U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-280, 50-281
License Nos.:	DPR-32, DPR-37
Report Nos.:	50-280/98-07, 50-281/98-07
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	Surry Power Station, Units 1 & 2
Location:	5850 Hog Island Road Surry, VA 23883
Dates:	July 26 - September 5, 1998
Inspectors:	R. Musser, Senior Resident Inspector K. Poertner, Resident Inspector G. McCoy, Resident Inspector (In Training) S. Freeman, Resident Inspector, Oconee (Sections M8.1 and M8.2) P. Fillion and C. Smith, Reactor Inspectors (Sections E1.1, E3.1 and E8.3 through E8.23) R. Gibbs, Reactor Inspector (Section E8.1) D. Jones, Radiation Specialist (Sections R1.2, R1.3, and R1.4)
Approved by:	R. Haag, Chief, Reactor Projects Branch 5 Division of Reactor Projects

ENCLOSURE 2

EXECUTIVE SUMMARY

Surry Power Station, Units 1 & 2
NRC Integrated Inspection Report Nos. 50-280/98-07, 50-281/98-07

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six-week period of resident inspection; in addition, it includes the results of announced inspections by five Region II inspectors.

Operations

- Licensee actions in preparation for the potential arrival of Hurricane Bonnie were conservative and station operation was not impacted by the storm (Section O1.2).

- The Unit 1 Auxiliary Feedwater system was properly aligned for standby operation (Section O2.1).

- The Unit 2 charging pump component cooling system was properly aligned for normal operation. The valve alignment procedure did not include the surge tank sight glass isolation valves. The licensee revised the procedure to require that the valves be verified open (Section O2.2).

Maintenance

- Unit 2 turbine inlet valve freedom testing was accomplished in accordance with the procedure requirements and the test results were acceptable (Section M1.1).

- Ventilation damper maintenance activities were properly documented and procedures were present at the job site during work activities (Section M1.2).

Engineering

- A violation was identified for not correcting design problems, conditions adverse to quality, in a timely manner. In 1992 the licensee identified that the setpoint for the overcurrent protection of the inside recirculation spray pump motors could result in spurious tripping upon motor starting, and that there was no analysis or test to demonstrate that the components in the 125 VDC Station Battery Distribution System would receive rated voltage for all design basis scenarios. However, these conditions were not corrected as of August 1998 (Section E1.1).

- Violations of 10 CFR 50.71(e) for failure to update the UFSAR and 10 CFR 50.59 for the facility not being as described in UFSAR were identified. However, the NRC is exercising discretion and refraining from issuing a Notice of Violation in consideration of the licensee having a good UFSAR review program in progress (Section E1.1).

- There was a weakness, acknowledged by the licensee, in the area of documenting how significant information such as information notices is disposed when that disposition involves closure without a detailed review by an Operating Experience group reviewer (Section E3.1).

- The Maintenance Rule periodic assessment met the requirements of paragraph (a)(3) of the Maintenance Rule (Section E8.1).

- An non-cited violation was identified for a condition outside the design basis as described in Licensee Event Report 50-280, 281/98008-00. The cause was an inadequate test procedure (Section E8.23).

- An unresolved item was identified related to not reporting the problem described in Licensee Event Report 50-280, 281/98008-00 within 30 days (Section E8.23).

Plant Support

- Health physics practices were observed to be proper and high radiation doors were found to be in good condition and locked (Section R1.1).

- The licensee was maintaining radioactive effluent monitoring instrumentation in an operable condition and performing the required surveillances to demonstrate their operability (Section R1.2).

- The onsite meteorological measurements' program was implemented in accordance with the Updated Final Safety Analysis Report (Section R1.3).

- The licensee was maintaining the Control Room Emergency Ventilation System in an operable condition and performing the required surveillances to demonstrate operability of the systems (Section R1.4).

- Security and material condition of the protected area perimeter barrier were acceptable (Section S1).

Report Details

Summary of Plant Status

Unit 1 and Unit 2 operated at power the entire reporting period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707, 40500)

The inspectors conducted frequent control room tours to verify proper staffing, operator attentiveness, and adherence to approved procedures. The inspectors attended daily plant status meetings to maintain awareness of overall facility operations and reviewed operator logs to verify operational safety and compliance with Technical Specifications (TSs). Instrumentation and safety system lineups were periodically reviewed from control room indications to assess operability. Frequent plant tours were conducted to observe equipment status and housekeeping. Deviation Reports (DRs) were reviewed to assure that potential safety concerns were properly reported and resolved. The inspectors found that daily operations were generally conducted in accordance with regulatory requirements and plant procedures.

O1.2 Hurricane Preparations

a. Inspection Scope (71707)

The inspectors monitored licensee actions to prepare for the potential arrival of hurricane Bonnie.

b. Observations and Findings

During the inspection period Hurricane Bonnie approached the North Carolina coast. The licensee monitored the storm track and implemented severe weather preparations in accordance with Operations Checklist (OC) -21, "Severe Weather," and AP-37.01, "Abnormal Environmental Condition." The Virginia Electric Power Company (VEPCO) Hurricane Response Plan is triggered by the prediction of hurricane force winds on-site by the Virginia Power Weather Center. Hurricane force winds were not predicted during the approach of Hurricane Bonnie; however, the licensee did implement the plan as a precautionary measure. The inspectors reviewed the licensee's preparations, reviewed the status of important systems, and monitored the storm's progress. Maintenance and surveillance activities performed by the licensee were minimized during the time frame that Hurricane Bonnie could impact the Surry station.

c. Conclusions

Licensee actions in preparation for the potential arrival of Hurricane Bonnie were conservative and station operation was not impacted by the storm.

O2 Operational Status of Facilities and Equipment

O2.1 Unit 1 Auxiliary Feedwater System

a. Inspection Scope (71707)

The inspectors performed a walkdown of the Unit 1 Auxiliary Feedwater (AFW) system.

b. Observations and findings

During the inspection period, the inspectors performed a walkdown of the Unit 1 AFW system. The inspectors reviewed the associated system drawings, valve alignment procedure, and inspected accessible portions of the system to verify proper valve alignment and material condition.

The system was properly aligned for standby operation. The inspectors identified one electrical breaker handle which required adjustment. This problem was identified to the licensee for resolution.

c. Conclusions

The Unit 1 Auxiliary Feedwater system was properly aligned for standby operation.

O2.2 Unit 2 Charging Pump Component Cooling Water System

a. Inspection Scope (71707)

The inspectors performed a walkdown of the Unit 2 Charging Pump Component Cooling (CHCC) system.

b. Observations and Findings

During the inspection period the inspectors performed a walkdown of the Unit 2 CHCC system. The inspectors reviewed the associated system drawings, valve alignment procedure, and inspected accessible portions of the system to verify proper valve alignment and material condition.

The system was properly aligned for normal operation. During review of procedure 2-OP-51.5A, "Charging Pump CC and SW Systems Valve Alignment," the inspectors determined the CHCC surge tank sight glass isolation valves were not verified open by the valve alignment procedure. The valves were verified open by the licensee and the procedure was revised to require that the valves be verified open during performance of the

valve alignment procedure. The inspectors verified that the Unit 1 procedure required that the surge tank isolation valves be verified open.

c. Conclusions

The Unit 2 charging pump component cooling system was properly aligned for normal operation. The valve alignment procedure did not include the surge tank sight glass isolation valves. The licensee revised the procedure to require that the valves be verified open.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Inspection Followup Item (IFI) 50-280, 281/97002-01: Long term corrective actions to resolve potential TDAFW pump overspeed trips. The licensee has initiated a modification package to provide a seal-in circuit in the turbine driven auxiliary feedwater start circuitry to prevent the pump from receiving an automatic stop signal based on steam generator level after an automatic start signal is received. The licensee plans to implement the modification during the next Unit 1 and Unit 2 refueling outages.

