporated as emergent work for SL2-11.

On December 7, the inspectors conducted another comprehensive tour of SSCs inside Unit 2 containment just prior to containment closeout for restart. The unit was in Mode 3, at normal operating temperature and pressure. Overall, the containment looked clear and clean, and SSCs appeared to be good condition. Numerous minor housekeeping and equipment condition problems were identified and reported to the outage shift director's staff. All of the inspector findings were tabulated, assigned to responsible licensee personnel, and resolved prior to restart. None of the findings involved significant equipment operability issues.

O7 Quality Assurance in Operations

O7.2 Quality Control Surveillance Activities During SL2-11

During SL2-11, Quality Control (QC) inspectors conducted dozens of spot checks and surveillances of ongoing activities involving maintenance, operations, engineering, and plant support personnel. The results from their inspections, surveillances and spot checks were reported promptly, via "Daily Quality Summary" sheets that were distributed or made available to all levels of management and supervision. Numerous findings

were generated on a daily basis that provided excellent, real-time feedback on the quality of outage work. Corrective actions were taken immediately to address QC findings through condition reports, plant work orders, or lessons-learned. The inspector noted that QC inspections, surveillances, and spot checks were proactive and included insightful observations.

O8 Miscellaneous Operations Issues

O8.1 (Closed) LER 335-97-003-00 Automatic Reactor Trip Resulting from the Loss of Electrical Power to the 1A2 Reactor Coolant Pump (IP 92901)

This event and corrective actions were discussed in detail in Inspection Report 97-03. All corrective actions have been completed. This item is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance (IP 61726, 62707)

The resident inspectors observed all or portions of the following corrective, preventive and predictive maintenance, and surveillance activities, including implementation of plant change/modifications (PCMs), work orders (WOs), and post-maintenance testing (PMT):

•WO 98018967	Unit 1 Auxiliary Feedwater Actuation System Monthly Surveillance
•Operating Procedure (OP) 2-1300050	Reactor Auxiliary Building Fluid Systems Periodic Test
•MMP(Mechanical Maintenance Procedure)8.7	Main Steam (MS) Safety Valve Testing, Removal, and Replacement
•WO 980004847 & 980005642	Thermal Overpressurization Relief Valve Installation(Valves SR14636 and SR02123)
•WO 97026567	2A MS Atmospheric Dump Valve Seat Leak Repair
•2-OSP-68.2	Local Leak Rate Test Of V15328
•WO 980001964 & 980001965	Power Operated Relief Valves V1474 & V1475 Rebuild
•OP 1-0810050	MS Isolation Valves Periodic Test

•WO 98021346	2B Intake Cooling Water Pump Discharge Pipe Repair
•PCM 98-031	Power Cable Reroute and PMT of SDC Hot Leg Suction Valves (V3652 & 3480) and Reactor Head Vent Valves
•WO 97021101	B Train Heated Junction Thermocouple Liquid Level Probe Replacement and PMT
•MMP 01.17	Reactor Coolant Pump Seal Replacement

The inspectors found the work performed under these activities to be professional and thorough. All work observed was performed with the work package or procedure in active use. The inspectors observed maintenance supervision and Engineering to be closely involved with the maintenance work. The inspectors also observed that work activities were properly documented and problems encountered during the performance of the work activities were appropriately resolved. Applicable foreign material exclusion (FME) controls, measuring and test equipment (M&TE) controls, PMT requirements, and QC hold points were being accomplished in accordance with requirements.

Specific discussions of additional maintenance observations are presented in Sections M1.2 through M1.6 below.

M1.2 2A Emergency Diesel Generator Governor Modification and Maintenance

a. Inspection Scope (IP 61726, 62707)

The inspector observed portions of the 2A Emergency Diesel Generator (EDG) governor modification, maintenance activities, and system retests. Discussions were held with maintenance workers, engineering personnel, and licensed and non-licensed operators.

b. Observations and Findings

During the week of November 16, the licensee performed routine 18-month preventive maintenance on the 2A EDG and installed the governor modification associated with PCM 96151 (refer to IR 98-10 for further details on the planned modification). Overall performance of the work was well coordinated and professionally conducted. All personnel involved were knowledgeable of their tasks. Supervision, Quality Control, and Engineering support were observed to be actively involved throughout the entire maintenance period.

The retest of the unit was coordinated through the System and Component Engineer (SCE). On multiple occasions the inspectors spoke with the SCE about problems encountered with the test. The inspector found the SCE's system knowledge sound.

Additionally, the inspector observed that the SCE did not allow the pressures of scheduling to rush the retest. On multiple occasions the SCE was observed taking the opportunity to review all available data to determine the causes of problems in the retests. Eventually, the SCE identified two failed components and was able to successfully complete the testing for the EDG.

M1.3 Observation of 2B Emergency Diesel Generator (EDG) Maintenance

a. Inspection Scope (IP 62707)

The inspectors observed portions of the maintenance performed on the 2B EDG.

b. Observations and Findings

The inspector observed that general work conditions were kept clean and organized. Equipment Clearance Orders (ECO) 2-98-10-086R and 2-98-10-070R for the electrical and mechanical portions of the maintenance, respectively, were reviewed by the inspector and found to be adequate and correctly implemented.

