ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	50-382
License No.:	NPF-38
Report No.:	50-382/96-11
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Hwy. 18 Killona, Louisiana
Dates:	July 21 through August 31, 1996
Inspectors:	L. A. Keller, Senior Resident Inspector T. W. Pruett, Resident Inspector D. L. Proulx, Resident Inspector, River Bend Station
Approved By:	P. H. Harrell, Chief, Project Branch D

ATTACHMENTS:

Attachment 1: Partial List of Persons Contacted
List of Inspection Procedures Used
List of Items Opened, Closed, and Discussed
List of Acronyms Used

EXECUTIVE SUMMARY

Waterford Steam Electric Station, Unit 3
NRC Inspection Report 50-382/96-11

This routine, announced inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection.

Operations

- All observed operations activities were conducted professionally and were consistent with safe operation of the facility (Section O1.1).

- A licensee audit revealed that the appropriate Limiting Conditions for Operation (LCO) was not entered for two Component Cooling Water (CCW) valves on the Equipment out-of-service (EOS) List, due to the failure of operators to recognize that the valves had a closed safety function. The inspectors determined that the valves were always capable of performing their closed safety function, the valves' condition did not require LCO entry and, therefore, this error was administrative in nature (Section O4.1).

- A nuclear auxiliary operator's inadvertent addition of the wrong type of oil to the CCW Pump A outboard bearing was a result of a lack of attention to details and is considered a noncited violation (Section O4.2).

Maintenance

- The licensee's maintenance scheduling process did not include provisions for quantitative assessments of unscheduled maintenance. Additionally, the qualitative assessments of maintenance on engineered safety features systems, concurrent with switchyard maintenance, was not implemented by the on-shift operations staff consistent with established practices. The adequacy of the licensee's risk assessments for unscheduled maintenance is an unresolved item (Section M1.2).

- As a result of not returning a manual/automatic station setpoint to its original state following maintenance, Auxiliary Component Cooling Water (ACCW) Pump B inadvertently started when power was returned to the pump. The unexpected start of the ACCW pump caused a waterhammer in the system. The failure to provide written instructions appropriate to the circumstances for returning the manual/automatic station to service is a violation of Technical Specification (TS) 6.8.1.a (Section M4.1).

Engineering

- A licensee self-assessment team questioned whether degraded CCW flows through the containment fan coolers indicated the coolers were not in compliance with a TS surveillance requirement. The licensee concluded that there was adequate CCW flow to meet all design basis requirements and that the coolers were in compliance with TS. The issue of compliance with TS Surveillance Requirement 4.6.2.2.b.2

and the adequacy of the 1325 gpm value is unresolved pending review by the NRC's Office of Nuclear Reactor Regulation (NRR) (Section E4.1).

- The engineering self-assessment finding that CCW flows experienced during full-flow conditions might indicate noncompliance with TS Surveillance Requirement 4.6.2.2 for the containment fan coolers was a positive example of questioning attitude. Overall, the self-assessment provided good findings and recommendations (Section E7).

- Rosemount transmitter calibration errors were found to be of minor safety significance. The failure to appropriately calibrate certain Rosemount transmitters is identified as a noncited violation (Section E8).

- The licensee's corrective actions related to the latest Reactor Coolant Pump (RCP) 2B baffle bolt failures were adequate (Section E8.4).

Plant Support

- Allowing Emergency Operating Facility (EOF) diesel generator fuel oil storage tank level to decrease below 50 percent and not providing a user's guide for EOF plant monitoring computer terminals were identified as poor emergency planning practices (Section P2.1).

Report Details

Summary of Plant Status

The plant began this inspection period in mid-loop operations due to RCP 2B seal problems. On July 30, 1996, RCP 2B seal replacement activities were completed and the plant was placed in Mode 4. The plant reentered Mode 5 later that day due to RCP 2B exhibiting similar seal problems that initiated the forced outage, on July 16, to replace the seal package. The seal was replaced and the plant entered Mode 4 on August 3. Mode 1 was entered on August 5 and the plant operated at or near full power throughout the rest of this inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations, control room board walkdowns, and plant tours. All observed activities were conducted professionally and were consistent with safe operation of the facility. Operators displayed good knowledge of plant status and understood the reason why control room annunciators were in alarm.

