UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 9, 2009

Mr. J. Randy Johnson
Vice President - Farley
Southern Nuclear Operating Company, Inc.
7388 North State Highway 95
Columbia, AL 36319

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC COMPONENT DESIGN BASIS INSPECTION 05000348/2009006 AND 05000364/2009006

Dear Mr. Johnson:

On February 27, 2009, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Joseph M. Farley Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the inspection results which were discussed on February 27, 2009, with yourself and other members of your staff.

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

Based on the results of this inspection, the inspectors identified a finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a Non-Cited Violation (NCV) consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you contest this NCV you should provide a response within 30 days of the date of this inspection report, with the bases 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, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Joseph M. 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 responses, 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/

Binoy B. Desai, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No.: 50-348, 50-364
License No.: NPF-2, NPF-8

Enclosure: Inspection Report 05000348/2009006 and 05000364/2009006
w/Attachment: Supplemental Information

(cc w/encl – See page 3)

cc w/encl:
Angela Thornhill
Managing Attorney and Compliance Officer
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

B. D. McKinney
Licensing Services Manager
B-031
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

Jeffrey T. Gasser
Executive Vice President
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

William D. Oldfield
Quality Assurance Supervisor
Southern Nuclear Operating Company
Electronic Mail Distribution

L. Mike Stinson
Vice President
Fleet Operations Support
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

David H. Jones
Vice President
Engineering
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

Moanica Caston
Vice President and General Counsel
Southern Nuclear Operating Company, Inc.
Electronic Mail Distribution

Dr. D. E. Williamson
State Health Officer
Alabama Dept. of Public Health
Electronic Mail Distribution

Mr. Mark Culver
Chairman
Houston County Commission
P. O. Box 6406
Dothan, AL 36302

Jim Sommerville
(Acting) Chief
Environmental Protection Division
Department of Natural Resources
Electronic Mail Distribution

Senior Resident Inspector
Southern Nuclear Operating Company, Inc.
Joseph M. Farley Nuclear Plant
U.S. NRC
7388 N. State Highway 95
Columbia, AL 36319

Letter to J. Randy Johnson from Binoy Desai dated April 9, 2009.

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC COMPONENT DESIGN BASIS INSPECTION 05000348/2009006 AND 05000364/2009006

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	05000348, 05000364
License Nos.:	NPF-2, NPF-8
Report No:	05000348/2009006 and 05000364/2009006
Licensee:	Southern Nuclear Operating Company, Inc
Facility:	Joseph M. Farley Nuclear Plant, Units 1 and 2
Location:	Columbia, AL
Dates:	January 26 – February 27, 2009
Team:	R. Moore, Senior Reactor Inspector (Lead) D. Jones, Senior Reactor Inspector C. Peabody, Reactor Inspector C. Even, Reactor Inspector S. Kobylarz, Contract Electrical Inspector B. Sherbin, Contract Mechanical Inspector
Accompanied by:	J. Eargle, Reactor Inspector (Training) R. Patterson, Reactor Inspector (Training) P. Braxton, Reactor Inspector (Training)
Approved by:	B. Desai, Branch Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000348/2009-006, 05000364/2009-006; 1/26 /2009 – 2/27/2009; Joseph M. Farley Nuclear Plant, Units 1 and 2; Component Design Basis Inspection.

This inspection was conducted by a team of four NRC inspectors from the Region II office, and two NRC contract inspectors. One Green finding, which was identified as a non-cited violation (NCV), was identified during this inspection. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," (ROP) Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

Green: The team identified a finding of very low safety significance involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control. Specifically, the licensee failed to establish measures to verify the design capability of the service water (SW) system to provide water as a suction source for the auxiliary feedwater (AFW) pumps while maintaining adequate SW flow to other safety-related components. The Technical Specification's (TS) action statement for Condensate Storage Tank (CST) Operability, 3.7.6.a, and the corresponding TS bases credit SW as a water source for AFW pumps upon a loss of normal feedwater supply from the CST.

The finding is more than minor because it is associated with the design control attribute of the Mitigating System Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Due to the lack of appropriate analysis or testing, the SW design basis accident capability was not assured. The team assessed the finding using the SDP and determined that the finding was of very low safety significance (Green) since it was a design deficiency determined not to have resulted in the loss of safety function. Specifically, the licensee had not operated in a condition for which the design deficiency in question was relied upon for operation. The finding was entered into the licensee's corrective action program. There is no cross cutting aspect to this finding because it does not reflect recent performance in that the original SW system analyses were performed in 1990 and 1999 and the inspectors indentified no subsequent opportunity for the licensee to identify this deficiency. (Sections 1R21.2.1)

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R21 Component Design Bases Inspection (71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components and operator actions for review using information contained in the licensee's Probabilistic Risk Assessment (PRA). In general, this included components and operator actions that had a risk achievement worth factor greater than 1.3 or Birnbaum value greater than 1 $X10^{-6}$. The components selected were located within the following systems: service water (SW), emergency diesel generator (EDG) and EDG subsystems, charging or high head safety injection, emergency core cooling system pump room coolers, Anticipated Trip without Scram (ATWS) mitigations and control (AMSAC), solid state protection system (SSPS), and 125 VDC. The sample included 18 components, six operating experience items, and five operator actions.

The team performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases had been correctly implemented and maintained. This design margin assessment considered original design issues, margin reductions due to modification, or margin reductions identified as a result of material condition issues. Equipment reliability issues were also considered in the selection of components for detailed review. These reliability issues included items related to failed performance test results, significant corrective action, repeated maintenance, maintenance rule (a)1 status, RIS 05-020 (formerly GL 91-18) conditions, NRC resident inspector input of problem equipment, System Health Reports, industry operating experience and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in depth margins. An overall summary of the reviews performed and the specific inspection findings identified is included in the following sections of the report.

.2 Results of Detailed Reviews

.2.1 Service Water Pumps

a. Inspection Scope

The team reviewed the functional system description (FSD), related design basis documentation, TS, pump vendor manual and related vendor correspondence, drawings, and the updated final safety analysis report (UFSAR) to identify design, maintenance, and operational requirements related to pumps. The documents were reviewed to verify that the pumps were capable of meeting their design basis requirements, with consideration of allowable pump degradation, net positive suction head (NPSH) and submergence requirements, pump minimum flow and pump-to-pump interaction (strong pump-weak pump), pond water loss, and strainer clogging affects on system performance. The Unit 2 SW pumps were assessed for a common cause failure potential. Pump house ventilation calculations were reviewed to ensure pump room temperatures can be maintained at acceptable levels. To assess the current condition of

the pumps, the team interviewed engineers, and reviewed system health reports and related condition reports (CRs). Test procedures and acceptance values were reviewed to verify that acceptance criteria were supported by calculations or other engineering documents, and to ensure that the design and licensing bases were met and that tests and/or analyses validated component operation under accident/event conditions. Recent underground SW piping test results were reviewed to ensure maintenance of pressure boundary. The pump operating procedures were reviewed to ensure the pumps were operated in accordance with their design basis requirements. A component and system walk down was performed to verify that the installed configuration would support its design basis function under accident/event conditions, that component configurations had been maintained consistent with design assumptions, and to assess observable material conditions.

b. Findings

Introduction: A Green NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, was identified for the licensee's failure to establish measures to verify the design capability of the SW system to provide both the design basis SW system loads and the alternate supply to the AFW system. Specifically, there was no hydraulic analysis, or testing to show that the SW system could provide water to the AFW pumps while maintaining adequate SW flow to other safety-related components.

