UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-335/94-24 and 50-389/94-24

Licensee: Florida Power & Light Co
9250 West Flagler Street
Miami, FL 33102

Docket Nos.: 50-335 and 50-389 License Nos.: DPR-67 and NPF-16

Facility Name: St. Lucie 1 and 2

Inspection Conducted: November 6 - December 3, 1994

Inspectors: R. Schin for — 12/12/94
R. L. Prevatte, Senior Resident Inspector — Date Signed

R. Schin for — 12/12/94
M. S. Miller, Resident Inspector — Date Signed

R. Schin — 12/12/94
R. P. Schin, Reactor Engineer, Region II — Date Signed

Approved by: K D Landis — 12/13/94
K. D. Landis, Chief
Reactor Projects Section 2B
Division of Reactor Projects — Date Signed

SUMMARY

Scope: This routine resident inspection was conducted onsite in the areas of plant operations, maintenance and surveillance, engineering support, plant support, and onsite followup of events.

Inspections were performed during normal and backshift hours and on weekends and holidays.

Results: Plant operations area:

Operations managed the second outage reactor coolant system reduced inventory without incident. The refueling outage was accomplished well within schedule without significant equipment or personnel problems. Strong management, good supervisory support, and teamwork resulted in the refueling outage being completed in 35 days (3 days ahead of schedule). Procedural compliance, effective command and control, good communication, and good prejob briefing with appropriate supervisory oversight resulted in a well-executed plant restart.

Within the areas inspected, the following non-cited violation was identified:

NCV 335,389/94-24-01, Failure to Perform TS-Required Periodic Procedure Reviews, paragraph 3.f.2.

Maintenance and Surveillance area:

Five maintenance and two surveillance activities were observed. A violation was identified involving an inadequate process for vendor technical manual changes. A strength was identified for good planning, management, and job oversight of the freeze seal and repair of a shutdown cooling isolation valve. It was noted that plant management requested repetitive walkdowns by QC to effectively insure area cleanliness and foreign material exclusion from systems and vital areas.

Within the areas inspected, the following violation was identified:

VIO 335,389/94-24-02, Inadequate Process for Changes to Vendor Technical Manuals, paragraph 4.a.3.

Engineering area:

Steam generator eddy current testing, tube plugging and installed plug inspections were conducted. Engineering support in analyzing and developing repairs for faulty plugs was timely and effective. Effective project management and timely engineering assistance developed and implemented an alternative repair to the refueling water tank when a code repair could not be accomplished. Five plant modifications were observed and noted to be adequately performed.

Plant Support area:

The plant support functions continued to be effective. Health Physics support of the outage was effective in reducing personnel exposure.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. Ball, Mechanical Maintenance Supervisor
* W. Bladow, Site Quality Manager
L. Bossinger, Electrical Maintenance Supervisor
H. Buchanan, Health Physics Supervisor
* C. Burton, St. Lucie Plant General Manager
* R. Church, Independent Safety Engineering Group Chairman
R. Dawson, Licensing Manager
* D. Denver, Site Engineering Manager
* J. Dyer, Maintenance Quality Control Supervisor
* H. Fagley, Construction Services Manager
* P. Fincher, Training Manager
R. Frechette, Chemistry Supervisor
K. Heffelfinger, Protection Services Supervisor
* J. Holt, Plant Licensing Engineer
* G. Madden, Plant Licensing Engineer
* J. Marchese, Maintenance Manager
W. Parks, Reactor Engineering Supervisor
* C. Pell, Outage Manager
* L. Rogers, Instrument and Control Maintenance Supervisor
* D. Sager, St. Lucie Plant Vice President
* J. Scarola, Operations Manager
* D. West, Technical Manager
* J. West, Site Services Manager
C. Wood, Operations Supervisor
W. White, Security Supervisor

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

NRC Personnel

* R. Prevatte, Senior Resident Inspector
* M. Miller, Resident Inspector
R. Schin, Reactor Engineer, Region II

* Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status and Activities

a. Unit 1

Unit 1 began the inspection period in a refueling outage. The Unit was restarted on November 29 and placed on-line on December 1. The Unit was at 80 percent power and escalating at the end of the inspection period.

b. Unit 2

Unit 2 operated at essentially 100 percent power for the inspection period.

c. NRC Activity

During the inspection period the Region I NDE Van completed a two week inspection on November 10. Their inspection results are documented in IR 335,389/94-405. J. J. Blake, Section Chief of Engineering Materials, was on site November 9 and 10 to review the Region I NDE inspection and attend the exit meeting. F. N. Wright of the Division of Reactor Safety and Safeguards was on site during the week of November 14 conducting inspections in the radiation protection area. The inspection results are documented in IR 335,389/94-23. R. P. Schin of the Division of Reactor Projects was on site during the week of November 14 assisting the resident staff. His inspection results are documented in this report.

3. Plant Operations

a. Plant Tours (71707)

The inspectors periodically conducted plant tours to verify that monitoring equipment was recording as required, equipment was properly tagged, operations personnel were aware of plant conditions, and plant housekeeping efforts were adequate. The inspectors also determined that appropriate radiation controls were properly established, critical clean areas were being controlled in accordance with procedures, excess equipment or material was stored properly, and combustible materials and debris were disposed of expeditiously. During tours, the inspectors looked for the existence of unusual fluid leaks, piping vibrations, pipe hanger and seismic restraint settings, various valve and breaker positions, equipment caution and danger tags, component positions, adequacy of fire fighting equipment, and instrument calibration dates. Some tours were conducted on backshifts. The frequency of plant tours and control room visits by site management was noted.

The inspectors routinely conducted main flow path walkdowns of ESF, ECCS, and support systems. Valve, breaker, and switch lineups as well as equipment conditions were randomly verified both locally and in the control room. The following accessible-area ESF system and area walkdowns were made to verify that system lineups were in accordance with licensee requirements for operability and equipment material conditions were satisfactory:

1) The inspector conducted a main flow path verification of shutdown cooling system train A and B on Unit 1. All valves, breakers, and switches were correctly aligned for the train/trains in service during the refueling outage.

2) The inspector conducted a main flow path verification of trains A and B of the Unit 2 Containment Spray System, including the hydrazine addition system. System lineup was found to be correct. One discrepancy was identified involving inadequate packing gland stud engagement on a system drain valve. The inspector notified the ANPS, who initiated a PWO to correct the condition.

3) The inspector conducted a main flow path verification of the Unit 2 Control Room Air Conditioning System. System lineup was found to be correct.

b. Plant Operations Review (71707)

The inspectors periodically reviewed shift logs and operations records, including data sheets, instrument traces, and records of equipment malfunctions. This review included control room logs and auxiliary logs, operating orders, standing orders, jumper logs, and equipment tagout records. The inspectors routinely observed operator alertness and demeanor during plant tours. They observed and evaluated control room staffing, control room access, and operator performance during routine operations. The inspectors conducted random off-hours inspections to ensure that operations and security performance remained at acceptable levels. Shift turnovers were observed to verify that they were conducted in accordance with approved licensee procedures. Control room annunciator status was verified. It was noted during outage work closeouts and preparations for plant restart that, in several instances, the control room was very crowded, resulting in a high noise level. When critical tasks occurred, such as CEA pulls and initial criticality, excess personnel were directed to leave the control room. This was discussed with Operations management and they stated that they are seeking a way to correct this item.

c. Clearances (71707)

During this inspection period, the inspectors reviewed clearance 2-94-11-057, isolating the 2B Boric Acid Holding Pump. No discrepancies were identified.

d. Technical Specification Compliance (71707)

Licensee compliance with selected TS LCOs was verified. This included the review of selected surveillance test results. These verifications were accomplished by direct observation of monitoring instrumentation, valve positions, and switch positions, and by review of completed logs and records. Instrumentation and recorder traces were observed for abnormalities. The licensee's compliance with LCO action statements was reviewed on selected occurrences as they happened. The inspectors verified that related plant procedures in use were adequate, complete, and included the most recent revisions.

During the inspection period, the licensee reported that a review conducted as a result of NRC Information Notice 94-75, "Minimum Temperature For Criticality," had resulted in the discovery that the TS-mandated minimum temperature for criticality of 515°F conflicted with the figure assumed in the units' accident analyses, 532°F, for HZP conditions. As a result, the licensee contacted its two fuel vendors, Seimens and CE, to inquire as to the bases for reload-specific analyses. The licensee concluded that the Unit 1 analyses have not been performed assuming a 515°F HZP condition. The licensee reported that ABB was still researching the issue for Unit 2.