O8.2 (Closed) Violation (VIO) 50-280/97003-01: Loss of containment integrity. The inspectors reviewed the licensee's corrective actions associated with this event and found them acceptable. The inspectors verified during the subsequent Unit 2 refueling outage that the specific deficiencies identified by the violation had been corrected prior to establishing containment integrity.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Turbine Inlet Valve Freedom Test

a. Inspection Scope (61726)

The inspectors observed portions of the Unit 2 turbine Inlet Valve Freedom Test.

b. Observations and Findings

On September 2, 1998, the inspectors observed the performance of procedure 2-OSP-TM-001, Revision 10, "Turbine Inlet Valve Freedom Test." The inspectors observed activities locally at the turbine throttles, in the emergency switchgear room and in the control room. During the test, the number 1 governor valve failed to shut in the maintenance mode and the D intercept valve shut when the C reheat stop and intercept valves were tested. Neither of these problems invalidated the testing in progress, and both were identified in DR S-98-2142 for further investigation. The number 1 governor valve was subsequently repaired.

The testing was performed in accordance with the procedural requirements, and the test results were acceptable.

c. Conclusions

Unit 2 turbine inlet valve freedom testing was accomplished in accordance with the procedure requirements and the test results were acceptable.

M1.2 Ventilation Damper Maintenance

a. Inspection Scope (62707)

The inspectors observed portions of the work activity associated with Work Order (WO) 00375779 and reviewed the completed work package.

b. Observations and Findings

On September 3, 1998, the inspectors reviewed maintenance activities associated with WO 00375779. The WO was generated as a preventive maintenance activity to lubricate the converter for the valve actuator associated with ventilation damper 2-VS-MOD-200A. The work activity was performed in accordance with procedure 0-MCM-0504-02, "Ventilation Damper Actuator Overhaul," Revision 2-P3. The work activity consisted of replacing the existing valve actuator with a new actuator. The licensee replaced the actuator to reduce the out of service time associated with performing the maintenance activity. The licensee plans to refurbish the actuator that was removed. The inspectors noted that the procedure was present at the job site during work activities observed and that the component was properly isolated to allow the work activity to commence.

c. Conclusions

Ventilation damper maintenance activities were properly documented and procedures were present at the job site during work activities observed.

M8 Miscellaneous Maintenance Issues (92700, 92902)

M8.1 (Closed) Licensee Event Report (LER) 50-280/97001-00 and -01: Shutdown due to steam drain line weld leak. The events described in this LER were previously discussed in Inspection Reports (IRs) 50-280, 281/96-13 and 50-280, 281/97-03. The inspectors reviewed Revisions 0 and one of the LER and proposed corrective action plan to prevent recurrence and found them adequate. The corrective actions included changing the procedure for main turbine trip block assembly corrective maintenance to add pull force testing of the trip solenoid coil, changing the turbine trip signal functional test to include testing of the trip solenoid prior to startup, and to replace the source range detectors every third cycle. The inspectors verified these actions had indeed been implemented.

M8.2 (Closed) LER 50-280, 281/97002-00 and -01: One train of auxiliary ventilation system inoperable outside TS. This LER and the events leading to it were previously discussed in IR 50-280, 281/97-02. Non-cited Violation (NCV) 50-280, 281/97002-02 was identified for failure to maintain two trains of Auxiliary Ventilation operable as required by TS. The inspectors reviewed Revisions 0 and 1 of the LER and corrective actions to prevent recurrence and found them adequate. Revision 1 of the LER stated that given the state of damper 1-VS-MOD-58B, if an automatic start signal occurred when fan 58A was operating, reverse rotation of fan 58B could have been enough to cause fan 58B to fail to start or continue to run. The corrective actions for Revision 1 included revising the ventilation filter train test to address reverse rotation considerations on fan operability, including checking for reverse rotation with the opposite fan running. The inspectors verified these actions had indeed been implemented.

M8.3 (Closed) VIO 50-280/97003-02: Failure to follow maintenance procedures. This violation involved the failure to properly install the cavity seal ring in preparation for refueling. Corrective actions included the modification of procedure 0-MCM-1150-01, Reactor Disassembly and Reassembly, to specify a sign-off step for the installation of RTV 3145 sealant along the inner J-seal. The licensee also committed to form a task team to review this violation and other maintenance procedural compliance issues and implement management-approved recommendations.

Revision 6 of procedure 0-MCM-1150-01 has been modified such that there are individual sign-offs for each step of the cavity seal ring procedure. The step for sealant application now specifically requires application along the entire circumference of the inner and outer J-seals. The accompanying figure, Figure 13 has also been modified to clearly indicate where the sealant is to be applied.

A maintenance task team reviewed the maintenance procedural compliance issues and identified four recommendations which were all accepted by management. These recommendations emphasized the role of first-line and second-line management's monitoring of maintenance field work. These recommendations were tracked by the licensee's Commitment Tracking System (CTS) (CTS Item 3844) and have been completed.

M8.4 (Closed) IFI 50-280, 281/97007-02: Alternate Alternating Current (AAC) diesel coolant temperature concerns and long term actions to resolve the issue. This item was opened for followup of inspectors' concerns about the elevated operating temperature of the AAC diesel in certain specific meteorological conditions. When the AAC diesel is operated while wind is from the northwest, the exhaust was blown back into the suction of the rooftop radiators, resulting in elevated operating temperatures.

As a result of the temperature concerns, the licensee initiated Design Change Package (DCP) 92-052 and modified the diesel exhaust piping such that the exhaust is released to the atmosphere vertically, at approximately the same elevation as the exhaust of the radiators. This will cause the hot exhaust gasses to be carried up and away from the

diesel building along with the radiator exhaust and reduce the overheating problems previously noted. Although the winds were not out of the northwest, the AAC diesel has been subsequently operationally tested after the installation of the modification.

M8.5 (Closed) VIO 50-280, 281/97002-03: Procedures not appropriate to the circumstances. The inspectors reviewed the licensee's response to NRC Inspection Report 50-280, 281/97-02, dated May 6, 1997, which describes the corrective actions for the above listed violation. This violation involved two instances where the licensee had failed to prescribe adequate instructions for activities affecting quality. Based on the inspectors' review of the violation response letter and the related corrective actions, it was concluded that the licensee had completed the required actions for this violation.

III. Engineering

E1 Conduct of Engineering

E1.1 Followup to Surry Plant Design Inspection

a. Inspection Scope (37551, 92903)

In February and March 1998, the NRC, Office of Nuclear Reactor Regulation (NRR), Events Assessments, Generic Communications and Special Inspection Branch, performed a design inspection of the Safety Injection and Recirculation Spray systems. The results of this inspection were recorded in the design inspection report (NRC Inspection Report Nos. 50-280, 281/98-201) issued May 11, 1998. The report transmittal letter and Executive Summary communicate the following conclusions:

- Discrepancies were identified regarding adherence of the systems to their design and licensing basis.
- The team found examples of inadequate corrective action for potential problems identified by the 1992 Electrical Distribution System Functional Assessment (an internal assessment).
- The team identified a number of UFSAR discrepancies.

The design inspection report transmittal letter states that any enforcement action resulting from that inspection will be handled by NRC Region II via separate correspondence. During the week of August 24 - 28, 1998, two Region II inspectors conducted an inspection at the VEPCO corporate office in Richmond, VA, to evaluate the findings of the design inspection to determine whether they represent violations of NRC requirements. Each IFI and Unresolved Item (URI) are discussed in Section E8, Miscellaneous Engineering Issues.

b. Observations and Findings

Observations and findings regarding the issues of corrective action and UFSAR discrepancies are discussed below.