Electrical Maintenance (EM) completed the replacement of the AC soakback motor under the observation of the inspector. The inspector reviewed the procedure used by the workers, EMP-100.03, Revision 5, The Overhaul of Motors, and determined that the EM crew used good procedural adherence. The inspector observed that communication and coordination between the EM workers was adequate to complete the job correctly. The inspector observed governor adjustments and balancing between the two EDG engines made by operations and engineering personnel following governor limit switch replacement. The adjustments and balancing of the EDG engines were performed in accordance with MP-2-0950187, Revision 2, Operation of the 2B EDG for Maintenance and Governor Setup Following Governor Actuator Replacement.

M1.4 Unit 2 Safeguards Testing, Train B (IP 61726)

On November 30 and December 1, an inspector observed most of the Integrated Safeguards testing conducted on Train B by the operators in accordance with Operating Procedure No. 2-0400050, Revision 29, Periodic Test Of The Engineered Safety Features. The inspector verified selected prerequisites were properly completed, and that certain precautions and limitations were being met. In general, Operations did an excellent job coordinating and controlling the entire test evolution. The "tiger-team" concept of augmenting the regular operating crew with additional operators dedicated to performing the test activities, worked extremely well. Strict procedural compliance was evident throughout the testing. The procedure was well written, and only required a minimal number of relatively insignificant changes during the course of the evolution. Essentially all plant equipment operated per the intended design, and met all significant acceptance criteria. The few minor problems that were identified were resolved.

M1.5 Unit 2 Startup (Low Power) Physics Testing

a. Inspection Scope (IP 61707, 61708, 61710, 61726)

The inspector observed startup physics testing conducted by Operations, Reactor Engineering, and contractor personnel.

b. Observations and Findings

The inspector reviewed the procedure used for startup physics testing, PTP-3200091, Revision 16, Reload Startup Physics Testing, and verified that the prerequisites were complete. The inspector observed the satisfactory completion of the following tests:

- All Rods Out Critical Boron Concentration
- Isothermal Temperature Coefficient
- Rod Worth Measurements by Rod Swap Method

Operations personnel successfully supported the physics testing by establishing and maintaining test conditions. The inspector verified the operator knowledge of the different procedures used for value determination, giving special attention to the precautions and limitations involved. Operations personnel were observed to use good procedural adherence throughout startup physics testing.

The inspector reviewed the finished procedure for completeness and found it was satisfactory and all signatures and verifications were complete. The inspector verified that the final test data met the acceptance criteria.

M1.6 Reactor Reassembly (IP 62707)

The inspector attended the brief held for all personnel involved with the reactor head set in accordance with OP-2-1600023, Revision 58, Refueling Sequencing Guidelines, Appendix H. The licensee individual conducting the brief adequately addressed the precautions and limitations. Implementation of past lessons learned was good in that the workers were given details of previous problems that contributed to increased exposure to maintenance personnel. The actions in place to eliminate these past problems were described to the maintenance team. Supervision was effective in controlling the evolution so that work was performed as scheduled without significant delays, minimizing personnel exposure. The workers were observed to be knowledgeable of the radiation exposure risk involved and implemented teamwork, efficient work practices, and peer oversight to successfully complete the maintenance.

M1.7 Conclusions on the Conduct of Maintenance

Maintenance outage activities were conducted professionally. Procedural compliance, worker knowledge, and pre-job briefings were strong. Coordination between different work groups and supervision of testing activities were effective.

M1.8 Inservice Inspection

a. Inspection Scope (Unit 2) (73753)

The inspectors evaluated implementation of the licensee's inservice inspection (ISI) program by observing in-process work activities and review of selected procedures and records. The observations, procedures and records were compared to the Technical Specifications (TS), the Updated Final Safety Analysis Report (UFSAR), and the applicable code (ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, with no Addenda). Portions of the following in-process ISI NDE examinations were observed:

- Liquid Penetrant (PT) examination of the following welds:
  - Zone 2-037, Weld Nos. RC-142-SW-8, RC-142-SW-12, and RC-142-FW-9
  - Zone 2-088, Weld No. CH-104-SW-18
  - Zone 2-046, Weld No. SI-112-FW-7
- Magnetic Particle (MT) examination of the following welds:
  - Zone 2-067, Weld Nos. BF-51-FW-3 and BF-201-228
- Visual (VT) examination of the following pipe supports/restraints:
  - Zone 2-088, Support Nos. CH-6-R3 and CH-72-R6
  - Zone 2-089, Support No. CH-75-R1
- Ultrasonic (UT) examination of the following welds:
  - Zone 2-067, Weld Nos. BF-51-FW-3 and BF-201-228
- Eddy Current (ET) examination data acquisition for the following steam generator tubes:
  - "A" Generator - Rotating Pancake Coil (RPC) at top of tube sheet

    Line 66 - Row 118, 120, 132, 134, and 136 tubes
    Line 67 - Row 113, 115, 117, 121, 123, 125, 127, 129, 133, and 137 tubes
    Line 68 - Row 122, 124, 126 and 128 tubes
  - B" Generator - Bobbin Coil full tube length inspection

    Line 23 - Row 11, 13, and 15 tubes
    Line 24 - Row 12 and 16 tubes
    Line 25 - Row 11 and 15 tubes

The inspectors also reviewed ASME Section XI repair records for repair of a corrosion thinned area on Intake Cooling Water (ICW) Pipe 36-CW-16-2.

