APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No: 50-382/91-31

Docket No: 50-382 License No: NPF-38

Licensee: Entergy Operations, Inc.
P.O. Box B
Killona, Louisiana 70066

Facility Name: Waterford Steam Electric Station, Unit 3 (Waterford 3)

Inspection At: Taft, Louisiana

Inspection Conducted: December 17, 1991, through February 1, 1992

Inspectors: W. F. Smith, Senior Resident Inspector
Project Section A, Division of Reactor Projects

S. D. Butler, Resident Inspector
Project Section A, Division of Reactor Projects

Approved: Mark A. Satorius, Acting Chief, Project Section A — 2/21/92 Date

Inspection Summary

Inspection Conducted December 17, 1991, through February 1, 1992 (Report 50-382/91-31)

Areas Inspected: Routine, unannounced inspection of plant status, followup, onsite response to events, monthly maintenance observation, bimonthly surveillance observation, and operational safety verification.

Results:

One violation was identified (paragraph 5.2) involving failure of the licensee to maintain a technically correct procedure for performing maintenance on hydramotor valve actuators. In 1990 the same section of the procedure was identified by licensee personnel as being incorrect and, although a technical review was focused on that section, it was changed in a poorly organized and incorrect manner, resulting in the procedure being incapable of being performed as written. This demonstrated a weakness in maintenance procedure reviews.

A noncited violation was identified (paragraph 4.1) involving two examples of plant nonlicensed operators failing to follow operations procedures to properly position a component cooling water valve and independently verify its position as being correct. The licensee was proactive in identifying, investigating, and correcting the problem, and it appeared that the safety consequences were minimal. Therefore, no violation is being cited.

A second noncited violation was identified (paragraph 4.2) involving failure to satisfy the surveillance requirement of Technical Specification (TS) 3.2.3, which required the core operating limit supervisory system (COLSS) azimuthal power tilt alarm setpoint to be verified correct. The astuteness of the operators in discovering the problem and the actions taken by the licensee were considered strengths. However, the violation was considered to be of minimal safety significance, thus no violation is being cited.

The licensee's actions to investigate and determine the source of reactor coolant leakage near Steam Generator (SG) No. 1 were appropriate to the circumstances. The bases for decisions appeared to contain conservatism and ALARA considerations (paragraph 4.3).

Other maintenance activities observed by the inspectors were conducted in an excellent manner. A maintenance department initiative to solve the problem of diesel fire pump and security diesel generator battery failures was appropriate (paragraph 5).

Surveillance activities, other than those identified in paragraph 4.2 discussed above, continued to demonstrate strengths.

Housekeeping at the plant, in general, has appeared to deteriorate slightly. The licensee was responsive to remarks made by the inspectors in this regard (paragraph 7).

DETAILS

1. PERSONS CONTACTED

1.1 Principal Licensee Employees

*D. F. Packer, General Manager, Plant Operations
*T. R. Leonard, Technical Services Manager
R. S. Starkey, Operations and Maintenance Manager
R. E. Allen, Security and General Support Manager
*A. S. Lockhart, Quality Assurance Manager
D. E. Baker, Director, Operations Support and Assessments
R. G. Azzarello, Director, Engineering
J. A. Ridgel, Radiation Protection Superintendent
*G. M. Davis, Events Analysis Reporting & Response Manager
*K. T. Walsh, Events Analysis & Reporting Supervisor
R. F. Burski, Director, Nuclear Safety
L. W. Laughlin, Licensing Manager
T. J. Gaudet, Operational Licensing Supervisor
*T. W. Gates, Licensing Engineer
J. G. Hoffpauir, Maintenance Superintendent
D. W. Vinci, Operations Superintendent
R. D. Peters, Assistant Maintenance Superintendent, Electrical
D. E. Marpe, Assistant Maintenance Superintendent, Mechanical
D. C. Matheny, Assistant Maintenance Superintendent, Instrumentation and Controls

*Present at exit interview.

In addition to the above personnel, the inspectors held discussions with various operations, engineering, technical support, maintenance, and administrative members of the licensee's staff.

2. PLANT STATUS (71707)

The plant was operated at 100 percent power for the entire inspection period, except for a few hours in December 1991 and again in January 1992, when power was reduced to 90 percent for monthly main turbine inlet valve cycling surveillance tests.

3. FOLLOWUP

3.1 Followup of Previous Inspection Findings (92701)

3.1.1 (Closed) Violation (VIO) 90-015-3

This violation involved failure of the licensee to obtain Plant Operations Review Committee (PORC) review and general manager approval of a postmodification test procedure used on the control room air conditioning system. The licensee's corrective action consisted of revising Administrative

Procedure UNT-007-028, "Design Change Initiation and Review." The licensee also committed to implement an improved postmaintenance retest program, which was completed by issuance of Procedure UNT-005-020, Revision 0, "Post Maintenance Testing." Although the revision to Procedure UNT-007-028 specifically required acceptance tests to be reviewed by the PORC and approved by the general manager, Procedure UNT-005-020 did not comply with the revision. Consequently, it appeared that lead discipline planners and system engineers could write a new retest on the postmaintenance test addendum page of a work autorization (WA) and implement the test without first obtaining PORC review and general manager approval. The inspector discussed this problem with the licensee, after reviewing the licensee's completed corrective actions for this violation. See NRC Inspection Report 50-382/91-03, dated March 4, 1991, paragraph 7.4.

On October 15, 1991, the licensee issued Revision 1 to UNT-005-020. The inspector reviewed the revised procedure and concluded that excellent guidance on postmaintenance testing was provided. This action addressed and resolved the concerns identified by the inspector.