O4 Operator Knowledge and Performance

O4.1 Failure to Recognize Closed Safety Function of CCW Valves

a. Inspection Scope (71707)

On July 3, 1996, the inspectors were informed that two CCW valves with closed safety functions had been previously declared out of service without closing the valves or entering the appropriate LCO. The inspectors reviewed the background and circumstances associated with the valves being out of service and reviewed the EOS list to determine if there were generic problems in this area. The EOS list is maintained by the licensee to track the status of equipment that has been removed from service. This list is used by the operations crews to ensure that any system affected by the equipment out of service will be declared inoperable and the appropriate TS LCO entered.

b. Observations and Findings

During a review of the EOS list on July 3, the licensee noted that Valves CC-620 (spent fuel pool heat exchanger temperature control valve) and CC-636 (letdown heat exchanger temperature control valve) have a closed safety function per the inservice testing program design basis documentation. Although these valves were on the EOS list, they were in service and operating appropriately to throttle CCW through the respective heat exchangers. The personnel performing the EOS list review noted that if Valves CC-620 and -636 were truly out of service then the

valves should either be closed or the appropriate TS LCO entered. Upon discovery of this problem on July 3, the licensee entered TS 3.7.3 for CCW Train A.

Valve CC-620 was placed on the EOS list on February 6, 1996, for replacement of the manual handwheel stem actuator coupling key. The valve was tagged out, but the work was never performed and the clearance was restored. Although the valve was returned to service, it remained on the EOS list as a result of the limit switch being inoperable. The licensee determined that the limit switch problem did not prevent Valve CC-620 from fulfilling its safety function and removed Valve CC-620 from the EOS list on July 3.

Valve CC-636 was placed in the EOS list on October 9, 1995, in order to perform a modification to the valve in accordance with Design Change 3430. The modification involved replacing the existing butterfly valve with a smaller globe valve. The clearance tags were subsequently removed and the valve was returned to service; however, since a portion of this modification was not completed, the valve remained on the EOS list. The licensee determined that the unfinished portion of the modification did not prevent Valve CC-636 from fulfilling its safety function and removed it from the EOS list on July 3. TS 3.7.3 was exited, on July 3, after Valves CC-620 and -636 were removed from the EOS list.

The inspectors determined that Valves CC-620 and -636 were returned to service, but left on the EOS list, due to the failure of operators to recognize that these valves had a closed safety function. The inspectors independently confirmed that Valves CC-620 and -636 were always capable of performing their closed safety function, and would not have required LCO entry. Therefore, this error was administrative in nature. The inspectors reviewed the other items on the EOS list and determined that there were no other items that would require the licensee to enter a TS LCO action statement. The inspectors noted that the Procedure OP-100-10, "Equipment Out Of service," Revision 7, was in the process of being revised to assist the operators in determining if entry into a TS LCO was appropriate after taking a component out of service.

c. Conclusions

The inspectors determined that Valves CC-620 and -636 were always capable of performing their closed safety function, the valves' condition did not require LCO entry and, therefore, this error was strictly administrative in nature.

O4.2 Addition of Incompatible Oil to CCW Pump

a. Inspection Scope (71707)

The inspectors reviewed the licensee's response to their identification that a nuclear auxiliary operator added incompatible oil to the CCW Pump A outboard bearing.

b. Observations and Findings

On August 23, 1996, while investigating a CCW Pump A outboard bearing oil leak, the licensee noted from the lube oil addition records that a nuclear auxiliary operator added 215 milliliters of SHC 626 (motor bearing oil) instead of DTE-MED (pump bearing oil) to the CCW Pump A outboard bearing on August 19. The licensee determined the cause to be human error in that the individual misread the type of oil to be used from the computerized equipment database.

Maintenance engineering determined that the oils were incompatible in that mixing of the different oils in the pump bearing could result in sludge formation. The licensee's immediate corrective actions included draining, flushing, and placing the correct oil in the bearing; performing a satisfactory inservice test; and counseling the individual. The licensee estimated that there was not enough incompatible oil added to result in bearing failure under any accident scenario. The licensee performed checks to verify that the proper oil had been added to other pumps and motors and identified no additional problems.