In addition to the above observations and record reviews, the inspectors reviewed the following assessments and audits and verified that the ISI program was audited on a periodic basis and that audit findings were corrected:

- Component, Support and Inspection Audit Report QAS-CSI-97-1 dated September 18, 1998

- Quality Assurance Audit Number QSL-ISI-97-14 dated April 9, 1998

b. Observations and Findings

During observation of the above in-process ISI activities, the inspectors found that detailed instructions and procedures were in place and were being followed by knowledgeable and qualified inspection personnel; approved and calibrated inspection equipment was being used; inspections were being performed in accordance with applicable Code requirements; program changes, including appropriate approval of code relief requests, were being controlled; and examination results were being properly evaluated and corrective actions taken as required. Plans and schedules for the current inspection period were in accordance with the approved ISI program. Qualified and knowledgeable licensee personnel provided strong direction and oversight of contract personnel performing ISI examinations.

In-process repair records for ICW pipe 36-CW-16-2 were detailed and met the requirements of ASME Section XI.

c. Conclusions

Inservice Inspection activities were being performed in accordance with requirements with strong licensee direction and oversight of contract personnel. Overall, the licensee's Inservice Inspection program was considered to be a strength.

Quality Assurance Audit QSL-ISI-97-14 was detailed, well performed, and contained meaningful findings. Appropriate corrective actions were taken for adverse audit findings.

M1.9 Flow Accelerated Corrosion (FAC) (49001)

The inspectors reviewed the FAC program procedures and observed grid layout and UT thickness measurements for the following checkmate/checkworks components:

- I-35.5MSI-T-16B
- 14HD84-P-20-46

Compliance with program procedure requirements, including evaluation and disposition of inspection results, was verified. The inspectors found that a detailed FAC program

was in place and was being implemented in accordance with procedural requirements by knowledgeable licensee personnel.

M4 Maintenance Staff Knowledge and Performance

M 4.1 Freeze Seal Activities (IP 62707)

The inspector observed portions of the freeze seal activities for valve V3113 replacement. The inspector observed that the work package was on station and in active use and all required contingencies were available and documented at the work site. The freeze seal technicians were knowledgeable of their task and attentive to their assigned duties. Additionally, the technicians understood the radiological conditions in the work area. The inspector concluded that the freeze seal activities were performed in accordance with licensee requirements in GMP-10, Revision 9, Application of Freeze Seals.

III. Engineering

E1 Conduct of Engineering

E1.1 Conduct of the Risk Assessment Team (IP 37551)

On November 25, the inspectors observed the Risk Assessment Team (RAT) evaluate an option to perform the 'B' train Safeguards test before the 'A' train. The RAT was composed of members from Operations, Engineering and the Shift Technical Advisor organizations. Their function was to review the change in the scheduled activity, take into account changes in the probabilistic risk assessments, and determine the advisability of undertaking the change. Throughout the process, the RAT asked multiple questions about specific actions in the new plan. The inspector concluded that the RAT performed a thorough review of the schedule change.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 335-97-002-00 Operation in Excess of Maximum Rated Thermal Power Due to Digital Data Processor Calorimetric Error (IP 92903)

NRC review of this voluntary Licensee Event Report was addressed in Inspection Reports 97-03 and 97-05. All corrective actions have been completed or are scheduled within the licensee's corrective action process. This item is closed.

E8.2 (Closed) VIO 50-389/97329-01014, Failure To Properly Construct Unit 2 Containment ECCS Sumps, and VIO 50-389/97329-02014, Failure To Promptly Identify And Correct Unit 2 Containment Sump Deficiencies

a. Scope

The inspectors toured the Unit 2 emergency core cooling system (ECCS) sumps; observed portions of ongoing repairs and conduct of inspections; examined applicable

condition reports (CRs) and inspection procedures; and reviewed associated historical corrective action documentation. The inspectors also held numerous discussions with responsible mechanics, quality control (QC) inspectors, system and design engineers, licensing personnel, and plant management.

b. Observations and Findings

In May 1997, near the end of the tenth Unit 2 refueling outage (SL2-10), an inspector accompanied the licensees's QC personnel while they conducted a closeout inspection of the Unit 2 ECCS sumps in containment. Technical Specifications (TS) 4.5.2.e.2 requires a visual inspection of the Unit 2 containment sumps every 18 months (TS 4.5.2.d.2 for Unit 1). During this particular inspection, the NRC inspector identified numerous as-built discrepancies. The discrepancies primarily involved gaps and openings in the ECCS sump screens in excess of design requirements described in the Updated Final Safety Analysis Report (UFSAR). The licensee reported the identification of the discrepancies, which had existed since original construction, in LER 50-389/97-02 dated June 17, 1997. Special inspection report (IR) 50-335, 389/97-09 dated July 9, 1997, addressed the sump screen issues. A predecisional enforcement conference was held on July 24, 1997. Based on the information from LER 97-02, IR 97-09 and the enforcement conference, two violations were cited on August 8, 1997. The violations addressed the discrepancies between sump screen design requirements and existing conditions and the failure to identify the discrepancies during TS required inspections of the sump.

