UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

October 20, 2004

Southern Nuclear Operating Company, Inc.
ATTN: Mr. L. M. Stinson
Vice President - Farley Project
P. O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT 05000348/2004004, 05000364/2004004, AND 07200042/2004001

Dear Mr. Stinson:

On September 25, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Joseph M. Farley Nuclear Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 1, 2004, with Mr. Don Grissette and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents three NRC-identified findings of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these two violations as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, two licensee-identified violations which were determined to be of very low safety significance are listed in this report. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Farley Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Brian R. Bonser, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket Nos. 50-348, 50-364, 72-42
License Nos. NPF-2 and NPF-8

Enclosure: Inspection Report 05000348/2004004,
05000364/2004004, and 07200042/2004001
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-348, 50-364, 72-42
License Nos.:	NPF-2, NPF-8
Report Nos.:	05000348/2004004, 05000364/2004004, and 07200042/2004001
Licensee:	Southern Nuclear Operating Company, Inc. (SNC)
Facility:	Joseph M. Farley Nuclear Plant
Location:	7388 N. State Highway 95 Columbia, AL 36319
Dates:	June 27, 2004 - September 26, 2004
Inspectors:	C. Patterson, Senior Resident Inspector R. Fanner, Resident Inspector G. Hopper, Senior Operations Engineer (Section 1R11) T. Kolb, Operations Engineer (Section 1R11) R. Carrion, Project Engineer, Projects Branch 6 (Section 4OA5.1) B. Crowley, Senior Reactor Inspector (Sections 4OA5.2 and 4OA5.3) M. Scott, Senior Reactor Inspector (Section 4OA5.4) R. Bernhard, Senior Risk Analyst (Section 4OA5.4) K. VanDoorn, Senior Reactor Inspector (Section 4OA5.4) M. Maymi, Reactor Inspector (Section 4OA5.4)
Approved by:	Brian R. Bonser, Chief Reactor Projects Branch 2 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000348/2004, 05000364/2004, 07200042/2004001; 6/27/2004-9/25/2004; Joseph M. Farley Nuclear Plant, Units 1 & 2; Licensed Operator Requalification, Maintenance Risk Assessments and Emergent Work Evaluation.

The report covered a three-month period of inspection by resident inspectors and announced inspections by operations engineers, reactor inspectors, and a senior risk analyst. Two Green non-cited violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July, 2000.

A. NRC-Identified and Self-Revealing Findings

Mitigating System Cornerstone

- Green. A non-cited violation was identified for failure to follow the requirements of licensee procedures FNP-0-AP-16, Conduct of Operations - Operations Group, and FNP-0-TCP-17.5, License Administration, as required by Technical Specification 5.4.1.a. This resulted in the incorrect certification of the reactivation of two SRO licenses.

  This finding is greater than minor because it involves the Mitigating System Cornerstone objective of the reliability and capability of operators to respond to initiating events to prevent undesirable consequences. The NRC considers the reactivation and proficiency of licensed operators an element of the human performance attribute which helps to minimize potential human errors. The finding was evaluated using the Operator Requalification Human Performance significance determination process and was determined to be a finding of very low safety significance because more than 20 percent of the reactivation records reviewed had deficiencies. (Section 1R11)

- Green. A finding was identified where the service water pump acceptance criteria for the quarterly dual pump flow testing were not set conservatively enough to identify degradation of a single pump that would have required action in accordance with the ASME Code. The enforcement aspects of this finding are unresolved pending review of the regulatory requirements.

  This finding affected the Mitigating System Cornerstone. This finding was greater than minor because if left uncorrected the finding could have become a more significant safety concern if pump degradation in excess of the code requirements had occurred, and had gone unevaluated or uncorrected. This finding is of very low safety significance because, for the past cases where the criteria would have been exceeded, the licensee has determined that no loss of system function was involved, and the nature of the degradation was not a sudden shift in pump performance that would have indicated a generic pump problem. Since there was no loss of system function, this finding was of very low safety significance. (Section 4OA5.4)

Initiating Event Cornerstone

- Green. A self-revealing non-cited violation was identified for failure to follow procedure for control of switchyard activities in accordance with TS 5.4.1.a. which resulted in a backhoe striking and damaging a 500KV bus support in the high voltage switchyard.

  This finding is more than minor because it adversely affected the protection against external factors attribute of the Initiating Event cornerstone for switchyard activities. The licensee considers activities in the high voltage switchyard as risk significant. The damage to the support occurred due to not following the procedural requirements in place to reduce the risk for work in the high voltage switchyard. This finding was determined to be of very low safety significance because it did not contribute to the likelihood of a reactor trip or the likelihood that mitigation equipment or functions would not be available. This finding involved the cross-cutting aspect of Human Performance. (Section 1R13)

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full rated thermal power (RTP) during this inspection period.

Unit 2 operated at or near full RTP until September 17 when power was reduced to 30 percent RTP to repair the main generator voltage regulator. The unit returned to full RTP on September 18 and operated at full RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Impending Adverse Conditions Review. The inspectors evaluated implementation of the adverse weather preparation procedures and compensatory measures for the four following adverse weather events. The inspectors reviewed procedures FNP-0-AOP-21.0, Severe Weather, and FNP-0-EIP-9.0, Emergency Classifications and Actions, to verify that applicable portions of the procedure were being performed for the expected high winds and rain. The inspectors conducted plant tours to verify that the licensee's list of loose material adequately identified items to be secured during high winds.

- Tropical Storm Bonnie
- Hurricane Frances
- Hurricane Ivan
- Hurricane Jeanne

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walk-downs. The inspectors performed partial walk-downs of the following three systems to verify they were properly aligned when redundant systems or trains were out of service. The walk-downs were performed using the criteria in licensee procedures FNP-0-AP-16, Conduct of Operations - Operations Group, and FNP-0-SOP-0, General Instructions to Operations Personnel. The walk-downs included reviewing the Updated Final Safety Analysis Report (UFSAR), plant procedures and drawings listed in the attachment, and checks of control room and plant valves, switches, components, electrical power line-ups, support equipment, and instrumentation.

- 1-2A, 1B, 1C, 2C Emergency Diesel Generators (EDGs) during 2B EDG maintenance
- 1A, 1C, 1D, 1E Service Water (SW) pumps during 1B breaker swap
- Unit 1 Component Cooling Water (CCW) system during 1C CCW Heat Exchanger maintenance

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Tours. The inspectors conducted a walk-down of the nine fire areas listed below to verify the licensee's control of transient combustibles, the operational readiness of the fire suppression system, and the material condition and status of fire dampers, doors, and barriers. To verify implementation, the inspectors also checked that compensatory measures, including fire watches, were in place for degraded fire barriers. The requirements were described in licensee procedures FNP-0-AP-36, Fire Surveillance and Inspection; FNP-0-AP-38, Use of Open Flame; FNP-0-AP-39, Fire Patrols and Watches; and the associated Fire Zone Data sheets. In addition, the inspectors reviewed procedure changes to FNP-0-ACP-35.2, Flammable Material, Combustible Material, and Chemical Product Control, that established interim compensatory measures to limit transient combustible materials in areas having large penetration seals with less than a three-hour rating.

- Unit 2 Non-Rad 121' Elevation, Fire Area 20
- Unit 1 100' Hallway adjacent to Centrifugal Charging Pump (CCP) room, Fire Area 4
- Unit 2 B Train 4160 Switchgear Room, Fire Area 21
- EDG building common area, Fire Area 56
- Unit 1 B Train 4160 Switchgear Room, Fire Area 21
- Unit 2 A Train 4160 Switchgear Room, Fire Area 41
- Unit 1 A Train 4160 Switchgear Room, Fire Area 41
- Unit 2 Cable spreading Room, Fire Area 40
- Unit 1 Cable spreading Room, Fire Area 40

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

External Flooding Review. The inspectors reviewed plant design features that protect against external flooding and related licensee procedures to verify the licensee's flood mitigation plans and equipment were consistent with the design requirements and risk

analysis assumptions. The inspectors reviewed flood protection barriers which included the service water spillway area and exterior wall material conditions. In addition, an inspection of underground valve boxes and cable pull boxes was conducted. The inspectors also reviewed condition reports and maintenance work orders to verify the licensee was identifying and resolving problems. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

Quarterly Resident Review. On August 24, the inspectors observed portions of the licensed operator training and testing program to verify implementation of procedures FNP-0-AP-45, Farley Nuclear Plant Training Program; FNP-0-TCP-17.6, Simulator Training Evaluation Documentation; and FNP-0-TCP-17.3, Licensed Operator Continuing Training Program Administration. The inspectors observed scenarios conducted in the licensee's simulator for a failure of a pressure instrument, loss of offsite power due to a degraded grid, safety injection occurring on Unit 2 , and failure of an emergency diesel generator. The inspectors observed high risk operator actions, overall performance, self-critiques, training feedback, and management oversight to verify operator performance was evaluated against the performance standards of the licensee's scenario. In addition, the inspectors observed implementation of the applicable emergency operating procedures listed in the attachment to verify that licensee expectations in procedures FNP-0-AP-16 and FNP-0-TCP-17.6 were met.