This violation is closed.

3.1.2 (Closed) Inspection Followup Item (IFI) 90-019-3

This item involved inspector concerns over inservice testing of SG blowdown containment isolation valves under no-flow conditions, when there would typically have been flow if the valves were called upon to perform their isolation function. The licensee's acceptance criterion for valve stroke time was 10 seconds with no-flow conditions, while the TS limit was 10 seconds under any conditions. Based upon the past performance of these valves, closing within an average of about 4 seconds, there was no immediate safety concern; however, the licensee performed an evaluation to determine whether the acceptance criterion should be reduced.

By September 17, 1991, the evaluation (Problem Evaluation/Information Request No. 86012) was completed with a recommendation to reduce the limiting stroke time to 5 seconds, which would assure a maximum calculated closing time of about 6.1 seconds under full flow conditions. The inspector followed up by reviewing the licensee's actions and noted that a revised valve stroke time calculation methodology was being developed for incorporation into the licensee's pump and valve inservice test program by the end of 1991. This methodology involved a Lotus 123 computer program which applied two methods of developing a maximum stroke time. This appeared more realistic and more conservative than the requirements of ASME Code Section XI and NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs." Basically the methodology provided a limit based on statistical data from the valves when they were known to be in good condition and operating properly. These values were compared with Final Safety Analysis Report (FSAR) and TS limits and the lower value was selected as the limit. However, the methodology did not consider the conditions under which the valves were to be tested, i.e., full (normal) flow or no flow, depending on the expected status of the system

when the valve might be called upon to perform its intended safety function. The ASME code did not address the issue because the program was designed to detect valve degradation, not identify specific operability status against TS or FSAR limits.

The inspector reviewed the licensee's database to determine if any acceptance criteria were based on TS limits with no margin for time loss from full flow, if applicable. The blowdown valves, which were the original concern, had more than sufficient margin to allow for flow. The largest value for required action was 6.2 seconds for Valve BD-103B, with a TS limit of 10 seconds. All other valves had sufficient margin or were not expected to be under significant flow conditions when called upon to perform their intended safety function. The inspectors will review the final implementation of the new valve stroke time limit methodology with the routine review of the revised inservice testing program.

This item is closed.

3.1.3 (Closed) IFI 90-026-1

On December 14, 1990, the licensee was conducting a control room pressure verification test in accordance Surveillance Procedure PE-005-004, Revision 4, "Control Room Air Conditioning System Surveillance." After a December 12 event when the licensee recognized that a fire seal had been inappropriately removed for rework, a temporary seal had been installed. This test was conducted to reestablish control room integrity and to confirm that no other seals were removed. When Emergency Filtration Unit (EFU) A was started, the control room did not pressurize to at least 1/8-inch water gauge (IWG) as required by the applicable TS, due to excessive control room leakage. When the operator attempted to throttle Bypass Damper HVC-213A, it would not close. As a result, the EFU could not deliver sufficient makeup air to pressurize the control room. EFU B was started, and HVC-213B was successfully closed, but with HVC-213A failed open, EFU B could not supply sufficient makeup air. Both EFUs discharged into a common duct which delivered the air to the control room envelope. The inspectors were concerned that the control room air conditioning system may have lost the capability to perform its safety function after a single failure.

This item was opened to follow up on the licensee's assertion that with the control room sealed per design and with the EFU dampers properly balanced, failure of either recirculation damper (HVC-213A or HVC-213B) in the balanced open position would not prevent either EFU from pressurizing the control room to 1/8 IWG. The inspectors reviewed the balancing data completed after the control room leaks were repaired. Based on discussion with the system engineer and review of documented balancing accomplished in accordance with WAs 01066982 and 01072637, the recirculation dampers were adjusted in coordination with the inlet dampers so that the EFUs delivered the required amount of air, and within TS limits for EFU differential pressure. As a result, HVC-213A and HVC-213B were mechanically limited to their "fail open" position, which was also the position the dampers assume when the EFU was actuated (by design). Subsequent testing in accordance with PE-005-004 indicated control room pressures well

above the TS minimum of 1/8 IWG, with the recirculation dampers in the balanced open position. Since the dampers cannot fail further open, the tests confirmed that failure of a single damper would not cause a loss of safety function.

This item is closed.

3.2 Other Followup (92701)

3.2.1 Design Deficiency for Containment Purge Isolation Valves Resolved

Paragraph 4.4 of NRC Inspection Report 50-382/91-30 discussed the licensee's December 11, 1991, discovery that the circuitry for the containment purge supply and exhaust isolation valves did not appear to meet the design requirements specified in their FSAR. The licensee had concluded, during a review of design basis documentation, that it was possible for a single failure of a containment isolation relay for the containment purge valves (CAP-103, -104, -203, -204) to prevent containment isolation. This was reported to the NRC Headquarters Duty Officer pursuant to 10 CFR Part 50.72 (B)(2)(III)(c) and -(d).