Procedure UNT-005-007, "Plant Lubrication Program," Section 5.4.2, stated that only lubricants specified on the information sheet in the Station Information Management System shall be used in lubrication tasks. The failure to ensure the correct oil was added to the CCW Pump A outboard bearing is a violation of TS 6.8.1.a. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the Enforcement Policy. Specifically, the violation was identified by the licensee, was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-382/9611-01).

c. Conclusions

A nuclear auxiliary operator inadvertently read the wrong line item off a computerized database which resulted in the addition of the wrong type of oil to the CCW Pump A outboard bearing. This error was a result of a lack of attention to details and is considered a noncited violation.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (61726, 62707)

The inspectors observed all or portions of the following activities:

- WA01149811: Replace RCP 2B mechanical seal
- WA01149346: Troubleshoot/check calibration of Valve ACC-126B
- WA01147321: VOTES testing of Valve SI-125B in accordance with ME-007-047
- PE-005-004: Control room envelope integrity test
- OP-903-068: Emergency Diesel Generator A monthly surveillance
- STP-115-0154: Special test procedure - CCW system flow balance

b. Observations and Findings

In general, the inspectors found the work performed to be adequate. All work observed was performed with the work authorization (WA) package and/or test procedure present and in active use. Technicians were experienced and knowledgeable of their assigned tasks. When applicable, appropriate radiation control measures were implemented. However, certain maintenance activities appeared to be in violation of NRC requirements or indicate problem areas, as discussed below in Sections M1.2 and M4.1.

M1.2 On-Line Maintenance Risk Assessment for Unscheduled Work

a. Inspection Scope (62707)

The inspectors performed a review of the licensee's process for ensuring that the assessment of equipment removed from service considered the impact on the performance of safety functions.

b. Observations and Findings

During a review of scheduled maintenance activities performed on August 12-14, 1996, the inspectors noted that the licensee removed portions of the low-pressure safety injection (LPSI), high-pressure safety injection (HPSI) and containment spray

(CS) Train B systems from service in conjunction with the performance of switchyard maintenance affecting batteries and a phase comparison relay. Scheduling personnel performed a quantitative analysis of the on-line maintenance using the risk monitor and determined that the activities involving LPSI, HPSI, and CS constituted an acceptable risk (plant safety index of 8.8 and a core damage frequency increase of 2.79E-5). The inspectors noted that the analysis did not include the impact of performing concurrent switchyard maintenance. The risk monitor is a computer tool maintained by safety and engineering analysis and utilized by planning and scheduling to quantitatively determine core damage frequencies for on-line maintenance.

The switchyard battery maintenance involved installing and paralielling a temporary battery, disconnecting the normal battery, performing activities on the normal battery, and reconnecting the normal battery. The maintenance on the phase comparison relay was performed in response to a failure causing one of the two main transformer output breakers to open. The licensee stated that the shift supervisor was aware of the switchyard maintenance activities and that based on his understanding, no significant increase in risk occurred as a result of these activities.

The inspectors noted that switchyard maintenance was not identified on the maintenance schedule, that scheduling was unaware of the switchyard maintenance activities, and that the switchyard maintenance activities had not been factored into the quantitative risk assessment. In response to the inspectors' concern, scheduling factored in the unplanned switchyard work in conjunction with the planned LPSI, HPSI, and CS maintenance and determined that the resulting plant safety index (6.1) and a core damage frequency increase (7.04E-4) were in the "high risk" category. Scheduling stated that they would not have allowed the performance of the maintenance activities associated with LPSI, HPSI, and CS had they been aware of the switchyard maintenance activities.

The inspectors noted that the risk monitor enabled the user to select one of four options for a potential loss of offsite power and that the licensee had not established specific criteria associated with each of the four options. As of August 14, scheduling arbitrarily assigned the worst case loss of offsite power penalty into the risk monitor for any switchyard maintenance activity. The licensee subsequently determined that the performance of the switchyard maintenance did increase the risk of a potential loss of offsite power, but not to the degree in which the scheduling department originally calculated.