Biennial Requalification Program Review. The inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of simulator operating tests associated with the licensee's operator requalification program to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR 55, Operators' Licenses. The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, Operator Licensing Examination Standards for Power Reactors. The inspectors also reviewed and evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3.5-1985. The inspectors observed three operator crews during the performance of the operating tests. Documentation reviewed included written examinations, Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, licensed operator qualification records, watchstanding and medical records, simulator modification request records and performance test records, the feedback process, and remediation plans. The records were inspected against the criteria listed in inspection procedure 71111.11. Documents reviewed are listed in the Attachment.

b. Findings

Introduction. A Green non-cited violation (NCV) was identified for failure to follow the requirements of licensee procedures FNP-0-AP-16, Conduct of Operations - Operations Group, and FNP-0-TCP-17.5, License Administration, as required by Technical Specification 5.4.1.a. This resulted in the incorrect certification of the reactivation of two senior reactor operator (SRO) licenses.

Description. The inspectors reviewed badge access transaction reports for the days on which the operators certified that they had completed watches under instruction. The operators documented this on Appendix 1 of procedure FNP-0-TCP-17.5, License Administration. The inspectors reviewed five operator's records and found that one SRO stood five SRO watches under instruction in the Shift Supervisor position with only 14.5 hours out of 40 in the control room area. This SRO was standing watch under the direction of the Shift Supervisor who spends the majority of his time in the control room supervising the unit operation. The inspectors found one other SRO's documentation that contained several inconsistencies. This SRO stood five watches under instruction in the Operations Shift Manager (SM) position with only 7.2 hours in the control room area. In addition, only approximately 25 hours of the required 40 hours were within the protected area. While the SM is not required to remain in the control room area, the reactivating SRO was standing watch under the direction of the SM and should have been performing normal shift functions with the actual SM. This SRO did not accompany the SM into the protected area during the afternoon of July 23, 2004 as evidenced by the badge access transaction reports. In addition, the SM who signed the form verifying completion of his watch on July 13, 2004 was not the person with whom he actually stood watch. The form also showed a completed watch on July 22, 2004 when it actually was performed on July 23, 2004.

Analysis. This finding is greater than minor because it involves the Mitigating System Cornerstone objective of the reliability and capability of operators to respond to initiating events to prevent undesirable consequences. The NRC considers the reactivation and proficiency of licensed operators an element of the human performance attribute which helps to minimize potential human errors. The finding was evaluated using the Operator Requalification Human Performance significance determination process and was determined to be a finding of very low safety significance because more than 20 percent of the reactivation records reviewed had deficiencies.

Enforcement. Technical Specification (TS) 5.4.1 requires written procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Procedure FNP-0-AP-16 is a procedure required by TS 5.4.1. Procedure FNP-0-AP-16, section 4.7.1, implements procedure FNP-0-TCP-17.5 to reactivate an inactive license. Procedure FNP-0-TCP-17.5 states, in part, "Before resumption of functions authorized by a license, an authorized representative of the facility shall certify that the licensee has completed a minimum of 40 hours of shift functions under the direction of a senior operator in the position to which the individual will be assigned." Contrary to the above, on March 10, 2004, and July 23, 2004, the licensee improperly certified that the

requirements for reactivation of an SRO's license had been met, in that, two SROs had not properly completed their 40 hours of reactivation watches under the direction of the actual watchstander in the position to which they were to be assigned. Because the failure to reactivate an inactive license in accordance with procedure FNP-0-AP-16 is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report (CR) 2004101959, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000348, 364/2004004-01, Failure to Properly Reactivate Senior Reactor Operator License.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following two issues to verify implementation of licensee procedures FNP-0-M-87, Maintenance Rule Scoping Manual; FNP-0-SYP-19, Maintenance Rule Performance Criteria; and FNP-0-M-89, FNP Maintenance Rule Site Implementation Manual; and compliance with 10 CFR 50.65. The inspectors assessed the licensee's evaluation of appropriate work practices, common cause failures, functional failures, maintenance preventable functional failures, repetitive failures, availability and reliability monitoring, trending and condition monitoring, and system specialist involvement. The inspectors also interviewed maintenance personnel, system specialists, the maintenance rule coordinator, and operations personnel to assess their knowledge of the program.

- CR 2004101522, Functional failure for 1C SW pump
- CR 2004101792, Safety Parameter Display System less than 99 percent availability

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors assessed the licensee's planning and control for the following six planned licensee activities to verify the requirements in licensee procedures FNP-0-ACP-52.1, Guidelines for Scheduling of On-Line Maintenance; FNP-0-AP-52, Equipment Status Control and Maintenance Authorization; and FNP-0-AP-16, Conduct of Operations - Operations Group; and the Maintenance Rule (MR) risk assessment guidance in 10CFR50.65 a(4) were met.

- CR 2004002293 to follow work on 2B CCP check valve issues
- Work Order 1040423101 to address CR 2004101522; work on breaker for 1C SW pump, DF-05 after failure
- 2B EDG planned 6 month maintenance outage

- Work Order 1040297701 for repair of pressurizer level transmitter, LT-459 after spiking low intermittently
- Testing of the Unit 2 voltage regulator after Voltage-Amperes Reactive (VAR) fluctuation
- CR 2004002235, Damage to 500 KV Bus structure

b. Findings

Introduction. A Green self-revealing NCV was identified for failure to follow procedure for control of switchyard activities in accordance with TS 5.4.1.a. resulting in a backhoe striking and damaging a 500KV bus support in the high voltage switchyard.

Description. On May 21, 2004, a large hole was found in a 500KV phase bus support in the high voltage switchyard. The licensee's review identified that personnel, operating a backhoe without a required spotter, had struck a support structure for one of three phases of the 500KV line between the number two auto bank transformer and disconnect number 1233. The activities being conducted by the backhoe had been authorized by the control room. The licensee assessed the damage to the support and concluded it did not pose a structural integrity problem. However, if the support had failed causing a fault in the 500KV line, a loss of one of the two auto bank transformers could have occurred. This loss would not have caused a loss of offsite power or loss of power to any safety-related equipment.

Procedure FNP-0-ACP4.0, Switchyard Control, establishes the controls to ensure activities conducted in the switchyard are conducted in a safe and controlled manner. The procedure establishes access authorization for people, vehicles, and equipment, and identifies control area boundaries and restricted area boundaries. Spotters are required for vehicle movement in the restricted area.

Analysis. This finding is more than minor because it adversely affected the protection against external factors attribute of the Initiating Event cornerstone for switchyard activities. The licensee considers activities in the high voltage switchyard as risk significant. The damage to the support occurred due to not following the procedural requirements in place to reduce the risk for work in the high voltage switchyard. This finding was determined to be of very low safety significance because it did not contribute to the likelihood of a reactor trip or the likelihood that mitigation equipment or functions would not be available. This finding involved the cross-cutting aspect of Human Performance.

Enforcement. TS 5.4.1.a requires written procedures be established, implemented, and maintained covering the activities recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A. RG 1.33, Appendix A, Item 9, requires procedures for performing maintenance that can affect the performance of safety-related equipment. Contrary to the above, procedure FNP-0-ACP-4.0, Switchyard Control, was not followed in that on or about May 14, 2004, a backhoe was operated in the high voltage switchyard without a required spotter which resulted in damaging a 500KV phase bus support. Because this failure to follow procedure is of very low safety significance and has been

entered in the licensee's corrective action program (CR 2004002235), this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000348,364/2004004-02, Backhoe Struck Support in High Voltage Switchyard.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five operability evaluations to verify they met the requirements of licensee procedures FNP-0-AP-16, and FNP-0-ACP-9.2, Operability Determination (OD), for technical adequacy, consideration of degraded conditions, and identification of compensatory measures. The inspectors reviewed the evaluations against the design bases, as stated in the UFSAR and Functional System Descriptions, to verify system operability was not affected.

- OD 04-06, CCP operability due to leak-by of check valve
- OD 04-07, 2E SW pump through wall leak on discharge expansion joint
- CR 2004102349, 2A SW pump high vibration
- OD 04-08, Number 1 Diesel Driven Fire Pump redundant starting circuit failure
- CR 20041001522, 1C SW pump breaker failure

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the criteria contained in licensee procedures FNP-0-ACP-52.1, Guidelines for Scheduling of On-Line Maintenance, and FNP-0-AP-52, Equipment Status Control and Maintenance Authorization, to verify post-maintenance test procedures and test activities for the following five systems/components were adequate to verify system operability and functional capability.