Resolution of Design Problems Identified by the Licensee

In December 1992, the licensee completed a calculation which reviewed and documented the overcurrent protection and coordination for the 480 V safety-related load centers for Units 1 and 2 (refer to IFI 98201-06). The number and title of that calculation are EE-0497, Safety-Related 480 V Load Center Coordination. The Summary of Results section of EE-0497 discusses the Inside Recirculation Spray (IRS) pump motors, and states:

> The nominal instantaneous setting is greater than 173 percent of the locked-rotor current, accounting for the maximum possible DC offset. Based on the tolerance of the type OD trip device instantaneous units (± 20%), 173 percent is not maintained.

This statement meant that theoretically the circuit breakers protecting the IRS motors could trip on motor starting. The relevant design criterion, as stated on sheet 40 of the calculation, was to have the instantaneous trip device set above 173 percent of locked-rotor current as a minimum, with 200 percent being preferred. Actually, the 173 percent setpoints was in terms of locked-rotor amperes at 460 V. The inspectors estimated what the voltage at the terminals of the motor would be upon starting assuming 480 V at the bus and 300 feet of cable. The estimate was 446 V. The setpoint in terms of locked-rotor current at 446 V was nominal 181 percent, with an uncertainty band of 144 to 199 percent. Therefore, the inspectors agreed with the calculation conclusion that theoretically the motor could trip upon starting, as the transient starting current could be above the minimum trip point. The setpoints have not been revised as recommended by the calculation. No DR was written for this problem at the time the calculation was issued. In March 1997, the breaker for the Unit 1 1A IRS pump spuriously tripped upon starting, and DR S-97-0943 was initiated. It was reasonable to assume that there has not been repeated spurious tripping of the IRS motor circuit breakers upon starting in the past, otherwise problem reports would have been written by the operators. This concept was used by the inspectors to conclude that there was no immediate operability concern. Nevertheless, the inspector's position was that the setpoint should be brought within the design criteria at the earliest opportunity.

In about June 1992, the licensee performed an Electrical Distribution System Functional Assessment (EDSFA) on Surry. That assessment identified that there was no analysis or test to demonstrate that the components on the 125 VDC Station Battery Distribution System would receive rated voltage for all design basis scenarios. Rated voltage is given as a range, i.e., minimum and maximum. EDSFA Item A-105 addressed the issue of low voltage and Item A-185 addressed the issue of high

voltage. The inspectors were not able to ascertain the official status of these items. However, it was clear from discussions with the cognizant engineers that nothing had been done on these items.

During the period of the design inspection, the licensee performed some voltage analysis on components selected by the design inspection team (inspection questions S-98-130 and 131). These questions were reviewed by the inspectors during the current inspection, and the inspectors agreed that the question responses gave some measure of confidence that there was no immediate operability concern with low voltage.

Both the breaker setpoint issue and the DC voltage analysis issue represent condition adverse to quality identified by the licensee in the past for which no DR was written and no corrective action was taken until intervention by the design inspection team. These circumstances represent a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," which requires that conditions adverse to quality be corrected in a timely manner. Subsequent to the design inspection, the licensee has committed to implement corrective actions for these problems. In the inspection report response letter, dated July 9, 1998, on Attachment 1, pages 34 and 35, the licensee states: "The development of a new DC System transient model and calculation encompassing end components will be completed by December 16, 1999." The inspectors examined Commitment Tracking System (CTS) Item No. 4211, and observed that the action plan included an item to develop a new DC System transient model and calculation encompassing end components by December 1, 1999. The inspection response letter Attachment 1, page 21, states: "Virginia Power will provide additional tripping margins, as required, between the individual motor feeders [breaker setpoint] and the locked rotor current." Furthermore, it states on page 21 that this will be accomplished by revising calculation EE-0497 and preparing a DCP to implement the setpoint changes. During the inspection the licensee indicated that the IRS breaker setpoint change will be implemented in a timely manner. The inspectors examined CTS Item Nos. 4210 and 4290, and observed that they were tracking the resolution of problems with Calculation EE-0497 and specifically the IRS pump breaker problem. In addition, the inspection response letter Attachment 2, pages 1 and 2, discusses the corrective action problem identified by the design inspection team (and discussed in this section). Attachment 2 proposes to perform a root cause analysis on the poor disposition of the EDSFA findings and to take programmatic type corrective actions if needed.

The circumstances described above, i.e., failure to take corrective action for identified design type problems, constitute a violation of 10 CFR 50, Appendix B, Criterion XVI, and will be identified as Violation 50-280, 281/98007-01, Failure to Take Corrective Action for Identified Design Problems.

UFSAR Discrepancies

The design inspection report identified eighteen UFSAR discrepancies, inaccuracies, inconsistencies etc. These are listed in Section E1.4.2

of the report, along with some Design Basis Document (DBD) discrepancies. During the current inspection, the inspectors evaluated each of the UFSAR items for significance. Each of the items fell into one of three categories:

A. A clarification of original or old wording would enhance the document

B. 50.71(e) issue

C. 50.59 issue

Based on these evaluations, the inspectors concluded that items in A above were not violations of NRC requirements. Items in B and C above were violations of 10 CFR 50.71(e) for failure to update the UFSAR and violations of 10 CFR 50.59 for the facility not being as described in UFSAR, respectively. However, according to NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," (the Enforcement Policy) as revised on May 13, 1998, the NRC may refrain from issuing a Notice of Violation when certain criteria are met for issues considered old design issues. Discretion may be considered if, in the Staff's view, the licensee would have identified the violation in light of the defined scope, thoroughness, and schedule of the licensee's initiative (UFSAR review program). The scope of the licensee's UFSAR review program is defined in a letter from VEPCO to the NRC dated May 23, 1997, on the subject of an integrated configuration management program.

The inspectors saw documentation that nine of the eighteen items in the report were already resolved by the licensee in that the necessary evaluations had been performed and the revised wording had been prepared. The inspectors examined a sample of these changes, and found that the evaluations and revised wording were correct. The inspectors also examined the methodology and data bases utilized in the UFSAR review program, and found that documentation was detailed and extensive. The inspectors concluded the licensee had a good UFSAR review program. The inspectors also noted that the UFSAR review program had not completed any system at the time of the design inspection.

In summary, the UFSAR discrepancies identified by the design inspection team did represent a violation of the requirement to update the UFSAR. However, the NRC is exercising discretion in accordance Section VII.B.3 of the Enforcement Policy and refraining from issuing a citation for this Severity Level IV violation.

c. Conclusions

A violation was identified for not correcting design problems, conditions adverse to quality, in a timely manner. In 1992 the licensee identified that the setpoint for the overcurrent protection of the inside recirculation spray pump motors could result in spurious tripping upon motor starting, and that there was no analysis or test to

demonstrate that the components in the 125 VDC Station Battery Distribution System would receive rated voltage for all design basis scenarios. However, these conditions were not corrected as of August 1998.

Violations of 10 CFR 50.71(e) for failure to update the UFSAR and 10 CFR 50.59 for the facility not being as described in UFSAR were identified. However, the NRC is exercising discretion and refraining from issuing a Notice of Violation in consideration of the licensee having a good UFSAR review program in progress.

E3 Engineering Procedures and Documentation

E3.1 Conduct of Operating Experience Review Program

a. Inspection Scope (92903)

The inspectors reviewed the licensee's evaluation for NRC Information Notice IN 98-22, Deficiencies Identified During NRC Design Inspections.

b. Observations and Findings

The Significant Information Focus Team, which is the second level of screening for INs, disposed IN 98-22 as follows: "Close to the North Anna architect/engineer inspection preparation team review. Information copies sent to Configuration Management, Nuclear Training and two supervisors at the Surry plant." North Anna did not receive an architect/engineer inspection and the preparation team was dissolved before it reviewed the subject IN.

The Corporate Operating Experience Coordinator, who chairs the Significant Information Focus Team meetings, stated that, even though not documented, the IN was not recommended for detailed review by the Operating Experience group because each of the items had already been received via separate communication. He also stated that the IN was included in technical staff training. The inspectors did not independently confirm these statements.