Before the restart of Unit 2 from SL2-10 in May 1997, the licensee conducted additional inspections of the Unit 2 ECCS sumps and effected repairs of all known discrepancies. NRC inspectors observed selected portions of the licensee's inspection and repair activities. The scope and details of the licensee's corrective actions to restore the Unit 2 ECCS sumps, and plans to inspect the Unit 1 sumps, were described in LER 97-02, the licensee's enforcement conference presentation, and the violation response dated September 4, 1997.

In November and December 1997, during SL1-14, the Unit 1 ECCS sumps were inspected in detail by the licensee and in a general fashion by the NRC. No significant discrepancies were identified with the inner double-barrier screen, but about two dozen aspects and/or locations of the outer screen required minor repairs. The licensee evaluated the Unit 1 sump discrepancies and concluded there were no outstanding operability concerns or reportability issues, as documented in CR 97-2225. The inspectors verified the satisfactory completion of the licensee corrective actions described in LER 97-02 (see IR 50-335, 389/98-03 dated April 27, 1998). The design configuration and acceptance criteria for Unit 1 are different than Unit 2.

On November 15, 1998, during SL2-11, maintenance and QC personnel inspected the Unit 2 ECCS containment sumps in accordance with Maintenance Surveillance Procedure (MSP) 68.01, Revision 1, "Containment Sump Inspection," and QC Technique Sheet (QCTS) 10.54, Revision 0, "Unit 1 and 2 Containment Sump Inspection." Eight as-built discrepant conditions (i.e., gaps or openings in excess of established acceptance criteria) were identified. These inspection procedures had been

specifically developed as part of the LER 97-02 corrective actions to ensure sump configuration and integrity met design requirements during future TS 4.5.2 inspections. The acceptance criteria of MSP-68.01 and QCTS for Unit 2 stated "no tears, holes, or gaps in excess of .090 inch diameter" were allowed; except for the inner divider screen in which "no tears, holes, or gaps in excess of .135 inch diameter" were allowed. These acceptance criteria were consistent with the design requirements specified in Section 6.2.2.2.3 of the Unit 2 USAR.

Shortly after the initial inspection of November 15, two additional as-built discrepancies were identified by engineering and maintenance services personnel during a walkdown inspection in preparation for repairing the initial eight discrepancies. On November 17, another two discrepancies were identified by an NRC inspector. Subsequently, in response to management concerns regarding the thoroughness of the initial QC inspection, another more detailed QC inspection of the Unit 2 ECCS sumps was conducted on November 22. The detailed QC inspection identified an additional 85 as-built discrepancies. Four more discrepancies were identified during repair activities. Almost all of the newly identified discrepancies found during SL2-11 were associated with the vertical screens, panels and structural members.

Condition report (CR) 98-1766 had been initiated to address the initial eight ECCS sump as-built discrepancies, and was expanded to include all identified discrepancies. Of the 101 total discrepancies, 26 were determined to be acceptable as-is. The majority of the remaining 75 discrepancies involved openings or holes in the .125 to .5 inch range in diameter, only slightly larger than the allowed acceptance criteria. The most significant discrepancies were a dozen or more, long thin gaps that were about a ½ inch wide or less, and from a few inches to several feet in length. In general, the discrepancies requiring repair were located in four areas at the interface between the screens and their frames; around penetrations through the screens; between structural members; and within the screens themselves.

Although much larger in number, the as-built discrepancies discovered during SL2-11 were generally smaller in size, both individually and collectively, than those discovered during SL2-10. Consequently the licensee's assessment of safety significance of CR 98-1766, concluded that the "Analysis of Safety Significance" documented in LER 97-02 for discrepancies discovered during SL2-10 was bounding for the SL2-11 conditions. This safety assessment concluded that critical ECCS components would not be adversely affected, and fuel assembly flow channels would not be significantly blocked due to postulated debris entering the through the small sump screen gaps, openings, and holes which were in excess of design requirements. However, similar to LER 97-02, the licensee did determine the discrepancies discovered during SL2-11 were reportable per 10 CFR 50.73 as "a condition outside the design basis of the plant" On December 22, 1998, the licensee issued a revision to LER 50-389/97-02. The licensee attributed the causes of the discrepancies to: 1) A failure to properly implement the design requirements during original construction; and 2) Inadequate inspections.

During their review, the inspectors questioned several details regarding assurance that the safety significance of the identified screen gaps was bounded by those evaluated in

1997. The licensee subsequently provided additional documentation which concluded that the previous evaluation bounded the recently identified discrepancies.

The inspectors observed selected portions of the licensee repair activities that went on for about two weeks. On December 1 and 3, 1998, an inspector accompanied QC personnel during their closeout inspections of the Unit 2 east and west (i.e., A and B train) ECCS containment sumps in preparation for restart from SL2-11. The inspector observed that the sumps were clean, clear of debris, and based on a limited inspection, restored to design requirements.