- 2C EDG 6-month maintenance outage
- 1B Containment Spray maintenance outage
- 2B Spent Fuel Pool (SFP) maintenance outage
- Unit 1 Turbine Driven Auxiliary Feedwater Pump (TDAFW) after maintenance outage
- 2B EDG 6-month maintenance outage

b. Findings

No findings of significance were identified

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the following activity related to the Unit 1 fall refueling outage for conformance to licensee procedures FNP-0-UOP-4.0, General Outage Operations Guideline, and FNP-1-UOP-4.1, Controlling Procedure for Refueling. The inspectors reviewed the Outage Risk Assessment prior to the start of the outage to verify that work activities which resulted in increased risk were properly assessed.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed surveillance test procedures and either witnessed the test or reviewed test records for the following seven surveillance tests to determine if the test adequately demonstrated equipment operability and met the TS requirements. The inspectors reviewed the activities to assess for preconditioning of equipment, procedure adherence, and valve alignment following completion of the surveillance. The inspectors reviewed licensee procedures FNP-0-AP-24, Test Control; FNP-0-M-050, Master List of Surveillance Requirements; and FNP-0-AP-16, and attended selected briefings to determine if procedure requirements were met.

Surveillance Tests
- FNP-1-STP-24.20B, Service Water Pumps “B” Train Shutdown Capability Test
- FNP-1-STP-1.0, Operations Daily and Shift Surveillance Requirements Modes 1,2,3,4
- FNP-1-STP-16.12A, Containment Spray Pumps Automatic Starting Test
- FNP-1-STP-22.1, 1A Auxiliary Feedwater Pump Quarterly Test

In-Service Tests
- FNP-1-STP-4.1, Charging Pump 1C Inservice Test
- FNP-2-STP-4.1, Charging Pump 2A Quarterly Inservice Test

RCS Leak Detection Systems
- FNP-1-STP-9.0, RCS , Leakage Test

b. Findings

No findings of significance were identified

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors evaluated emergency plan drills on July 14 and July 28 to verify the licensee was properly classifying the event, making required notifications, making protective action recommendations, and conducting self-assessments. The drills included activation of all emergency response facilities. The inspectors used procedure FNP-0-EIP-15.0, Emergency Drills, as the inspection criteria. The inspectors were in the Technical Support Center (TSC) on July 14 and in the control room (simulation area) and the TSC on July 28. The inspectors reviewed FNP-0-EIP-9.0, Emergency Classification and Actions, to validate the classification of the event made by the licensee. The inspectors subsequently observed and reviewed the notifications made, communications between emergency response team members, team work of licensee personnel, licensee identification of weaknesses and deficiencies, corrective action documentation, and overall performance.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled the licensee data submittal for the performance indicators (PIs) listed below to verify the accuracy of the data reported. The PI definitions and the guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 2, and licensee procedure FNP-0-AP-54, Preparation and Review of NRC Performance Indicator Data, were used to verify procedure and reporting requirements were met.

Mitigating Systems Cornerstone
- Unit 1 and Unit 2 Residual Heat Removal (RHR) safety system unavailability
- Unit 1 and Unit 2 High Head Safety Injection (HHSI) safety system unavailability

The inspectors reviewed a selection of licensee event reports (LERs), portions of Unit 1 and Unit 2 operator log entries, daily morning reports (including the CR descriptions), the monthly operating reports, and PI data sheets to determine whether the licensee adequately identified unavailable hours for the period from April 2003 through March 2004. The inspectors also reviewed this data to verify the accuracy of the number of critical hours reported and the licensee's basis for crediting the data. In addition, the

inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

1. Daily Condition Report Reviews

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by either attending daily screening meetings that briefly discussed major CRs or accessing the licensee's computerized corrective action database and reviewing each CR that was initiated.

2. Annual Sample Review.

a. Inspection Scope

The inspectors reviewed the problem identified in CR 2004102220 for past occurrences of similar issues. The 2B EDG was declared inoperable when a fuse failed in the control circuit while changing a bulb on a diesel running light on the local control panel. The EDG operation became erratic and was secured. The inspectors reviewed IN 94-68, Safety-Related Equipment Failures Caused By Faulted Indicating Lamps.

b. Findings and Observations

No findings of significance were identified. The inspector determined from discussions with plant operators that this problem has occurred in the past with the EDGs, main steam atmospheric reliefs, and TDAFW pump. Other examples of fuse failures on the EDGs were as follows:

- 2B EDG, CR 2002002081
- 2B EDG, CR 2000004743
- 1C EDG, CR 2000005398

The inspectors found that the licensee's response to IN 94-68 as documented in REA-95-0744 was narrow in scope and specifically did not address the EDGs. Collectively, the problems occurring after the IN was issued reveal many missed opportunities to eliminate this problem. The actions taken focused on correcting the specific problem and bulb replacement. A design change to eliminate the fuses failure was not made.

4OA3 Event Follow-up

1. (Closed) Licensee Event Report 05000364/2004-001-00: Technical Specification 3.7.8 Violation Due to Operation with One Train of Service Water Inoperable

On March 30, 2004, the 2E Service Water Pump failed to start on a safety injection test signal during the required 18-month surveillance. The cause was determined to be due to a splice that failed because of incorrect assembly of the splice insulation in a cable pull box. Lack of proper sealing had caused the splice to corrode. It is likely that this condition existed for greater than the TS allowed outage time of 72 hours. This condition was reviewed using the signifiance determination process and was determined to be of very low safety significance because the other train of SW was available, only one of two SW pumps was affected, and the affected pump could be started manually from the control room as directed by emergency operating procedures. This condition was documented in the licensee's CAP as CR 2004001493. The enforcement aspects of this violation are discussed in Section 4OA7.

4OA4 Cross Cutting Aspects of Findings

Section 1R13 describes a finding for failure to follow procedure for control of switchyard activities. The cause of this finding involved the cross cutting aspect of Human Performance.

4OA5 Other Activities

1. Review of Cask Storage Pad No. 3 Construction and Other Modifications For Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope

The licensee plans to use the Holtec vertical cask system under a general license in accordance with the Holtec Certificate of Compliance # 72-1014. The inspectors reviewed the Southern Nuclear Operating Company's submittal to the NRC dated March 27, 2000, with respect to its intention to apply the previously approved 10 CFR 50, Appendix B, Quality Assurance (QA) Program to activities at the Farley ISFSI in order to determine the adequacy and effectiveness of recent and on-going ISFSI activities at Farley. The inspectors reviewed construction and modification activities of the first section of Cask Storage Pad No. 3, Auxiliary Building modifications, and Spent Fuel Pool modifications associated with ISFSI. Design parameters for the construction of the pad provided in the Holtec Final Safety Analysis Report (FSAR) were reviewed against the construction specifications for the pad and the reactor's Part 50 FSAR. The construction specifications and the soil testing results for the backfill under the pad were also reviewed to verify the stability of the pad area. Photographs of the excavation prior to the placement of the material were also reviewed. The inspectors compared results to the project construction specification; the design drawings; and standards, codes, and criteria of the American Concrete Institute (ACI) and the American Society for Testing and Materials (ASTM).

The inspectors examined the rebar installation and observed the concrete placement for the first section of Cask Storage Pad No. 3. The inspectors reviewed construction drawings to verify that the rebar size, grade, spacing, splice length, supporting chairs, and concrete coverage protection on the top, side, and bottom was according to DCP 02-9809-C009. The inspectors evaluated concrete formwork installation including depth, straightness, edge angle installation, and horizontal bracing. The inspectors reviewed batch tickets for the materials and observed concrete placement, vibration, and finish. The inspectors observed slump tests, air content tests, temperature measurements, and cylinder samples collected for compression tests.

The inspectors also reviewed the cask crane, spent fuel pool crane, and crawler and walked down the cask transport route and a concrete overpack fabrication pad to verify completion. In addition, the inspectors walked down the spent fuel pool area to review portions of the work platform already installed in the spent fuel pool pit area for the preparation of cask loading operations.

The inspectors reviewed nonconformance reports, including one which involved concrete being out of specification during the third Haul Route Section pour, as specified in SS-111626 for air and slump. The inspectors reviewed resolution of the issue which was completed on July 25, 2004, when the cylinder compression break tests satisfied the acceptance criteria. The inspectors also reviewed Concrete Test Reports from February 25 to July 19, 2004, and Sand Cone Density Test Field Worksheets from February 19 to July 26, 2004, to verify that adequate QA verification was completed in compliance with the applicable requirements of 10 CFR Part 72, Subpart G.

The inspectors visited the concrete batch plant, Couch Ready Mix USA Plant No. 614, in Dothan, Alabama, to determine if the computer-controlled plant met all requirements and was providing the specified concrete to the site. The inspectors also reviewed records documenting inspection of the concrete batch plant and the concrete truck mixers. Calibration certificates for test equipment were also reviewed to determine if they were in accordance with specifications, as required by the National Institute of Standards and Technology (NIST).

During the actual concrete placement, the inspectors reviewed the concrete unrestricted vertical drop to the point of placement to determine if required ACI Standard 304, Guide for Measuring, Mixing, Transporting and Placing Concrete, was met. The inspectors reviewed the licensee's resolution of concerns over potential voids in the region inside the edge angle steel due to tight clearances between the angle and the rebar, which was addressed by thorough compaction within the congested angle regions. The inspectors also reviewed ASTM C94/C94M-04, Standard Specifications for Ready Mixed Concrete, to assure that these standards were met for the manufacture and delivery of high quality ready-mixed concrete to the licensee. The inspectors reviewed the licensee's resolution of the first and third concrete samples taken at the site which did not meet the slump acceptance criteria (between five and seven inches). The inspectors reviewed cylinder break strength results obtained at seven and twenty-eight days by licensee-generated Non-Conformance Report 2004-009 to resolve this issue. In addition, the inspectors reviewed activities to ensure that concrete testing was performed by qualified personnel

and that concrete placement activities were continuously monitored by licensee and quality assurance personnel.

b. Findings

No findings of significance were identified.