As a result of the licensee's review, STAR 0-94110455 was initiated to track corrective actions. The inspector reviewed the STAR (which was still open at the close of the inspection period) which was resolved for Unit 1 prior to criticality. The licensee performed an engineering evaluation (JPN-PSL-SEFJ-94-036) which concluded that a minimum temperature for criticality of 515°F was acceptable. Unit 2 results were pending at the conclusion of the inspection period, however, the unit was at 100% power and so was unaffected by the issue.

The inspector found that the licensee's actions on this issue were proactive and appropriate.

e. Reduced Inventory Operations (71707)

On November 18, Unit 1 was taken to reduced inventory conditions. The inspector reviewed OP 1-041022 Rev 18, "Shutdown Cooling," and safety evaluation for reduced inventory JPN-PSL-SENP-94-029 prior to reduced inventory. The following items were observed prior to reduced inventory:

- Containment Closure Capability - Instructions were issued to accomplish this, tools were stationed nearby the containment equipment hatch. The E-4 penetration (typically used during the outage to pass temporary lines into containment) had its blind flange installed. The P-54 penetration was "potted;" that is, temporary lines were passed into containment and the remaining space in the penetration was sealed with a sealing compound.

- RCS Temperature Indication - Two pairs of normal mode 1 CETs were available for indication; each pair was part of an independent instrument bus. Indication to operators was available on QSPDS displays in the control room.

- RCS Level Indication - Independent RCS wide and narrow range level instruments, which indicated in the control room, were operable. Additionally, a Tygon tube loop level indicator in containment was to be manned during level changes and was

available to control room operators via closed circuit television. An operator was to be stationed in the control room to continuously monitor reactor water level during mid-loop operation.

- RCS Level Perturbations - When RCS level was altered, additional operational controls were invoked. At plant daily meetings, operations took actions to ensure that maintenance did not consider performing work that might effect RCS level or shutdown cooling.

- RCS Inventory Volume Addition Capability - One HPSI pump was dedicated and available for RCS addition. The pump was powered from A train electrical buses, as the B EDG has not been declared operable (although it was available) following outage work.

- RCS Nozzle Dams - Nozzle dams were installed and were monitored periodically in containment. Following the reduction of level to mid-loop, the nozzle dams were to be removed, the SG manways reinstalled, and water level raised to just below the RCP seal package level for seal package maintenance.

- Vital Electrical Bus Availability - The A train of electrical power was operable per TS during the inventory reduction. The B train EDG, while not operable per TS, was available for service and the B Train electrical plant was energized. The licensee's procedures prohibited switchyard work while in a reduced inventory condition.

- Pressurizer Vent Path - The manway atop the pressurizer was removed to provide a vent path.

Operations also assigned shift mid-loop managers to ensure that: all procedures for draindown were reviewed and accurate; all outage meeting personnel were aware that the plant was on reduced inventory and that appropriate conditions were maintained; the containment closure crew remained on station, were knowledgeable on their procedure, closure tools were in place and the crew was aware of all containment penetration status. Overall this evolution was handled very effectively, with proper focus on safety, and the unit exited reduced inventory conditions on November 21. Management involvement and oversite were very evident during time period.

f. Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems (40500)

1) Facility Review Group Meetings

The November 10 FRG meeting included review of Revision 2 and the safety evaluation for a change to Site Specification SPEC-C-013; Installation Guidance for Miscellaneous Non-Safety

Related Items on Existing Structures. This change was made to provide clarification of miscellaneous items and added a figure to the appendix. Six temporary procedure changes needed in the outage were also reviewed and approved. The meeting was conducted in a professional manner with emphasis on safety.

The November 17 meeting reviewed a special report to the NRC involving a valid failure of 1B emergency diesel generator due to a burned wire from the magnetic amplifier terminal block to the generator field. The FRG discussed the event and draft report in detail. The licensee root cause analysis appeared to have been adequately detailed to reveal the root cause and needed corrective action. The inspector was impressed with the PGM's probing questions on this item. In addition to this item, numerous other procedure changes were covered.

2) QA Audit Review (40500)

The inspector reviewed QA Audit Report QSL-OPS-94-24, which covered the areas of operations, maintenance, surveillance testing, materials control, outage preparations, and technical specification administrative controls. Three findings were documented in the report; one concerning the adequacy of a TS-required letter from the President-Nuclear Division to station personnel emphasizing the command and control authority of the NPS/ANPS, one involving failures to perform TS-required periodic reviews in a timely fashion, and one involving a failure to properly label and control incoming material.

With respect to the failure to perform TS-required periodic reviews of procedures, the audit found that three out of approximately 1400 procedures were outside the 36 +/- 6 month review cycle required by QI 5-PR/PSL-1, "Preparation, Revision, Review/Approval of Procedures." The audit went on to describe that, in August, six procedures were beyond the required review time. QA review of records indicated that, between January and April, 20-24 procedure reviews per month exceeded the review time limit. A STAR was generated to track and address the issue.

The inspector discussed the issue with the Information Services Manager, assigned to resolve the STAR. The inspector was told that the backlog was, in part, the result of the licensee's practice of requiring a review every 36 months, whether or not a given procedure had been revised (which would require a FRG review in itself) during the 36 month period. It was stated that the total turnover of procedures, on an annual basis, amounted to approximately 280%. The licensee committed to change their procedure review requirements to reset a given procedure's 36 month review cycle each time the procedure was revised, while tracking the total population to ensure that

procedures which are not revised in a 36 month period are forwarded for the TS-required periodic review.

The licensee's failure to perform TS-required periodic procedure reviews within the time frames specified in AP 0010120, "Conduct of Operations," represents a violation of Unit 1 and Unit 2 TS 6.8.2. This violation will not be cited because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the NRC enforcement policy. It will be identified as NCV 50-335,389/94-24-01, Failure to Perform TS-Required Periodic Procedure Reviews.

Overall, the inspector found the audit activities to have been thorough in scope and well-documented.

g. Outage Activities (71707)

1) Refueling and Core Verification

In preparation for Unit 1 refueling, the inspector reviewed OP 1-1630024, Rev 38, The Refueling Machine Operation, for familiarization with refueling equipment operation. The inspector additionally reviewed PC/M 054-194, Fuel Reload for Cycle 13. The Cycle 13 core consists of 84 new assemblies, 49 cycle 11, and 84 cycle 12 assemblies. The inspectors reviewed the licensee's preparations for refueling and found that training and briefings had been conducted for the personnel assigned to refueling. The inspector noted that, in response to URI 94-09-02 and 03, the licensee had assigned an SRO to ride the refueling machine as an observer and had also incorporated the "move list" into their refueling procedure PREOP-3200090, Rev 10. The inspector verified that the prerequisites of the above refueling procedure had been completed prior to the start of fuel movement.

Fuel movement started on November 7 and was completed on November 11. The inspectors observed refueling activities in the control room, the TSC area set up for refueling coordination, the refueling floor, and as a rider in the refueling machine. Observations were made from each of the above areas on several occasions during refueling.

The inspector found that each station was staffed in accordance with procedural requirements and assigned personnel appeared to be well qualified and diligent in the performance of their assigned tasks. The only deficiencies noted were a few instances of some minor procedural oversights by the refueling machine operator that required prompting by the SRO observer.

On November 8, the inspector observed the Reactor Engineering spotter for refueling identify that a fuel assembly was

extending from below the boom. The refueling SRO assessed the situation and determined that the cause was a failure of the refueling machine operator to unlatch the mast prior to lowering the fuel assembly. The fuel assembly was retracted, the operation halted, and the operator turned the machine over to his scheduled relief prior to resuming activities.

Frequent management presence was noted at all the above stations. Except for some minor refueling bridge equipment problems/failures and the above item, the evolution went well and was completed ahead of schedule. It was noted that operations had obtained contractor services of refueling equipment specialists who were available around the clock to respond to any equipment problems.

The licensee completed their core verification on November 11. Since this event occurred on a holiday, the inspector planned to review the video film of the evolution. On Monday it was found that the video film was blank and the verification had not been recorded. The inspector reviewed the QC and Reactor Engineering (RE) records of their visual verification of fuel assembly and CEA location. This visual verification is done independently by QC and RE using a TV monitor. The inspector verified that the QC and RE verification sheets matched the locations required by the fuel loading PC/M-054-194 attachment 7.1.