Essentially all of the "Corrective Actions Taken And The Results Achieved" described in the violation response dated September 4, 1997, were previously reviewed and verified by the inspectors during special inspection IR 97-09 and closeout inspection of LER 97-02. The "Corrective Steps To Avoid Further Violations" were verified during this report period and determined to be consistent with commitments made in the September 4, 1997 response.

The additional problems identified during SL2-11 and detailed review of the corrective actions performed during SL2-10 indicated that the licensee's previous efforts to restore the Unit 2 ECCS sumps were too narrowly focused. During SL2-10, licensee inspections and repairs were directed almost exclusively on discrepancies identified in the sump divider screen and the upper, horizontal screens. Little or no attention in the form of detailed inspections was paid to the vertical screens. Consequently, large numbers of pre-existing construction discrepancies went unnoticed. It was not until SL2-11, after the discovery of additional discrepancies on the vertical portions of the screens, that QC finally conducted a thorough, hand-over-hand inspection of all sump surfaces.

The inspectors reviewed the information presented by the licensee at the enforcement conference, and provided in the violation response. The information indicated that the Unit 2 ECCS containment sumps had been restored to design requirements before Unit 2 restart from SL2-10. The information did not clearly state that additional further corrective actions would be required to restore the sumps to the design requirements. Although the licensee indicated that new ECCS sump inspection procedures (i.e., MSP-68.01 and QCTS 10.54) were being developed to provide more specific inspection guidance, these procedures were "intended to ensure that the physical condition of the sump screens continues to meet the design requirements." Plant change/modification (PCM) package 98-029, approved by the Facility Review Group on August 26, 1998 in preparation for SL2-11, stated "During the Unit 2 refueling outage scheduled to begin November 1998, an inspection of the screen panels enclosing the sump area not inspected in 1997 will be performed. Any discrepancies in the as-found condition of the screens will be repaired at that time."

The failure to conduct sufficiently thorough and comprehensive inspections during SL2-10 constituted inadequate corrective actions to identify and correct conditions adverse to quality (the Unit 2 ECCS sump as-built discrepancies) and is a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The inadequate corrective actions resulted in inaccurate information being provided to the NRC in that the sump

was not restored to design requirements as was indicated. During this refueling outage, licensee management recognized that a detailed inspection of the sump was necessary and the licensee consequently identified that the corrective actions had not been adequate. Thorough corrective actions were completed and a detailed report was submitted. This issue is identified as Violation (VIO) 50-389/98-11-01, Inadequate Corrective Actions Taken To Restore Unit 2 Containment Sumps To Design Requirements. It was determined that enforcement action regarding the inaccurate information provided to the NRC was not appropriate because the inaccurate information was a direct consequence of the inadequate corrective actions.

The two 1997 violations are considered closed based upon completion of the corrective actions detailed in the licensee's violation response, and additional corrective actions taken during SL2-11 that ultimately restored the Unit 2 ECCS containment sumps to design requirements.

c. Conclusions

Insufficiently comprehensive inspections during the 1997 Unit 2 refueling outage resulted in a failure to promptly identify and correct conditions adverse to quality. A violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" was identified. The inadequate corrective actions resulted in inaccurate information being provided to the NRC in that the sump was not restored to design requirements as was indicated. Initial inspections this refueling outage were not adequate. After additional discrepancies were identified by NRC inspectors and licensee personnel, licensee management recognized that a detailed inspection of the sump was necessary. The licensee consequently identified that the corrective actions had not been adequate. Thorough corrective actions were subsequently completed and a detailed report was submitted. This issue is identified as Violation (VIO) 50-389/98-11-01, Inadequate Corrective Actions Taken To Restore Unit 2 Containment Sumps To Design Requirements.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Radiological Controls of Material Removed From the Unit 2 Containment (IP 71750)

On several occasions the inspectors observed routine material removal from the Unit 2 Reactor Containment Building (RCB) through the equipment hatch. On all occasions, the inspectors observed the ramp crew personnel dressed in the required anti-contamination clothing, proper packaging of materials for transportation to a temporary radioactive material storage area, and active participation of the Health Physics (HP) technicians in controlling the radioactive material. The surveys performed by the HP technicians were adequate to ensure that no contamination was inadvertently spread from the RCB ramp to the surrounding areas.

R1.2 Occupational Radiation Exposure Control Program

a. Inspection Scope (83750)

The inspectors reviewed implementation of selected elements of the licensee's radiation protection program during the current Unit 2 Refueling Outage (RFO). The review entailed observation of radiological protection activities including personnel exposure monitoring, radiological postings, verification of posted radiation dose rates and contamination levels within the Radiologically Controlled Area (RCA), and primary coolant shutdown chemistry controls for dose rate reduction. Those activities were evaluated for consistency with the programmatic requirements, personnel monitoring requirements, occupational dose limits, radiological posting requirements, and survey requirements specified in Subparts B, C, F, G, and J of 10 CFR 20.

b. Observations and Findings

The inspectors conducted frequent tours of the RCA to observe radiation protection activities and practices. Personnel preparing for routine entries into the RCA were observed being briefed on the radiological conditions in the areas to be entered. The inspectors determined that personnel entering the RCA were adequately briefed on the radiological hazards which could be encountered while in the RCA and the radiological protective measures required to be taken during the entry. Individuals at selected job sites were interviewed and it was determined that the workers were aware of the necessary radiological information associated with their activities.