The inspectors questioned the licensee to determine if assessments of emergent or unscheduled maintenance activities on the overall effect on performance of safety functions were being performed. Based on discussions with scheduling, maintenance, and operations, the inspectors determined that the licensee routinely did not quantitatively assess the impact of unscheduled maintenance on the performance of safety functions. However, the licensee did perform a limited

qualitative assessment in that the on-line maintenance philosophy only allowed work on selected components within a single safety train and that maintenance on components in separate safety trains or in conjunction with electrical power source maintenance would not be performed.

The inspectors noted that the qualitative assessments, which were frequently performed by the operations shift supervisor, were informal and relied primarily upon the knowledge level of each individual (i.e., no checklist, matrix, or other tool). The inspectors questioned several senior reactor operators to determine what function the switchyard batteries performed. Based on these discussions, the inspectors determined that the knowledge level of operations personnel regarding the function of the switchyard batteries varied widely. Specifically, the range of responses provided to the inspector was from no knowledge of the battery function, to back-up power supply to annunciators, to back-up power supply for protective relays, to a full understanding of the purpose of switchyard batteries.

The inspectors noted that the shift supervisor's assessment of the qualitative risk was not consistent with current on-line maintenance practices in that maintenance on one train of LPSI, HPSI, and CS were performed concurrently with maintenance on an electric power source.

In response to the inspectors' observations, the licensee commenced a review of on-line maintenance controls. Interim corrective actions taken by the licensee included, in part: (1) operations personnel notifying scheduling of unscheduled maintenance activities, (2) providing the operations shift support center with the risk monitor capability, and (3) providing personnel with a consistent methodology to assess the risk of performing switchyard maintenance on a loss of offsite power.

The inspectors questioned the adequacy of the quantitative and qualitative assessments for maintenance activities involving switchyard maintenance in conjunction with LPSI, HPSI, and CS maintenance on August 12-14. The inspectors concluded that the licensee's maintenance scheduling process did not provide provisions for quantitative assessment of risk of unscheduled maintenance activities. This issue will be tracked as an unresolved item pending an evaluation of the licensee's risk assessment process by the NRC maintenance rule review committee (50-382/9611-02).

c. Conclusions

The licensee's maintenance scheduling process did not include provisions for quantitative assessments of risk of unscheduled maintenance. Additionally, the qualitative assessments of maintenance on engineered safety features systems, concurrent with switchyard maintenance, was not implemented by the on-shift operations staff consistent with established practices. The adequacy of the licensee's risk assessments for unscheduled maintenance is an unresolved item.

M4 Maintenance Staff Knowledge and Performance

M4.1 Inadvertent ACCW Pump Start and System Waterhammer

a. Inspection Scope (62707)

The inspectors reviewed the circumstances surrounding an inadvertent automatic start of ACCW Pump B and coincident waterhammer of the ACCW system following maintenance on a CCW temperature control instrument loop.

b. Observations and Findings

On July 29, 1996, ACCW Pump B automatically started when control power was restored to the 4160-volt feeder breaker following maintenance on a CCW temperature control instrument loop. The unexpected start of the ACCW pump caused a waterhammer in the system. The susceptibility of the ACCW system to waterhammer during an ACCW pump start due to void formation in the ACCW system is discussed in NRC Inspection Report 50-382/95-23. Due to the potential to damage ACCW system components from waterhammer, the licensee, by procedure, shuts the pump discharge valve prior to starting the pump. Since this was an inadvertent start, the discharge valve was open, and as a result, the system experienced a waterhammer. The licensee walked down the system and determined that the waterhammer event did not damage the system.

The licensee determined the cause of the inadvertent pump start was the failure to restore the CCW temperature control loop manual/automatic Station CC ITIC7070B setpoint to its original setting following maintenance. Manual/automatic Station CC ITIC7070B provides control signals to Valve ACC-126B (CCW heat exchanger outlet temperature control valve), which in turn throttles CCW flow through the CCW heat exchanger in order to maintain CCW temperature at a predetermined setpoint. An automatic start signal is sent to the respective ACCW pump when the CCW train temperature exceeds the manual/automatic setpoint by more than 10°F. This particular pump start occurred because the manual/automatic station setpoint was set at 50°F (minimum) when it was returned to service, while CCW water temperature was 86°F.