Apparently as a result of NRC inquiry into the handling of IN 98-22, the IN has been reopened, and will receive a detailed review by an Operating Experience reviewer.

The inspectors commented that there appeared to be a weakness in documenting the reason for closeout of the IN. The Corporate Operating Experience Coordinator agreed with that comment. He indicated that they were in the process of improving the documentation of reasons for items closed without detail evaluation by an Operating Experience reviewer.

c. Conclusions

There was a weakness, acknowledged by the licensee, in the area of documenting how significant information such as INs are disposed when

that disposition involves closure without a detailed review by an Operating Experience group reviewer.

E8 Miscellaneous Engineering Issues

E8.1 Maintenance Rule Periodic Assessment

a. Inspection Scope (37551, 62706, and 92902)

Paragraph (a)(3) of the Maintenance Rule requires that performance and condition monitoring activities and associated goals and preventive maintenance activities be evaluated taking into account, where practical, industry-wide operating experience. This assessment is required to be performed at least one time during each refueling cycle, not to exceed 24 months between evaluations. The inspectors discussed the requirements with the corporate Maintenance Rule coordinator who is responsible for this activity. The inspectors also reviewed the completed assessment which was issued in March 1998.

b. Observations and Findings

The inspectors verified that the completed assessment was in accordance with the guidance contained in NUMARC 93-01, "Nuclear Energy Institute Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2, which included review of: goals and monitoring, performance criteria, effectiveness of corrective actions, balancing of availability and reliability, the use of industry operating experience, and effectiveness of a preventive maintenance program.

c. Conclusions

The Maintenance Rule periodic assessment met the requirements of paragraph (a)(3) of the Maintenance Rule.

E8.2 (Closed) VIO 50-280, 281/97002-04: Failure to meet the requirements of 10 CFR 50.9(a) for LER 50-280/97002-00, and

(Closed) VIO 50-280/97003-03: Failure to meet the requirements of 10 CFR 50.9(a) for LER 50-280/97001-00.

The inspectors reviewed the licensee's response to NRC Inspection Report 50-280, 281/97-02, dated May 6, 1997, which describes corrective actions for the violations listed above. These violations involved reporting inaccurate information to the NRC in Licensee Event Reports. Based on the inspector's review of the violation response letter and the related corrective actions, it was concluded that the licensee had completed the required actions for these violations.

E8.3 (Open) IFI 50-280, 281/98201-01: Low Head Safety Injection (LHSI) pump Net Positive Suction Head (NPSH). This item involves the method of calculation of the available NPSH for the LHSI, Inside Recirculation Spray (IRS) and Outside Recirculation Spray (ORS) pumps. The issue is

the same as the issue of Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal," issued October 7, 1997. The NRC is reviewing information on this issue supplied by the licensee in response to the design inspection report, in response to the generic letter and in response to a request for additional information. The IFI remains open pending review by the NRC.

E8.4 (Closed) IFI 50-280, 281/98201-02: Error in Calculation SM-104, Reactor Cavity Water Holdup. The IFI was opened because calculation SM-104, Revision 1, failed to account for some of the water volume lost over a period of time from the containment floor. The calculation was revised by the licensee to address this concern. The inspectors reviewed revision 2 of the calculation which determined the available Net Positive Suction Head (NPSH) for safeguard pumps following a design basis Loss of Coolant Accident (LOCA) based on the effects of the following:

- Holdup of spray water in the reactor cavity
- Recirculation spray piping fill volume
- Draining condensate films on passive heat sinks in containment
- Suspended spray droplets in the containment atmosphere.

Based on the results of the above analysis the following penalties were applied to currently reported available NPSH values in order to reflect the integrated effects of these uncertainties:

- Outside recirculation spray pumps; -0.15 foot
- Inside recirculation spray pumps; -0.16 foot
- Low head safety injection pumps; -0.17 foot.

The licensee prepared UFSAR change request number FS-98-021 to revise UFSAR sections 6.2 and 6.3. The basis for this change was Westinghouse Nuclear Safety Advisory Letter (NSAL) 97-009, Containment Sump Issues. The licensee's review of the issues listed in NSAL 97-009 led to the conclusion that the penalties documented in calculation SM-104, Revision 2, should be subtracted from currently reported NPSH for the spray pumps. The inspectors reviewed the 50.59 evaluation, performed for the UFSAR change, and verified that the UFSAR change request was in the licensee's commitment tracking system with a schedule completion date of August 31, 1998. This item was being tracked by Task Item No. 682.

Based on objective evidence reviewed this item is closed.

E8.5 (Open) URI 50-281/98201-03: Unit 2 LHSI pump minimum flow. The design inspection team identified that one of the Unit 2 Low Head Safety Injection (LHSI) pumps could be subjected to less than rated minimum

flow for certain design basis scenarios. The susceptibility of the LHSI pumps to interact during recirculation at close to shut off head conditions was documented by the licensee on DR S-98-0660. Additionally, in response to DR S-98-0660 the licensee prepared calculation number ME-0558 in order to evaluate a proposed plant modification to the Unit 2 LHSI pump recirculation piping. The inspectors reviewed calculation ME-0558 and determined the scope of the plant modification to include relocating each LHSI pump recirculation line from downstream of the pump discharge check valve to upstream of the discharge check valve. The calculation concluded that with implementation of the plant modification the LHSI pumps discharge flow rates during parallel operation will result in flows of approximately 132 gpm for pump 2-SI-P-1A and 185 gpm for pump 2-SI-P-1B. As discussed in NRC Inspection Report Nos. 50-280, 281/201, paragraph E.1.2.1.2(g), the Unit 2 LHSI pumps were considered operable based on 18 gpm recirculation flow and operator action within 30 minutes to secure one LHSI pump. Consequently, the post modification flow rate of 132 gpm and 185 gpm were considered adequate to maintain the Unit 2 LHSI pumps operable.

The licensee in their response letter to the design inspection, dated July 9, 1998, committed to implement a plant modification during the 1999 Refueling Outage (RFO) for Unit 2 and the 2000 RFO for Unit 1 in order to resolve this issue. The licensee also committed to review their response to NRC IEB 88-04 to ensure that there are no other invalid assumptions regarding pumps that are susceptible to potentially harmful interactions. The review will be completed by October 1, 1998, and a revised response submitted if necessary.

The URI remains open pending evaluation of other potential design basis issues.

E8.6 (Open) IFI 50-280/98201-04: Motor thermal overload for 1-SI-P-1B. In the licensee's response to the design inspection report, dated July 9, 1998, the licensee committed to provide overcurrent protection for the 1-SI-P-1B motor by adjusting the setpoint of the trip device or replacing the trip device if necessary. The inspectors observed that this item was tracked by CTS No. 4288. Also, the licensee has been requested to furnished additional details of the equipment in a telephone conversation on July 28, 1998. The IFI remains open pending review by the NRC.

E8.7 (Open) IFI 50-280, 281/98201-05: Adequacy of 4160 VAC electrical cables to withstand fault current. Reference to IEEE standards indicates that, given the available short-circuit current magnitude, the breaker operating time and the type of cable (aluminum conductor), a minimum size of 250 KCM would be required to ensure that the 250 °C momentary temperature rating is not exceeded. The problem is that several circuits have smaller conductors, for example the charging pump motors are fed with No 1 AWG size cable. The fact that some cables are undersized from a short-circuit viewpoint means that, if a short-circuit were to occur on one of those cables, the protecting circuit breaker

could not possibly operate fast enough to prevent severe damage along the whole length of the cable. This situation raises questions about whether the installation meets Appendix R requirements. One specific question is whether a fire induced short-circuit on a circuit not required for safe shutdown could result in significant damage to a safe shutdown required circuit given the fact that the two circuits could be in close proximity in a cable tray.