Description: At the Farley Nuclear Plant the safety related, seismically qualified condensate storage tank (CST), was the credited source of water for the AFW system. However, the capability to provide SW as an alternate AFW source was described in the UFSAR Section 6.5.2.1 and credited in the TS. The TS action statement for the CST, 3.7.6.a, and corresponding TS bases credited SW as a water source for AFW pumps if the CST was not available. Additionally, TS Bases 3.7.8 for Service Water stated, in part, that the SW system provided a backup source of water to the AFW system. TS Bases 3.7.9 for the Ultimate Heat Sink (UHS) stated that the UHS was designed in accordance with Regulatory Guide 1.27, which requires a 30 day supply of cooling water in the UHS, and that the design basis operating temperatures of safety related equipment are not exceeded. Emergency Operating Procedure (EOP) FNP-1-FHP-H.1, Response to Loss of Secondary Heat Sink, directed alignment of SW to the AFW pumps on a loss of CST water.

The team reviewed SW system hydraulic calculation SM-ES-89-1499-007, Rev. 6, "Hydraulic Analysis of the Service Water System" and determined that the SW lineup to the AFW pumps was not evaluated to ensure adequate flow to safety related components, including the AFW pumps, could be maintained. The team also reviewed Ultimate Heat Sink calculation SM-ES-89-1500-004, Rev. 0, "Reg. Guide 1.27 Evaluation of the UHS Service Water Pond-Ultimate Heat Sink Analysis" and determined that there was no water loss evaluation for operating the SW system when SW is aligned to AFW system. The water loss would occur when steaming SW through the steam generator relief valves. Additionally, the licensee could provide no testing that demonstrated the capability of the SW system to concurrently provide water for the AFW and SW accident loads.

The licensee determined, during the inspection, that there would be adequate SW flow and pressure at the piping location where the suction for AFW pumps would be aligned, and that other SW loads would be maintained. The licensee entered CR 2009102135 into their corrective action program to assess and document the adequacy of the SW system to provide an alternate AFW source in addition to the design basis accident loads for the SW system. The team concluded that the failure to analyze the impact of the additional AFW load on the SW system capability was an original design deficiency.

Analysis: The performance deficiency was that the licensee did not establish adequate design control measures, via technical analysis or testing, to demonstrate the capability of the SW system to provide the alternate AFW source concurrently with design basis SW loads. The finding was more than minor because it was associated with the design control attribute of the Mitigating System Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Due to the lack of appropriate analysis or testing, the SW design basis accident capability was not assured. The team assessed this finding for significance in accordance with NRC Manual Chapter 0609, Appendix A, Attachment 1, Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations, and determined that it was of very low safety significance (Green), since it was a design deficiency determined not to have resulted in the loss of safety function. The team concluded that there was no cross cutting aspect to this finding because the original SW system analyses were performed in 1990 (SW system) and 1999 (UHS pond) and the inspectors indentified no subsequent opportunity for the licensee to identify this deficiency

Enforcement: 10 CFR 50 Appendix B, Criterion III, Design Control, requires, in part, that design control measures shall be provided for verifying or checking the adequacy of design via simplified calculation methods, or by the performance of a suitable testing program. Contrary to the above, design control measures were not provided to verify the adequacy of the SW system design in that the system hydraulic analysis did not include the capability to provide the AFW and SW accident loads concurrently. Additionally, there was no test documentation to demonstrate this capability. Design calculation SM-ES-89-1499-007, Rev. 6, (rev. 0 dated 4/17/07) “Hydraulic Analysis of the Service Water System” failed to provide a service water system hydraulic analysis which addressed the AFW pump suction alignment to the service water system. The SW pond analyses for water loss, design calculation number SM-ES-89-1500-004, Rev. 0, “Reg. Guide 1.27 Evaluation of the Service Water Pond-Ultimate Heat Sink (UHS) Analysis” (Rev. 0 dated 9/4/90) did not include an evaluation of the UHS water loss for SW supply to the AFW system. This was an original design deficiency. Because the finding was of very low safety significance and has been entered into the licensee's corrective action program (CR 2009102135), this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000348,364/2009006-01, Inadequate Verification of SW Capability to Concurrently Provide System Design Basis Cooling Requirements and the AFW Alternate Water Source.

.2.2 Service Water Strainers

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the SW strainers. The machinery history, as demonstrated by component related CRs, corrective maintenance, and system health reports, was reviewed to verify that design bases have been maintained. The team reviewed strainer inspections, cleaning procedures, and results, to verify that established acceptance criteria were met and that fouling was within anticipated design limits. ASME in-service (Section XI) pressure testing procedures and results were reviewed to verify that leakage was within anticipated design limits. The team examined records for both corrective and preventative maintenance and reviewed applicable corrective actions to verify that potential degradation was being monitored and/or prevented. A field walkdown of the SW strainers was performed to assess observable material conditions and to verify that the installed configuration was in accordance with plant drawings.

b. Findings

No findings of significance were identified.

.2.3 ECCS Pump Room Coolers (Unit 2)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the AFW pump rooms and charging pump room coolers. There are three charging pump rooms and two AFW motor driven pump rooms that are cooled by ceiling-mounted room coolers that reject heat to service water via fan-forced room air driven through a finned-coil. The team reviewed the room coolers' specifications, design bases information and supporting calculations to identify the heat removal requirements and capability of the charging pumps room coolers and motor-driven AFW pump room coolers. Recently completed thermal performance test results were reviewed to ensure adequate heat transfer capability was maintained for the five room coolers. The room cooling fans' sizing and power availability were reviewed to verify the reliability, availability, and capability of the forced air flow required for room cooling. Corrective action documents were reviewed to verify the licensee's capability for detection, monitoring, and correction of potential degradation. A field walkdown was performed with the system engineer to assess observable material conditions and verify that the system configuration was consistent with the design basis assumptions, system operating procedures, and plant drawings.

b. Findings

No findings of significance were identified.

.2.4 EDG Auxiliaries - EDG room ventilation

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, vendor data, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDG room ventilation. Calculations supporting the installed system capability were reviewed to verify that design bases and assumptions were appropriately translated and that conclusions supported overall system capability. Elementary electrical diagrams and selected preventative maintenance history were reviewed to verify that energy sources, including those used for control functions would be available and unimpeded during accident/event conditions. A component and system walkdown was performed in order to verify that the component's installed configuration was in accordance with plant drawings, and supported its design function under accident/event conditions. System Health Reports, selected CRs, and work orders were reviewed by the team in order to verify that potential degradation was monitored or prevented and that component replacement was consistent with in-service/equipment qualification life. Operating procedures were reviewed to verify that operator actions were consistent for accident/event conditions.

b. Findings

No findings of significance were identified.