2) Plant Restart

Unit 1 completed the major portions of work for the refueling outage and commenced systems and component reassembly and return to service during the week of November 21. The unit entered mode 4 on November 26 and mode 3 on November 27. The inspectors conducted frequent unit tours and reviewed the out of service logs and outage work activities to ensure that components and systems were being returned to service to meet TS requirements. Tours of containment and other plant areas were conducted as system pressures were increased to verify that leaks were being identified and corrected by plant personnel.

Prior to reactor restart, operations management conducted a prejob briefing, which the inspector attended, for the operations crews assigned to perform the restart. This briefing focused on the requirements of Infrequent Operations AP0010020, Rev 5, and Test Procedure TP 1-320088 Unit 1 Initial Startup After Refueling. The inspector found this briefing to be very detailed and thorough. He noted that the presenter asked questions of the shift at the end of the briefing to ensure that operators understood their startup tasks.

The inspector observed initial rod pull during the night of November 28 and dilution to criticality on the morning of November 29. He noted that additional operations support personnel and management were present to provide assistance as needed. CEA 53 dropped during rod pull and required replacement of an electronic card. Timely response was provided by I&C personnel to complete this repair. The inspector noted good procedural compliance, effective command and control, and good communications throughout the above activities.

After achieving criticality, low power physics testing was conducted for approximately 24 hours. The inspector conducted general observations of these activities and discussed the test results with reactor engineering. No significant problems occurred or were identified during these tests.

After completing these tests, the unit was placed on line and the outage ended on December 1. It should be noted that the planned 38 day refueling outage was completed three days ahead of schedule. The inspector reviewed the licensee's planned and completed work activities for the outage and found that 3,736 work activities and 51 PC/Ms had been scheduled for the outage. The inspector found that 15 emergent PC/Ms and 951 emergent work activities were added to the outage. Sixty-six PC/Ms were completed and 99.9% of the work activities were accomplished. Four work activities were canceled; two were the result of unavailable parts, one item did not require any work, and one item could not be accomplished within the scheduled work window. A review by the inspector determined that none of these items would affect safe plant operation.

The inspector was impressed with the licensee's overall management of the outage. The outage was fully staffed with supervision, management, and work and support personnel to support around the clock work. The work appeared to be levelized for day and back shifts. Management and supervisory personnel were drawn from all site organizations to form a cohesive and efficient outage team and to promote ownership. Effective schedules were developed and followed. A plant trip on October 26 resulted in entering the outage about five days ahead of schedule. The outage organization responded well to this and emergent activities that occurred during this outage. The craft outage resources appeared to be experienced, were familiar with the plant, and performed quality work. The overall management and execution of the refueling outage was identified as a strength.

h. Followup of Operations LERs (92700)

(Closed) LER 389/94-005, Technical Specification 3.0.3 Entered When Emergency Core Cooling Systems Limiting Condition for Operation Was Not Met Due to Personnel Error

The inspector reviewed the licensee's actions with respect to this event. The event itself involved inadvertently tagging out a LPSI pump in one train of ECCS while a charging pump was removed from service in the opposite train. The event is described in IR 94-15.

The license's corrective actions involved restoring LPSI pump operability, which allowed them to exit TS 3.0.3, and modifying the methods of removing equipment from service. The inspector verified that:

- The changes made to the Equipment Out of Service Log referred to in the LER have been made
- Operating Procedure OP-0010122, "In-Plant Equipment Clearance Orders," has been revised to include ANPS verification of the operability of redundant components prior to establishing or modifying clearances.
- Licensed operator requalification training included a discussion of the event.

The inspector concluded that the licensee's corrective actions were of appropriate scope and had been completed satisfactorily. At the end of the inspection period, the licensee modified the Equipment Out of Service Log after operator feedback indicated that the new format was of limited use. The licensee revised the new format to remove the multisection format in lieu of a single section.

(Closed) LER 335/94-005, Automatic Reactor Trip Caused by 1A Main Transformer Differential Current Trip Due to Contact With Metal Facia Dislodged From a Nearby Building During Inclement Weather

The inspector reviewed the licensee's corrective actions regarding this event, which was described in IR 94-14. As a result of the event, a number of tests were performed to verify main transformer performance. Additionally, the licensee inspected the buildings in the vicinity of the Unit 1 and Unit 2 transformers. The buildings had been in place since Unit 1 construction and were inspected to current county building codes. As a result of the inspections, the existing facia was secured with more screws that were placed more closely than before, approximately every six inches. The inspector was satisfied that the licensee had, in the LER, correctly characterized the event and had satisfied their specified corrective actions.

(Closed) LER 335/94-002, Inadvertent Load Shed of the 1A3 4160 Volt Bus Due to Procedural Inadequacy

The inspector reviewed the subject LER and the licensee's corrective actions. The event discussed in the LER is documented in IR 94-01. The inspector found that the licensee's corrective actions relative to procedural guidance was performed adequately; specifically:

- OP 1-0010125, "Schedule of Periodic Tests, Checks, and Calibrations," was revised to require daily tests of the undervoltage relay test circuit and checks of the status of undervoltage relays.

- OP-0010125A, "Surveillance Data Sheets," was revised to include amplifying information on the method employed to test undervoltage relays.

Additionally, the licensee had removed and replaced the 2X-2 relay which was identified as a causal factor in the event. The relay was bench tested after removal and found to be inoperable. The licensee could not explain the inoperability, given that the relay was operable when removed from the unit.

The license suspected that the failure mode for the relay (the failure mode leading to the event) involved decomposition in electrolytic capacitors in the relay. The licensee has experienced similar failures in the past, and produced a report of a failure analysis performed off-site which reached this conclusion. However, the licensee was unable to verify this theory by direct observation, as the relay in question was inadvertantly discarded after the bench test failure.

The inspector concluded the licensee's corrective actions were appropriate to the circumstances and were conducted as described in the LER.

(Closed) LER 335/93-008, Inadvertent Start of 1B Containment Spray Pump Due to Personnel Error

This event occurred when an operator, through error, inadvertently operated the wrong RTGB switch while attempting to cycle the containment spray valve during a surveillance. The above event did not result in adverse effects. This LER was voluntarily submitted for information purposes. The major corrective actions that resulted from this event was a human factor study to prevent recurrence of this event. This study recommended replacement of the conventional pump control switch with a pistol grip switch for the 1A, 1B, 2A, and 2B containment spray pumps. Replacement of the switches resulted in these switches being different from the valve switches. The inspector verified that this and other corrective actions stated in the LER had been completed.

(Closed) LER 335/94-004, Automatic Reactor Trip Caused by Control Element Drive Mechanism Bus Overcurrent and Undervoltage Transient Due to Procedural Error

The cause of the above events was an overcurrent condition on CEDM bus caused by CEDM motor generation (MG) sets being out of phase due to a procedural error. This error resulted from an incorrect temporary change being made to a procedure to permit on-line maintenance on 1A2 4.16KV startup transformer breaker. Use of this procedure resulted in an abnormal electrical lineup with an EDG which was independent of offsite power providing power to one CEDM MG while the other MG set was supplied by offsite power. A resulting phase mismatch between the two paralleled CEDM MG sets caused an overcurrent condition and tripped the A MG set output breaker and several TCBs which led to a reactor trip. The licensee determined that this temporary procedure change should have been processed through the FRG.

The licensee's corrective actions for this item included maintenance checks of affected components and repair of the breaker that initially led to this condition. This action was completed before the unit was restarted. The remaining corrective action involved training of operations temporary procedure change reviewers to reinforce the need for FRG review and approval of complex procedure changes. The inspector verified that this training had been conducted as a part of LOR training for Cycle 94.3 which was completed on July 8, 1994. This appears to be adequate to address the problem.

i. Followup on Previous Operations Inspection Findings (92901)

(Closed) VIO 389/94-15-01 Failure to Perform a Technical Specification-Required Shutdown

The inspector reviewed the licensee's corrective actions relating to the subject violation. The details of the violation are documented in IR 94-15. The inspector agreed with the licensee's conclusion that the failure to perform the TS-required shutdown resulted from a personnel error in the interpretation of TS. The licensee's corrective actions, involving emphasizing the need for strict TS adherence, was considered appropriate. Additionally, the licensee's actions to make Operations management aware of other sources within the organization that may aid the decision-making process was considered sound.