As stated in the licensee's response to the design inspection report, dated July 9, 1998, and as confirmed during the inspection, the licensee's approach to resolving this issue is to attempt to obtain test reports that will show that a cable damaged by short-circuit could not result in damaging an adjacent cable to the extent that it could not perform its intended function. The licensee stated they had knowledge that tests had already been conducted for use at another plant that would apply to the Surry situation.

The inspectors' position was that the licensee's approach was reasonable, and they should be given a reasonable period of time to pursue that approach. Should the licensee use a test report to show that the existing installation is acceptable, the NRC would want to review that report. In addition, the NRC would want to verify by on-site inspection that configurations assumed in the report are consistent with the actual installation. If the test report cannot be obtained or cannot be used to show acceptability of the existing installation, then compliance with Appendix R would be in question, and the NRC would monitor that situation. For the reasons stated herein, the IFI remains open.

E8.8 (Closed) IFI 50-280, 281/98201-06: Breaker-to-breaker and breaker-to-fuse analysis. This issue involves problems discussed in the Summary of Results and Conclusions sections of Calculation EE-0497. This calculation was completed in December 1992, and its purpose was to determine the setpoints of the overcurrent trip devices at the safety-related 480 V load centers of both units. It was a re-constitution type calculation generated because the basis for the original setpoints was lost. The IFI does not involve breaker to fuse coordination as that is not covered by Calculation EE-0497.

The Summary of Results section states that several problems (with the existing setpoints) were identified in the calculation, but that none of these were safety significant. The inspectors reviewed each problem discussed in the Conclusions section of the calculation. The inspectors agreed that the problems were not safety significant, except for one case. That case is the setpoint for the IRS pump motors, which is discussed in Section E1.1 of this report under the heading: Resolution of Design Problems Identified by the Licensee. In the response letter to the design inspection report, dated July 9, 1998, the licensee committed to resolve all issues discussed in the EE-0497 calculation by making setpoint changes if necessary. The inspectors noted that CTS Items 4210 and 4290 were tracking this item. The IFI was closed.

E8.9 (Closed) IFI 50-280, 281/98201-07: Breaker replacement. In their response to the design inspection report, the licensee committed to replace circuit breakers as necessary at the next refueling outages to make the enhancements recommended, or implied by, the analysis of penetration protection. The analysis is contained in Technical Report EE-0094, Containment Electrical Protections - Electrical Protection Devices - Power Circuits Surry Unit 1, and EE-0095 for Unit 2. The inspectors reviewed these technical reports, and agreed with the licensee's position that the technical report conclusions did not represent any operability concerns. The inspectors observed that CTS Item No. 4291 was tracking this work scope.

E8.10 (Open) URI 50-280, 281/98201-08: Emergency Diesel Generator (EDG) battery transfer switch. The design inspection team identified that there was no analysis to demonstrate the capacity of number 3 EDG battery to supply two sets of EDG loads. The lack of analysis raised questions about a possible common mode failure, because the breaker which could connect the second set of loads did not have sufficient administrative controls.

In response to the NRC's concern the licensee prepared Potential Problem Report (PPR) No. 98-021, dated March 2, 1998, which described the design adequacy of the transfer switches used to allow 125 VDC control power for the number 1 and/or 2 EDGs to be supplied from number 3 EDG battery. This PPR documented an evaluation of the applicable design criteria for the original plant design and the licensing basis for the use of these switches. The PPR stated that because use of the throw over switches were permitted by procedure and no analysis of their use was found, it was recommended that a station DR be written in order to initiate corrective action. The PPR also recommended that (1) operation of the switches be prevented by pulling their respective fuses and locking them in the position where each battery is powering its associated EDG 125 VDC load; and (2) revising plant procedures 0-AP-17.04 and 0-FCA-12.00 to remove the requirement for use of the switches.

In the response to the design inspection report, dated July 9, 1998, the licensee stated the switch has been disabled by locking them in the "open" position. The inspectors reviewed station DR S-98-0605 and verified that the recommendations of PPR-98-021 had been incorporated for disabling the transfer switches and revising the procedures to delete the steps detailing operation of the switches. This item has been incorporated in the licensee's commitment tracking system and assigned CTS No. 4202 to ensure completion of this commitment by June 30, 1999. Additionally, a Request for Engineering Assistance (REA) has been submitted for preparation of a design change package to either physically remove or physically secure the throw over switches to prevent their use in the future. Although these corrective actions were adequate to address the issue, the URI will remain open pending review by the NRC to determine whether an unreviewed safety question was involved during past operation.

E8.11 (Open) URI 50-280, 281/98201-09: DC tie breaker. This item was identified in connection with a concern of whether closing the DC tie breaker with both batteries connected to the DC busses constituted an Unreviewed Safety Question (USQ). The licensee wrote station DR S-98-0719 to document that the interim configuration of two batteries and four chargers was not covered by a calculation of record and would likely exceed the fault interrupting current of the bus. The inspectors reviewed DR S-98-0719 and determined that the licensee's developed corrective actions for this item included the following:

- Station engineering to provide guidance for revising procedures on how to perform removal and return to service of the station batteries by July 31, 1998.

- Procedures department to revise procedures 1/2-MOP-EP-30 and 31; and 1/2-MOP-EP-204 thru 207 by September 15, 1998.

The above corrective actions have been incorporated in the licensee's commitment tracking system. Additionally, CTS No. 4292 has been assigned to monitor completion of the corrective actions which has been scheduled for October 1, 1998, in the commitment tracking system. This item remains open pending review by the NRC to determine whether an unreviewed safety question exists or existed in the past.

Also, the design inspection team identified a issue as to whether the molded case switch used to cross connect the station batteries met applicable regulatory requirements (IFI 50-280, 281/98201-10). Station DR S-98-0661 was written to document this plant condition and to initiate corrective action. The inspectors reviewed DR S-98-0661 and verified that corrective actions had been developed for resolution and recurrence control of this item. The corrective action plan involved preparation of a Type 1 report, "Evaluation of DC Cross-Tie Surry Station," dated July 31, 1998. This report concluded that the existing molded-case switch which serves as the DC cross-tie does not meet Safety Guide 6 requirements of having at least one interlock to prevent operator error that could parallel their standby sources. It also recommended that the existing DC system be modified by supplementing the existing molded-case switch or replacing the single molded-case switch with two devices. A Request for Engineering Assistance (REA) was prepared for development of the plant modification in support of implementation by the end of Unit 2 year 2000 RFO and by the end of Unit 1 year 2001 RFO.

In the response to the design inspection report, dated July 9, 1998, licensee committed to perform an evaluation to determine whether modifications were required to comply with Safety Guide 6. The licensee also committed to develop design change packages to support implementation by the end of Unit 2 2000 RFO and by the end of Unit 1 2001 RFO. The inspectors verified that this item had been incorporated in the licensee's commitment tracking system and CTS No. 4262 had been assigned for monitoring closure of all corrective actions. However, final disposition of this manner is pending evaluation of the USQ.

E8.12 (Closed) IFI 50-280, 281/98201-10: DC bus tie interlock. This issue has been combined with URI 50-280, 281/98201-09. Thus, the IFI is considered closed.

E8.13 (Closed) IFI 50-280, 281/98201-11: Battery calculation discrepancies. The inspectors reviewed Calculation No. EE-0046, "125 VDC Loading Analysis-Unit 1 Batteries; Analysis of New Annunciator Loading," Revision 1, Addendum 01B which was prepared by the licensee to address concerns identified by the NRC.

The calculation evaluated station batteries 1A and 1B new loading for the replacement annunciators and incorporated changes to battery 1A and 1B load model based on the February 1998 Surry A/E inspection. The revision addressed the two-hour accident duty cycle for battery 1A and 1B and the four-hour Station Blackout (SBO) duty cycle for battery 1A.