The inspectors observed the use of personal radiation exposure monitoring devices by personnel entering and exiting the RCA. During tours of the RCA the inspectors noted that the required dosimetry was being properly worn by personnel when entering and while in the RCA. The inspectors also noted that personnel exiting the RCA routinely surveyed themselves for contamination using personal contamination monitors. The inspectors concluded that the licensee was closely monitoring personnel radiation exposure in a manner consistent with 10 CFR 20.1502.

During tours of the RCA the inspectors noted that general areas and individual rooms were properly posted for radiological conditions. Survey maps indicating dose rates and contamination levels at specific locations within the RCA were posted at the entrance to the RCA. Radiological postings were also conspicuously displayed at individual contaminated and high radiation areas. At the inspector's request, a licensee Health Physics Technician performed dose rate and contamination surveys in several rooms and locations. The inspectors verified that the survey instrument readings were consistent with the posted area dose rates. Contact dose rates from several radioactive material bearing containers were also verified to be consistent with the dose rates recorded on container labels. Independent contamination surveys performed around several posted contaminated areas indicated that contamination was not being tracked out of the contaminated areas. The inspectors concluded that the licensee's practices for radiological posting and labeling were consistent with the requirements of Subpart J of 10 CFR 20.

The inspectors reviewed As Low As Reasonably Achievable (ALARA) program details, implementation, and goals for the Unit 2 RFO. The inspectors noted that the cumulative projection was being met as of day eleven of the scheduled 30 day outage. The goal for the collective dose during the outage was established by the licensee's ALARA Committee at 135 man-rem. As of day eleven the outage collective dose was 48 man-rem. The inspectors also noted that based on scheduled activities, the projection for 1998 annual collective dose was approximately 203 man-rem but the ALARA Committee had established an aggressive challenge goal of 184.8 man-rem for the year. The inspectors concluded that the Committee's practice of establishing challenging goals reflected licensee management's support and commitment to overall dose reduction. The inspectors determined that individual radiation exposures for 1998 year-to-date were well within the regulatory limits for occupational dose specified in 10 CFR 20.1201 (a).

The inspectors reviewed the licensee's procedures for follow-up actions to Personnel Contamination Events (PCEs) and reviewed selected records for those events which occurred during 1998. Procedure HPP-70, Personnel Contamination Monitoring, indicated that the threshold for initiating follow-up actions was skin or clothing contamination in excess of 100 net counts per minute (ncpm) as measured by a hand held frisker. The licensee's records indicated that as of November 19, 1998, 42 PCEs had occurred. Procedure HPP-72, Determination of Dose to the Skin from Skin Contamination, established a threshold of 500 mrem for assignment of a skin dose. No skin or hot particle contamination events exceeded the threshold for assignment of a skin dose. Procedure HPP-30, Personnel Monitoring, indicated that the threshold for assignment of an internal dose from an uptake of radioactive material was one mrem. Two of the PCEs which occurred during the Unit 2 outage resulted in assignments of internal dose (3 & 17 mrem CEDE) but were well within regulatory limits. The inspectors reviewed those internal dose calculations and detected one minor error. The license promptly corrected their calculations and the individuals dose records. The inspectors concluded that the licensee had implemented an effective process for identification and assessment of potential personnel exposure from internal, skin, and hot particle contamination. No regulatory dose limits were exceeded.

The inspectors reviewed the licensee's records for contaminated floor space within the RCA. Radiation Protection personnel maintained records of the areas within the RCA, excluding the Containment Buildings, which had contamination levels in excess of 1000 disintegrations per minute per 100 square centimeters (dpm/100 cm^2). Contaminated areas were categorized as either temporarily contaminated recoverable areas or non-recoverable areas. Generally the recoverable areas were temporarily established work areas in which planned activities had the potential for causing the proximate area to become contaminated and after which would be decontaminated, i.e., recovered. The non-recoverable areas were process areas in which the nature of the work in the area required the area to remain contaminated, or infrequently accessed high radiation areas in which the potential exposures that would be incurred while decontaminating the area would not be consistent with ALARA principles. The recoverable square footage was tracked on a daily basis and tabulated as of the last day of each month. The inspectors noted from that tabulation that the month ending values for recoverable contaminated floor space during the non-outage periods of 1998 were much less than one percent of

the RCA floor space and the non-recoverable area was approximately 12 percent. The inspectors concluded that the licensee was aggressive in reclaiming temporarily contaminated areas designated as recoverable.

The inspectors also reviewed the licensee's plans for primary chemistry controls during the reactor shutdown for the Unit 2 RFO. One specific goal of the chemistry control plan was to reduce the ^{58}Co activity concentration to less than 0.05 micro-Curies per milliliter (μCi/ml) in order to assure adequate clean-up of the coolant. The inspectors reviewed trend plots for several chemistry parameters monitored by the licensee during the shutdown, including the ^{58}Co concentration. The ^{58}Co concentration peaked at approximately 3.29 μCi/ml after the hydrogen peroxide injection and was then reduced to 0.05 μCi/ml after 77 hours of clean-up operations. The licensee also monitored the dose rates at several locations in the Containment Building during this process. Plots of those data indicated significant dose rate reductions as the radioactive material was removed from the coolant. Based on reviews of analytical results for selected chemistry parameters and dose rate monitoring data, the inspectors concluded that the licensee had closely monitored and controlled primary coolant chemistry during the shutdown for the Unit 2 RFO and had reduced the dose rates from RCS components.