As of the end of this inspection period, the licensee had not completed their root cause assessment for this incident. The inspectors performed an independent assessment and determined that the written instructions included in the WA package for the maintenance on the CCW temperature control loop manual/automatic station were not appropriate to the circumstances. Specifically, WA01149346 did not address restoring the manual/automatic Station CC ITIC7070B setpoint to its original setting following maintenance. The inspectors observed that this activity did not appear to be within the skill of the craft. The

failure to provide written instructions appropriate to the circumstances for CCW temperature control loop maintenance is a violation of TS 6.8.1 (50-382/9611-03).

c. Conclusions

The inspectors concluded that the WA did not provide instructions appropriate to the circumstances for restoring the CCW temperature control loop to service following maintenance.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Inspection Followup Item 50-382/9604-01: Review of the licensee's evaluation on extending replacement schedule for safety-related relays. The licensee extended the replacement schedule for numerous safety-related Agastat relays from 10 to 40 years, despite vendor guidance that the qualified life of the relays was 10 years. The inspectors reviewed the licensee's evaluation for extending the replacement schedule and determined that it followed acceptable practices for determining the life of electric/electronic components; however, it did not address the vendor's rationale for establishing 10 years as the replacement interval. The inspectors were unable to clearly establish the relay vendor's basis for selecting 10 years as the qualified life. However, the inspectors determined that the vendor had not identified an anticipated failure mechanism for these relays that would occur after some specific period of operation in excess of 10 years. The inspector noted that these relays were included in the licensee's maintenance program and are routinely tested. The inspectors noted that, per the licensee's testing and corrective action programs, any relay failures that were the result of age-related phenomenon would require evaluation of the replacement schedule. The inspectors determined that the licensee's extension of the replacement schedule for these relays was acceptable.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E.2.1 Review of Facility and Equipment Conformance to Updated Final Safety Analysis Report (UFSAR) Description

A recent discovery of a licensee operating a facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected. The following inconsistency was noted between the wording of the UFSAR and the plant practices, procedures and/or parameters observed by the inspectors.

- UFSAR Tables 6.2-6, 6.2-21, and 9.2-3 specified CCW flow rates through the containment fan coolers and shutdown cooling heat exchangers that were not consistent with those demonstrated during a special test conducted in October 1995 and August 1996. This issue is discussed in Section E4.1.

E4 Engineering Staff Knowledge and Performance

E4.1 CCW Flow Issues

a. Inspection Scope (37551)

On August 12, 1996, during the ultimate heat sink design basis self-assessment, a question was identified by the self-assessment team regarding the low flow results obtained during a CCW flow balance test performed during the last refueling outage (RFO 7) and the impact on the TS flow requirements. The inspectors reviewed the flow balance test results, CCW startup testing results, the licensee's operability analysis, and the applicable UFSAR and TS sections.

b. Observations and Findings

TS Surveillance Requirement 4.6.2.2.b.2 requires verifying that, following a safety injection actuation signal, CCW flow to each containment fan cooler is greater than or equal to 1325 gpm. The licensee's test to verify flow greater than 1325 gpm is typically conducted with CCW in its normal alignment and, therefore, flows through the containment fan coolers are greater than would be expected during a design basis accident. Tests conducted with CCW in its normal lineup have always resulted in flows through the coolers greater than 1500 gpm.
On August 12, a licensee self-assessment team noted that a special test, conducted during RFO 7, with CCW in its accident lineup, demonstrated flows less than 1325 gpm to each containment fan cooler. The licensee generated Condition Report (CR) 95-0955 to document and evaluate that CCW flow through the containment fan coolers was less than the value specified in the UFSAR, which was 1350 gpm. The flow through the coolers was:

Train A	Containment Fan Cooler A	1300 gpm
	Containment Fan Cooler C	1320 gpm
Train B	Containment Fan Cooler B	1200 gpm
	Containment Fan Cooler D	1290 gpm

CR 95-0955 and its attached engineering analysis concluded that the containment fan coolers remained operable as long as CCW flow was greater than 1100 gpm. However, the CR did not address the applicability of TS Surveillance Requirement 4.6.2.2.b.2.