Based on the above review the inspectors verified that the changes in the load model in response to the findings of the A/E inspection included:

- Inverter load based on the accident loading of the vital busses in lieu of inverter full load rating.
- Switchgear manufacturer recommendation for using switchgear spring charging motor current of 6.5 times rated current of 10 Amps.
- Inclusion of an additional breaker operation in the first minute of the duty cycle for additional conservatism.
- Inclusion of a random load for an additional breaker operation during the duty cycle for additional conservatism.

The licensee in their response to the design inspection report, dated July 9, 1998, committed to revise calculation EE-0046 by March 30, 1999 to incorporate all A/E inspection findings. The inspectors verified that CTS No. 4211 had been assigned to Corporate Engineering for completion of this item. Based on objective evidence reviewed this item is closed.

E8.14 (Closed) IFI 50-280, 281/98201-12: Battery design margin. The design inspection report identified the following concerns with calculation 14937.28, Verification of Lead Storage Battery Size for Emergency Diesel Generator, Revision 2:

- Calculation should provide worst case battery loading by assuming at least two unsuccessful starts in the first minute.
- The starting currents for some DC motors in the EDG starting circuit may be partially concurrent with the current drawn by the EDG field flashing circuitry.

- The second start attempt in the first minute invokes two redundant starting circuits thereby almost doubling the load demand.

In response to the above concerns the licensee wrote station DR S-98-0677 to document deficiencies and initiate corrective actions. Additionally, the licensee in their response to the design inspection report, dated July 9, 1998, stated that an operability review had been performed for the issues listed on station DR S-98-0677 and concluded that the Emergency Diesel Generator (EDG) battery had adequate margin such that the documented deficiencies do not present an operability concern. The license also committed to revise calculation 14937.28 for the EDG battery two hour load profile to incorporate the concerns listed above. Calculation 14937.75, Verification of Lead Storage Battery Size for Emergency Diesel Generator Under Station Blackout Conditions, Revision 1, will also be reviewed and revised if similar discrepancies are identified.

The inspectors reviewed calculation 14937.28 Revision 2, and verified that there was a battery margin of 88.8% with its present duty cycle. The inspectors concurred with the licensee's conclusion that adequate margins exist and there is not an operability concern for the EDG battery. Corrective actions documented on station DR S-98-0677 were reviewed to verify agreement with the licensee's commitment in their response to the design inspection report, dated July 9, 1998. The inspectors verified that these corrective actions had been incorporated in the licensee's commitment tracking system and CTS No. 4223 had been assigned to monitor closure of this item scheduled for December 16, 1998.

This item is closed based on objective evidence reviewed.

E8.15 (Closed) IFI 50-280, 281/98201-13: DC fault contribution. The design inspection report documented a concern where a calculation for determining the EDG batteries short-circuit current had not been prepared. The inspectors were informed by the licensee that a station DR had not been prepared for this item because a condition was never identified in which available fault currents exceeded component design. The licensee in their response to the design inspection report, dated July 9, 1998, committed to prepare a EDG battery short-circuit calculation by December 1, 1998. The inspectors verified that CTS No. 4298 had been assigned to this item and responsibility for closure had been assigned to the Corporate Engineering Group. This item is closed based on objective evidence reviewed.

E8.16 (Closed) IFI 50-280, 281/98201-14: DC load flow/voltage drop. This issue is discussed in Section E1.1 of this report under the heading: Resolution of Design Problems Identified by the Licensee. The issue represents an example of a violation of NRC requirements in the area of corrective action. The IFI is closed because satisfactory corrective actions have been put in place.

E8.17 (Closed) IFI 50-280, 281/98201-15: Adequate DC component voltage. This issue is essentially the same as the issue of IFI 98201-14 except that IFI 98201-14 dealt with the Station Battery Distribution System and 98201-15 dealt with the Diesel Generator Batteries Distribution Systems. The issue is that the licensee did not have a calculation demonstrating that the components would receive rated voltage for all design basis scenarios. The inspectors found that the situation with the diesel generator batteries was not as significant as the situation with the station batteries for two reasons. First, the loss-of-offsite-power test conducted each outage very nearly duplicated the design basis scenario for the diesel generator batteries. Therefore the test went a long way in demonstrating the system could perform its design basis function. Second, the inspectors observed that the diesel generator battery (Exide EI-5) is capable of supplying 210 Amperes for one minute and 97 Amperes for one hour. The calculated load for the first minute was 83 Amperes. Therefore, there was a good deal of design margin to cover any design basis loads that may not appear in the loss-of-offsite-power test. In their response letter to the design inspection, the licensee committed to develop a new analysis for voltage drop for diesel generator battery loads. The inspectors observed that CTS Item No. 4299 was tracking this scope of work.

E8.18 (Closed) IFI 50-280, 281/98201-16: DC load control. In their response to the design inspection report, the licensee committed to revise the relevant procedures to strengthen the control over adding of loads to the DC busses. The specific procedures to be revised were mentioned in the response. In addition, the licensee committed to provide training on the revised procedures. The inspectors observed that CTS Items 4179 and 4297 are tracking these commitments.

E8.19 (Closed) IFI 50-280, 281/98201-17: Battery surveillance test. In their response to the design inspection report, the licensee committed to revise the procedure for the battery performance test to make the test consistent with the test described in industry standards (IEEE 450). The change would continue a performance test until final design end voltage was reached thereby determining the true battery capacity. Previously the test was terminated at the duty cycle time which had been showing a capacity less than the true capacity. The inspectors confirmed that the procedure for emergency diesel No 1 battery was revised as described above and made effective May 21, 1998. The inspectors observed that CTS Item No. 4355 was tracking this commitment.

E8.20 (Closed) IFI 50-280, 281/98201-18: Fuse control. In their response to the design inspection report, the licensee clarified certain statements in the design inspection report. The licensee stated that their item equivalency evaluation procedure was adequate as written. They determined that certain individuals were not always using the procedure when making substitutions of non-safety-related fuses. Therefore, the corrective action will be to review the maintenance work management process to determine whether enhancements are required. As a minimum, training will be provided as to how fuse substitutions shall be

controlled. The inspectors observed that CTS Item Nos 4300 and 4301 were tracking these commitments.

E8.21 (Open) IFI 50-280, 281/98201-19: RS System flow. The inspectors reviewed the licensee's corrective actions for resolution of the deficiencies identified with calculation ME-405 which did not account for flow diversions from Units 1 and 2 inside recirculation spray (IRS) and outside recirculation spray (ORS) pumps. The licensee in response to the NRC concerns prepared station DR S-98-0673 to initiate corrective actions including alternatives to minimize flow through the unidentified flow paths. The corrective actions developed as a result of DR S-98-0673 were tracked under CTS No. 4129 and resulted in initiation of a Recirculation Spray System Margin Improvement Project.

This project was intended to address the short term and long term corrective actions identified in the response to station DR S-98-0673 for improving the flow paths from the IRS and ORS systems. Mechanical Engineering Technical Report ME-0116, Revision 0, Recommendations for Recovery of RS System Delivered Spray Flow Losses, described the long term and short term corrective actions developed by this project. The short term corrective actions were identified as elimination of the recirculation flow paths that do not directly contribute to the spray flows or to the net positive suction head (NPSH) improvements of the recirculation spray pumps. The long term corrective actions recommended remodeling the IRS system and ORS system to include the effects of EDG frequency variations; voltage variations; and instrument uncertainties. The long term corrective actions also recommended evaluating the size of the ORS pump discharge flow restricting orifice and the IRS bleed flow orifice.