Conclusions

The licensee was properly monitoring and controlling personnel radiation exposure during the Unit 2 Refueling Outage and posting area radiological conditions in accordance with 10 CFR Part 20. The licensee had implemented an effective shutdown chemistry control plan and closely monitored primary coolant chemistry during the shutdown for the Unit 2 Refueling Outage.

R4 Staff Knowledge and Performance in Radiation Protection and Chemistry

R4.1 Health Physics (HP) Technician Knowledge and Performance

a. Inspection Scope (IP 71750)

The inspector observed HP technicians establish conditions for radiography, remove the refueling pool skimmer and hose, provide coverage for the steam generator lancing team, and conduct normal duties within the Unit 2 Reactor Containment Building (RCB).

b. Observations and Findings

The inspector observed the HP technicians make preparations to perform radiography on V2431 which is a valve associated with the pressurizer auxiliary spray line. The HP technicians correctly followed the procedures for verifying boundaries and establishing the initial conditions. Boundary guards were verified and questioned by the inspector to confirm that responsibilities were understood by the personnel involved. The inspector reviewed the radiography procedure in use for completeness and found that one of the prerequisites was not initialed as being complete. The inspector questioned the radiographer about the prerequisite and was shown that it had been completed

satisfactorily. The radiographer updated the procedure with the required initial for the prerequisite prior to commencing radiography.

HP technicians were observed removing the refueling pool skimmer and hose from the refueling pool. The inspector observed good radiation coverage of the workers performing the task by the HP technician. The technician quickly stopped the workers from performing steps in the removal of the skimmer and hose if radiation levels were unknown and had not yet been verified. The technician then proceeded to verify radiation levels and brief the workers so that the skimmer and hose removal could continue. The HP technician was also observed to be very cognizant of those around the area to warn of high radiation levels to ensure that exposure to personnel remained As Low As Reasonably Achievable (ALARA).

The inspector observed HP technician coverage of the steam generator lancing team. The HP technician provided continuous coverage through the use of remote monitors. Several individuals were observed asking questions of the HP technician, but he would defer the questions to another HP representative so that his coverage was not interrupted.

Several HP technicians were questioned by the inspector following shift change to assess their understanding of plant conditions and the issues surrounding the jobs in progress. The HP technicians were aware of the plant status and familiar with the work being completed during their shift.

c. Conclusions

The HP technicians observed by the inspector were aware of plant status and provided good coverage for the work for which they were responsible, ensuring that personnel exposure was controlled in accordance with the ALARA program.

R5 RP&C Staff Training and Qualification

R5.1 Qualification of Contract Technicians

a. Inspection Scope 83750

The inspectors reviewed the qualification records of contractor radiation protection technicians for consistency with the requirements of TS 6.3.1 and ANSI/ANS-3.1-1978.

b. Observations and Findings

The inspectors reviewed the resumes of four selected individuals working as contractor senior radiation protection technicians during the Unit 2 outage. Those resumes listed the individuals previous work experience at various nuclear power plants and fuel processing facilities. On one of those resumes the inspectors noted an error in the calculated number of months of credited work experience at one nuclear power plant. The licensee's vendor updated the individuals resume to correct that error and to include credited work experience at a fuel processing facility. Given that correction the

inspectors determined that the selected individuals met the requirement for three years of working experience to qualify as senior radiation protection technicians pursuant to section 4.5.2 of ANSI/ANS-3.1-1978.

c. Conclusions

Contractor personnel working as senior radiation protection technicians during the Unit 2 outage met or exceeded the qualification requirements specified in the technical specifications and applicable industry standard.

R8 Miscellaneous RP&C Issues (92904)

R8.1 (Closed) IFI 50-335, 389/97-300-01: Disagreement Between Electronic Dosimeter Alarm Setpoints and Radiation Work Permit (RWP) limits. During a previous inspection the inspectors noted that the dose alarm setpoint on the electronic dosimeter provided to an individual entering the RCA was set at a value greater than the accumulated dose allowed by the RWP for the individuals RCA entry. This discrepancy was entered into the licensee's corrective action program as Condition Report (CR) No. 97-1316. The licensee determined that the electronic dosimeter alarm setpoints had been increased from 10 mrem to 25 mrem during the recent outage but had not been reset for the non-outage period. As indicated in the CR, the licensee's corrective action for this issue was to revise procedure HPP-1 Radiation Work Permits to include instructions for making dosimeter alarm setpoints consistent with RWPs. The inspectors reviewed revision No. 12 to procedure HPP-1 and determined that appropriate corrective actions had been taken by including those provisions in the procedure. This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

P8 Miscellaneous Emergency Planning Issues

P8.1 Meeting With Public Officials At St. Lucie County Emergency Operations Center

On November 18, inspectors met with St. Lucie County officials at the county Emergency Operations Center (EOC). The purpose of the meeting was to allow local officials an opportunity to meet with the new Senior Resident Inspector (SRI), and to familiarize the inspectors with the EOC and meet with local emergency management personnel. The SRI conducted an informal presentation regarding NRC, licensee and public responsibilities for emergency planning (EP) and emergency response. Discussions were held afterwards, and a tour of the St. Lucie EOC was conducted by the county Radiological Emergency Planner. No new EP issues or concerns were identified during the meeting.