.2.5 EDGs (1C and 2B)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDGs 1C and 2B. The heat transfer calculation assumptions for the SW cooling flow to the EDGs were evaluated with respect to the component performance capability and heat transfer capability of the heat exchangers. The adequacy of EDG fuel oil capacity and capability to meet TS requirements was evaluated, including impact of low sulphur fuel, instrument uncertainty and potential pump votexing. System Health Reports, corrective maintenance and CR historical records were reviewed to assess adverse trends and to verify that potential degradation was monitored or prevented. Test procedures and acceptance values were reviewed to verify that acceptance criteria were supported by calculations or other engineering documents, and to ensure that the design and licensing bases were met and that tests and/or analyses validated component operation under accident/event conditions. Periodic test results and procedures were reviewed to verify fuel oil levels in the storage and day tanks, essential service flow rates, and thermal performance of heat exchangers were demonstrated and maintained within acceptable limits. Recently completed engine maintenance work packages were reviewed to ensure parts, such as oil and air filters, were replaced when required. A component and system walk down was performed to verify that the component installed configuration would support its design basis function under accident/event conditions, that component configurations had been maintained consistent with design assumptions, and to assess observable material conditions.

The team reviewed the one-line diagram and the vendor nameplate rating to determine the EDG rated output capability. The team reviewed the assumptions and design inputs of the steady state EDG loading calculation to verify the adequate EDG sizing. The team reviewed the results of surveillance tests to verify that the diesel generator test conditions enveloped design basis and technical specification requirements. Operating procedures were reviewed to determine whether appropriate load ratings and limitations were incorporated.

b. Findings

No findings of significance were identified.

.2.6 AFW System Check Valves

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for selected AFW system check valves. Maintenance history, as demonstrated by system health reports, preventive and corrective maintenance, and CRs, was reviewed to verify that potential degradation was being monitored and addressed. The team conducted interviews with the AFW System Engineer to obtain additional information and verify the station's implementation and analysis of industry operating experience related to check valves. The team also conducted a field walkdown of these check valves to verify that the installed configuration was consistent with the design basis and plant drawings and to assess observable material conditions.

b. Findings

No findings of significance were identified.

.2.7 EDG Auxiliaries - Air Start System

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDG air start subsystem. Calculations supporting the installed system capability were reviewed to verify that design bases and assumptions were appropriately translated and that conclusions supported overall system capability. Test procedures and acceptance values were reviewed to verify that acceptance criteria were supported by calculations or other engineering documents, and to ensure that design and licensing bases were met and that tests and/or analyses validate component operation under accident/event conditions. A component and system walkdown was performed in order to verify that the component's installed configuration was in accordance with plant drawings, and supported its design function under accident/event conditions. Maintenance history, as demonstrated by system health reports, corrective maintenance documentation, Maintenance Rule (MR) monitoring, CRs, work orders, and surveillance test results, was reviewed to verify the capability to identify and correct system degradation or malfunction.

b. Findings

No findings of significance were identified.

.2.8 EDG auxiliaries – Fuel Oil Transfer Pumps (FOTPs)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDG FOTPs. The team reviewed the NPSH calculation to verify that the FOTPs would be available and unimpeded during accident conditions. Maintenance history, as demonstrated by system health reports, corrective maintenance documentation, MR monitoring, CRs, and surveillance test results, was reviewed to verify the design bases have been maintained, to verify that potential degradation was being monitored, and that identified degradation or malfunctions had been adequately addressed. The team verified the PM history and schedule consistent with vendor recommendations. Additionally, the team conducted a field walkdown of the FOTPs with the EDG System Engineer to verify that the installed configuration was consistent with the design basis and plant drawings.

b. Findings

No findings of significance were identified.

.2.9 Motor Operated Valves (MOVs) 115 B & D

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for MOVs 115B and 115D, which provide the charging pump suction from the RWST. The team examined stroke test data as well as in-service (IST) trending to verify that design basis functions were being maintained. Corrective and preventative maintenance records, MR scoping and failure information, and related CRs were reviewed to verify that identified degradation was being adequately monitored and addressed. The team also verified that the worst case/highest system differential (dp) condition was used to determine the maximum valve opening and/or closing requirements to ensure the valves would perform their intended safety-related design basis function. A review was conducted of the licensee's testing procedures and results from diagnostic valve testing to verify the MOVs were tested in a manner that would detect a malfunctioning valve and verify proper operation of the valve. The team reviewed calculations pertaining to motor sizing and structural integrity in order to verify adequacy of the actuator sizing for the system application. The team reviewed vendor recommendations for preventative maintenance and operation to verify that the maintenance practices ensured that design basis requirements are continually met. The team also conducted a field walk down of the valves to verify that the installed configuration was consistent with the design basis and plant drawings and to assess observable material conditions.

b. Findings

No findings of significance were identified.

.2.10 Reactor Coolant System (RCS) Power Operated Relief Valves (PORVs)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the RCS PORVs. The team reviewed plant in-service and bench testing procedures and results to verify that established acceptance criteria, ASME code requirements, and design bases were maintained. The team examined records and test data for both corrective and preventative maintenance, as well as reviewed applicable corrective actions to verify that potential degradation was being monitored and/or prevented. The team reviewed the adequacy of valve sizing for the RCS feed and bleed evolution, and the sizing and testing of the nitrogen back-up supply for the PORVs.

b. Findings

No findings of significance were identified.

.2.11 Emergency Air Compressors

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the Unit 1 Emergency Air Compressor B. The emergency air compressors provide the emergency air supply for the turbine drive AFW (TDAFW) steam admission valves and the steam generator (SG) atmospheric relief valves (ARVs). The team examined records and test data for both corrective and preventative maintenance, as well as reviewed applicable corrective actions to verify that the design bases were being maintained and that potential degradation was being monitored and corrected. The team examined the MR scoping and functional failures pertaining to this component to verify that MR availability was being properly maintained and managed. The team also conducted a field walk down of Emergency Air Compressor B to verify that the installed configuration was consistent with the design basis and plant drawings.

b. Findings

Introduction: The team identified an unresolved item (URI) related to performance monitoring of the emergency air system. There was no maintenance or operational documentation that would provide reasonable assurance that the emergency air system could provide an emergency air supply to the end use components. The end use components were the SG ARVs and the TDAFW pump steam admission valves. The downstream flow path components had not been operated or maintained since 1977 and 1981 during startup testing, for Units 1 and 2, respectively. This flow path included piping, check valves, manual valves, pressure control valves, and three-way solenoid valves.