The licensee in their response to the design inspection report, dated July 9, 1998, committed to implement design changes to eliminate non-needed flow paths for the recirculation spray system by the end of 1998 refueling outage (RFO) for Unit 1 and 1999 RFO for Unit 2. System flow calculations were also required to be updated at the time the design change packages were implemented in order to include those flow paths that could not be eliminated. At the time of the inspection the licensee was in the process of developing Design Change Number (DCN) 98-040, Recovery of RS System Delivered Spray Flow/Surry Unit 1. The purpose of this plant modification was to implement the short term corrective actions to recover the shortfalls in recirculation flows documented in CME-98-0013 by closing the valves identified within the scope of DCN 98-040. The inspectors observed that table 4 of this document listed spray flow margins that would be achieved after implementation of the plant modification. Section 4, "References" of the DCN, however, did not identify the calculation of record which supported the values of spray flow margins documented in table 4. The inspectors were informed by the licensee that a formal calculation had not yet been prepared to demonstrate the margins that would be available after implementation of the plant modification. Station DR S-98-0673 identified CTS No. 4129 as the tracking mechanism for ensuring that required corrective actions are completed by the end of the next RFO for

each unit. This item is left open until plant modification DCN 98-040 and the associated system flow calculations have been approved and issued for use.

E8.22 (Closed) IFI 50-280, 281/98201-20: Unqualified coatings. In their response to the design inspection report, the licensee outlined their program for resolving the issue of whether debris from unqualified coatings and other debris could clog the containment sump screens. The inspectors discussed the program with the cognizant engineers. They presented a detailed program flow chart which depicted 22 specific activities arranged in three phases. They also presented the purchase order with specification showing that Phase 1 work had been awarded to an outside engineering firm. The inspectors concluded that implementation of the coatings/debris program should resolve this issue.

E8.23 (Closed) LER 50-280, 281/98008-00: Auxiliary ventilation fans in a condition outside design basis for certain accidents. Auxiliary ventilation fans 1-VS-F-58A and -58B are components in the Emergency Ventilation Filtration System which provides a method for control of airborne isotopes and provides cooling for the charging pumps. The fans are safety-related and they are shared between the two units. Normally, the 58A fan is aligned to the 1H bus and the 58B fan is aligned to the 2H bus. The design provided for the capability to align the 58A fan to the 2J bus by physically disconnecting and reconnecting power cables in splice boxes. Similarly, the 58B fan could be aligned to the 1J bus.

The auxiliary ventilation fans receive safety injection start signals and loss-of-power load shed signals. Surveillance test OPT-ZZ-001 which is basically a logic test of safety injection and load shed signals included these fans in the test. One of the power supply realignments described above (depending on which unit was in the refueling outage) was made during the test, because it was thought necessary to actually make the realignment to test all the logic. Specifically, it was thought that realignment was necessary to verify load shedding upon a loss of voltage. When in the test alignment, the Emergency Ventilation Filtration System was outside the design basis. For example, a test condition could be Unit 1 on-line and Unit 2 in an outage. A typical surveillance test alignment was the 58A fan aligned to the 2J bus and the 58B fan aligned to the 2H bus. Then, if a Unit 1 LOCA were to occur coincident with loss-of-offsite-power (this means on both units), and the No. 2 emergency diesel generator failed to start, power would be lost to both the fans. The 58B fan would loose power due to failure of the No.2 emergency diesel generator, and the 58A fan would loose power due to the loss-of-offsite-power. Apparently, the licensee did not recognize in the past that the design basis was not met while in the test configuration. The licensee identified this problem while they were discussing the concept of whether the design basis is a loss-of-offsite power on one unit or on both units. Review of outage history data from 1994 by the licensee showed that the test alignment was maintained for extended periods of time following completion of the OPT-ZZ-001 test. The three longest durations in the test alignment were 142 days, 42 days and 25 days.

The cause of this problem was that the test procedure OPT-ZZ-001 did not adequately control the test in that it did not specify restoring the normal alignment immediately following the test, nor did it initiate an Limiting Condition for Operation (LCO) clock when the test alignment was entered. These circumstances represent a violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," which requires that testing be performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.

The licensee's corrective action to preclude recurrence of this problem has already been developed and initiated. The basic resolution is to leave the 58A and 58B fans in their normal alignment during the logic testing. This solution became apparent once it was realized that the load shed function could be tested while in the normal configuration. The inspectors reviewed the concept of this change to the test procedure, along with the safety evaluation for the change, and concluded that it was a valid resolution to the problem.

Since the violation was non-repetitive, licensee identified and the corrective action was developed and close to implementation, it will be treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. It is identified as Non-Cited Violation 50-280, 281/98007-02, Emergency Ventilation Filtration System Outside Design Basis for Certain Scenarios for Certain Periods of Time.

While reviewing LER 98-08 the inspectors observed that the LER was not submitted within 30 days of discovery of the event. The inspectors considered the discovery date to be the initiation date of the underlying DR. Deviation Report S-98-0503 describes the deviation as follows:

> The alternate power supplies for 1-VS-F-58A and 1-VS-F-58B are the 2J and 1J power supplies respectively. Due to the #3 EDG being the swing diesel generator, when the 58 fans are powered by the alternate power source, a loss of offsite power would result in the loss of power to the fan if the #3 EDG transferred to the other unit.

The DR indicates the date of discovery was February 20, 1998. The LER report date was May 22, 1998, which was 91 days after the date of discovery. The licensee stated the interpretation that 10 CFR 50.73(a)(1) which requires that LERs be submitted within 30 days after discovery of the event allows for evaluation time in the case of design basis issues. Their practice has been to start the 30 day clock upon final determination that the condition is in fact reportable. The NRC will review this interpretation further before making a final determination as to whether this practice violates NRC requirements. The matter is identified as URI 50-280, 281/98007-03, Failure to Submit LER Within 30 Days.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 General Comments (71750)

On numerous occasions during the inspection period, the inspectors reviewed Radiation Protection (RP) practices including radiation control area entry and exit, survey results, and radiological area material conditions. In addition, the inspectors reviewed the status of numerous locked high radiation doors and found them to be in good condition and locked. Overall, no discrepancies were noted, and the inspectors determined that RP practices were proper.

R1.2 Radioactive Effluent Monitoring Instrumentation

a. Inspection Scope (84750)

The inspectors reviewed procedures and records pertaining to surveillances and alarm setpoints for selected radioactive effluent monitors. The surveillance procedures and established alarm setpoints were evaluated for consistency with the operational and surveillance requirements for demonstrating the operability of the monitors. Those requirements were specified in sections 6.2.2 and 6.3.2 and Attachments 3 and 12 of VPAP-2103, "Offsite Dose Calculation Manual (ODCM)."

b. Observations and Findings

The inspectors toured the Control Room and relevant areas of the plant with a licensee representative to determine the operational status for the following effluent monitors.

RM-RRM-131	Radwaste Facility Liquid Effluent Line
1-SW-RM-120	Circulating Water Discharge Line
1-GW-RM-130-1	Process Vent Noble Gas Activity Monitor
1-VG-RM-104	Ventilation Vent Noble Gas Activity Monitor

The above monitors were found to be well maintained and operable at the time of the tours.

The inspectors reviewed 14 procedures related to channel checks, source checks, channel calibrations, channel functional tests, and alarm setpoints for the above listed monitors. The inspectors determined that the procedures included provisions for performing the required surveillances in accordance with the relevant sections of the ODCM and at the specified frequencies. The inspectors also reviewed recently completed surveillances for the above listed monitors. Those records indicated that the surveillances were being kept current and performed in accordance with their applicable procedures. The inspectors also verified that the current alarm setpoints for three of the above listed monitors were determined in accordance with the licensee's procedure for

establishing effluent setpoints and were more conservative than required by the ODCM.