Upon further review, the licensee determined that the as-built containment purge isolation valve configuration was properly described in the FSAR and was evaluated by the NRC in the appropriate Safety Evaluation Report. The arrangement had also been evaluated by Ebasco, the plant Architect-Engineer, prior to initial fuel load in Memorandum ES-8808-84, dated February 20, 1984. On the basis of these evaluations, the licensee decided that no single failure would prevent an isolation to occur when called upon, and on January 3, 1991, retracted the 10 CFR Part 72 report. The inspectors reviewed the licensee's documentation, including Memorandum ES-8808-84, and similarly concluded that neither a design deficiency nor a nonconformance existed. There appeared to be sufficient redundancy and diversity in the design to preclude any loss of function (i.e., containment isolation) given a single failure. All of the containment purge isolation valves were designed to fail closed on loss of power. The containment-to-ambient differential pressure transmitters would serve as the first line-of-defense and the containment isolation actuation signal would serve as the second line-of-defense in providing safety-related closing signals to the valves. In addition, for small break scenarios where the containment isolation actuation signal was not called upon, the containment purge isolation valves would be closed on Hi-Hi radiation from any one of the containment area radiation monitors. This issue is considered resolved and is no longer a safety concern. The licensee will not be issuing the LER discussed in the above referenced inspection report.

3.3 In-Office Review of Licensee Event Reports (LERs) (90712)

The following LERs were reviewed. The inspectors verified that reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and that the LER forms were complete. The inspectors confirmed that unreviewed safety questions and violations of TS, license conditions, or other regulatory requirements had been adequately described. The Region IV staff determined that an onsite inspection followup of the event was not appropriate. The NRC tracking status is indicated below.

3.3.1 (Closed) LER 91-007, "Incorrect Electronic Current Sensor Rating on a 480 V Safety Related Bus due to Improper Architect-Engineer Review."

No problems were identified by the inspector as a result of the review of this LER. Due to the licensee's proactive identification of the problem, the completeness of the report, and the appropriateness of the corrective action, this LER is closed.

3.3.2 (Closed) LER 91-012, "Failure to Perform Emergency Diesel Generator Surveillance Due to Inadequate Attention to Detail"

This event was documented in paragraph 7 of NRC Inspection Report 50-382/91-21 dated August 19, 1991. A Notice of Violation (VIO 91-021-3) was issued due to the recurring nature of this problem. The licensee identified the violation, took satisfactory corrective action, and appropriately reported the event in this LER. Followup inspection of completed corrective actions will be conducted during a future inspection based on the licensee's response to the Notice of Violation. This LER is closed.

3.3.3 (Closed) LER 91-008, "Reactor Coolant System Leakage in Excess of Technical Specifications due to Check Valve Leakage."

This LER was reviewed in NRC Inspection Report 50-382/91-21 dated August 19, 1991. The inspector did not close the LER because the document failed to adequately address the plant conditions at the start of the event, and other salient points were not fully discussed. The licensee issued Revision 1 on October 18, 1991, which was in the improved, sequential format adopted recently. The salient points were covered; however, the initial plant conditions (i.e., hot shutdown versus hot standby) were incorrect. The inspector pointed this out to the licensee and determined that the author of the LER had made a cognitive error when he reviewed the documentation and revised the LER inappropriately. On January 20, 1992, the licensee issued Revision 2, with the correct data. This event was discussed in detail in NRC Inspection Report 50-382/91-18, resulting in an unresolved item which was closed in NRC Inspection Report 50-382/91-22. No violations were identified.

This LER is closed.

3.3.4 (Closed) LER 91-020, "Indicated Skin Exposure to Contract Technician in Excess of 10 CFR 20 Limits."

NRC Region IV conducted a special inspection between September 30 and October 2, 1991, to follow up on this event. The results of that inspection concluded that the possibility existed that an actual personnel exposure in excess of regulatory limits occurred, but the evidence was not conclusive. The licensee's internal review program provided an objective, unbiased, and thorough evaluation of the event.

This LER is closed.

3.4 Onsite Licensee Event Report (LER) Followup (92700)

The following LERs were selected for onsite followup inspection to determine whether the licensee had taken the corrective actions as stated in the LER and whether responses to the events were adequate and met regulatory requirements, licensee conditions, and commitments. The NRC tracking status is indicated below.

3.4.1 (Closed) LER 91-003, "Improper Testing of the Main Steam Safety Valves (MSSVs) Due to Incorrect Vendor Supplied Data and Procedural Inadequacy"

This LER involved an error in the data provided by the MSSV vendor which could have resulted in the safety valve setpoints being set approximately 11 pounds per square inch (psi) lower than the intended setpoint.

The MSSVs were tested using the Trevitest method. This method involved a test rig that provided a hydraulic assist pressure to the valve upper assembly. This assist pressure was in addition to the existing steam line pressure; when the assist pressure was of sufficient magnitude, the MSSV would open. The sum of the two pressures was the set pressure for the MSSV to open.

In order to determine the required assist pressure, two dimensions of the MSSVs were required: the inside and outside diameter of the valve seat. A mean seat diameter was then calculated and used to derive a mean seat area, which in turn was used to calculate the MSSV setpoint.

Prior to the fourth refueling outage, a licensee engineer discovered that the vendor-supplied value for the outside seat diameter of the MSSV was incorrect. The licensee obtained the correct valve data from the vendor and tested all 12 installed MSSVs. Two MSSVs tested outside the required setpoint tolerance of plus or minus 1 percent (roughly 10 psi depending on the exact setpoint); one tested 3 psi above the tolerance and the other tested 3 psi below the tolerance. Both MSSVs were reset to meet TS requirements.

As a result of the discovered error in the valve data, the licensee conducted a review of completed surveillances from previous refueling outages. The review revealed that incorrect data had been used since the first refueling outage. The licensee's review also revealed that, during the second refueling outage, the required number of MSSVs were not tested in accordance with the pump and valve inservice testing (PVIST) requirements derived from ASME Code Section XI and TS surveillance requirement 4.0.5. This event was previously documented in NRC Inspection Report 50-382/91-09 and was dispositioned as a licensee-identified violation of NRC regulations that met the criteria in Appendix C, paragraph V.G., of the NRC's "Rules of Practice," 10 CFR Part 2, and was not subsequently cited.