Description: The emergency air system was scoped into the station maintenance rule program (FNP-0-M-87, Maintenance Rule Scoping Manual) in 1994. The scoping document stated that the emergency air system provided a mitigating function to prevent core damage and radioactive release by providing back-up air to the ARVs and the TDAFW steam admission valves to allow the cooldown of the reactor coolant system. The use of the emergency air for these purposes was directed by the emergency operating procedures. The FSD for Instrument Air (A-181012) stated that the ARVs and TDAFW steam admission valves shall be provided with an emergency air supply. The UFSAR, Section 10.3.8, Main Steam Atmospheric Power Relief Valves, stated that in the event a high-energy line break prohibits operator access for local operations of the power relief valves with the simultaneous loss of offsite power and valve air supply, an alternate air supply consisting of two seismic category I air compressors (emergency air compressors) was provided for remote operation of the ARVs. The team noted that although the emergency air compressors were periodically started and run for approximately one hour to an isolated header, the flow path between the emergency air compressor and the end use components was not verified. Following identification of this issue by the team, the licensee initiated CR 2009101539, No Assurance that Air from the Emergency Air Compressors Will Supply the ARVs

During the inspection, the licensee performed a test to verify the flow path between the emergency compressors and the end use components for both trains of each unit. The test identified a blocked flow path due to a seized closed check valve (NV075A) in the train 1A emergency air header downstream of the compressor. The licensee's investigation of the check valve determined that the valve failure was caused by rust build-up inside this piston type check valve. Each unit has five of these check valves in the emergency air start system

The team identified a common cause vulnerability of the emergency air systems for both units related to the system air quality and degradation of the piping. The system contained carbon steel piping, did not include dryers or filters, and was subject to moisture in stagnant piping; conditions that would contribute to the formation and transport of rust. In the equipment history, the inspectors noted two previous indications of degraded piping conditions. Two Unit 2 work orders (WOs 2062451701 and 2082451701) documented the repair of seized (stuck open) check valves (NV075A and NV075B) in July 2006 and August 2008. The WOs documented the cleaning of rust from the valve internals. A stuck open check valve could result in inadequate air flow being provided to downstream components or could allow air from the opposite train to be diverted away from the SG ARVs and TDAFW steam admission valves. Additionally, the rust in the degraded piping could be transported to the end use components and adversely impact their operation. In the week following the onsite CDBI, the licensee performed piping internal inspections which provided additional indications of common cause vulnerability due to degraded piping in both units as well as an additional seized check valve (NV075B).

The team noted that the Unit 1, Emergency Air Train B compressor had operational deficiencies which reduced its reliability during the time that the Unit 1 train A was inoperable due to flow path blockage. These included the following:

- Elevated motor amps which significantly reduced the margin to thermal overload setpoint. A running current of 14.5 amps was identified. The motor nameplate current was specified as 11.5 amps. The calculated minimum overload trip setpoint was 16 amps.
- Licensee analysis determined that degraded grid operation of the 1B motor could result in a motor current or 15.9 amps.
- Deficiencies with the unloader device (pressure control) were identified during semi-annual surveillances in June 2008, and December 2008. Repair was was not implemented until March 13, 2009.
- On February 20, 2009, the malfunctioning unloader resulted in the lifting of relief valve (PSV 2B) during performance of the licensee's troubleshooting plan.
- On February 20, 2009, to prevent the continuous cycling of the relief valve, the operators manually started/stopped the compressor to maintain adequate system pressure. It was stated in the licensee's evaluation of this condition that excessive starting of the compressor would eventually trip thermal overloads.
- On February 20, 2009, the operators did not have procedural guidance for operating the 1B compressor with a faulty unloader device. On March 13, 2009, the station established compensatory actions to manually control header pressure (100 psig) to prevent excessive staring of the compressor.

Based on the above, the inspectors concluded that the 1B compressor operational deficiencies adversely impacted the reliability and availability of the Unit 1 Emergency Air System between June 2008 and March 2009, during the period when the 1A train was inoperable.

The inspectors identified no immediate safety concern because the end use components were normally supplied by the instrument air system via a different flow path with one of the non-safety instrument air compressors supplied by the emergency diesel generator. Additionally the station had the capability for local-manual operation of the end use components. This finding was identified as URI 05000348,364/2009006-02, Degraded Emergency Air System Conditions, pending further inspection and interface with the licensee to determine the extent of condition and impact from the degraded emergency air system conditions.

.2.12 Boron Injection Tank (BIT) Inlet Valve (2-MOV-8803A/B)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the charging pump inlet valve to the boron injection tank. This MOV was in the charging pump discharge path to the RCS loop. The team examined stroke test data to verify that design basis functions were being maintained. The team also reviewed corrective and preventative maintenance records, Maintenance Rule (MR) scoping and failure information, as well as reviewed applicable corrective actions to verify that potential degradation was being monitored and/or prevented. The team reviewed calculations

pertaining to motor sizing, differential pressure, and structural integrity in order to verify that the valve stem and actuator can perform the functions prescribed by the design bases. Additionally, the team reviewed the licensee's commitment and implementation of this commitment to GL 95-07, Pressure Locking and Thermal Binding of Safety Related Power Operated Gate Valves, with respect to 2-MOV-8803B. This included review of the licensee's evaluation of MOV thrust requirements for pressure locking of this valve and the evaluation of the capability of the installed actuator to achieve the thrust to unseat the valve. The team reviewed vendor recommendations for preventative maintenance and operation to verify that the maintenance practices ensure that design basis requirements are continually met. The team also conducted a field walk down of the valves to verify that the installed configuration is consistent with the design basis and plant drawings.

b. Findings

No findings of significance were identified.

.2.13 Containment Suction Valve to Residual Heat Removal Pump (RHR) – 1/2-MOV-8811A/B

a. Inspection Scope

The team reviewed the licensee's commitment and corrective actions related to GL 95-07, Pressure Locking and Thermal Binding of Safety Related Power Operated Gate Valves, related to RHR 1/2-MOV-8811A/B. The Unit 2-8811A MOV was a flexible wedge gate (FWG) valve susceptible to pressure locking. The remaining 8811 MOVs were solid wedge gate (SWG) valves which were susceptible to thermal binding but not susceptible to pressure locking. The team reviewed the licensee commitments for GL 95-07 as applicable to these valves and their corrective actions. The corrective actions included evaluation of the FWG valves for required thrust to overcome pressure locking and verification of the MOV actuator capability to provide this thrust. The SWG MOVs corrective actions were the establishment of water solid piping (cold trap) downstream of the valve. The team reviewed the methodology used by the licensee to identify valve specific thrust requirements for pressure locking and actuator sizing of the 2-MOV-8811A valve to verify that the valves were capable of opening under potential pressure lock conditions. The MOV test results from the last two performances for the 2-MOV-8811A valve were reviewed. Additionally, the team reviewed the capability of the actuator to open the valve against a suction line pressure equal to the line relief valve set point pressure.

b. Findings

No findings of significance were identified.

.2.14 AMSAC (ATWS mitigation system actuation circuitry- Unit 1)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the AMSAC to confirm that AMSAC would perform in accordance with these requirements. The team reviewed control wiring diagrams to confirm the required diversity with the Solid State Protection System (SSPS). The vendor manual was reviewed to verify recommended preventative maintenance was implemented. The team selectively reviewed calibration and test procedures and a sample of results to confirm the AMSAC system was performing in accordance with functional requirements, and that corrective actions were being identified and dispositioned when necessary. A walkdown of the AMSAC cabinets was performed to assess visible material condition. Maintenance and corrective action history were selectively reviewed to verify that component degradation was being identified and corrected at the appropriate threshold and interval.

b. Findings

No findings of significance were identified.