2. Reactor Pressure Vessel Head (RPVH) Replacement

a. Inspection Scope

The inspectors observed/reviewed the activities detailed below for the replacement RPVH to verify compliance with applicable Codes (ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda and Section III, 1998 Edition with 2000 Addenda) as defined in Design Change Package (DCP) 03-1-9914-0-001, Replacement Reactor Vessel Closure Head Assembly Upgrade Package.

RPVH and Control Rod Drive Mechanism (CRDM) Housing Fabrication Records and Receiving Inspection Activities

The inspectors reviewed the following RPVH fabricator (Mitsubish Heavy Industries) records:

- Production Welding Records for CRDM latch housing to rod travel housing full penetration Welds WC-H009-1A thru 5A, 11A thru 15A, 26A thru 30A , and 47A thru 51A
- Production Welding Records for CRDM head adapter to latch housing full penetration Welds WC-H202-1A thru 6A, 19A thru 24A, and 43A thru 48A
- Production Welding Records for head penetration J-groove Butter Welds WO-A107-6A thru 10A, 16A thru 20A, 31A thru 35A, and 51A thru 54A
- Production Welding Records for head penetration J-groove Welds WC-A109-6A thru 10A, 21A thru 25A, and 51A thru 54A
- Production Welding Records for head clad Welds WO-A103-1 thru 4A
- Welder qualification records for all of the above listed welds
- Nondestructive examination (NDE) reports (liquid penetrant (PT) and ultrasonic (UT), as applicable), including personnel and examination materials certifications for all of the above listed welds
- Certified Material Test Reports (CMTRs) for the welding materials used for all of the above listed welds
- Radiographic (RT) film, reader sheets, and NDE personnel qualification records for CRDM housing Welds WC-H009-14A, 16A, 19A, 20A, 23A, 24A, 27A, 28A, 43A, 44A, 45A, WC-H202-47A, 48A, 50A, 52A, and 54A
- Intermediate and final post weld heat treatment (PWHT) records, including time-temperature strip charts for the RPVH
- CMTRs for the replacement RPVH and the CRDM head adapter flanges

The inspectors reviewed the planned receiving inspection activities for the replacement RPVH as detailed in licensee procedure SCM-RI-004, Receiving Instruction for Replacement of Reactor Vessel Closure Head (RRVCH), Revision 0

Preservice Inspection (PSI) and Baseline Inspections

The inspectors reviewed the Replacement Reactor Vessel Head Inspection Final Report WDI-PJF-1302842-FSR-001, which documented the ASME Section XI PSI, and baseline inspections performed to provide baseline conditions for future inspections in accordance with NRC Order EA-03-09.

Relative to ASME Section XI PSI of the replacement RPVH, the inspectors reviewed the competed NDE records (UT and PT) of : (1) 16 peripheral Category BO CRDM latch housing to rod travel housing welds, (2) 16 peripheral Category BO CRDM latch housing to head adapter welds, (3) four peripheral Category BO instrumentation port head adapter welds and (4) two peripheral Category BO RVLIS head adapter welds. In addition, NDE personnel certification records, NDE materials certification records, and a sample of NDE equipment certification records for these welds were reviewed.

The baseline inspections consisted of: (1) automated inside diameter UT and eddy current (ET) examination of 48 CRDM penetrations, four instrument penetrations, 2 RVLIS penetrations, and the vent line (2) outside diameter and J-groove weld eddy current (ET) examination of 48 CRDM penetrations, four instrument penetrations, and two RVLIS penetrations, (3) under head visual (VT) examination of all J-groove welds and penetration outside diameters, (4) top of head bare metal VT examination of all penetrations, and (5) under head PT inspection of all penetration to head J-groove welds using “PT white” acceptance criteria. For these inspections, the inspectors reviewed the summary report of results, the PT records for the J-groove welds, a sample of the automated UT results, and a sample of NDE examiner certification results.

b. Findings

No findings of significance were identified.

3. Review of 10 CFR 50.59 Evaluations for the Replacement RPVH

a. Inspection Scope

The inspectors reviewed DCP 03-1-9914-0-001, Replacement Reactor Vessel Closure Head Assembly Upgrade Package, including the associated 10 CFR 50.59, evaluation to verify that changes between the original RPVH and the replacement RPVH, and modifications resulting from installation of the replacement RPVH were properly evaluated in accordance with 10 CFR 50.59.

b. Findings

No findings of significance were identified.

4. Temporary Instruction (TI) 2515/159: Review of Service Water System Problems Affecting Safety Related Equipment

A. Review of Generic Letter 89-13

a. Inspection Scope

Utilizing TI 159, the inspectors reviewed the licensee's implementation of the five recommendations of Generic Letter (GL) 89-13, Service Water System Problems Affecting Safety-Related Equipment. Inspectors were to verify that the actions implemented in response to NRC GL 89-13 are programmatically controlled and have been maintained effective. NRC GL 89-13 and the licensee's responses to the GL were used as the technical guidance for this inspection. On a sampling basis, the inspectors reviewed the following portions of the licensee's service water program:

- The implementation of an ongoing program of surveillance and control techniques to detect and reduce the incidence of flow blockage problems as a result of biofouling.

- The test program for the heat transfer capability for those safety-related heat exchangers that are cooled by the service water system (SWS) (the SWS side of CCW, the safety-related room coolers, and the EDG heat exchangers).

- The routine inspection and maintenance program for open-cycle SWS piping and components that ensure corrosion, erosion, protective coating failure, silting, and biofouling will not degrade the performance of the safety-related systems supplied by service water below their design requirements.

- The program that provides assurance that the SWS will perform its intended function in accordance with the design basis for the plant.

- The maintenance practices, operating and emergency procedures, and training used to ensure that safety-related equipment cooled by the SWS will function as intended and that the operators of this equipment will perform effectively.

- The program that insures that operating experience that relates to GL 89-13 is incorporated into the licensee procedures and training through an assessment of applicability, distribution of information to appropriate staff, and the performance of technical reviews.

The inspectors reviewed the licensee's operational experience (OE) program, corrective action program, test and inspection data, work order information, trend information, visual inspection records, tubesheet plugging records, modification installation records, operator training guidance, flow diagrams, coat repair records, and operational procedures. The inspectors discussed plant specific problems with the licensee to determine the implementation of the generic letter recommendations.

b. Findings

Introduction. A Green finding was identified where the service water pump acceptance criteria for the quarterly dual pump flow testing were not set conservatively enough to identify degradation of a single pump that would have required action in accordance with the ASME Code.

Description. Review of the service water ASME pump testing concluded that the pump acceptance criteria for the quarterly dual pump flow testing were not set conservatively enough to prevent a single pump from exceeding its ASME allowed degradation before action was taken. The same numerical percentage of the total two pump flow baseline was used for the dual pump flow tests criteria as would be used for the percent degradation allowed for single pump flow test criteria. Using the percentage of total two pump flow, instead of calculating a flow rate (gallons per minute) degradation of the most limiting single pump flow for the amount of degradation allowed during the two pump flow tests, allows for a higher flow rate degradation before a limit is exceeded. This could potentially result in allowing a single pump to accumulate twice the degradation allowed by the code before action is taken. After the finding was identified, the utility performed a review of current and past calculated single pump flow data. The licensee evaluated the data to determine if any of the pumps had degraded far enough that any actions taken in response to past degradation in the dual pump flows would have changed if the more restrictive single pump criteria had been considered. The utility concluded that no change in response would have been required.

Analysis. This finding affected the Mitigating System Cornerstone. This finding was greater than minor because if left uncorrected the finding could have become a more significant safety concern if pump degradation in excess of the code requirements had occurred, and had gone unevaluated or uncorrected. This finding is of very low safety significance because, for the past cases where the criteria would have been exceeded, the licensee has determined that no loss of system function was involved, and the nature of the degradation was not a sudden shift in pump performance that would have indicated a generic pump problem. Since there was no loss of system function, this finding was of very low safety significance.

Enforcement. 10CFR50.55a requires pump testing to be performed in accordance with the ASME Code. The 1990 ASME O&M Code, Subsection ISTB, requires that vertical line shaft centrifugal pumps shall be in the alert range when a single pump's flow degrades to .93 to <.95Q, and shall be in the required action range for values <.93Q or >1.1Q, where Q represents the single pump’s reference flow value. The licensee established values of degradation for dual pump testing that would have allowed a single pump to degrade to twice its allowed value before entering the action or alert levels. However, the licensee provided information that it had been granted relief from the single pump testing requirements. It was not clear to the inspectors if the degradation values for single pumps were still required. This item remains unresolved pending review of the basis for relief and determination of the regulatory requirement for degradation. This finding is identified as Unresolved Item (URI) 05000348,364/2004004-03, Nonconservative Acceptance Criteria Used For Service Water Pump Testing.