The licensee tested four MSSVs each refueling outage, in accordance with the periodicity established by Section XI. If any of the four tested valves failed to lift within the acceptable pressure band, then a second set of four MSSVs were required by Section XI to be tested. Section XI then required that if any

of the second set of four valves failed to properly lift, the remaining four valves must be tested. The licensee's review determined that, while testing MSSVs during the second refueling outage, the first and second set of four valves tested did not properly lift, but licensee personnel failed to perform testing on the remaining four MSSVs. All 12 MSSVs were tested during the third refueling outage.

The licensee identified the root cause as the MSSV vendor's failure to provide correct data. The licensee conducted a review of TS surveillances to determine which surveillances would involve vendor-supplied information that test results would be dependent upon. The licensee determined that no incorrect vendor-supplied information had been used in TS surveillances.

The licensee identified the root cause of failing to test the correct number of valves as an inadequate procedure. They revised Surveillance Procedure MM-007-015, "Trevitest of Main Steam Safety Valves," to incorporate the correct MSSV dimensions, and the correct retest requirements of ASME Code Section XI. In addition, the licensee reviewed other surveillance procedures to verify that PVIST programs were adequately addressed. During this review they determined that two surveillance procedures, shutdown cooling suction relief valve testing and pressurizer relief valve testing, were addressed by the PVIST program and that the retest requirements were in accordance with ASME Section XI.

This LER is closed.

4. ONSITE RESPONSE TO EVENTS (93702)

4.1 Valve Found Out of Position, Cross-Connecting Independent Loops of the Component Cooling Water (CCW) System

On December 20, during performance of Procedure OP-100-009, Revision 11, "Control of Valves and Breakers," Valve CC-304A was found locked open when the required position was locked closed. Procedure OP-100-009 required that the position of valves on the locked valve list be verified at least quarterly. CC-304A was the CCW system Loop A inlet isolation to Essential Chiller A/B. Since Essential Chiller A/B was aligned to replace Chiller B, it was receiving CCW from the B CCW loop via CC-304B, Loop B inlet isolation to Essential Chiller A/B. In this configuration, CC-304A was required to be locked closed to prevent cross connecting the A and B loops of CCW to the chillers.

The licensee's immediate action after discovering CC-304A in the wrong position was to properly position the valve upon direction from the shift supervisor and initiate Potentially Reportable Event Report 91-068. Additionally, the licensee determined that the event was reportable to the NRC as required by 10 CFR Parts 50.72 and 50.73. Since two independent trains of the safety related CCW system were cross-connected by having CC-304A and -B open at the same time, they considered the plant as being in an unanalyzed condition.

Subsequent investigation by the licensee revealed that CC-304A was inadvertently locked open on December 1, when operators placed Chiller A/B in

service and secured Chiller B. Procedure OP-002-004, Revision 6, "Chilled Water System," requires CC-304A to be locked closed when placing Chiller A/B in service and supplying CCW from Loop B. The failure to follow procedures was a violation of NRC requirements.

Further investigation by the licensee revealed that a limit switch plate installed on the valve visually blocked the open and closed labels cast on the valve body. A letter "C", which was installed to indicate the closed position, was also partially obliterated with paint and could have been mistaken for an "O". This would have caused the operators to change the valve to the open position, thinking they were closing it. The valve was a 4-inch butterfly valve and the operators did not utilize other available methods of determining the position of the valve. Review of a computer printout from December 1 confirmed this explanation, since it indicated the valve changing to the "not closed" position approximately the time the valve realignment was being completed.

In addition to the quarterly check of CC-304A required by OP-100-009, the valve was checked monthly by Procedure OP-903-049, Revision 6, "Component Cooling Water and Auxiliary Component Cooling Water Loop Operability Check." Procedure OP-903-049 was performed as scheduled on December 5, and the operator recalled questioning the position of the valve and contacted the control room for clarification. He apparently convinced himself that the valve was in the required position and left the valve locked open after cycling it closed and back open again as shown by the plant computer.

Additional immediate actions by the licensee included valve alignment checks of the CCW system and the chilled water system to ensure that no other valves were mispositioned. None were found out of position.

The licensee issued LER 91-023 on January 20, as required by 10 CFR Part 50.73. They indicated that the root cause of the event was inadequate labeling on CC-304A. As a contributing cause, the independent verifier failed to attempt to move the valve in the closed direction as required by Procedure OP-100-009, which gives direction on checking valve positions. This failure to follow procedures was also a violation of NRC regulations.

Corrective action to be accomplished subsequent to the immediate actions taken above included: (1) identifying and providing adequate position labeling for similar valves in the chilled water and CCW system and others which could cross-connect independent safety trains, (2) counseling involved personnel, and (3) providing additional operator training on the proper use of Procedure OP-100-009, "Control of Valves and Breakers."

The licensee determined that the actual error was not safety significant, by analyzing the impact of operating with both Valves CC-304A and -B open. The worst case single failure during an accident would have been loss of one CCW pump. This could allow opposite train CCW flow to the essential chiller to be diverted to the idle train. The licensee stated in LER 91-023 that preliminary analysis indicated that the flow diversion would be small enough

not to affect other safety-related components other than the essential chiller. They further stated that, even though the performance of the remaining chiller would be degraded, enough time would have been available to identify and correct the valve misalignment prior to losing the safety function of the remaining chilled water loop. The licensee has scheduled completion of the final analysis by February 28, 1992.