(Closed) URI 389/94-09-03, Adequacy of Review and Approval of Refueling Core Alterations (Move List)

This item involved interpretation of Unit 2 TS 6.8.1, 6.8.2, and 6.8.3 with regards to the licensee's "Recommended Move List". The inspector had found that the licensee had de-proceduralized this procedure because the frequent changes that were required during

core alterations had historically resulted in lengthy delays during refueling. Since it was no longer a part of a TS-controlled procedure, changes were made by Reactor Engineering without FRG review and approval.

This issue had been discussed with the licensee in detail without resolution and was referred to NRC management in September 1994. Further NRC review found that, in previous cases dealing with this question, the NRC had determined that the fuel movement list was a part of the refueling procedure and that any changes to the list must go through the licensee's procedure change process.

The inspector verified that the licensee had made changes to the refueling procedure to incorporate the recommended move list into the refueling procedure.

(Closed) URI 389/94-09-02, Adequacy of a Single Operator on the Refueling Bridge During Core Alterations

This item was identified during the Unit 2, March, 1994, refueling outage when an inspector found that the licensee had stationed one licensed operator on the refueling bridge to perform refueling operation. This single licensed operator was performing the actual refueling operation and the SRO was in the control room area. The inspector questioned the validity of having one person perform this function and whether this met the TS requirement and the NRC's intent regarding a licensed operator "observing" core alterations. After lengthy discussions with the licensee on this issue it was referred to NRC management for further review. Subsequent NRC evaluation of this item determined that the licensee's TS 6.2.2.d, which allowed for observations of core alterations and fuel movement by a reactor operator and supervision by an SRO or LSRO from the control room, had been agreed with by Region II in a letter to the licensee dated September 30, 1981. However, since 10 CFR 50.54(M)(2)(IV) requires "each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading or transfer) a person holding a senior operator (SRO) license or senior operator license limited to fuel handling (LSRO) to directly supervise the activity and, during this time, the licensee shall not assign other duties to this person", the licensee's TS appear to be in contradiction with the regulation and therefore the licensee should modify their TS accordingly.

Based on the above, the licensee changed their refueling procedure to require an SRO observer on the refueling bridge during core alterations. The inspector verified that these changes had been made and implemented. The licensee is currently discussing with the NRC how the TS will be amended to comply with the regulation.

(Closed) NCV 389/94-09-01, Incorrect Grappling of a Fuel Assembly

During the March, 1994, Unit 2 refueling, an operator incorrectly grappled a fuel assembly due to an error in the Recommended Move List and the operator's failure to identify that error by comparing the bridge and trolley indicators. The licensee's immediate corrective actions were adequate. Subsequent additional corrective actions, including additional procedural controls on the Recommended Move List and stationing an SRO on the bridge while refueling to observe and supervise the operator, are adequate to close this item.

4. Maintenance and Surveillance

a. Maintenance Observations (62703)

Station maintenance activities involving selected safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review: LCOs were met; activities were accomplished using approved procedures; functional tests and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; and radiological controls were implemented as required. Work requests were reviewed to determine the status of outstanding jobs and to ensure that priority was assigned to safety-related equipment. Portions of the following maintenance activities were observed:

1) NPWO 65/8592 - Unit 1 TCB 18 Month Periodic Maintenance

The inspector observed selected portions of the maintenance performed on Unit 1 TCBs, conducted in accordance with MP-0920071 Rev 3, "Periodic Maintenance of Reactor Trip Switchgear and Breakers." The inspector witnessed maintenance activities on TCB-8 involving general component condition inspections, verification of the tightness and continuity of control wiring leads, and the condition of relay contacts, which were cleaned and checked for resistance. The governing procedure was available locally, with one electrician reading and signing off steps as they were completed.

Notable in this activity was a check made of cutout switch condition and the integrity of the switches' mounting screws. The requirement to check the cutout switch was a new addition to the current revision of the procedure. A broken cutout switch, attributed to a loose mounting screw, was responsible for a failure of a TCB to open during Unit 2 RPS logic testing conducted in July, 1994 (see IR 94-15). The mounting screw was found to be tight on TCB-8, and the switch was undamaged. Electricians performing the maintenance stated that the seven

TCBs inspected previous to TCB-8 also had satisfactory cutout switches.

2) Shutdown Cooling Valve (V3480) Replacement (PC/M 082-194 M)

Due to body-to-bonnet leakage and the need to upgrade a valve with excessive maintenance history, a decision was made to replace the ten-inch gate shutdown cooling suction valve from RCS loop 1A during the current outage. This valve is the first of two valves used to isolate the high pressure RCS from the low pressure SDC system and is therefore unisolable. This work was planned for mode 6 with the reactor vessel head removed and the refueling cavity flooded up to normal refueling level. Under this condition, the valve also provides integrity for the refueling cavity. The licensee therefore developed plans to use a freeze seal for the piping to permit valve replacement without having to defuel the reactor.

This licensee's freeze seal procedure, Application of Freeze Seals, GMP-10, Rev 0, had been used to provide isolation on other occasions and for repairs on this same valve in a previous outage. Since this application had safety significance, the licensee performed a 10 CFR 50.59 evaluation of this application and the process controls.

The inspector reviewed the licensee's above procedure and 10 CFR 50.59 evaluation, prior to the freeze seal application, and found both to be detailed and thorough. The inspector found that a nitrogen tank truck with evaporator was stationed near the containment equipment hatch as the primary nitrogen supply. A shutoff valve with disconnect capability was provided in case the hatch needed to be closed for containment integrity. Eleven portable nitrogen dewars were also placed in containment and connected to the supply piping as a backup source if needed. This backup source was capable of supplying approximately twelve hours of nitrogen if needed.

The inspector performed a detailed walkdown of the nitrogen supply system, the freeze seal equipment installed on the shutdown cooling piping, and the associated temperature monitoring equipment with the engineering manager of this project after it was installed and prior to it being placed in operation. The inspector found that a contractor who specializes in freeze seals was used by the licensee for these jobs at all their plants. The inspector met with that contractor and discussed the technical details of the installation and how the freeze seal would be maintained. All questions were answered satisfactorily.

The inspector noted from the safety evaluation and installation walkdown that redundant equipment had been installed and that contingency plans had been developed and equipment prestaged to

provide temporary plugs and/or seals if the freeze seal should develop a leak or fail. The inspector also noted that if the freeze seal failed and the refueling cavity drained down to the level of the cut piping, the fuel would still remain covered, the RCS hot leg would remain full, and shutdown cooling would remain in operation to remove decay heat.

The freeze seal was activated on November 4 and work commenced on cutting out and replacing V3480. This work continued until the final welding and NDE acceptance on November 11. The inspector conducted daily walkdowns of the freeze seal and V3480 work activities. He found that all the required controls were being maintained and that excellent supervisory and management oversite was implemented on this critical job. The inspector witnessed the liquid penetrant test conducted on the inboard root weld of V3480. Four minor indications were found in various radial locations at the weld interface with the base metal. No indications were present in the weld material itself. The indications were removed and the areas were re-examined with satisfactory results.

This task was completed within the licensee's planned schedule without incident. The preplanning, job execution, and supervisory and management oversite of this job was identified as a strength.

The inspector accompanied construction QC for a leak check of V3480 following the unit's return to normal operating pressure and temperature. This method had been approved for use in lieu of a hydrostatic test through a relief request to NRR. The approved relief allowed a system pressure test similar to that provided for mechanical joints in the ASME Boiler and Pressure Vessel Code, Section XI, IWA-5000. The licensee had installed insulation around V3480 with the exception of the upper weld area. Consequently, a four hour hold was placed on the inspection, as described in Section XI, IWA-5213, for insulated piping. Upon achieving the required soak time, the line was inspected. The upper weld was inspected with satisfactory results; however, the QC inspector performing the inspection noted several drops of water forming and flowing from an insulation joint below the subject valve. The NRC inspector noted that the water was apparently cold and that there was no evidence of steam which might have indicated a leak from the valve or the lower, covered, weld. The licensee removed the sheet metal and some of the insulation around the valve body, allowing direct inspection of the body-to-bonnet joint and packing gland. No leakage was observed. Also, no evidence of moisture buildup was found in the insulation itself. The licensee hypothesized that the noted moisture was the result of pressure washing which had been performed in the area prior to RCB closeout. The inspector agreed with the conclusion.