B. TI inspection Findings on Program Effectiveness and Maintenance

1. Review of Licensee actions that are being implemented for the five recommended actions of Generic Letter 89-13.

   a. The inspectors reviewed the programs for surveillance and control of flow blockage problems as a result of biofouling.

      Review of two years of operational history revealed no degraded system performance with respect to plugging or flow blockage. Operability determinations, condition reports, LERs, system health reports, and work orders reviewed related mostly to piping pin hole leaks, component wear, and/or degraded material conditions. Corrective actions taken to address these issues included replaced piping and/or components, increased preventive maintenance, and review of the extent of condition.

      The SWS pond, which serves as the ultimate heat sink, is at an elevation above plant level. Its water level is maintained by the river water system. The interior of the SWS intake and pumping structure at the pond (between the traveling screens and the pump pits or bays) is periodically cleaned. Visual inspection and cleaning of the intake structure are done on a three-year frequency per the commitments of the licensee's response to the GL 89-13. The licensee's commitment letter (January 23, 1990) indicated that the frequency would be initially on a two-year basis and adjusted as appropriate. Based on this review, the frequency appears appropriate.

      The use of biocides and flushing of infrequently used lines is recognized in the licensee's program document and implemented via standing procedures. The licensee's commitment letter indicated flushing or inspection and flushing would be utilized. The letter indicated that chlorination or an equivalent treatment would not be necessary. Infrequently used SWS lines [e.g., emergency recirculation lines (discharge of the plant back to the pond), and suction source to the turbine driven auxiliary feedwater pumps] are flushed. The flushing has been effective in mitigating any potential clogging. However, the infrequently used lines may or may not receive peak chlorination depending on the biocide schedule. The licensee does not coordinate flushing and peak chlorination. The flush times in several of the infrequently used pipes have short flush periods of 5 or 10 minutes. When questioned, it was stated that these times did not have engineering justification. A review of maintenance history and parametric operational data did not indicate any operational problems. The licensee wrote a corrective action document to evaluate the flush time effectiveness.

      Treatment of the raw SWS water and the licensee's trending of the biocide effects indicate that Asiatic clams, and micro-biologically influenced corrosion levels have been kept at satisfactory/acceptable levels. Two chlorination treatments are scheduled via site procedures; one to continuously treat for micro-fouling and the second to treat for clams in their peak growth periods. Opening and inspection of

components has revealed very few clams and at infrequent times. Annual sampling of clams is performed as stipulated in the commitment letter.

b. The inspectors performed a review of the implemented test program for the heat transfer capability of all safety-related heat exchangers cooled by the SWS.

For the CCW heat exchangers, the licensee initially committed to performing performance testing for three cycles, then adjust testing based on these results. However, the licensee also stated in their response "Alabama Power Company intends to implement this program; however, should other means become available for implementing these actions in the future, the program may be revised accordingly." Licensee test data showed that four tests had been performed for each CCW heat exchanger. The first test for each heat exchanger had failed criteria set forth in design analysis assumptions for fouling factor (.0028), however, additional testing resulted in the fouling factors being within the design assumptions. The last three tests according to records were performed subsequent to cleaning rather than a worse case fouled condition and were therefore of limited value. In at least one case the fouling factor (.00167) was more than original vendor design criteria (.0015) indicating some fouling even in the cleaned condition. The licensee subsequently changed their process for maintaining CCW heat exchangers to cleaning only, on an eighteen-month frequency. Documented justification for this was only that the chemistry program had been improved. The justification did not consider testing data or any other pertinent information regarding adequacy of heat transfer capabilities calling into question whether these heat exchangers have been maintained within design bases assumptions. The licensee initiated CR 2004102818 to track this issue. Pending further analysis of justification for CCW heat exchangers remaining operable for all conditions, this is URI 05000348,364/2004004-04: Justification Required for Operability of Component Cooling Heat Exchangers Under Worst Case Conditions.

The licensee committed to open and clean air to water heat exchangers. In addition, the licensee was conducting performance testing of air to water heat exchangers using the heat effectiveness method to trend performance on a trial basis. Over the past several cycles, inspection of the service water side of the air to water exchangers showed only limited fouling from silt accumulation, and little or no biofouling. Heat loads during past performance testing were not high enough to determine fouling factors. A review of the heat exchanger performance data indicated high variability in testing results. The test engineers interviewed indicated that plant conditions and seasonal periods that generate more heat load are being evaluated for potential test times to reduce test data scatter and variability via the increase in heat load.

c. The inspectors performed a review of the service water piping periodic inspection and maintenance program.

The review revealed no degraded system performance due to corrosion, erosion, protective coating failure, silting, and biofouling had been identified. Siltation does occur in localized spots in the system requiring piping replacement and monitoring for reduction in cross-section and microbe induced wall thinning. The current inspection program detects and quantifies the extent of loss of pipe wall thickness, pitting, and reduction of flow area in service water piping. Selected points are periodically examined via a combination of radiographic testing (RT) (for pipe sizes up to approximately 8 inches) and ultrasonic testing (UT) (for pipe sizes over 8 inches). Piping selection criteria, acceptance criteria, and test results were used to determine scheduling of repairs, replacements, future re-inspections, and continued operation. Various points identified to be degraded were verified to have been repaired via piping replacements.

Components such as heat exchangers that have been opened and inspected revealed little damage or silting. Due to past erosion problems, the CCW and EDG heat exchangers ends and tube ends have been coated with epoxy in the last 10 years and the coating gets inspected on an outage basis. New diesel heat exchangers have been installed with tube sheet and tube end epoxy coatings. The CCW and most diesel heat exchanger tubes are also eddy current tested. The commitment letter indicated that most heat exchangers would have preventive maintenance tasks to open and clean as necessary. The initial commitment letter specifically mentioned that the containment coolers would be tested. Due to accuracy problems, testing has not been possible with these units, and the licensee, in accordance with a subsequent commitment letter statement, now verifies flow and visually inspects the units inside and out on a preventive task frequency.

d. The inspectors reviewed the testing program used to verify that the SWS will perform its intended function in accordance with the design basis for the plant.

The inspectors reviewed past performance results for the service water pumps for Units 1 and 2. The testing was performed in two ways. At cold shutdown, single pump testing was conducted in a method similar to that normally conducted by the ASME pump code. During power operation, the site conducts dual pump flow tests in which the output of the system with two pumps running is compared to a reference value in lieu of the single pump ASME quarterly tests. A relief request was submitted in 1992 to allow the dual pump tests.

In addition to comparing the flow values to a reference value, the utility has developed a methodology that allows the pump flows to be corrected to a standard head value, and single pump flows to be derived using the three dual pump combinations for each unit to determine the corresponding individual pump outputs. At the time of the inspection, these single pump flow values were not compared to any acceptance criteria for single pump performance, but were used

for information only. The inspector reviewed the method, and determined the method to be valid, but the equations used to normalize the pump flows had not been updated to reflect the most recent pump head curves. The licensee wrote a corrective action item on this normalizing problem.

The inspectors review of past pump flow testing data determined that the consistency of the flow data had changed after December 2000. Pump flows during some periods showed unexplained improvements. In addition, the 'C' pump, which can be selectively aligned to either train, had different calculated flows during each train's testing. A review of the testing procedure showed the instrument calibration of the flourescent dye concentration device is conducted as part of the test procedure. The procedure has technicians prepare a low concentration and a high concentration mixture to set the low and high values for the machine, and measures a background value using service water. An independent standard is not used to check the accuracy of the instrument as calibrated by the mixed samples. Data is not recorded for all pumps that would indicate which injection point is used for the dye for all tests. The lack of standardization and records made troubleshooting the lack of consistent data difficult. At the end of the inspection, the utility was still performing reviews to look for the source of the inconsistencies. Testing with two instruments will be performed at the next interval. A condition report was opened at the time of the inspection to address the inconsistent flow measurement problems.

The inspectors reviewed the plant's flow balance testing program. A validated flow balance has not been performed in the last several cycles. Since the time of the last testing, heat exchanger and small bore piping replacements have been performed. A flow balance is planned for an upcoming outage. The flow balance test data is used as an input to the Flow Balance Calculation, which is used as the basis for service water pump and heat exchanger operability assumptions. Since the last flow balance, no major change or flow alterations have been made.

Design features installed to minimize silting and biofouling of piping and components have performed as expected. The heat sink pond is filled and made up by the river water system. River silt has the opportunity to settle in the pond prior to the water being pumped through the plant. There are stop logs (interlocking heavy panels) normally installed in front of the SWS pumps in the SWS pond pumping structure. The logs prevent silt and clams from being drawn directly from the pond and the intake structure’s bottom into the pumps. This feature, accompanied with the biocide treatments, keeps the plant nearly free of clams. In addition, the licensee dredged the section in front of the river water structure in 1997 and cleaned the structure in 2004. Even with the these features and activities, the “B” moving screens in front of the pond structure and stop logs have been fouled by silt to the point that the screens would not move and required additional cleaning around the screens. Immobilization of the screens does not affect system operability directly. The licensee is considering re-performance of the river dredging activity.