.2.15 Service Water Intake Structure 125VDC Battery 3/4

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the SW intake structure batteries. The team reviewed the assumptions and design inputs to the battery sizing and voltage drop study, and the TS and maintenance allowable intercell and terminal connection resistance limits, to verify the adequate sizing of the battery. The battery voltage study was reviewed to verify adequate voltage was available to critical components. The vendor manual was reviewed to verify battery and charger installation and operating instructions were implemented. Battery TS surveillance test and inspection results were reviewed to verify degradation was identified and anomalies were addressed and corrected. The equipment history, as indicated by corrective work orders and CRs, was reviewed to verify that identified equipment problems were corrected. Modification history was reviewed to identify changes to the battery/charger system and potential effect on the design basis for the battery. A field walkdown was performed to assess observable material conditions of the batteries and chargers.

b. Findings

No findings of significance were identified.

.2.16 Uninteruptible Power Supply (UPS) for Turbine Driven AFW (TDAFW) Pump Controls

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the TDAFW Pump UPS. The battery sizing analysis' inputs, battery voltage drop analysis, and TS were reviewed to verify the adequate sizing of the UPS battery for accident loads. The battery voltage drop analysis was reviewed to verify adequate voltage was available to the critical components during accident conditions. The vendor manual was reviewed to verify UPS and battery operation and maintenance instructions were implemented. Field walkdowns were performed to assess observable material conditions and verify system alignment was consistent with current drawings and operating procedures. Equipment history, as indicated by CRs and corrective maintenance work orders, was reviewed to verify that equipment problems and operational issues were appropriately resolved.

b. Findings

No findings of significance were identified.

.2.17 EDG - Start logic, Interlocks, Relays

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDG start logic, interlocks, and relays. EDG start, stop, and shutdown circuits were reviewed to verify the logic of operation was consistent with the accident analysis and that the energy sources used for control functions would be available and unimpeded during accident conditions. Surveillance test procedures were reviewed to verify that testing of the safety related logic circuits encompassed all devices used during accident conditions, validated component operation during accident conditions, and ensured the design and licensing bases were met. Field walkdowns were performed to assess observable material conditions and verify system alignment was consistent with current drawings and operating procedures. Selected CR's and work orders were reviewed by the team to verify that potential component degradation was monitored and appropriately addressed.

b. Findings

No findings of significance were identified.

.2.18 EDG 2B, 1C SW Intake and Discharge Valve Motors (MOV 519, 537)

a. Inspection Scope

The team reviewed the FSD, related design basis documentation, drawings, TS, and the UFSAR to identify design, maintenance, and operational requirements for the EDG 2B, 1C SW Intake and Discharge Valve Motors. Torque and thrust calculations were reviewed to verify that the motors' output torque was adequate to operate the valves

under design dp and worst case voltage conditions. Maintenance test results were reviewed to verify that testing validated the design basis of the MOVs. Component walkdowns were performed to assess the observable material condition and verify the system configuration was consistent with current drawings and operating procedures. Selected CR's and work orders were reviewed by the team to verify that potential component degradation was monitored and appropriately addressed.

b. Findings

No findings of significance were identified.

.3 Review of Low Margin Operator Actions

a. Inspection Scope

The team performed a margin assessment and detailed review of five risk significant and time critical operator actions. Where possible, margins were determined by the review of the assumed design basis and UFSAR response times. For the selected operator actions, the team performed a walkthrough of associated Emergency Operating Procedures (EOPs) Abnormal Operating Procedures (AOPs), Annunciator Response Procedures (ARPs), and other operations procedures with appropriate plant operators and engineers to assess operator knowledge level, adequacy of procedures, availability of special equipment when required, and the conditions under which the procedures would be performed. Detailed reviews were also conducted with operations and training department leadership, and through observation and utilization of a simulator training period to further understand and assess the procedural rationale and approach to meeting the design basis and UFSAR response and performance requirements. Operator actions were observed on the plant simulator and during plant walk downs. Operator actions associated with the following events/evolutions were reviewed:

- ATWS event
- Loss of instrument air (recover air to SG ADVs and TDAFW pump steam admission valve)
- Operator response to inadvertent SI (false SI signal) – termination criteria for SI
- Operator actions to provide nitrogen back up for Pressurizer PORVs
- Primary side feed and bleed (loss of secondary side cooling)

b. Findings

No findings of significance were identified.

.4 Review of Industry Operating Experience

a. Inspection Scope

The team reviewed selected operating experience issues that had occurred at domestic and foreign nuclear facilities for applicability at the Farley Nuclear Plant. The team performed an independent applicability review for issues that were identified as applicable to the Farley Nuclear Plant and were selected for a detailed review. The issues that received a detailed review by the team included:

- NRC IN 2006-26, Failure of Magnesium Rotors in MOV actuators
- GL 83-28 and 85-09, Salem ATWS (include recent French event)
- NRC IN 2007-05, Vertical deep draft pump shaft and coupling failures
- NRC IN 2007-06,&28 Potential common cause vulnerabilities in essential service water systems
- North Anna event of spurious safety injection Rx Trip
- GL 95-07, Pressure Locking and Thermal binding of Safety-Related Power–Operated Gate Valves

b. Findings

No findings of significance were identified.

.5 Review of Permanent Plant Modifications

a. Inspection Scope

The team reviewed three modifications related to the selected risk significant components in detail to verify that the design bases, licensing bases, and performance capability of the components have not been degraded through modifications. The adequacy of design and post modification testing of these modifications was reviewed by performing activities identified in IP 71111.17, Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications. The following modifications were reviewed:

- MDC S040266301, 1C EDG Speed Signal Generator Repair and Annunciator Modification, 2/06
- MDC C081583401, Remount DG Louver Actuators in the Vertical Position, 08/05/2008
- DCP 97-2-9199-00-005, Replacement of Emergency Air to Atmospheric Relief Solenoid Valves, Rev. D

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings, Including Exit

On February 27, 2009, the team presented the inspection results to Mr. Johnson and other members of the licensee staff. No proprietary information was reviewed as part of this inspection.

ATTACHMENT: SUPPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

M. Byrd, Mechanical/Civil Engineering Supervisor
A. Cary, Problem Investigation Program Supervisor
C. Collins, Plant Manager
S. Gates, Senior Specialist
P. Hayes, Engineering Director
L. Hogg, Security Manager
J. Horn, Training Manager
J. Hutto, Operations Manager
R. Johnson, Site Vice President
C. Medlock, Site Design Manager
B. Moore, Site Support Manager
D. Reed, Shift Manager

NRC personnel:

E, Crowe, Senior Resident Inspector
S. Sandal, Resident Inspector
B. Desai, Engineering Branch 1, Chief

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000348,364/2009006-01	NCV	Inadequate Verification of SW Capability to Concurrently Provide System Design Basis Cooling Requirements and the AFW Alternate Water Source (Section 1R21.2.1)

Opened

05000348,364/2009006-02	URI	Degraded Emergency Air System Conditions (Section 1R21.2.11)

LIST OF DOCUMENTS REVIEWED

Licensing Documents

TS, Current
UFSAR, Current
SER and Supplements

Design Basis Documents (Functional System Descriptions)