Although the two examples of operators failing to follow procedures in this one instance were violations of NRC requirements, the violations are not being cited because the licensee's efforts in identifying and correcting the violations met the criteria in Appendix C, paragraph V.A., of the NRC's "Rules of Practice," 10 CFR Part 2. The inspectors will review the finalized analysis and will verify completion of the licensee's corrective actions as part of the closeout of LER 91-023.

4.2 Azimuthal Power Tilt Alarm Not Properly Set

On January 21, while training licensed operator candidates in the control room, the licensee discovered that the COLSS azimuthal power tilt alarm was not set in agreement with the tilt allowance that had been inputed into the core protection calculators (CPCs). The CPC tilt allowance was a fixed addressable constant which introduced a specific penalty into the plant protection system to account for an assumed maximum tilt. The COLSS continuously calculated azimuthal tilt and, if it reached or exceeded the fixed value set into the CPCs, the COLSS would trip an annunciator in the control room to alert the operators, permitting them to take corrective action pursuant to TS 3.2.3 ("Limiting Condition for Operation regarding Azimuthal Power Tilt").

The operators promptly adjusted the COLSS alarm setting in accordance with the COLSS operating procedure. Upon further investigation, the licensee discovered that on July 20, 1991, after receiving a COLSS alarm during a plant transient, the operators properly increased the CPC tilt allowance (thus increasing the penalties) and the COLSS alarm setting as required by TS 3.2.3. On July 21, the operators restored the CPC allowance to the original value, but failed to adjust the COLSS alarm setpoint accordingly. As a result, from July 21, azimuthal power tilt could have exceeded the CPC allowance without the knowledge of the operators and in violation of TS 3.2.3, which required operator action when the CPC allowance was exceeded.

Further investigation and review of COLSS data recorded by the plant main computer since July 20, 1991, revealed no operating instance where the CPC allowance was exceeded, except during startups on August 26 and November 18, 1991, when it was not unusual or unexpected for this situation to occur. In both those instances, the condition cleared within the the 2 hours allowed by the TS 3.2.3.a action and thus was considered to be safety significant. However, the inspectors questioned why the monthly surveillance test, Surveillance Procedure NE-5-103, Revision 3, "COLSS Alarm Verification," failed to identify the deficiency. TS 4.2.3.2.c required the azimuthal power tilt to be determined within the limit by verifying at least once per 31 days that the COLSS azimuthal tilt alarm would actuate at an azimuthal power tilt greater than the azimuthal power tilt allowance used in the CPCs. The purpose

of Procedure NE-5-103 was to satisfy this surveillance requirement. Section 8.3 of the procedure did not appear to do more than verify that the COLSS alarm would annunciate. The procedure did not appear to take into account the possibility that the COLSS alarm might not be set correctly and, thus, might not alarm when the CPC allowance was exceeded. As a result, the surveillance requirements of TS 3.2.3 were not met from July 20, 1991, until January 21, 1992. This was in violation of NRC regulations.

The licensee's permanent corrective actions included revisions to the surveillance and operating procedures applicable to the COLSS and the CPC so that the surveillance requirements of TS 3.2.3 would be met and to implement additional administrative controls that would maintain the proper relationship between the CPC azimuthal power tilt allowance and the COLSS tilt alarm setpoint. The licensee verefied, by reviewing the documentation required each time the CPC allowance was adjusted, that there was no instance before July 20, 1991, when the COLSS alarm was not adjusted as required. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation met the criteria in Appendix C, paragraph V.A., of the NRC's "Rules of Practice," 10 CFR Part 2.

4.3 Reactor Coolant System Leak

On January 9, during a reactor containment building entry to add lubricating oil to a reactor coolant pump motor, the licensee discovered boric acid crystals and water leaking below SG No. 1. The leakage was sampled and determined to be reactor coolant. For approximately 10 days, the licensee attempted to determine the source of the leak by studying arrangement drawings, utilizing video cameras, and gaining access where practicable. Dose rates in the proximity of the most likely sources of leakage near or at the bottom of the SG were estimated at 120 REM per hour, by placing thermoluminescent dosimeters in the area with graphite poles. This precluded sending a man to the area for visual inspection. The licensee experienced difficulty in maneuvering the video camera due to the height and density of plant equipment in the area of the leak. Camera and camera mounting equipment failures also hampered the search process. The inspectors viewed the video tapes obtained and noted that they were inconclusive but did contribute to the conclusion reached by the licensee that the SG cold leg primary manway gasket was the likely source of leakage. This was based upon no evidence of leakage found above the manway, stains on the manway insulation pad, boric acid buildup on the SG base, and the fact that the manway had been removed during the previous refueling outage.

The NRC's concerns included the possible boric acid wastage of manway studs which were made of ASME SA-540 Grade B-24 steel. There was also concern about possible stress corrosion cracking failure and over the possibility of the leak being other than the manway gasket. If the leak was from a primary boundary, i.e., a failed weld or crack in the body of a pipe or valve, continued operation would be prohibited by the plant's TS.