Review of set points for SWS alarms and actuations revealed that these are consistent with design basis and assumptions. The inspectors reviewed the set points, actuation response, design basis, and setup procedures for the majority of critical components. The inspectors reviewed the operator actions in the emergency and abnormal procedures and verified these were consistent with the capabilities of the installed instruments and equipment.

A system walkdown conducted by the inspectors verified that the SWS configuration was consistent with design drawings and the system's material condition was acceptable.

A review of three modifications implemented on the SWS revealed that changes had not compromised the system design bases or introduced single active failure vulnerabilities. The design change packages reviewed included a modification to the turbine building service water supply isolation valves so that these would go to a throttled position upon indication of a loss of offsite power rather than remain open. This modification increased the flow to the safety related components served by service water. The second design change package reviewed replaced the circulation water makeup valve actuator and control system. This modification increased the reliability of the valve actuator. The third design change package provided the design to convert the Unit 2 service water pumps to a product lube configuration. The configuration lubricates the pump internal bearing with the fluid being pumped and eliminated the need for an external water source. The design change packages included 50.59 evaluations, post modification testing, and revised maintenance requirements and procedures as necessary.

e. The inspectors reviewed the licensee's operating and maintenance procedures used to assure the system is operated within design basis.

The inspectors reviewed the SWS alarm response procedures and operating procedures for normal, abnormal, and emergency system operations to assure the system is operated within design basis. In addition, the inspectors walked through the procedural steps with a Senior Reactor Operator. Procedures worked as expected with the conditions to be met. Assessment of SWS flow instrumentation and operating logs relied upon during accident conditions revealed that the flow instrumentation was functional and readable. The operator logs were checked for consistency, correct span readings, and historical availability. Review of system corrective action issues related to flow instrumentation revealed no issues.

Review of local and remote equipment required for operation during accident and normal conditions was performed. The indications to operate the necessary equipment in accordance with procedures were available. In addition, most equipment was located in non-radiation areas. The environmental conditions were adequate for remote operation of equipment

Operator classroom and simulator training for the SWS were adequate. The licensed operator training procedure/plan was extensively reviewed and

questioned as to its technical adequacy. The plan contained information about recent modifications to the SWS pumps. When questioned, the operators were aware of the most recent, on-going modifications on the Unit 2 SWS pumps lubrication subsystem.

The inspectors walked through the system operating procedure and system piping and instrument diagrams with engineering and operations staff. As indicated previously, part of this was done with a senior licensed operator regarding the emergency and abnormal operating procedures. The procedures and drawings clearly represented the plant configuration.

Review of the vendor manual for components revealed that manuals were up to date, contained reasonable instructions, and had been updated through the modification process when necessary.

Review of the system operating procedure and system piping and instrument diagrams revealed that appropriate system valve alignment requirements had been established.

Review SWS maintenance procedures indicated that these were adequate and sufficient to perform the task indicated. The procedure and maintenance activities were discussed with maintenance personnel about specific activities such as heat exchanger open and inspection, eddy current, and tube plugging.

Review of the maintenance history for the SWS for the past two operating cycles looking for recurring problems or trends revealed challenges of corrosion wall thinning for which the licensee had established an ongoing program of inspection and replacement and SWS pump testing.

Review of completed maintenance activities revealed these were properly performed and maintenance staff were adequately trained. The inspectors discussed training and the actual activities with training staff and performing personnel.

f. Using SWS operating experience that relates to Generic Letter 89-13, the inspectors reviewed the licensee program for generic operating experience to determine its effectiveness with respect to service water.

The inspectors determined that the operating experience program reviewed SWS Generic Letter 89-13 related information, distributed the information to appropriate staff, assessed applicability, performed technical reviews, and had corrective actions in place as necessary. Sources of operating experience information reviewed by the licensee included NRC information notices, industry notices, and vendor information. Information was disseminated to the appropriate system engineers and evaluated at an operating experience review board for applicability. Operating experience evaluations reviewed related to SWS traveling screens and strainer clogging and damage, intake inspection diver events, Auxiliary Feedwater

System orifice plugging, and pump coolers plugging. The evaluations applicable to the station had corrective actions in place and revised procedures as necessary.

2. Conclusions on the Inspection Findings as Identified by the TI 159

a. The effectiveness of Generic Letter 89-13 in communicating information.

The effectiveness of Generic Letter 89-13 in communicating information was judged to be adequate, in that the licensee implemented a program to assess the facility's vulnerability to the service water issues described in the document. The utility still has separate programs to review different portions of the system's vulnerability, but the site does not have a single individual responsible for an overall program assessment.

b. Licensee actions that are being implemented for the five recommended actions of Generic Letter 89-13.

As stated in their responses to the GL, the inspectors determined that the licensee implemented the GL programs.

c. Effective programmatic maintenance of the actions in response to GL 89-13.

For the most part, the licensee has maintained the status of the GL programs. They have improved their base program and adjusted it beyond the initial implementation in areas such as AFW suction line flushing and in their biofouling control areas. As indicated Part B, there have been areas were the licensee has had problems in program implementation.

- The CCW heat exchanger testing was flawed in that the performance tests were done after cleaning (pre-conditioning). Then testing was discontinued without justification and periodic cleaning was continued with albeit reported good results (i.e., maintenance workers opening the CCW exchangers found no visible fouling). A URI was issued. The licensee plans to resume performance testing in the near future.

- The licensee has demonstrated a problem in identifying individual SW pumps that did not meet ASME code requirements. This resulted in a URI.

- The licensee had infrequently used piping that had no engineering justification for their flush times. The licensee wrote a corrective action document to followup on this issue.

d. As applicable, noteworthy SWS operational history that supports inspection results.

A review of the licensee’s SW history did not provide any noteworthy problems in system availability. Aside from the issues in 4A and 4B, the licensee was

modifying Unit 2 to remove a liability in the SW pump internal lubrication scheme. Pipe wall thinning has been a continuous but a manageable problem.

e. Effectiveness assessment of licensee's program procedure(s) on related SWS operating experience.

Overall, the procedures that were reviewed were of good quality. The procedures required personnel that understood the SW system and its proper operation. The supporting documentation that provide engineering clarity on a few sampled engineering decisions was not present or lacking definition. Examples of these were the lack of clear code application on the SW pump performance testing, the lack of engineering justification on infrequently used piping flushing times, and the unclear evaluation regarding the transition from CCW performance testing to just performing exchanger open and inspection.

The plant personnel were largely knowledgeable on OE issues and the plants' history. Much of the knowledge was institutionalized to plant documentation.

4OA6 Meetings, Including Exit

On October 1, 2004, the inspectors presented the inspection results to Mr. Don Grissette and the other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- T.S. 5.4.1.f requires that procedures be implemented for the fire protection program. Licensee procedure FNP-0- AP-39, Fire Patrols and Watches, was not followed for fire watch rounds in the diesel generator building on February 28, 2004. This violation is of very low safety significance because there was no actual fire and the condition only existed for a short duration. This issue was reviewed and documented by the licensee's corporate office.

- T.S. 3.7.8 requires that two pumps in each train of service water be operable. The licensee found during surveillance testing that one pump of a train would not automatically start on a safety injection signal. This violation is of very low safety significance because the other train of SW was available and the pump could be started manually from the control room. This condition was documented in the licensee's CAP as CR 2004001493.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel
R. V. Badham, Security Manager
D. E. Grissette, Plant General Manager
J. R. Johnson, Assistant General Manager - Operations
R. R. Martin, Operations Manager
B. L. Moore, Maintenance Manager
J. Horn, Training and Emergency Preparedness Manager
W. D. Oldfield, Quality Assurance Supervisor
C. D. Collins, Nuclear Support General Manager, Farley Project
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B. Bonser, Chief, Reactor Projects Branch 2

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened		
05000348,364/2004004-03	URI	Nonconservative Acceptance Criteria Used For Service Water Pump Testing (Section 4OA5.4)
05000348,364/2004004-04	URI	Justification Required for Operability of Component Cooling Heat Exchangers Under Worst Case Conditions (Section 4OA5.4)
Opened and Closed		
05000348,364/2004004-01	NCV	Failure to Properly Reactivate Senior Reactor Operator License (Section 1R11)
05000348,364/2004004-02	NCV	Backhoe Struck Support in High Voltage Switchyard (Section 1R13)
Closed		
05000364/2004-001-00	LER	Technical Specification 3.7.8 Violation Due to Operation with One Train of Service Water Inoperable (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R06: Flood Protection Measures

Drawing D-171488, Yard Grades and Drainage
Drawing D-171426, General Layout Yard Drainage
WO 00712521, Water in low voltage switchyard and protected area in pull boxes
FNP-0-AOP-21.0, Severe Weather
FNP-0-GMP-60.1, General Inspection Outdoor Electrical Duct Run Pull Boxes
FNP-0-GMP-91.0, Procedure for Sealing Leakage Through Slabs, Walls, and Joints
FNP-0-GMP-0.4, Repair and Replacement Instructions for ASME Class CC Components