The NRC Region II NDE independent measurements van was onsite during this activity and assisted the residents in their inspection efforts. They performed inspection on the welding activity and reviewed some results of the licensees NDE. The results of their inspections are contained in IR 335,389/94-405.

3) NPWO 61/0418 - Disassemble and Inspect MOV 1-V-3660, LPSI/HPSI Pump Recirculation to RWT

As noted in NRC IR 50-335,389/94-11, the licensee had planned to inspect the valve internals of 1-V-3660 during this Unit 1 outage to investigate the cause of an unusual diagnostic force trace. MOV 1-V-3660 is a safety-related three-inch Velan flex-wedge gate valve. It is normally open during power operation to allow HPSI and LPSI pump recirculation to the RWT. Also, it receives an automatic ESF Recirculation Actuation Signal to close.

The inspector reviewed STAR 1-94110374, which adequately described the problem, assessed the root cause, and listed corrective actions to be accomplished including repairs to the valve and actuator. The STAR was detailed and clearly written.

On November 15, 1994, the inspector observed the repaired valve in the plant and reviewed the work package used in the field for the mechanical maintenance performed on the valve. The inspector observed no deficiencies in the repaired valve. The PWO was clearly written and contained sufficient information to perform the work. It required disassembly and reassembly of valve 1-V-3660 as per vendor technical manual 8770-6251, Velan Valves. (The licensee used technical manuals as plant procedures, a process described in QI 5-PR/PSL-1, Preparation, Revision, Review/Approval of Procedures, Revision 58.) However, the PWO specified a torque value of 150 ft. lbs. for the bonnet-to-body bolts, while Plant General Manager approved technical manual 8770-6251, Velan Valves, required 130 ft. lbs. Also, the work package used to perform the work included pages from the unapproved change to the technical manual. The maintenance technician had followed the PWO and torqued the bonnet-to-body bolts to 150 ft. lbs. when reassembling the valve earlier that day.

The inspector inquired about where the unapproved change came from. He reviewed Document Change Request (DCR) #DCR-SLM-94-043, New Velan Torque Instructions, dated October 11, 1994, in which the Nuclear Engineering Department approved and distributed an April 12, 1994, vendor recommended change to the manual. The change revised the required bonnet-to-body bolt torque for a valve such as 1-V-3660 from 130 ft. lbs. to 150 ft. lbs. On November 9, 1994, Document control had distributed that DCR and manual change to holders of controlled copies of

the technical manual. Licensee engineers stated that the DCR did authorize maintenance personnel to put the change into their copy of the technical manual and to use the information in the change in performing work in the plant, without review and approval by plant management. They showed the inspector that this process was approved by Procedure QI 3-PR/PSL-1, Design Control, Revision 32, which stated that a DCR for an administrative change to a vendor technical manual, that does not require any work in the plant, does not require plant review and approval.

The inspector noted that QI 5-PR/PSL-1 required that changes to technical manuals received from the vendor shall be reviewed by the FRG and approved by the Plant General Manager. Licensee engineers stated that their process complied with that QI, because that review and approval would be done at a later date. The DCR distributed the rough change to be put in the front of the technical manual. Then, months later, the Nuclear Engineering Department would issue the change again, in a more finished condition. At that time, the change would be reviewed by the FRG, approved by the Plant General Manager, and distributed to be entered into the main part of the technical manual as replacement pages.

On November 16, the inspector discussed the PWO with the maintenance planner who had written it. The planner stated that he had obtained the 150 ft. lbs. from a change to the technical manual (similar to the one distributed by the DCR) on September 12, 1994, when he had written the PWO. He stated that, at that time, the change had already been inserted into the middle of the maintenance department copy of the technical manual. He did not know when or how the change had been put into the manual. The inspector noted that, in the front of that technical manual, there were about 34 DCRs and changes dated from 1992 through 1994. The changes were marked up revisions to pages that existed elsewhere in the main part of the manual. The planner stated that, when planning a PWO, he would refer to the main part of the technical manual and then refer to the changes in front of the manual to see if any of them affected the work he was planning. If there were any differences, he would use the information from the changes in the front of the manual. He stated that he considered the entire manual, including the changes in the front, to be approved for him to use. The inspector noted that, at that time, the particular change in question was inserted into the main part of the manual and that the copy distributed by Document Control was not in the front of the manual. Maintenance department personnel looked for and found the copy of the change that had been distributed to them by Document Control and inserted it into the front of the manual the next day.

The inspector also reviewed Administrative Procedure 0010432, Nuclear Plant Work Orders, Revision 72, and found that it permitted maintenance personnel to deviate from a Plant Manager approved technical manual without the prior approval required by TS 6.8.2 and TS 6.8.3. Procedure step 8.7.3 allowed deviation from a technical manual when it "is not invoked, but only used as a reference" with only concurrence from a vendor or a maintenance engineer, prior to returning the affected equipment to service.

The inspector concluded that, during April 12 - November 16, 1994, the licensee's process for making and using changes to vendor technical manuals was inadequate in that it failed to assure that, prior to implementation or use, changes to technical manuals were reviewed and approved as required by TS 6.8.2 and TS 6.8.3. This violation will be tracked as VIO 335,389/94-24-02, Inadequate Process for Changes to Vendor Technical Manuals.

4) NPWO 65/7595, Remove and Replace Operator for 1-V-3660 After Mechanical Maintenance Inspects Valve

The inspector reviewed the I&C work package, the results of the post-maintenance VOTES testing, and the installed valve operator. The VOTES test results were normal and met the acceptance criteria. The inspector noted no deficiencies and concluded that the test was adequately performed.

5) NPWO 63/1944, Test RPS Channel Bypass Circuits

In Unit 2 LER 94-003, the licensee stated that they would test Unit 1 RPS bypass circuits during this Unit 1 outage. The inspector reviewed the completed work package and test instruction 1-LOI-I&C-13, Unit 1 RPS Bypass Verification Test. The test found no deficiencies with the Unit 1 RPS channel bypass circuits. The inspector concluded that the test was adequately performed.

b. Surveillance Observations (61726)

Various plant operations were verified to comply with selected TS requirements. Typical of these were confirmation of TS compliance for reactor coolant chemistry, RWT conditions, containment pressure, control room ventilation, and AC and DC electrical sources. The inspectors verified that testing was performed in accordance with adequate procedures, test instrumentation was calibrated, LCOs were met, removal and restoration of the affected components were accomplished properly, test results met requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel. The following surveillance tests were observed:

1) OP 1-0410050, Rev 42, HPSI/LPSI Periodic Test

The inspector witnessed the portion of this test performed on the A HPSI pump on November 16. The SNPO performing the test had valid portions of the procedure in hand at the pump and performed data taking properly.

2) I&C 1-1400053, Reactor Protection and Engineered Safeguards System Response Time Testing

The inspector observed the subject testing, performed on the D channel pressurizer pressure transmitter following its replacement. The test involved applying a step change in pressure to the transmitter from just below to just above its high pressure setpoint. The introduction of the step change was accomplished by the operation of a solenoid valve which aligned one charged accumulator (above the channel's setpoint) to another accumulator (just below the channel's setpoint). The actuation signal to the solenoid valve was recorded on the sequence of events recorder, as was the tripping of the channel on pressurizer pressure. By comparing the times from the sequence of events recorder, overall loop response time could be ascertained.

The test was conducted by an I&C system supervisor and two I&C technicians. Because the test was performed in the final stage of containment closeout, no phone or radio communications were available from the site of the test to the control room. As a result, the personnel performing the test had to relay communications from the site of the test to a phone located approximately 100' away, around a corner, resulting in poor communications. Additional difficulties were experienced due to leaks in the test rig, which resulted in difficulties in establishing and maintaining accumulator pressures. Leakage from the high pressure accumulator resulted in two failed attempts to trip the pressure channel due to insufficient pressure. Difficulties in communications resulted in one channel trip from the test rig without the control room being sufficiently forewarned.