On January 22, a conference call was conducted between the licensee, Region IV, Nuclear Reactor Regulation, and the resident inspectors to discuss the

licensee's plans to take corrective action. The licensee expressed confidence that the leak was from the cold leg primary manway gasket, based on what was observed to date, and the fact that other Combustion Engineering plants have seen this type of manway leakage. Based upon preliminary and conservative calculations considering worst case boric acid wastage of all the manway studs, the licensee was assured of structural integrity for 133 days from the start of leakage. That translated to a shutdown on or about February 22, based on the knowledge that indications of leakage were not seen in early October 1991. The licensee scheduled an outage to commence on February 17, and the resident inspectors trended unidentified reactor coolant system leakage and noble gas in the containment atmosphere. From January 23 through February 1 there was no apparent increase in either parameter. At the end of this inspection period, leakage had not increased, and the licensee was planning to shut down on February 17. This discussion will continue in NRC Inspection Report 50-382/92-03.

Conclusions:

The inspectors noted a weakness in the implementation of valve lineup checks by auxiliary operators, indicating a need for additional training, and for improvement on procedure compliance. The licensee identified the issues and took appropriate corrective actions. Due to the proactive approach taken by the licensee, NRC enforcement action was not taken.

Deficiencies were identified in the surveillance and operating procedures associated with COLSS, as it pertained to azimuthal power tilt. The operators were astute in their discovery of the improper setting of the COLSS alarm and were proactive in identifying the issue. The licensee took appropriate corrective actions and, as a result, NRC enforcement action was not taken.

The licensee's actions to investigate and determine the source of reactor coolant leakage near SG No. 1 were appropriate to the circumstances.

5. MONTHLY MAINTENANCE OBSERVATION (62703)

The station maintenance activities affecting safety-related systems and components listed below were observed and documentation reviewed to ascertain that the activities were conducted in accordance with approved WAs, procedures, TS, and appropriate industry codes or standards.

5.1 WA 01088055: Diesel Fire Pump Corrective Maintenance

On December 26 and 27, the inspector observed portions of troubleshooting and repairs on Diesel Fire Pump (DFP) No. 2. During routine surveillance testing the pump failed to start, with the DFP batteries suspected as the cause. The DFP had two batteries with a starting circuit designed to shift to Battery No. 2 if Battery No. 1 failed. Battery No. 2 already had Condition Identification Tag (CI) 278274, which had identified low specific gravity on November 27. The licensee explained that a replacement battery was on order, but not received. When the DFP would not start on Battery No. 1, the system shifted to Battery No. 2, which also failed to successfully start the engine. Troubleshooting was

initiated as authorized by the WA. The technicians determined, by temporary use of a similar commercial grade battery used on the security diesel generator, that both batteries had failed. The technicians conducted appropriate troubleshooting, and the auxiliary operator used the proper procedure to operate the DFP. While expediting new batteries, the licensee found a local source with batteries in stock and, by December 28, had restored the DFP to service with new batteries.

No further problems were identified, until approximately 1 week later when the security diesel generator again failed to start on demand, due to a similar battery failure. The inspector questioned the value of preventive maintenance activities performed on the DFP and security diesel batteries. The licensee had already initiated action to find a more reliable manner of monitoring battery condition. On January 29, the licensee stated that they were purchasing a Snap-On Model MT 1590 alternator and voltage regulator, which is a device which places a load on a battery while testing and will alert the licensee to a failing battery before it fails. Use of the alternator and voltage regulator will be incorporated into the licensee's quarterly battery maintenance program for the DFPs and the security diesel generator. This was considered an appropriate maintenance initiative.

5.2 WA 01087991: Disassembly, Inspection, Reassembly, and Post-Maintenance Testing of Hydramotor

On January 1, 2, and 3, the inspector reviewed and observed portions of the disassembly, inspection, reassembly, and postmaintenance testing of the Model NH92 hydramotor actuator for Essential Chilled Water Flow Control Valve CHW-129AB. During surveillance testing in accordance with ASME Code Section XI, the valve did not meet stroke timing acceptance criteria. The licensee implemented the above WA to inspect for problems, clean, replace seals, and retest the valve actuator.

On January 1 the actuator was removed from the valve. The inspector reviewed the clearance tagout and found it to be appropriate. Firewrap had to be removed from the cabling, and a fire impairment tag was posted in accordance with fire protection administrative procedures.

On January 2, the inspector observed the disassembly, inspection, cleaning, and reassembly of the actuator. The WA required this work to be performed in accordance with Maintenance Procedure MM-007-027, Revision 0, "Hydramotors, Models NH92 and AH92, Removal, Maintenance, Testing, and Installation." The technicians had been trained to work on Hydramotors and demonstrated a good working knowledge of the equipment and the special tools required. They performed the tasks in accordance with the procedure and the manufacturer's technical manual and demonstrated good work qualities. Care was taken to maintain part cleanliness and in the correct orientation and the work area was kept orderly by continually stowing tools that were not in use.

Minor procedure problems were revealed. Early in the disassembly process, the technicians were unable to find the step in the procedure that drained the hydraulic oil from the actuator. They resolved the problem with the planner by

adding an appropriate step in the WA. Later, while the inspector was reviewing the procedure, a missing page was identified. This missing page was discovered to be the page containing instructions to drain the hydraulic oil. The technicians promptly obtained a new procedure that had been page checked, but were uncertain whether to transfer signatures and data from the original procedure with the missing page to the new copy or add the missing page to the original procedure in use. After some discussion they chose to add the missing page to the original procedure in use to avoid possible errors in transferring signatures and data. The inspector considered this to be a good decision, and questioned licensee management to determine whether their staff might need some direction as to how to deal with missing pages in such documents.