In response to the self-assessment team's concern, the licensee performed an assessment of the CCW flows through the coolers under accident conditions and determined that the coolers remained operable and were in compliance with the TS operability requirements. The basis for the licensee's position was that the value of 1325 gpm, as specified in the TS, was a design assumption for analysis and not intended as a minimum flow requirement through the containment fan coolers. The licensee stated that the intent of TS Surveillance Requirement 4.6.2.2.b.2 was to verify that the flow control valve for the cooler was fully open and not to verify minimum accident flow rates would be achieved. The inspectors acknowledged the licensee's position and the information was forwarded to NRR for a determination of compliance with the TS.

The inspectors questioned the difference between the UFSAR value of 1350 gpm and the TS value of 1325 gpm. It was determined by engineering that there is a 25 gpm tolerance for error for instruments used to measure CCW flow through the coolers. The licensee stated that this tolerance was apparently applied in the wrong direction to ensure 1350 gpm to each cooler. The inspectors noted that if the instrument uncertainty had been applied appropriately, the TS value would be 1375 gpm.

CR 95-0955 documented degraded CCW through the shutdown cooling heat exchangers (2900 gpm vice UFSAR value of 3000 gpm) in addition to the containment fan coolers. The CR determined the apparent cause of the degraded CCW flows was increased flow resistance through the dry cooling towers as a result of fouling. The CR concluded that as long as flow through the containment fan coolers exceeded 1100 gpm and flow through the shutdown cooling heat exchangers exceeded 2600 gpm, no operability concern existed. Therefore, the plant was started up with the expectation that the dry cooling tower tubes would be cleaned during system outages and the CCW full-flow test would be reperformed during the next refueling outage, scheduled for the spring of 1997. The dry cooling tower cleaning was completed in February 1996.

On August 23, the licensee performed a CCW full-flow test after the dry cooling towers were cleaned. The results of the August 23 test were:

Train A	Containment Fan Cooler A	1340 gpm
	Containment Fan Cooler C	1310 gpm
Train B	Containment Fan Cooler B	1250 gpm
	Containment Fan Cooler D	1370 gpm

These results indicated that at least one cooler in each train has CCW flow greater than the TS required a minimum of 1325 gpm. These flowrates satisfied the requirements for system operability as specified in TS 3.6.2.2.

The issue of compliance with TS Surveillance Requirement 4.6.2.2.b.2 and the 1325 gpm flow requirement specified in the TS is unresolved pending review by NRR (50-382/9611-04).

c. Conclusions

The inspectors acknowledged the licensee's position that they were in compliance with the TS requirements for CCW flow through the containment fan coolers following a safety injection actuation signal. The inspectors determined that the TS value of 1325 gpm through the coolers was the result of applying instrument error in the wrong direction. The issue of compliance with TS Surveillance Requirement 4.6.2.2.b.2 and the adequacy of the 1325 gpm value is unresolved pending review by NRR.

E7 Quality Assurance in Engineering Activities (37551)

From August 12-16, 1996, the licensee performed an engineering self-assessment of the ultimate heat sink (CCW and ACCW systems). The self-assessment team was composed of offsite engineering personnel (both Entergy and contractors) knowledgeable in the subject areas. On August 12, the self-assessment team questioned whether degraded CCW flows through the containment fan coolers during previous full-flow testing indicated the coolers were not in compliance with the TS surveillance requirement. The inspectors considered the self-assessment team's identification of this issue to be a positive example of questioning attitude. The technical aspects of this issue are discussed in Section E4.1. The issue of compliance with TS Surveillance Requirement 4.6.2.2.b.2 is unresolved pending review by NRR.

The inspectors attended the exit meeting for the licensee's ultimate heat sink self-assessment team and noted the team provided valuable insights into the ultimate heat sink deign basis, material condition, and operating practices.