F8 Miscellaneous Fire Protection Issues

F8.1 (Closed) Unresolved Item 50-335/98-09-02, Control of Combustible Materials. As documented in IR 98-09, an inspector identified two minor fire protection issues that warranted further inspection to determine compliance. In the first case, transient combustibles were being stored in the spare battery room (located within the Unit 1 cable spreading room). The inspector notified the control room, CR 98-1281 was

written, and the materials were promptly removed. Plant Fire Protection personnel subsequently demonstrated to the inspector that the combustible materials discovered improperly stored in the spare battery room did not exceed the transient combustible loading limits assumed by the UFSAR Fire Hazards Analysis. Consequently, the presence of these discarded materials represented poor housekeeping by licensee personnel but was not a regulatory compliance issue.

In the second case, while observing maintenance activities on the 1A Intake Cooling Water (ICW) pump, the inspector noticed that the Hot Work Permit (HWP) written and approved for the job did not require a fire watch. The HWP indicated no fire watch was needed because there were no "combustibles within a 35 foot radius [that] cannot be removed or protected." However, the inspector noted that combustible materials were present (and would not have been removed) within 35 feet of the area that would involve open flame work and informed the maintenance foreman and supervisor. After conferring with site Fire Protection personnel, the maintenance foremen revised the HWP accordingly, before open flame work actually began. Administrative Procedure No. 00100434, Revision 36, Section 8.3, "Open Flame Work and Welding," requires the responsible foreman or supervisor to determine the appropriate fire protection requirements and approve the HWP. Failure to determine the appropriate fire protection requirements for hot work associated with maintenance on the 1A ICW pump constituted a violation of established administrative controls. This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

V. Management Meetings and Other Areas

X1 Exit Meeting Summary

The resident inspectors presented the inspection results to members of licensee management, after the end of the inspection period, on December 15, 1998. An interim exit meeting was held on November 20, 1998 to discuss the findings of Region based inspectors. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Alexander, Inspections Supervisor
M. Allen. Operations Manager
C. Bible, Site Engineering Manager
G. Bird, Security Manager
W. Bladow, Site Quality Manager
G. Casto, Emergency Preparedness Supervisor
J. Connor, Codes & Components Supervisor
T. Coste, ISI Coordinator
D. Fadden, Training Manager
D. Faulkner, Chemistry
R. Gil, Components, Supports and Inspections (CSI) Manager
J. Holt, Maintenance Manager
H. Jacobs, Mechanical Maintenance Supervisor
E. Katzman, Supervisor, Health physics & Chemistry
W. Klein, FAC Engineer
W. Korte, Electrical Maintenance Supervisor
C. Ladd, Operations Supervisor
R. McCullers, Supervisor, Health Physics
H. Mercer, Technical Supervisor, Health Physics
K. Mohindroo, Plant Engineering Manager
M. Moran, Operations Support Engineering Manager
T. Patterson, System Engineering Manager
A. Pawley, I&C Maintenance Supervisor
A. Scales, Assistant Operations Supervisor
A. Stall, St. Lucie Plant Vice President
E. Weinkam, Licensing Manager
C. Wood, Work Control Manager
R. West, St. Lucie Plant General Manager

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation, and corporate personnel.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 49001	Inspection of Erosion/Corrosion Programs
IP 60710:	Refueling Activities
IP 61707:	Reactor Shutdown Margin
IP 61708:	Isothermal and Moderator Temperature Coefficient Determination
IP 61710:	Control Rod Worth Measurements
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observations
IP 71707:	Plant Operations
IP 71711:	Restart from Refueling
IP 71750:	Plant Support Activities
IP 73051:	Inservice Inspection - Review of Program
IP 73052:	Inservice Inspection - Review of Procedures
IP 73753:	Inservice Inspection
IP 83750:	Occupational Radiation Exposure
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92702:	Followup on Corrective Action For Violations and Deviations
IP 92901:	Followup - Plant Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering
IP 92904:	Followup - Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-389/98-11-01	VIO	Inadequate Corrective Actions Taken To Restore Unit 2 Containment Sumps To Design Requirements. (Section E8.2)

Closed

50-335/97-003-00	LER	Automatic Reactor Trip Resulting from the Loss of Electrical Power to the 1A2 Reactor Coolant Pump (Section O8.1)
50- 335/97-002-00	LER	Operation in Excess of Maximum Rated Thermal Power Due to Digital Data Processor Calorimetric Error (Section E8.1)
50-389/97329-01014	EEI	Failure To Properly Construct Unit 2 Containment ECCS Sumps (Section E8.2)
50-389/97329-02014	EEI	Failure To Promptly Identify And Correct Unit 2 Containment Sump Deficiencies (Section E8.2)
50-335, 389/97-300-01	IFI	Disagreement between electronic dosimeter alarm setpoints and RWP limits (Section R8.1)

Discussed

None