Section 1R11: Licensed Operator Requalification

FNP-1-ARP-1.9, Annunciator Response Procedure
FNP-1-EEP-0, Reactor Trip or Safety Injection
FNP-1-AOP-5.2, Degraded Grid
FNP-1-AOP-5.0, Loss of A or B Train Electrical Power
FNP-O-EIP-9.0, Emergency Classification and Actions
QA Audit of Training and Qualification, Audit No. F-T&Q-2004 LOG: FQA-S2004-15Job Performance Measures
Scenarios 2B-C, 2E-C, 3B, 6B, 6C, 7D-C
Reactivation Records: Appendix 1of FNP-0-TCP-17.5
Badge Access Transaction Reports
Licensed Operator Medical Records
Remedial Training Records
Cycle 9 Week 1 SRO exam and Cycle 9 Comp Remedial 1
Scenario 3C, 8A-C, 13C-C, 3B
Written Exams
Cycle 9 Weeks 1, 3, 4 & 5
Simulator Fidelity Documents
FNP-0-CTG-3.1, Manual Reactor Trip
FNP-0-CTG-3.2, Simultaneous Trip of all Feedwater Pumps
FNP-0-CTG-3.3, Simultaneous Closure of all MSIVs
FNP-0-CTG-3.7, Maximum Rate Power Ramp
FNP-0-CTG-4.0, One Hour Steady State
FNP-0-CTG-4.1, Steady State Plant Comparison to Reference Plant
Simulator Change Requests
1999090- Steam Generator Replacement Instrument Changes
2004092 - Abort Occurs in Scenario Module
2004071 - Steam Dump Response (Steam Pressure Mode)
2004006 - Re-Model Letdown System

Section 4OA5: Other

Review of Cask Storage Pad No. 3 Construction and Other Modifications For Independent Spent Fuel Storage Installation (ISFSI)
Southern Nuclear Operating Company Specifications SS-111626, Revision 2, ISFSI Construction

Holtec Certificate of Compliance # 72-1014 for Spent Fuel Storage Casks, Amendment 1, including Appendix A, Technical Specifications for the HI-STORM 100 Cask System, and Appendix B, Approved Contents and Design Features for the HI-STORM 100 Cask System
HI-STORM 100 Cask System Safety Evaluation Report (SER)
Final Safety Analysis Report (FSAR) for the Holtec International Storage and Transfer Operation Reinforced Module (HI-STORM) 100 Cask System, Docket 72-1014, Revision 1
American Concrete Institute (ACI) 349-97, Code Requirements for Nuclear Safety Related Concrete Structures
American Society for Testing and Materials (ASTM) C94/C94M-04, Standard Specification for Ready-Mixed Concrete
Plant Farley FSAR, Chapter 17.2.3, Design Control
NRC Information Notice (IN) 95-28, Emplacement of Support Pads for Spent Fuel Dry Storage Installations at Reactor Sites
NRC IN 95-29, Oversight of Design and Fabrication Activities for Metal Components Used in Spent Fuel Dry Storage Systems
Design Change Package S02-0-9809, ISFSI Pads, including 10 CFR 50.59 Screening/Evaluation
Farley Dry Storage Project Field Change Request Log
Farley Dry Storage Project Nonconformance Status Log
Nonconformance Report 2004-009, Concrete placed in the first pur for storage pad #3 was out of specification
Subcontract Purchase Order 608300001026, Concrete and Concrete Testing
Material Purchase Order 608300001007, Reinforcing Steel
Contract Purchase Order QP040082, to provide concrete and concrete testing services for ISFSI storage pads, cask haul route, and staging pad
Concrete Test Reports including concrete test data and compression test results prepared by Contractor (Crouch Ready Mix USA) 2/25/04 - 7/19/04
Concrete Test Reports including 7-day and 28-day concrete test data and compression test results prepared by Contractor (Crouch Ready Mix USA) for concrete delivered for placement at Farley site on 8/6/04
Sand Cone Density Test Field Worksheets including Moisture-Density Curves prepared by independent Contractor (Carmichael Construction Testing) 2/19/04 - 7/26/04
National Ready Mixed Concrete Association Certificate of Conformance for Concrete Production Facilities for Plant No. 614, Couch Ready Mix USA, expires August 18, 2005
Certificates of Calibration for test equipment property of Couch Ready Mix USA

<u>Reactor Pressure Vessel Head (RPVH) Replacement</u>
DCP 03-1-9914-0-001, Replacement Reactor Vessel Closure Head Assembly Upgrade Package
EVAL-04-54, Applicability Checklist for DCP 03-1-9914-0-001, Revision 1
10 CFR 50.59 Screening/Evaluation for DCP 03-1-9914-0-001, Revision 1
Westinghouse WCAP 16224-P, Southern Nuclear Operating Company - Joseph M. Farley Unit 1 Replacement Reactor Head Vessel Closure Head - Design Report, Revision 1
Westinghouse WCAP 16225-P, Southern Nuclear Operating Company, Joseph M. Farley Units 1 and 2, Replacement Control Rod Drive Mechanism - Design Report, May 2004
Westinghouse Calculation CN-RCDA-04-8, Revision 1, Farley Units 1 & 2 RRVCH - ASME Section XI Code Reconciliation
Westinghouse Calculation WB-CN-ENG-04-3, Farley CRDM - ASME Section XI Reconciliation, Revision 1

Farley Nuclear Plant Receiving Instruction SCM-RI-004, Receiving Instruction for Replacement of Reactor Vessel Closure Head (RRVCH), Revision 0
Westinghouse Farley Unit 1 SNC Replacement Reactor Vessel Head Inspection Final Report WDI-PJE-1302842-FSR-001

Temporary Instruction (TI) 2515/159: Review of Service Water System Problems Affecting Safety Related Equipment

Condition Reports

2001002349, 2C SW Pump Discharge Check Valve Wear and Corrosion, 09/19/01
2001002967, Through Wall Leak in a Safety Related Section of Service Water Piping, 11/27/01
2002001050, 1D SW Pump Lube Water Pressure Control Root Valve Clogging, 05/07/02
2002001647, Leak Identified on the 2C D/G SW Return to Unit 2, 07/29/02
2002001843, SW Strainer B Bypass Piping Minimum Wall, 08/14/02
2003001208, SW Valve Box 1 Material Condition and Degraded Supports, 05/15/03
2003001493, 1D Containment Cooler Service Water Leak, 06/26/03
2003002151, Cyclone Separator Minimum Flow Requirement Discrepancies, 08/27/03
2003002747, 2B SW Pump Motor Cooler Leak, 10/14/03

Procedures

FNP-0-AP-65, FNP Operating Experience Evaluation Program, Rev. 12
FNP-0-M-82, Service Water Plan, Rev. 6

Operability Determinations

01-06, SW Pond Discharge Flume Weld Deficiencies, 06/17/01
01-11, SW Operability with PS502 Support Degraded, 10/18/01
01-14, 1A CCW HX SW Relief Line Leak, 11/28/01
01-15, 1A CCW HX SW Drain Line Leak, 11/29/01
02-04, SW Operability on PS560 Leak, 06/20/02
02-07, 2B and 2C D/G SW Return Header Pin Hole Leak V528, 07/31/02
02-09, U2 A Train SW Mini-Flow, 10/01/02
02-11, Pinhole Leak in V560, 11/16/02
03-05, U1 SW Pump Miniflow Pin Hole Leak, 06/23/03
03-07, 2A SW Motor Temperatures, 10/23/03
03-08, 1B MDAFW SW Supply MOV 3209B Pinhole Leak, 11/03/03

Operating Experience Review Evaluations

IN 04-01, Auxiliary Feedwater Pump Recirculation Line Orifice Fouling - Potential Common Cause Failure, 02/20/04
IN 04-07, Plugging of Safety Injection Pump Lubrication Oil Coolers with Lakeweed, 06/16/04
SEN 141, Diver's Umbilical Becomes Entangled in Operating Service Water Pump, 01/16/98
SEB 223, Debris in ESW Results in Low Cooling Water Flow to all EDGs, 02/17/04
SEN 239, Massive Fish Intrusion Result in Duel Unit Shutdown and Subsequent Inoperability of EDGs, 12/09/03
SER 1-02, Intake Structure Blockage Results in Multi-Unit Transients and Potential Loss of Heat Sink, 04/11/02
SER 6-03, Cooling Water System Debris Intrusion, 06/15/04

Work Orders

68645, Replace C/S Service Water Supply Piping with S/S Piping, 10/19/95

239008, Replace Existing Service Water Piping to and from the SGFP 'A' Turbine Oil Coolers, 05/09/91
272565, Replace Ell Upstream of Q1P16V635B in SW Pump Water Supply, 04/07/94
502666, Replace Elbow Due to Pitting in Heat Affected Zone of the Weld, 10/05/95