E8 Miscellaneous Engineering Issues (92700, 92903)

E8.1 (Closed) Unresolved Item 50-382/9510-03: Rosemount instrument transmitter calibration errors. On November 2, 1995, while reviewing main steam flow calculations, the licensee discovered that the static pressure correction for some safety- and nonsafety-related Rosemount differential pressure flow and level transmitters was in error. The misapplication of the static pressure correction and subsequent instrument calibrations resulted in safety injection tank (SIT) and steam generator indicated levels being higher than the actual level. Records indicated that the SIT actual levels were below the minimum level allowed by TS 3.5.1 for periods longer than the allowed outage time. The licensee submitted Licensee Event Report (LER) 95-005 to address this issue. The inspectors left this item unresolved until the licensee reviewed all other calculations associated with Rosemount transmitters

to determine the extent of the problem and to review the licensee's corrective actions.

Subsequently, the licensee submitted LER 96-001, which again concerned out-of-specification SIT levels. Due to the previous error corrections associated with LER 95-005, two SIT levels were out-of-specification high, requiring entry into TS 3.0.3 for 14 minutes. The licensee demonstrated that although the SIT levels were outside TS limits, they did not exceed the levels assumed in the safety analysis. Therefore, this event was of minor safety consequence.

The inspectors evaluated the licensee's results of the calculation reviews. The licensee identified a number of other errors in applying correction factors to Rosemount transmitter outputs. These errors did not affect operability of any safety-related Rosemount transmitters and were not safety significant. These items were corrected upon discovery.

The two examples of failure to control SIT levels within the TS limits is a violation of TS 3.5.1. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII of the NRC Enforcement Policy. Specifically, the violation was identified by the licensee, was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-382/9611-05).

E8.2 (Closed) LER 50-382/95-005: Rosemount instrument transmitter errors. This item was addressed in Section E8.1 of this report.

E8.3 (Closed) LER 50-382/96-001: Entering TS 3.0.3 due to safety injection tank levels reading high. This item was addressed in Section E8.1 of this report.

E8.4 (Closed) Inspection Followup Item (IFI) 50-382/9610-02: Review root cause and corrective actions for RCP baffle bolt failures. On July 16, 1996, the plant was shut down when flow through the RCP 2B mechanical seal was lost. The licensee removed the mechanical seal cartridge and found that all six bolts on the rotating baffle, located immediately below the seal cartridge, were broken. The bolts are used to retain the baffle to the RCP shaft. The baffle itself fits over and directs controlled bleed-off flow through the seal heat exchanger to cool the water prior to entering the seal cartridge.

Examination of the mechanical seal found metallic particles within the pressure breakdown device and between the seal faces. The licensee concluded that these metallic particles were wear products that resulted from the baffle bolt failures. The cause of the failure of the baffle bolts was determined to be loss of bolt preload. Loss of preload reduces the clamping force of the joint between the baffle and the RCP shaft and can result in relative motion between the baffle and bolts, which can result in fatigue failure of the bolting. The most likely cause of loss of preload was identified by the licensee as inadequate thread engagement. To prevent future bolt

failures, the baffle bolts were modified to add 1/2 inch to their length. Additionally, proper preload was ensured by measuring the elongation of the baffle bolts during installation.

On July 29-30, following the initial RCP 2B seal failure outage, the licensee again experienced seal failure shortly after placing RCP 2B in service. The licensee determined that the cause of this failure was blockage of the mechanical seal from existing debris. The mechanical seal was again replaced and all potential sources of debris were thoroughly cleaned and inspected. The pump was returned to service on August 3 with no further seal problems experienced to date.

IV. Plant Support

P2 Status of Emergency Planning (EP) Facilities, Equipment, and Resources

P2.1 Tour of EOF

a. Inspection Scope (71750)

On July 29, 1996, the licensee distributed Inter-Office Correspondence W3D3-96-0146, "Waterford 3 Technical Support Center (TSC) Staffing." The correspondence indicated that when access to the control room envelope is limited to a specified number of persons and an emergency occurs requiring staffing and activation of the TSC, responders shall report to the EOF. The correspondence was initiated in response to deficiencies involving leakage of the normal air Intake Valves HVC-101 and -102 (See NRC Inspection Report 50-382/9621).