A181001, Service Water System Functional System Description, Rev. 53
A181009, Chemical & Volume Control System (HHSI), Rev. 30
A181012, Instrument Air System Functional System Description, Rev. 16
A181005, Functional System Description Diesel Generator System, Version 35.0
A181010 Functional System Description Auxiliary Feedwater System, Version 18.0

Drawings

A-170763, Installation Detail, SW Flow Switch, Version 4.0
D-171331, Outdoor Concrete-Service Water Intake Structure, Rev. A
D-200013, P&ID-River Water, Service Water, and Circulating Water System, Vers. 33.0
D-205003, P&ID-Service Water System, Version 36.0
D-205011, P&ID-Radwaste Building HVAC, Rev. 8
D-200209, P&ID-Lube Oil System for Diesel Generator 2B, Rev. 11
D-200210, P&ID-Intercooler Water System for Diesel Generator 2B, Rev. 8
D-200211, P&ID-Jacket Water Coolant System for Diesel Generator 2B, Version No. 17
D-170801, P&ID-Lube Oil System for Diesel Generator 1C, Rev. 16
D-170803, P&ID-Air Coolant System for Diesel Generator 1C, Rev. 10
D-170805, P&ID-Jacket Water Coolant System for Diesel Generator 1C, Rev. 21
G125-1152, Aerofin Drawing of Charging/HHSI Pump Room Coolers, Rev. 0
G125-1160, Aerofin Drawing of AFW Pump Room Coolers, Rev. 0
B-200219L Sheet 44, License Renewal Mechanical Boundary Q2P16F501B, Rev. 1
B-200219L Sheet 45, License Renewal Mechanical Boundary Q2P16F501A, Rev. 1
D-200013 Sheet 2, P&ID River Water, Service Water, and Circulating Water System, Rev. 22
D-205033 Sheet 1, P&ID Main Steam and Auxiliary Steam Systems, Rev. 36
D-205033 Sheet 2, P&ID Main Steam and Auxiliary Steam Systems, Rev. 22
D-205035 Sheet 2, P&ID Service Air, Rev. 6
D-205038 Sheet 1, P&ID Safety Injection System, Rev. 36
D-205239 Sheet 6, P&ID Chemical and Volume Control System, Rev. 3
D-170806, P&ID – Air Start System for Diesel Generator 1-2A, Rev. 22
D-170807, P&ID – Air Start System for Diesel Generator 1C, Rev. 21
D-200212, P&ID – Air Start System for Diesel Generator 2B, Rev. 21
D-173096, Unit 1 Loads Diagram, Sheet 2, Rev. 17
D-172678, Elementary Diagram – Heating and Ventilating Diesel Generator and Oil Storage Rooms 1C, Sheet 1, Rev. 11
D-203096, Unit 2 Loads Diagram (Emergency), Sheet 2, Rev. 10

D-172678, Elementary Diagram – Heating and Ventilating Diesel Generator and Oil Storage Rooms 1C, Sheet 2, Rev. 8
D-202676, Elementary Diagram – Heating and Ventilating Diesel Generator and Oil Storage Rooms 2B, Sheet 1, Rev. 6
D-202676, Elementary Diagram – Heating and Ventilating Diesel Generator and Oil Storage Rooms 2B, Sheet 2, Rev. 6
D-170337, Mechanical – General Arrangement – Diesel Generator Building – HVAC – Roof Plan, Rev. 6
D-170060 Diesel Generator Fuel Oil System, Rev. 15
B-170058 Diesel Generator Fuel Oil Storage Tank 1C, Sheet 36, Rev. 3
B-170058 Diesel Generator Fuel Oil Storage Tank 1B, Sheet 35, Rev. 3
5655D37, Sh. 7, Functional Diagrams Steam Generator Trip Signals, Rev. A1
5655D37, Sh. 14, Functional Diagrams Auxiliary Feedwater Pumps Startup, Rev. 6
5655D37, Sh. 15, Turbine Trip, Runbacks & Other Signals, Rev. 8
3D20701, Sh. 1, AMSAC Farley Unit 1 Interconnection Diagram, Rev. A0
D-172708, Sh. 1 of 2, Single Line Cable & Conn. Diagram – D.C. Distribution Train “B” Service Water Building, Rev. 3
D-202778, Diesel Generator 2B Start, Stop, and Shutdown, Rev. 17
D202747, Elementary Diagram Service Water Pump No. 2A
D202749, Elementary Diagram Service Water Pump No. 2C Bus 2K, Rev. 11
D-175035, Unit 1 P&ID – Service Air, Sheet 2
D-175034, Unit 1 P&ID – Instrument Air System, Sheet 1
D-175034, Unit 1 P&ID – Instrument Air System, Sheet 2
D-175034, Unit 1 P&ID – Instrument Air System, Sheet 3
D-170131, Unit 1 P&ID – Compressed Air System, Sheet 1
D-170131, Unit 1 P&ID – Compressed Air System, Sheet 2
D-205035, Unit 2 P&ID – Service Air, Sheet 2

Condition reports (CRs)

2006100516, Response to NRC IN 2006-22, New Ultra-Low-Sulfur Diesel Fuel Oil Could Adversely Impact Diesel Engine Performance
2006106636, SW Local Wet Pit Level Supports Indication Corroded

2007101412, Response to NRC IN 2007-05, Vertical Deep Draft Shaft and Coupling Failures
2007101413, Response to NRC IN 2007-06, Common Cause Vulnerabilities in Essential SW Systems
2007104270, Evaluate As Found Data for 2E SW Pump
2007101859, Evaluate Low Sulfur Fuel Oil for EDGs
2007106223, Lube Oil Temp Reading High, 2B Diesel Generator
2008102721, Jacket Water Leak When Performing 1C Hydro
2008102817, DG 1C Nitrites Out Of Spec Low
2008105002, Replace All ESF Room Cooler Power Fuses
2008104863, 2C Charging Pump Room Cooler Barely Passed Thermal Performance
2008105173, 1A Charging Pump Room Cooler Control Power Fuse Failure
2008111867, Farley Flow Balance Calc SM-ES-89-1499, Version 6.0 Did Not Include Max. DP Across the SW Strainers