541892, Replace Spool Piece In the Sullectron Electrical Water Treatment Bypass Due to Pinhole Leak, 10/30/99
20000153, Replace Vent Valve Q1P16V259B on A Train Auxiliary Building SW Return Header, 03/27/00
20007754, Replace Turbine Oil Cooler Bypass Elbow Due to Wall Thinning, 03/18/01
99006446, Replace Pipe Up to Reducer at Q2P16V722A Due to Pitting, 10/30/99

Design Change Packages (DCPs)
92-1-7927, Turbine Building Service Water Supply Isolation Valves Throttling Position Modification During Loss of Offsite Power, Rev. 1
99-1-9525, Circulation Water Makeup Valve Actuator and Control System Replacement, Rev. 5
00-2-9686, Product Lube Conversion for Unit 2 Service Water Pumps, Rev. 3

Other Documents
FP 99-0359, Service Water Inspection Program (Issued Under REA-99-1975), Rev. 4
FP 99-0753, Service Water Piping Inspections Report, 11/29/99
FP 00-1108, Service Water Inspections - Final Report, 12/08/00
FP 02-0644, Service Water Examinations and FAC RT, 12/04/02
PS-04-0394, Final Report - Service Water RT Inspection - 2003 DWP, 03/26/04
System Health Reports, Service Water System, 2003-2004
LER 2004-001-00, Operation with One Train of Service Water Inoperable, 03/30/04

TI 159 Documents
Procedures
FNP-0-M-82, Service Water Plan, Rev. 6
FNP-1-SOP-24.0, Service Water System, Version 51.0
FNP-1-SOP-24.0B, Service Water-Auxiliary Building, Rev. 9
FNP-0-SYP-9, User's Guide for Safety Related Service Water Heat Exchangers Thermal Performance, Rev. 3
FNP-0-MP-94.2, Component Cooling Water Heat Exchanger Tube Plugging, Version 1.0
FNP-0-ETP-4367, Performance Test for Units 1 & 2 Colt-Pielstick (Large) Diesel Generator Jacket Water Heat Exchangers, Version 9.0
FNP-0-ETP-4379, Performance Test for Units 1 & 2 Component Cooling Water Heat Exchangers, Revision 6
FNP-0-ETP-4447, Temperature Effectiveness Test for FNP Safety-Related Room Coolers, Version 3.0
FNP-0-ETP-4368, Performance Test for Units 1 & 2 Small Diesel Generator Jacket Water Heat Exchangers, Version 8.0
FNP-1-ETP-4395, Service Water Flow Balance Validation Test, Revision 5
FNP-1-STP-24.1, 1A, 1B, 1C Service Water Pump Quarterly Inservice Test, Version 48.0
OPS-52102F, Service Water - Student Text, dated 4/04/02
FNP-0-M-82, Service Water Plan, Revision 6
FNP-0-ARP-8, [Annunciator Response Procedure] Service Water Structure, Version 20.0

FNP-0-ARP-19.1, 4075 KW Diesels 1-2A, 1B and 2B Local Alarm Panels, Revision 19
FNP-1-ARP-1.1, Main Control Board Annunciator Panel A, Version 37.0
FNP-1-AOP-7.0, Loss of Turbine Building Service Water, Version 37.0
FNP-0-AOP-31.0, Loss of Service Water Pond, Revision 10
FNP-1-AOP-10.0, Loss of Service Water, Revision 12
FNP-1-EEP-0, Reactor Trip or Safety Injection, Revision 28
FNP-1-STP-40.0, Safety Injection with Loss of Off-Site Power Test, Version 44.0
A-181001, Service Water Program Document, Table T-2.3, Set Points, Revision 37
FNP-0-ETP-1007, Service Water Wet Pit Cleanup, Revision 7
FNP-1-SOP-22.0, Auxiliary Feedwater System, Appendices E and F, Flushing SW and CST to the TDAFW Pump Piping, Version 52.0
FNP-1-SOP-24.0, Appendix 3, Service Water System Flushing, Version 51.0
FNP-0-ETP-4483, Service Water Underground Piping Flow Test, Version 1.0
FNP-2-SOP-24.0A, Service Water System - Outside Structures, Version 11.0
FNP-1-SOP-12.A, Containment Air Cooling Systems, Revision 2
FNP-0-ACP-52.2, Work Order Development and Approval, Figure 4, Service Water Visual
FNP-0-CCP-708, Chemical Addition/Control of the Service Water System, Version 52.0
FNP-2-IMP-212.16, Service Water Surge Tank Level and Pressure Instrumentation Calibration, Version 12.0
FNP-1-IMP-0.11, Instrument Airline and Pressure Regulator Preventive Maintenance Procedure, Version 20.0

Other Documents
Inspection/Clam Report, Version 31.0
Service Water System Health Report, First Quarter 2004 (TYPICAL)
NRC Inspection Report 50-348, 364/93-13, dated October 1, 1993 [SWSOPI]
U 162784, Instruction 242, Self Cleaning Plant Service Water Strainer
U-166153, Shell Details for CCW Heat Exchanger
D-1770119, P&ID - Service Water System, Revision 1
D-171331, Outdoor Concrete - Service Water Intrake Structure, General Arrangement, Revision 6
D-171325, Outdoor Concrete, Service Water Intake Structures, Stop Logs, Reevision 1
A-170059, sheet 148, P&ID - Control Air By-Pass Control for Service Water Valve Q1P16V563
Licensee Event Report 50-364 2000-001-02, June 5, 2000
Valve Stroke time Data for Unit 1 SW Motor Operated Valves per STP-24.7 and 45.6, Valves V514, 515, 516, 517, 518, 538, 539, 545, ansd 546
Maintenance Rule Computer Sort of Functional Failures for Last Three Years
FNP-0-IMP-430.1, Data Sheet 1 [completed], “A” Train Service Water Pond Level, NSP25LT0501 (TYPICAL)
Eason Diving and Marine Company Rep rt on River Water Dreging and Clean Up, March 4, 2004
Service Water Visual Inspection/Clam Reports for CCW heat exchangers dated 01/25/2001, 01/26/2001, 08/07/2001, 08/13/2001, and 08/12/2004
CCW Heat Exchanger Maintenance History (Through February 2004 Eddy Current Inspection)
MEC-174, Maintenance Training Program OJT/OJE Completion Guide for Clean, Test and Repair a Heat Exchanger, Rev. 2
MEC-42102C, Student Text for Cleaning Heat Exchangers dated 02/01/2002
MEC-42102C, Heat Exchanger Cleaning Methods Instructor Guides dated 02/01/2002
NRC Commitment Evaluation Summary, Clean or Test CCW Heat Exchanger dated 10/15/1998

Test results for CCW heat exchanger 1A (FNP-0-ETP-4379) dated 03/15/1997
Test results for CCW heat exchanger 1B (FNP-0-ETP-4379) dated 03/16/1997
Test results for CCW heat exchanger 1C (FNP-0-ETP-4379) dated 03/16/1997
Test results for CCW heat exchanger 2A (FNP-0-ETP-4379) dated 10/13-1996
Test results for CCW heat exchanger 2B (FNP-0-ETP-4379) dated 07-06-1992
Test results for CCW heat exchanger 2B (FNP-0-ETP-4379) dated 03/25/1993
Test results for CCW heat exchanger 2C (FNP-0-ETP-4379) dated 03/23/2993
Test results for CCW haet exchanger 2A (FNP-0-ETP-4379) dated 03/27/1998
Test results for CCW heat exchanger 2B (FNP-0-ETP-4379) dated 03/29/1998
Test results for CCW heat exchanger 2C (FNP-0-ETP-4379) dated 03/29/1998
Letter AP-20979, Bechtel to Morey dated 12/17/1993, FNP Units 1 and 2 Component Cooling Water Design Basis Heat Loads

Condition Reports
2003000624, The Unit 1 1C CCW heat exchanger could not be cleaned as planned
2001002716, Per STP-24.13, the Service Water Pump would not pass the flow requirements for Cold Shutdown

Work Orders
T001383601, Cleaning of 1A CCW heat exchanger
T001625501, Cleaning of 1C CCW heat exchanger
T001626001, Cleaning of 1C CCW heat exchanger
0W68803901, Cleaning of 1C CCW heat exchanger
0W71570601, Cleaning of 1A CCW heat exchanger
0W71571001, Cleaning of 1B CCW heat exchanger
0W71821801, Cleaning of 1C CCW heat exchanger
0W68803101, Cleaning of 1A CCW heat exchanger
0W68803501, Cleaning of 1B CCW heat exchanger
0W68803901, Cleaning of 1C CCW heat exchanger
0W67814101, Cleaning of 2A CCW heat exchanger
0W67814401, Cleaning of 2B CCW heat exchanger
0W68242801, Cleaning of 2C CCW heat exchanger
0W70313101, Cleaning of 2A CCW heat exchanger
0W70378401, Cleaning of 2B CCW heat exchanger
0W70313301, Cleaning of 2C CCW heat exchanger
0W68803701, Eddy current testing of CCW heat exchanger 1C

Self Assessments/Audits
SAER Audit Report No. 01-M/44, Audit of Maintenance Activities, dated 8/27/01