On August 14, the inspectors performed a walk through and inventory of the EOF to ensure that the licensee would be able to accommodate inclusion of TSC personnel in the EOF.

b. Observations and Findings

The inspector observed that the EOF diesel generator fuel oil storage tank capacity was 500 gallons and that the level was 225 gallons. EP personnel stated that the diesel generator operated for 1 hour every Tuesday which resulted in an approximate 4 gallon decrease in fuel oil storage tank level. EP personnel also stated that a task existed that required the fuel oil storage tank be drained and refilled every year and that the task may not be performed frequently enough to maintain a desirable quantity of fuel oil in the storage tank. Following the inspectors observation, EP personnel initiated a new task to verify the fuel oil storage tank level once per month and to refill the tank if the level decreased to 300 gallons.

The inspector observed that a plant monitoring computer user's guide was not located at each operating station. In October 1995, the licensee replaced the old plant monitoring computer with a new model. Because the user's guide had not been approved by the licensee, EP personnel did not provide user instructions for the new plant monitoring computer stations in the EOF. Following the inspectors' observation, emergency planning provided copies of selected attachments from Procedure OP-004-012, "Plant Computer System," at each operating station. Emergency planning stated that the user's guide would be placed at each operating station once the procedure was revised.

The inspectors observed that the licensee had the 1993 version of NUREG/BR 0150, "Response Technical Manual," instead of the 1996 version. In response to the inspectors' observation, the licensee obtained several copies of the 1996 NUREG/BR 0150 version. EP personnel stated that updated copies of NUREG/BR 0150 were normally provided by the NRC when new revisions were issued and that there had been a delay in the licensee's receipt of the updated revision.

c. Conclusions

The inspectors determined that allowing the EOF fuel oil storage tank level to decrease below 50 percent and not providing a user's guide for the plant monitoring computer were poor emergency planning practices.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 9, 1996. The licensee acknowledged the findings presented.

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

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. G. Azzarello, Manager, Maintenance
C. M. Dugger, General Manager, Plant Operations
J. J. Fisicaro, Director, Nuclear Safety
T. J. Gaudet, Acting Manager, Licensing
D. C. Matheny, Manager, Operations
M. B. Sellman, Vice-President, Operations
D. W. Vinci, Superintendent, System Engineering
A. J. Wrape, Director, Design Engineering

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observations
71707	Plant Operations
71750	Plant Support Activities
92901	Followup - Plant Operations
92902	Followup - Maintenance
92903	Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-382/9611-01	NCV	Failure to follow procedures for oil addition to CCW pump (Section O4.2)
50-382/9611-02	URI	Adequacy of quantitative and qualitative assessments for risk of switchyard work in conjunction with other work (Section M1.2)
50-382/9611-03	VIO	Inadequate written instructions for CCW temperature control loop work (Section M4.1)
50-382/9611-04	URI	Compliance with TS Surveillance Requirement 4.6.2.2.b.2 and adequacy of 1325 gpm value (Section E4.1)
50-382/9611-05	NCV	Rosemount transmitter calibration errors (Section E8.1)

Closed

50-382/9510-03	URI	Rosemount instrument transmitter calibration errors (Section E8.1)
50-382/9604-01	IFI	Review licensee's evaluation on extending replacement schedule for safety-related relays (Section M8.1)
50-382/9611-01	NCV	Failure to follow procedures for oil addition to CCW pump (Section O4.2)
50-382/9611-05	NCV	Rosemount transmitter calibration errors (Section E8)
50-382/9610-02	IFI	Review root cause and corrective actions for RCP baffle bolt failures (Section E8.4)
50-382/95-005	LER	Rosemount instrument transmitter errors (Section E8.2)
50-382/96-001	LER	Entering TS 3.0.3 due to safety injection tank levels reading high (Section E8.3)

LIST OF ACRONYMS USED

ACCW	Auxiliary Component Cooling Water
CCW	Component Cooling Water
CR	Condition Report
CS	Containment Spray
EOF	Emergency Operating Facility
EOS	Equipment Out-of-Service
EP	Emergency Planning
gpm	Gallons Per Minute
HPSI	High Pressure Safety Injection
IFI	Inspection Followup Item
LCO	Limiting Conditions for Operation
LER	Licensee Event Report
LPSI	Low Pressure Safety Injection
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PDR	Public Document Room
RCP	Reactor Coolant Pump
RFO	Refueling Outage
SIT	Safety Injection Tank
TS	Technical Specifications
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
WA	Work Authorization