2008112737, Scavenging Air Leak on 2B EDG, Left Bank
2009102135, SW Backup to AFW Not Included in SW Hydraulic Calc, 02/26/2009
2009102138, SW Test procedure FNP-0-ETP-4483 Includes 15% Uncertainty
2005111457, Lower limit not working, valve will not stay open, 11/10/2005
2006107259, PORV N2 Bottle PCV Inlet Connections are Leaking, 08/02/2006
2007103976, Conditions noted during Pressure Test 160.27-1, 04/25/2007
2007104427, PORVs 444B and 445A needed for mid-loop operation, 05/03/2007
2007104852, Received a report of high vibrations on HHSI lines, 05/11/2007
2007104972, MOV 8803B Leaking Past Seat, 05/15/2007
2007106444, FNP-2-STP-47.0 Slow Stroke of Q2P19HV2228, 07/02/2007
2007108435, Strainer Packing Leaking and Needs Adjustment, 08/29/2007
2007109500, Modify the Open Torque Switch Setting for MOVs, 10/01/2007
2008100497, Strainer making rubbing noise during backwash cycle, 01/18/2008
2008100854, Paint is chipping from nuts on top of the SW 2A strainer, 01/31/2008
2008101019, Several nuts on top cover appear to have metal loss, 02/04/2008
2008101020, Several nuts on top cover appear to have metal loss, 02/04/2008
2008107873, Tracking CR for VT-1 performed on SW Strainer nuts, 08/06/2008
2008108901, 2A SW Strainer shaft is severely eroded and needs replacement, 09/04/2008
2008109340, In Response to GL 95-07, 09/16/2008
2008110691, Hand switch for Q2E21LCV115D broken, 10/19/2008
2008111535, Chunks of rust laying on baseplate of SW strainer, 11/01/2008
2008111793, PORV 444B Showing Dual Indication on MCB, 11/06/2008
Dislodged, 12/23/2008
2008111943, 1-2A DG B Air Compressor Pressure Switch Not Starting the A/C Until Receiver Pressure Gets to 365 psig, 11/09/2008
2008107887, Discrepancy between the DG FSD and Set Point Indices, 08/06/2008
2008105259, Study Needed to Determine Appropriate Changes to DG CO2 System, 05/27/2008
2008104971, As-Found Condition of the Louver that Exists for 2B Diesel Generator Exhaust Fan B, 05/19/2008
2008104749, As-Found Condition of the Louver that Exists for 2B Diesel Generator Fan A, 2B D/G Manual Fuel Oil Transfer Pump in alert range (vibration)
2007102575 Difference between 2B FOTP vibration STP-81.5 and Eng Eval. 3/21/07
2008102207 MDC required to add mass or stiffen due to vibration on 2B FOTP
2008109562 2B D/G Auto FOTP seal leakage during partial STP-81.5 run
2008106833 Request for FNP PdM Group to perform vibration analysis
2008110018 TDAFW Pump run on miniflow, indications of pump cavitation
2008110780 TDAFW Pump Discharge Check valve Q2N23V003 exceeded the Acceptance Criteria of 5 gpm
2007102121, Inoperable TDAFW Because of Loss of Attendant Equipment, 3/07
2007102251, TDAFWP UPS Fault Light on MCB, 3/07
2007201530, 2B TDAFWP UPS motherboard and SCR #13 replacement, 5/07
2007108046, TDAFWP UPS Over Temperature/Fan Failure Alarm, 8/07
2007108079, B TDAFWP UPS High Temperature Alarm, 8/07
2008104627, Unit 2 A TDAFWP UPS Inverter Failure Light Illuminated, 5/08
2007100657, In Synch Light did not Illuminate Within 30 sec Timeframe, 1/07
2008106575, TDAFWP UPS on Service B Inverter Failed, 7/08

2007201528, 1A and 1B TDAFWP UPS Wires Touching Bus Bar, 4/07
2007201529, 2A TDAFWP UPS Wires Touching Bus Bar, 4/07
2007201598, Response to NRC IN 2006-26, 10/07
2008100310, TDAFW UPS Measured Values Greater Than Ones Used in Calculation, 1/08
2008102234, Replace Tachometer Signal Generator, 3/08
2008109451, Relay did not Meet Acceptance Criteria, 9/08
2009101141 1-2A EDG Auto Transfer Pump unavailable due to exceeded Maintenance Rule Performance Criteria
2009100768 1-2A Auto Fuel Oil Transfer Pump is not starting on Day Tank low-level2005112938, "B" train logic test switch #17 tested bad, 12/22/05
2005104278, Received MCB annunciator JE2 along with bistable TSLB-4, 04/28/05
2007111408, Both 48 volt "B" train SSPS power supplies were noted to be tripped, 11/08/07
2007100962, EE1, CTMT press HI-1 alert, in alarm and bistable TSLB 1-2 locked in, 02/02/07
2007112795, During FNP-2-STP-33.0B for position 23 no "good" or "bad" indication, 12/21/07
2007100537, B Train SSPS Hi Contain Press Safety Injection Function tested BAD, 01/19/07
2009100285, TS SR 3.8.4.5 cell-to-cell and terminal connection resistance limit, 01/09/09
2007106481, Review and Evaluate Event at North Anna
2008113535, 1B Emergency Air Compressor – Distance Piece Out of Spec.
2008106439, Emergency Air Compressor 1B Operability Test Failed
2008100222, Emergency Air Compressor 1B – Air Compressor Stopped
2005103675, 1B Emergency Air Compressor - Overload Tripped on Phase 2
2005103037, 2B Emergency Air Compressor – Air Compressor Failed During One Hour Run
2008102748, 1A Emergency Air Compressor – Cylinder Head Re-installed 180 degrees Out

<u>CRs written due to CDBI</u>

2009100845, There is no Performance Criterion for Monitoring Availability of Function R43-F03 (emergency air compressors), 01/27/2009
2009100902 Inadequate labeling of the 2A MDAFW pump suction check valve
2009100862, During walkdown corrosion observed on #1 cell post connection Battery Bank #3, 01/27/09
2009100863, During walkdown corrosion observed on cells 1, 4, 31 and 43 Battery Bank #4, 01/27/09
2009100903, Electrical panel doors found open in diesel building, 01/28/09

2009101529, Inspect for corrosion in weekly battery surveillance procedures, 02/12/09
2009101589, AMSAC technical manual recommended maintenance, 02/13/09
2009101583, 2B EDG Overspeed Trip Test Did Not Meet Acceptance Criteria, 2/09
2009101853, Review of Structural Integrity of MOV8884 After Stall Condition, 2/09
2009102148, Procedure Acceptance Criteria Does Not Agree With Battery Specification, 2/09

<u>Completed Surveillances:</u>

FNP-0-MP-13.1, Emergency Diesel Generators 1C and 2C 24 Month Inspection, 03/22/08
FNP-0-MP-14.1, Emergency Diesel Generators 1-2A, 1B and 2B 24 Month Inspection, 02/10/07
FNP-0-ETP-4367, Performance Test for Units 1 and 2 Colt-Pielstick (Large) DG Jacket Water Heat Exchanger, 07/30/08