The test was ultimately performed with satisfactory results; however, the inspector found that the workarounds of both communications difficulties and a leaking test rig led to poorly coordinated performance.

c. Followup on Previous Maintenance Inspection Findings (92902)

(Closed) VIO 335,389/93-22-01 Failure to Follow Procedure for UHS Valves Air Supply Maintenance

The inspector reviewed the licensee's corrective actions relative to this violation and concurred in the licensee's conclusion that the

violation was the result of a cognitive personnel error. The inspector found that the licensee's actions involving counseling the system engineer involved in the incident and the balance of system engineers was appropriate to the circumstances. This violation is closed.

(Closed) IFI 335,389/93-19-01, Floor Drain Capability

This item identified that a floor drain around the hydrogen seal oil unit was plugged. This area was being used to remove water that was being discharged during the testing of the deluge system for the hydrogen seal oil system. The inspector expressed a concern that failure to remove this water could present a fire hazard if an oil leak was present and could also lead to oil overflowing to ground areas. As a result, the licensee cleaned out the drain and added a note to their maintenance procedure MP-0959063, Rev 8, to verify that the oil separating box is pumped out and free flowing prior to performing any deluge system test. The inspector reviewed the above procedure and verified that the changes had been completed in November 1993.

d. Onsite Followup of Maintenance LERs (92700)

(Closed) LER 335/94-001, Manual Reactor Trip Due to the Loss of the 1B Steam Generator Feedwater Pump Caused by Equipment Failure.

This event resulted in a unit trip from 100% power. The licensee's corrective action included replacement of the low flow switch, the low flow time delay relay, and the wiring between the above switch and relay. Electrical insulation and continuity checks were also performed. An autopsy of the removed switch and time delay did not reveal any component failure. System engineers monitored the component on plant restart and it functioned correctly. All of the above corrective actions were completed prior to unit restart and LER submittal.

(Closed) LER 389/94-006, Trip Circuit Breaker Failure due to a Broken Piece of Phenolic Block Lodged in the Trip Latch Mechanism

The inspector reviewed the subject LER and the progress of the licensee's corrective actions. The subject of this LER is documented in IR 94-15. The licensee's corrective actions for this event were found to be completed satisfactorily. As discussed in this report, paragraph 4.a.(1), the inspector witnessed Unit 1 TCB inspections conducted for the current outage and found that the cutout switches were procedurally inspected, as committed to in the licensee's LER. Additionally, the inspector reviewed an evaluation performed by the licensee's engineering organization covering the use of a locking material on the cutoff switch mounting screw to prevent it from backing out. The evaluation referenced discussions with GE (the breaker's vendor) which resulted in the recommendation that no locking material be employed for the switch mounting screw

based on the industry-unique failure mode encountered. The evaluation stated that the maintenance practice of ensuring full screw engagement was adequate to ensure that, should a screw begin to back out, it would be detected prior to becoming loosened.

The inspector concluded the licensee's corrective actions were satisfactory.

e. Foreign Materials Exclusion Controls (TI 2515/125)

The inspector reviewed the licensee's foreign materials exclusion measures to assess their effectiveness. At the time of the review, Unit 1 was in a refueling outage, and so the bulk of the review focused on activities related to the control of materials in containment. In reviewing the program, the inspector reviewed the following procedures:

- QI 13-PR/PSL-2, Rev 23, "Housekeeping and Cleanliness Control Methods" - This procedure delineated general requirements for the control of system cleanliness, defined classes of cleanliness, requirements for housekeeping, controls to be applied to contaminant-producing activities, cleanliness inspection criteria, and provided methods for the control of foreign materials in the rector cavity.

- OP 1-0030121, Rev 68, "Reactor Plant Heatup - Cold to Hot Standby - This procedure included a verification of containment cleanliness prior to the establishment of containment integrity.

- AP 0010728, Rev 11, "Post Outage Review" - This procedure delineated requirements for a plant management walkdown of the containment building and penetration rooms. The walkdowns were specified to occur prior to entry into Mode 4 and were performed by managers or designees from Mechanical Maintenance, Electrical Maintenance, I&C Maintenance, and Operations. After the management walkdown, the procedure required a walkdown by QC prior to entry into Mode 4.

The inspector observed foreign material controls implemented during the following outage-related activities:

- Refueling - Per QI 13, a control point was established on the 62' elevation of containment to log items into the cavity area while the reactor vessel head was removed. Individuals were logged in by name, and a list of materials brought into the cavity area by each individual was recorded. The inspector reviewed STAR 1-941103341, written by a QC inspector, which covered this area. The QC inspector had witnessed personnel entering the cavity area from other than the control point and found that a lack of knowledge of the QI 13 requirements for the control of the area existed on the part of cavity monitors.

The STAR was dispositioned promptly, with a change to the logging format made and a reiteration of cavity-area requirements made by management in shift turnover meetings.

- Reactor Cavity Seal Ring Installation - The inspector witnessed various stages of seal ring installation, which involved the placement and welding of seal ring components about the vessel head. The inspector noted the use of vacuum cleaners in the direct vicinity of grinding being performed in the area, which reduced the level of contaminants in the cavity.

- V3480 Replacement - The inspector observed the working conditions in the vicinity of V3480 during its replacement. The inspector noted that, following the removal of V3480, the open end of the pipe had been covered thoroughly to prevent foreign material intrusion.

- Containment Closeout - The inspector accompanied QC personnel on a containment closeout tour conducted November 26. The tour followed management tours required by AP 0010728. The inspectors identified various conditions precluding closeout including:

  - A leaking steam generator hydraulic snubber, which had spread a considerable oil film in the local area.

  - Two plastic pipe caps lodged between CEDMs in the reactor vessel head.

  - Numerous instances of cut tie-wraps, insulation metal trimmings, and tape.

  - Work materials (e.g. face shield, gloves) stored away in the vicinity of the pressurizer spray valves.

  - Work materials, including a PWO package, gloves, and unqualified tie wraps, contained in a plastic bag inside an electrical cabinet.

  - A tool room containing, in various drawers, unqualified tie wraps, spools of solder, electrical and mechanical connectors, and an aerosol can. The area also contained plastic bags and signs taped to cabinets. The QC inspector generated a STAR to address the material control aspects of this finding.

The inspector found the QC walkthrough to be very detailed and thorough. In discussing the tour with members of QC, the inspector was told that several pretour inspections had been performed by QC at the request of licensee management. It was explained that this was not unusual and that QC walkthroughs were typically accompanied by other workers, who removed debris

as QC identified it. The inspector concluded that, while the containment was ultimately returned to a satisfactorily clean state, the licensee relied heavily on QC involvement to achieve these results. Rather than employing QC as a final check or verification of conditions, the licensee appears to have employed QC in an on-line support fashion to achieve containment cleanliness.

Prior to exiting containment, the inspector entered the containment sump and verified it to be clean and free of debris. The inspector noted that the area surrounding the ECCS strainers was itself a larger stainer, formed of grating and wire mesh and was locked to prevent access.

Upon exiting containment after the tour, and on exiting on a subsequent Mode 3 tour, the inspector noted the use of form HPP 1.4, "Loose Debris Verification Form," on which individuals sign as verifying that they left no loose debris as a result of their containment entry.

Overall, the inspector found that the licensee had an effective program for the control of materials. Program requirements were both centrally defined (in QI 13) and dispersed throughout appropriate implementing procedures. Personnel appeared to be sensitive to the program's requirements in the course of their work practices and QC observations were effective in identifying problems and enforcing requirements. Notwithstanding the positive aspects of the program, the inspector found that, in the area of containment closeout following the Unit 1 outage, the licensee relied heavily on informal inspections by QC to achieve containment cleanliness.

5. Engineering Support (37551)

a. Steam generator tube inspection and repair.

The licensee performed inservice and mechanical inspection of SG A and B tubes during the current Unit 1 refueling outage. The inspection included:

- Remote visual of existing tube plugs for location and condition.
- Full length bobbin coil examination of all active tubes.
- MRPC examination of 100% of hot leg and 3% of cold leg tube expansion transitions for circumferential crack detection.
- MRPC examinations to clarify selected bobbin coil indications.

Fifty-six tubes that needed to be plugged were identified in SG A and thirty-eight in SG B. The tubes were plugged using CE mechanical plugs.