During the postmaintenance stroke test, Section 8.10 of MM-007-027 was noted by the inspector to be technically incorrect and in conflict with the manufacturer's technical manual. Section 8.10 had been changed once in 1990 because it had "an inadequate technical review" and could not be performed properly as written. The change was hand-written and poorly organized and again could not be performed properly. Since the WA authorized the work in accordance with MM-007-027 and the vendor technical manual, the technicians used the manual to accomplish the task intended, but not correctly delineated, by MM-007-027. The first line supervisor authorized this approach. Under these circumstances, the inspector was not concerned with the supervisor's decision, provided the procedure was corrected prior to its next use. However, failure to maintain a technically correct procedure was a violation of TS 3.8.1 (IO 91-031-01).

On January , the inspector witnessed the retest of the valve after the actuator was installed and the stroke was adjusted for the specific application. The test was conducted by the operators in accordance with Surveillance Procedure OP-903-032, Revision 8, "Quarterly IST Valve Tests." The valve functioned smoothly and met the acceptance criteria for stroke timing.

On January 9, the inspector reviewed the completed WA documentation and noted that the technician's comment sheet made no reference to the difficulties encountered in the yoke removal sequence, and no comments about Section 8.10 of MM-007-027 being incorrect, other than the procedure being poorly written. The inspector discussed these with the mechanical maintenance assistant superintendent, in terms of the lack of feedback from the technicians such that the procedure would be corrected. The licensee initiated a quality notice against the procedure deficiency, thus entering the problem into their corrective action program. The inspectors will follow up on actions taken as part of the inspection conducted on corrective actions taken in response to the above violation.

5.3 WA 01087063: Preventive Maintenance on Containment Spray (CS) Pump A

On January 15, the inspector observed preventive maintenance on CS Pump A. The inspector verified that the pump was removed from service and tagged as required by the licensee's administrative procedures. The WA was reviewed by the inspector and determined to be properly prepared and approved. The work

consisted of changing the lubricating oil in the pump bearings, changing the grease in the motor/pump coupling, and re-torquing the coupling bolts after reassembly. The inspector verified that controlled procedures and drawings were being used, that the proper lubricants were being used as specified by the work instruction, and that a properly calibrated torque wrench was used. No problems were identified during the work.

5.4 WA 01088717, 01088324: Maintenance on Emergency Diesel Generator (EDG) A

On January 16, the inspector observed maintenance on EDG A. The inspector verified that the EDG was properly removed from service and that the work was authorized by the shift supervisor. The work was being performed by qualified maintenance personnel in accordance with properly prepared and approved WAs. The inspector observed removal of the lube oil strainer for inspection. The differential pressure across the strainer had been observed to be increasing during recent surveillance runs of the EDG. There was no significant visible debris on the strainer, but it was cleaned and reinstalled in the system and properly torqued. The licensee also removed crankcase inspection plates to attempt to locate the source of suspected water leakage into the crankcase of the engine. Significant moisture had been detected emitting from the crankcase vent during recent surveillance runs of the engine. The system engineer suspected that jacket cooling water was leaking into the crankcase past one of the cylinder liner seals. There was no visible leakage past the seals on any of the 16 cylinders with the system pressurized to about 4 psi by the jacket cooling water pump. Oil samples were analyzed and indicated no significant moisture accumulating in the oil. The licensee intended to continue monitoring the engine oil to ensure that it was not degrading and attempt to identify the leak during the next major engine outage by performing a special pressure test on the jacket water system. The inspectors will follow up on the results of this test. This shall be tracked under IFI 91-031-02. No problems were identified during the maintenance.

Conclusions:

Although there was a violation identified which reflected a weakness in the processing and technical reviewing of a detailed maintenance procedure, the performance of the technicians was good during maintenance on a hydramotor valve actuator.

Other maintenance activities observed demonstrated excellent work practices and procedure compliance. The maintenance department initiative to solve the problem of monitoring battery performance for the fire pump and security diesel starters was appropriate.

6. BIMONTHLY SURVEILLANCE OBSERVATION (61726)

The inspectors observed the surveillance testing of safety-related systems and components listed below to verify that the activities were being performed in accordance with the TS. The applicable procedures were reviewed for adequacy,

test instrumentation was verified to be in calibration, and test data was reviewed for accuracy and completeness. The inspectors ascertained that any deficiencies identified were properly reviewed and resolved.

6.1 Procedure OP-903-094, Revision 7, "ESFAS Subgroup Relay Test - Operating"

On January 6, the inspector observed performance of a portion of Procedure OP-903-094 and reviewed the completed data from previously completed portions of the test for ESFAS Train A. The inspector verified that an approved procedure was being used by the operator performing the test, the test was properly authorized for performance, and the precautions and prerequisites were satisfied. Step 7.21 of the procedure was performed, which opened Valve SI-602A, the containment sump outlet isolation valve. The operation of the valve had to be coordinated with the electrical maintenance group, because Operations Standing Instruction 91-04 required that the valve be verified fully closed after cycling by checking the valve's limit switch assembly. The inspector verified that electrical maintenance personnel were prepared to check the position of the valve using a properly prepared and approved WA. No problems with the surveillance were identified.

6.2 Procedure OP-903-035, Revision 7, "Containment Spray Pump Operability Check"

On January 15, the inspector observed the performance of Procedure OP-903-035 for CS Pump A. The procedure satisfied the surveillance requirements of TS 4.6.2.1.c as well as other requirements of Section XI of the ASME Code for "Inservice Pump and Valve Testing." The inspector verified that the test was performed in accordance with an appropriate, approved procedure and that the test was properly authorized. Test equipment used during the test was properly calibrated. The inspector verified that the test data for the pump was properly recorded and was within the acceptable ranges obtained from the licensee's baseline data notebook in the control room. No problems were identified during the surveillance.