FNP-0-ETP-4368, Performance Test for Units 1 and 2 Small DG Jacket Water Heat Exchanger, 08/04/08
FNP-2-STP-24.12 (2A, 2B, and 2C) Service Water Pump Cold Shutdown/Refueling IST, 05/01/07, 11/18/08
FNP-2-STP-24.13 (2C, 2D, and 2E Service Water Pump Cold Shutdown/Refueling IST, 04/30/07, 11/08/08
FNP-2-STP-24.1 (2A, 2B, and 2C Service Water Pump Quarterly IST, 11/12/08
FNP-2-STP-24.2 (2C, 2D, and 2E Service Water Pump Quarterly IST, 12/07/08
FNP-2-ETP-4395, Service Water Flow Balance Validation Test, 09/25/05
FNP-0-ETP-4483, Service Water Underground Piping Flow Test, 12/15/2008
FNP-2-STP-45.6, Turbine Building Service Water Cold Shutdown Valves IST, 08/21/07
FNP-2-STP-129-2060178801, Inservice inspection (Pressure Testing) of Class 3 Systems and Components, 04/06/2007
FNP-2-STP-129-2042033401, Inservice Inspection (Pressure Testing) of Class 3 Systems and Components, 09/28/2005
FNP-0-STP-63.5-S071353001, HVAC Verification for Diesel Generator Building, 12/10/2008
FNP-0-MP-12.4, Diesel Engine Air Start System Semi-Annual Inspection, 11/25/2008
FNP-2-STP-80.1-2070208701, Diesel Generator 2B Operability Test, 09/21/2008
FNP-0-STP-63.5-S070183701, HVAC Verification for Diesel Generator Building, 09/17/2008
FNP-2-STP-154.1-WO2070067201, 1B Diesel Generator Air Dryer Operability Verification, 08/01/2008
FNP-2-STP-80.1-2080571101, Diesel Generator 2B Operability Test, 08/18/08
FNP-0-STP-80.2-S080507701, Diesel Generator 1C Operability Test, 08/05/08
FNP-0-STP-154.2-S063294401, 1C Diesel Generator Air Dryer Operability Verification, 06/20/2008
FNP-0-STP-80.2-S063294801, Diesel Generator 1C Operability Test, 06/12/2008
FNP-0-MP-12.4, Diesel Engine Air Start System Semi-Annual Inspection, 05/08/2008
FNP-0-STP-154.1-S080315501, 1-2A Diesel Generator Air Compressor Outlet Check Valves Operability Verification, 02/21/2008
FNP-0-STP-154.1-S062313701, 1-2A Diesel Generator Air Compressor Outlet Check Valves Operability Verification, 01/20/2008
FNP-0-STP-63.5-S061404501, HVAC Verification for Diesel Generator Building, 01/10/2008
FNP-0-STP-63.5-S060211601, HVAC Verification for Diesel Generator Building, 07/25/2007
FNP-0-STP-63.5-S052351701, HVAC Verification for Diesel Generator Building, 01/15/2007
FNP-2-STP-628.9-WO2060143701, Diesel Generator Relief Valve Set Pressure and Seat Tightness Testing, 11/22/2006
FNP-2-STP-628.9-WO0714255, Diesel Generator Relief Valve Set Pressure and Seat Tightness Testing, 05/13/2004

Calculations

SM-ES-89-1499-001, Service Water Pumps' Permissible Degraded Curves, Rev. 3
SM-ES-89-1500-007, Bounding Service Water Inlet Temperature Profile, Rev. 0
CN-96-0043, Ultimate Heat Sink Evaluation-Power Uprate and Replacement Steam Generators, Rev. B
SM-ES-89-1500-004, Reg. Guide 1.27 Evaluation of the UHS Service Water Pond-Ultimate Heat Sink Analysis, Rev. 0

SM-ES-89-1499-007, Hydraulic Analysis of the Service Water System, Rev. 6
SM-ES-89-1524-001, Waterhammer Analysis of the Service Water System, Rev. 3
SM-96-1059-001, Minimum EDG Fuel Oil Storage Capacity, Rev. 2
SM-89-1613-001, EDG Fuel Oil Day Tanks, Rev. 1
SM-90-1905-002, EDG FOST and Day Tanks Level Indication Loop, Rev. 0
SM-03-9941-001, Charging and MDAFW Pimp Room Heatup Eval. Using Alt. Cooling During a Fire, Rev. 0
SM-C036017701-001, Room Cooler Heat Transfer Performance, Rev. 0 (Includes review of CCN-F-07-0003)
SM-97-1505-001, PROTO-HX Small and Large Diesel Generator Heat Exchanger Models, Rev. 2 (Including CN-03-0008, CCN-F-06-0002, CCN-F-09-0001, V1)
SM-94-475-001-NS, Analysis of Fan Failure in SW Intake Structure, Rev. 0
30.2, Heat Loads of SW Cooled Rooms, Rev. 3
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FNP-0-MP-13.19, Inspection of Starting Air Compressor for Diesel Generators 1C and 2C, Version 4.0
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2082047701, Replace / Repair Handswitch Q2E21LCV115D, 10/27/2008
2082151901, PORV 444B Showing Dual Indication on MCB, 11/12/2008
C081583402, Remount Louver Motor QSY41M0513D in Accordance With MDC C081583401, 08/21/2008
S080155001, Adjust packing on valve QSR43V586, 01/25/2008
S072121101, 1-2A DG #2 to #1Air Header X-Connection, 12/06/2007
S070511701, DG Room 2B Intake Louver, 03/09/2007
S060354500, Perform FNP-0-STP-80.5 on 1C DG, 2/24/2008
1071181901, 1-B DG #1 to #2 Air Header X-Connection, 02/19/2008
1070940301, AMSAC Operational Test, FNP-1-STP-302.B, 11/10/08
1070349901, AMSAC Operational Test, FNP-1-STP-302.B, 08/21/08
S041753201, Battery Service Test, 05/10/05
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S061724101, Battery Service Test, 11/19/07
S042246401, #3 Battery Performance Test, 10/24/06
S041703901, #4 Battery Performance Test, 05/12/06
2060449301, Diesel Generator 2B 24hr Test, FNP-2-STP-80.6, 12/11/07
S052583801, Diesel Generator 1C 24hr Test, FNP-0-STP-80.7, 09/12/06
S060354701, Diesel Generator 1C 24hr Test, FNP-0-STP-80.7, 02/26/08
2052706601, Perform FNP-2-STP-45.11, Completed 8/10/06
2060172901, Perform FNP-2-STP-45.11, Completed 8/1/07
2062451701, Emergency Air Compressor 2A Reservoir Outlet Check Valve, Completed 6/4/08
2081628601, Emergency Air Compressor 2B Reservoir Outlet Check Valve, Completed 8/08

Surveillance Tests

FNP-2-STP-45.1, CVCS Cold Shutdown Valves IST, 10/16/2005, 5/6/2007, and 10/20/2008
FNP-2-STP-45.4, ECCS Cold Shutdown Valves IST, 11/7/2006 and 4/23/2007
FNP-2-STP-45.11, Miscellaneous Valve Cold Shutdown IST, 11/18/2005 and 5/7/2007

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FNP-2-STP-65.2, Emergency Air Compressor 2B Operability Test, 7/5/2007, 12/20/2007, and 6/5/2008

Miscellaneous

Letter from W. G. Hairston, Alabama Power to NRC, Subject: Farley Units 1 and 2-Minflow Evaluation-NRC Bulletin No. 88-04, 11/30/98
Letter from K. W. Rehard, Fairbanks-Morse to F. D. Kuester, Southern Co., Subject: Cooling No. C071213001-002, Transition to Ultra Low Sulfur Diesel Fuel, 03/05/08
Open CDM, Measurements-Samplepoint, Analysis, Sample date, Diesel FOST 1C and 1B, From 01/01/08 to 01/26/08
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Modifications:

MDC C081583401, Remount DG Louver Actuators in the Vertical Position, 08/05/2008
MDC S040266301, 1C EDG Speed Signal Generator Repair and Annunciator Modification, 2/06
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