During installed plug verification a leaking plug was identified. A detailed inspection revealed nineteen total plugs that needed repair. Two of the plugs were ABB welded plugs and the remainder were Westinghouse mechanical plugs in the SG hot leg channel heads. These seventeen plugs were Inconel 600 and were from a single heat (NX2387) that were installed in 1984. NRC Bulletin 89-01 and Westinghouse analysis recommend repair/replacement of these plugs by 2004. Preliminary examination of the failed plugs indicated potential axial or limited circumferential cracking above the expander. Since these failures were much sooner than predicted, the failed plugs were sent to Westinghouse for additional analysis.

The inspector observed selected portions of the SG inspections and repairs and participated in a conference phone call with NRR on November 16, 1994. The inspector verified that the tube repairs identified above were completed.

This issue was reviewed by the Region II Engineering Section Chief who was onsite during this time. The Region I NDE Van was also onsite during these activities and reviewed the eddy current testing of SG tubes and visited the licensees corporate laboratory where the data was being analyzed. The NDE Van inspection results are documented in IR 335,389/94-405.

b. RWT Repairs (PC/M 128-194)

In July 1993, the bottom of Unit 1 RWT developed a through-wall pit that resulted in leakage. A relief request was granted by the NRC for temporary non-code repair. A code repair was attempted during the current Unit 1 refueling outage. When a fourteen inch square area containing the damaged area was cut out, significant external corrosion was discovered. An attempt to perform a code repair of this area was not fully successful and indications were found in the welded area. A decision was then made to request relief and perform an alternate non-code repair to correct through wall leakage and corrosion on the RWT bottom. FPL discussed this item during telephone conferences with NRC Region II and NRR on November 9, 10, and 16. The relief request and safety evaluation of the alternative repair was prepared and submitted to NRR on November 16, 1994.

The alternative repair consisted of a welded patch over the existing defective area that had been removed, sandblasting, and installation of a vinyl ester fiberglass reinforced liner as the tank bottom. Based on test data supplied by the liner materials vendor, this material is compatible with the borated water, a radiation environment, and has a useful life of at least ten years.

The inspector tracked the licensees activities in this area. He was assisted by the Region I NDE Van Personnel and the Region II Section Chief for the Engineering Branch who were onsite at this time. The inspector reviewed the coatings vendor information, the licensee safety evaluation for the proposed alternative repair JPN-PSL-SENP-93-035 and PC/M 128-194 used to accomplish the repair. He reviewed the project with the licensee's coatings expert and project manager and conducted several inspections of the work in progress and the finished product. Even though the licensee was presented with several significant challenges when they were unable to complete a satisfactory code repair, they handled this project effectively and were able to make an alternative repair that will allow continued use of the tank until engineering develops an ultimate solution to this issue.

The inspector noted that engineering, health physics, chemistry, and other support areas were very responsive in providing assistance needed on this project. The management of this project by the plant chemistry manager and the support provided by the corporate coatings expert were very instrumental in completing this project in a timely manner and was identified as a strength.

c. Install Pull-to-Lock Switches on Unit 1 CCW and ICW Pumps (PC/M 182-193)

This PC/M installed pull-to-lock switches in the control room for operator control of the Unit 1 CCW and ICW pumps. It had previously been installed in Unit 2. The pull-to-lock switches allow pump lockout in their pull-to-lock position and also perform the latching relay memory function by their slip contacts. Use of the pull-to-lock feature replaced the previous procedural controls to prevent undesirable CCW and ICW pump start conditions when operating the C pump as a replacement for either the A or B pump. The pull-to-lock switches also replaced the HFA latching relays, which had reliability problems as discussed in previous inspection reports.

The inspectors reviewed the PC/M, safety evaluation, work package, a sample pull-to-lock switch, some of the installation work in progress, all of the installed switches, post-modification testing of the 1A and 1C ICW pumps, post-modification operating procedure revisions, and post-modification operator training. The inspectors noted minor inconsistencies/omissions in operating procedures, operator training, and control of cleanliness inside RTGB cabinets, but no safety-significant problems. Overall, the inspectors concluded that the modification was well designed, installed, and tested.

d. Install New RCP Vibration Monitor (PC/M 007-194)

This modification replaced the Bently Nevada 7200 RCP vibration monitoring system with an improved model, Bently Nevada 3300. The 3300 system is a microprocessor based unit which is capable of

vector monitoring. It fits in the same cutout in the back of the RTGB and uses the same inputs. This modification had previously been completed on Unit 2.

The inspector reviewed the PC/M, the installed Bently Nevada 3300, and the related operating procedures. The inspector noted no deficiencies and concluded that the modification had been adequately performed.

e. Upgrade EQ of Wide Range SG Level Instruments (PC/M 012-194)

This modification replaced SG level transmitters LT-9012 and LT-9022 with EQ transmitters and added EQ conduit seals and splices. The inspector reviewed the PC/M and inspected the installed EQ transmitters, conduit seals, and splices. The inspector noted no significant deficiencies and concluded that the modification had been adequately performed.

f. Cavity Seal Ring Replacement (PC/M 228-193)

This modification will reduce man-rem exposure during outages by eliminating the installation and removal of the old temporary reactor cavity seal ring. It provides a permanently installed pressure boundary for the refueling pool during refueling operations. Also, it provides shielding from gamma radiation to reduce exposure rates in the area of the reactor vessel flange during plant outages. It replaces the old reactor cavity seal ring, neutron shield water bags, and support steel.

The inspectors reviewed the PC/M and observed portions of the shield ring fabrication and installation inside the containment building. The inspectors identified no deficiencies and concluded that the modification was adequately performed.

g. Followup on Previous Engineering Inspection Findings (92903)

(Closed) VIO 335,389/93-22-02 Failure to Perform and Document a 10 CFR 50.59 Safety Evaluation for Temporary Modifications to UHS Valves' Air Supply

The inspector reviewed the licensee's response to this violation and concurred in the licensee' conclusion that the failure to perform a 10 CFR 50.59 Safety Evaluation was the result of an incorrect interpretation of the requirements of the code, as they related to the installation of a mechanical jumper. The licensee's corrective actions included preparing a Safety Evaluation for the subject jumper, counseling personnel on the subject of Safety Evaluations, and revising plant procedures to provide consistent bases for determining the need for Safety Evaluations. The inspector reviewed the subject procedures and found that 10 CFR 50.59 screening criteria had been standardized and were reflective of code

requirements. The inspector found the licensee's corrective actions satisfactory. This violation is closed.

6. Plant Support (71750)

a. Fire Protection

During the course of their normal tours, the inspectors routinely examined facets of the Fire Protection Program. The inspectors reviewed transient fire loads, flammable materials storage, housekeeping, control of hazardous chemicals, ignition source/fire risk reduction efforts, fire protection training, fire protection system surveillance program, fire barriers, fire brigade qualifications, and QA reviews of the program. No deficiencies were identified.

On November 16, the Halon fire suppression system for Unit 1 cable spreading room inadvertently actuated. Operations responded, did not locate a fire but found that the system had actuated. A detailed investigation by the licensee found that a degraded seal on a conduit cover for the cable spreading room actuation station had leaked during heavy rain and resulted in the system actuation. The inspector reviewed the licensee investigation and verified that the system had been repaired and returned to service.

b. Physical Protection

The inspectors verified by observation during routine activities that security program plans were being implemented as evidenced by: proper display of picture badges; searching of packages and personnel at the plant entrance; and vital area portals being locked and alarmed.

c. Radiological Protection Program

Radiation protection control activities were observed to verify that these activities were in conformance with the facility policies and procedures, and in compliance with regulatory requirements. These observations included:

- Entry to and exit from contaminated areas, including step-off pad conditions and disposal of contaminated clothing;
- Area postings and controls;
- Work activity within radiation, high radiation, and contaminated areas;
- Radiation Control Area (RCA) exiting practices; and,
- Proper wearing of personnel monitoring equipment, protective clothing, and respiratory equipment.

Area postings were independently verified for accuracy by the inspector. The inspector also reviewed selected Radiation Work Permits (RWPs) to verify that the RWP was current and that the controls were adequate.

Especially noteworthy in this area has been the HP support of the outage and outstanding oversite of work activities to reduce personnel exposure to ALARA.

7. Onsite Followup of Events (Units 1 and 2)(93702)

Nonroutine plant events were reviewed to determine the need for further or continued NRC response, to determine whether corrective actions appeared appropriate, and to determine that TS were being met and that the public health and safety received primary consideration. Potential generic impact and trend detection were also considered.

a. SIAS/CIAS Actuations

On November 23, Unit 1 experienced a SIAS/CIAS due to failures of two pressure transmitters. The unit was being filled and vented at the time and RCS pressure was approximately 60 psig. All safety systems responded appropriately.