6.3 Procedure OP-903-007, Revision 2, "Turbine Inlet Valve Cycling Test"

On January 25, the inspector observed the control room operators conducting turbine valve cycling tests, which were implemented to satisfy the surveillance requirements of TS 4.3.4.2.a and 4.3.4.2.b. This required cycling of the four high pressure throttle valves, governor valves, and six low pressure reheat stop and intercept valves every 31 days was conducted to verify that the turbine overspeed protection system was operable. The test was conducted with satisfactory results, and the operators at the valves reported by direct observation that the valves operated smoothly. The control room operators experienced difficulty with the position indicating lights on the main control panel, due ostensibly to high resistance connections in the sockets and/or burned out bulbs. The operators initiated a Condition Identification Report to correct the problem. The procedures were followed in an orderly and deliberate manner, and operator trainees were afforded the opportunity to manipulate the turbine controls under the direct supervision of the licensed operator.

The licensee also completed Surveillance Procedure OP-903-005, Revision 7, "Control Element Assembly Operability Check," prior to the inspector's arrival. The inspector reviewed the completed data and the logs. The data was in order and satisfied the TS surveillance requirements to move each of the CEAs a minimum of 5-inches. While moving CEA No. 66 from 147.45 inches (as read on CEA Calculator No. 1) to 141.45 inches, the CPCs sensed a position of 139 inches and actuated a reactor trip signal on CPC Channel A. The reactor protection system logic was configured such that 2 CPC channel trip signals were required to trip the reactor. Since CPC Channel A was the only channel having CEA No. 66 as a target CEA, no other trip signals were present for the other three channels of CPCs. When the CEA was withdrawn to its original position, the trip signal cleared.

Conclusions:

Surveillance activities observed continued to demonstrate strengths. The licensee staff involved in the performance of TS surveillance appeared to be knowledgeable in the objectives and followed procedures well.

7. OPERATIONAL SAFETY VERIFICATION (71707)

The objectives of this inspection were to ensure that this facility was being operated safely and in conformance with regulatory requirements, to ensure that the licensee's management controls were effectively discharging the licensee's responsibilities for continued safe operation, to assure that selected activities of the licensee's radiological protection programs were implemented in conformance with plant policies and procedures and in compliance with regulatory requirements, and to inspect the licensee's compliance with the approved physical security plan.

Radiological work practices were observed to be excellent. The licensee demonstrated a sensitivity to minimizing exposures, as evidenced by the approaches to finding the RCS leak near SG No. 1 and by the daily reporting of exposure to licensee management at the plan-of-the-day meetings.

During the holiday periods, the inspectors placed additional focus on the performance of the licensee's security staff in terms of protected area perimeter monitoring, alertness in the control stations, and screening of personnel at the primary access point and found no problems.

The inspectors conducted control room observations and plant inspection tours and reviewed logs and licensee documentation of equipment problems. Through in-plant observations and attendance of the licensee's plan-of-the-day meetings, the inspectors maintained cognizance over plant status and TS action statements in effect. Control room observations did not reveal any problems. The operators continued to perform their functions in a professional manner, and proper numbers of senior reactor operators and reactor operators were maintained (and usually exceeded) as required by TS.

The inspectors noted that the reactor operator logs were becoming increasingly cryptic and were not fulfilling the guidelines established by licensee

management. After mentioning this to the shift supervisor, an immediate improvement was noted and subsequent log keepers became aware of the concern. The inspectors will continue to monitor the logs for completeness and detail. The inspectors noted a deteriorating trend in housekeeping practices throughout the plant. For example, candy wrappers were found in the radiologically controlled safeguards remote valve galley, where eating, drinking, and smoking was prohibited; dirt was seen in the emergency diesel generator rooms; and ladders were found adrift. This was discussed with licensee management, and actions were taken to restore the level of housekeeping normally seen at Waterford 3.

On January 15, while conducting a night shift tour, the inspector noted that, for over a week, control room pressure envelope airlock doors on two of the three airlocks would not latch. Control room pressure tended to open the doors, aggravating the leakage of control room pressure. The doors were identified as air lock doors with posted signs to keep closed and were numbered No. 86 and No. 261. The inspector expressed concern that plant personnel using the doors did not take the initiative, until prompted by the inspector, to document the deficiency on a condition identification report so that repairs could be appropriately scheduled and executed. The deficiency was then corrected.

Conclusions:

The overall performance of the licensee in plant operations, security, and radiological work practices continued to be a strength. Minor issues such as housekeeping, log keeping, and door maintenance were dealt with in a responsive manner, once they were identified by the inspectors.

8. SUMMARY OF TRACKING ITEMS OPENED IN THIS REPORT

The following is a synopsis of the status of all open items generated and closed in this inspection report.

VIO 90-015-03 was closed.
IFI 90-019-03 was closed.
IFI 90-026-01 was closed.
LER 91-003 was closed.
LER 91-007 was closed.
LER 91-008 was closed.
LER 91-012 was closed.
LER 91-020 was closed.
VIO 91-031-01, "Failure to Maintain Maintenance Procedure," was opened.
IFI 91-031-02, "EDG A Jacket Water Leak Test Followup," was opened.

9.0 EXIT INTERVIEW

The inspection scope and findings were summarized on February 4, 1992, with those persons indicated in paragraph 1 above. The licensee acknowledged the

inspectors' findings. The licensee did not identify as proprietary any of the material provided to, or reviewed by, the inspectors during this inspection.