The unit's design is such that a SIAS is manually blocked while depressurizing the plant to prevent an inadvertent SIAS. The block is enabled when 3 of 4 pressurizer pressure channels decrease to below 1700 psig. The block is automatically cleared when 2 of 4 channels increase to 1712 psig. A post-event review indicated that the C and D pressurizer pressure channels each began to increase output with the C transmitter leading the D by approximately 10 minutes. Within approximately 5 minutes of beginning their upward trends in output, each transmitter cleared the 1712 psig SIAS block reset setpoint. With the SIAS block automatically reset, and channels A and B correctly indicating approximately 60 psig, the 2-out-of-4 logic necessary to initiate a SIAS for low pressurizer pressure was satisfied and at 9:37 p.m. the SIAS/CIAS automatically initiated.

The licensee found that the C and D loops' pressure transmitters' outputs plateaued and remained constant through the event and that the outputs only dropped off after multiple lifting and relanding of leads in the instrument loops. Loop calibrations were performed on both transmitters employing prime standards and, in both cases, the transmitters showed sluggish responses.

The pressure transmitters for the pressure channels in question were Rosemount models 1153, with serial numbers indicating that they had been refurbished by Rosemount due to susceptibility to oil leakage. The licensee contacted the vendor following the event and was told that the sluggish responses observed during the calibration checks were indicative of transmitter oil losses. The vendor also stated

that transmitter output spikes had been observed in the past and were found to be due to metallic filings contaminating transmitter oil; however, the licensee's data indicated that the transmitter output ramped upward rather than spiking upward. The C and D channel transmitters were removed and replaced and at the end of the inspection period the licensee was negotiating with the vendor on how best to perform a failure analysis. Additionally, the licensee performed response time testing on the A and B channels and is planning future response time tests for other transmitters on both units.

On November 24, the licensee experienced a B side SIAS actuation during the return to normal phase of D pressurizer pressure channel transmitter response time testing. At the time of the actuation, the A, B, and C pressurizer pressure channels' trip bistables were withdrawn from their cabinets (although not removed), the D channel was in trip following the response time test, and the A SIAS actuation subsystem was in bypass. Operators were making preparations to bypass the B side actuation subsystem when the actuation occurred.

The licensee was unable to determine a root cause for the event with certainty; however, one plausible theory assumed that an A, B, or C channel trip bistable was insufficiently withdrawn from its cabinet, allowing male/female pins to engage momentarily. Such a momentary contact, in conjunction with the tripped D channel, would have satisfied the 2-out-of-4 logic necessary for a SIAS and, as a B train SIAS was not yet blocked, the observed actuation would have occurred. At the end of the inspection period, the licensee was exploring the subject of response time testing to identify methods to accomplish the testing while minimizing the possibilities for inadvertent ESFAS actuations.

In both cases, the licensee made the appropriate notifications under 10 CFR 50.72. The licensee is currently preparing LERs on both issues.

8. Exit Interview

The inspection scope and findings were summarized on December 2, 1994, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection results listed below. Proprietary material is not contained in this report. Dissenting comments were not received from the licensee.

Item Number	Status		Description and Reference
335,389/94-24-01	closed	NCV	Failure to Perform TS-Required Periodic Procedure Reviews, paragraph 3.f.2.

335,389/94-24-02	open	VIO	Inadequate Process for Changes to Vendor Technical Manuals, paragraph 4.a.3.
335,389/93-19-01	closed	IFI	Floor Drain Capability, paragraph 4.c.
335,389/93-22-01	closed	VIO	Failure to Follow Procedure for UHS Valves Air Supply Maintenance, paragraph 4.c.
335,389/93-22-02	closed	VIO	Failure to Perform and Document a 10 CFR 50.59 Safety Evaluation for Temporary Modifications to UHS Valves' Air Supply, paragraph 5.c.
389/94-09-01	closed	NCV	Incorrect Grappling of a Fuel Assembly, paragraph 3.i.
389/94-09-02	closed	URI	Adequacy of a Single Operator on the Refueling Bridge During Core Alterations, paragraph 3.i.
389/94-09-03	closed	URI	Adequacy of Review and Approval of Refueling Core Alterations (Move List), paragraph 3.i.
389/94-15-01	closed	VIO	Failure to Perform a Technical Specification-Required Shutdown, paragraph 3.i.
335/93-008	closed	LER	Inadvertent Start of 1B Containment Spray Pump Due to Personnel Error, paragraph 3.h.
335/94-001	closed	LER	Manual Reactor Trip Due to the Loss of the 1B Steam Generator Feedwater Pump Caused by Equipment Failure, paragraph 4.d.
335/94-002	closed	LER	Inadvertent Load Shed of the 1A3 4160 Volt Bus Due to Procedural Inadequacy, paragraph 3.h.
335/94-004	closed	LER	Automatic Reactor Trip Caused by Control Element Drive Mechanism Bus Overcurrent and Undervoltage Transient due to Personnel Error, paragraph 3.h.
335/94-005	closed	LER	Automatic Reactor Trip Caused by 1A Main Transformer Differential Current Trip Due to Contact With Metal Facia Dislodged From a Nearby Building

			During Inclement Weather, paragraph 3.h.
389/94-005	closed	LER	Technical Specification 3.0.3 Entered When Emergency Core Cooling System Limiting Condition for Operation Was Not Met Due to Personnel Error, paragraph 3.h.
389/94-006	closed	LER	Trip Circuit Breaker Failure due to a Broken Piece of Phenolic Block Lodged in the Trip Latch Mechanism, paragraph 4.d.

9. Abbreviations, Acronyms, and Initialisms

ABB	Asea Brown Bouveri (company)
ALARA	As Low as Reasonably Achievable (radiatio&n exposure)
ANPS	Assistant Nuclear Plant Supervisor
CCW	Component Cooling Water
CE	Combustion Engineering (company)
CEDM	Control Element Drive Mechanism
CET	Core Exit Thermocouple
CIAS	Containment Isolation Actuation Signal
DCR	Documentation Change Request
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EQ	Environmental Qualification
ESF	Engineered Safety Feature
ESFAS	Engineered Safety Feature Actuation System
GE	General Electric Company
GMP	General Maintenance Procedure
HFA	A GE Relay Designation
HPP	Health Physics Procedure
HZP	Hot Zero Power
ICW	Intake Cooling Water
IFI	[NRC] Inspector Followup Item
IR	[NRC] Inspection Report
JPN	(Juno Beach) Nuclear Engineering
LCO	TS Limiting Condition for Operation
LER	Licensee Event Report
LOI	Letter of Instruction
LOR	Licensed Operator Requalification
LPSI	Low Pressure Safety Injection (system)
LSRO	Senior Reactor Operator limited to fuel movement
MOV	Motor Operated Valve
MRPC	Motorized Rotating Pancake Coil
NCV	NonCited Violation (of NRC requirements)
NPS	Nuclear Plant Supervisor
NPWO	Nuclear Plant Work Order
NRC	Nuclear Regulatory Commission
NRR	NRC Office of Nuclear Reactor Regulation

OP	Operating Procedure
PC/M	Plant Change/Modification
PGM	Plant General Manager
PSL	Plant St. Lucie
PWO	Plant Work Order
QA	Quality Assurance
QC	Quality Control
QI	Quality Instruction
QSPDS	Qualified Safety Parameter Display System
RCB	Reactor Containment Building
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RPS	Reactor Protection System
RTGB	Reactor Turbine Generator Board
RWP	Radiation Work Permit
RWT	Refueling Water Tank
SDC	Shut Down Cooling
SG	Steam Generator
SIAS	Safety Injection Actuation System
SNPO	Senior Nuclear Plant [unlicensed] Operator
SRO	Senior Reactor [licensed] Operator
STAR	St. Lucie Action Report
TCB	Trip Circuit Breaker
TI	[NRC] Temporary Instruction
TIA	[NRC] Task Interface Agreement
TP	Test Procedure
TS	Technical Specification(s)
TSC	Technical Support Center
UFSAR	Updated Final Safety Report
UHS	Ultimate Heat Sink
URI	[NRC] Unresolved Item
VIO	Violation (of NRC requirements)