The licensee indicated that effluent monitor percent availability was not routinely tabulated, therefore, the inspectors reviewed the licensee's records of DRs pertaining to the four selected monitors. During the period January 1997 through July 1998 no DRs were issued for monitors RR-RRM-131 and 1-SW-RM 120, five were issued for monitor 1-GW-RM-130-1, and eighteen were issued for monitor 1-VG-RM-104. Most of the DRs issued for monitor 1-GW-RM-130-1 were initiated when it was found, during periodic testing, that the setpoints had reverted to more conservative default values, apparently due to sporadic electrical spikes. The licensee has addressed reliability problems of monitor 1-VG-RM-104 as evidenced by a decreasing trend in the number of DRs, i.e., most of the DRs issued for monitor 1-VG-RM-104 occurred in early 1997 with only three in 1998. From the items reviewed and discussions with the cognizant system engineer, the inspectors determined that the selected monitors were seldom out of service for extended periods except for scheduled preventive maintenance and surveillance testing.

c. Conclusions

The licensee was maintaining radioactive effluent monitoring instrumentation in an operable condition and performing the required surveillances to demonstrate their operability.

R1.3 Meteorological Monitoring Program

a. Inspection Scope (84750)

The inspectors evaluated implementation of the licensee's onsite meteorological measurements program for consistency with the program description contained in Section 2.2.1.2 of the Updated Final Safety Analysis Report (UFSAR).

b. Observations and Findings

The inspectors reviewed meteorological surveillance procedures and determined that they included provisions for performing daily channel checks and semiannual channel calibrations. The inspectors also reviewed the licensee's records for calibration of the instrumentation used to monitor wind speed, wind direction, and air temperature. Those records indicated that the most recent instrument calibrations, which had been performed during May 1998, were current and had been performed in accordance with the applicable procedures. The inspectors reviewed recently completed Control Room Logs and Operating Records and determined that channel checks of the meteorological monitoring instruments had been performed on a daily basis. During a tour of the Control Room the inspectors noted that the meteorological monitoring instrumentation was operable.

The UFSAR indicated that a microprocessor-based data acquisition system was used for collection of meteorological monitoring data and that the data were edited for validity each month before being transferred to the historical database. The inspectors reviewed licensee records for the valid data capture rate from the various monitoring instruments. Those data indicated that the year-to-date valid data capture rate for the first six months of 1998 was greater than 99 percent which was consistent with industry guidelines.

The inspectors determined that the meteorological monitoring surveillance requirements were met and the instruments were maintained operable.

c. Conclusions

The inspectors concluded that the onsite meteorological measurements program was implemented in accordance with the UFSAR.

R1.4 Control Room Emergency Ventilation System

a. Inspection Scope (84750)

The inspectors reviewed the licensee's procedures and records for the surveillances required to demonstrate operability of the Control Room Emergency Ventilation System (CREVS). Those procedures and records were evaluated for consistency with the operational and surveillance requirements delineated in TS 3.19, 3.23, 4.1 and 4.20.

b. Observations and Findings

The inspectors toured the Turbine Building, Control Room, Emergency Switchgear and Relay Room, and Mechanical Equipment Rooms in which the Control Room ventilation systems were located. The licensee's cognizant system engineer accompanied the inspectors on the tours, during which the major components of the systems were located and identified. The emergency ventilation systems included redundant bottled air supply systems for pressurizing the Control Room for one hour under accident conditions and four independent air filtration units consisting of fans, dampers, pre-filters, High Efficiency Particulate Air (HEPA) filters, and charcoal adsorber filter beds. The inspectors verified that the air flow paths and arrangement of the system components within those paths were consistent with the system diagram (Figure 9.13-3) referenced in Section 9.13.2 of the UFSAR. The inspectors observed that the components and associated ductwork were well maintained structurally and that there was no physical deterioration of the equipment or ductwork sealants.

The inspectors reviewed selected ventilation system surveillance procedures and determined the they included provisions for performing functional tests, filter leak tests, air flow measurements, differential pressure measurements, and charcoal adsorption efficiency testing. The surveillance frequency and acceptance criteria for the test results

specified in those procedures were consistent with the TS requirements. Review of selected records of those tests, generally the most recently completed, indicated that they had been performed in accordance with the testing procedures and that the acceptance criteria had been met. The inspectors noted that the filter leak tests were most recently performed during January 1997, which exceeded the 18 month surveillance frequency required by TS 4.20 but did not exceed the plus or minus 25 percent adjustment to surveillance time intervals allowed by TS 4.0.2.

c. Conclusions

The inspectors concluded that the licensee was maintaining the CREVS in an operable condition and performing the required surveillances to demonstrate operability of the systems.

S1 Conduct of Security and Safeguards Activities

On numerous occasions during the inspection period, the inspectors performed walkdowns of the protected area perimeter to assess security and general barrier conditions. No deficiencies were noted and the inspectors concluded that security posts were properly manned and that the perimeter barrier's material condition was properly maintained.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 18, 1998. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF PERSONS CONTACTED

M. Adams, Superintendent, Engineering
R. Allen, Superintendent, Maintenance
R. Blount, Manager, Nuclear Safety & Licensing
M. Crist, Superintendent, Operations
E. Collins, Director, Nuclear Oversight
E. Grecheck, Site Vice President
L. Hartz, V. P. Nuclear Engineering
J. Martin, Corporate Maintenance Rule Coordinator
B. Shriver, Manager, Operations & Maintenance
T. Sowers, Superintendent, Training
B. Stanley, Supervisor, Licensing
W. Thornton, Superintendent, Radiological Protection

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observation
IP 62706:	Maintenance Rule
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 84750:	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 92901:	Followup - Plant Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-280, 281/98007-01	VIO	Failure to take corrective action for identified design problems (Section E1.1). No response required for violation.
50-280, 281/98007-02	NCV	Emergency Ventilation Filtration System outside design basis for certain scenarios for certain periods of time (Section E8.23).
50-280, 281/98007-03	URI	Failure to submit LER within 30 days (Section E8.23).

Closed

50-280, 281/97002-01	IFI	Long term corrective actions to resolve potential TDAFW pump overspeed trips (Section O8.1).
50-280/97003-01	VIO	Loss of containment integrity (Section O8.2).
50-280/97001-00, -01	LER	Shutdown due to steam drain line weld leak (Section M8.1).
50-280, 281/97002-00, -01	LER	One train of auxiliary ventilation system inoperable outside T.S. (Section M8.2).
50-280/97003-02	VIO	Failure to follow maintenance procedures (Section M8.3).
50-280, 281/97007-02	IFI	Alternate alternating current (AAC) diesel coolant temperature concerns and long term actions to resolve the issue (Section M8.4).
50-280, 281/97002-03	VIO	Procedures not appropriate to the circumstances (Section M8.5).
50-280, 281/97002-04	VIO	Failure to meet the requirements of 10 CFR 50.9(a) for LER 50-280/97002-00 (Section E8.2).
50-280/97003-03	VIO	Failure to meet the requirements of 10 CFR 50.9(a) for LER 50-280/97001-00 (Section E8.2).
50-280, 281/98201-02	IFI	Error in Calculation SM-1047, "Reactor Cavity Water Holdup" (Section E8.4).
50-280, 281/98201-06	IFI	Breaker-to-breaker and fuse-to-fuse analysis (Section E8.8).
50-280, 281/98201-07	IFI	Breaker replacement (Section E8.9).
50-280, 281/98201-10	IFI	DC bus tie interlock (Section E8.12).
50-280, 281/98201-11	IFI	Battery calculation discrepancies (Section E8.13).
50-280, 281/98201-12	IFI	Battery design margin (Section E8.14).

50-280, 281/98201-13	IFI	DC fault contribution (Section E8.15).
50-280, 281/98201-14	IFI	DC load flow/voltage drop (Section E8.16).
50-280, 281/98201-15	IFI	Adequate DC component voltage (Section E8.17).
50-280, 281/98201-16	IFI	DC load control (Section E8.18).
50-280, 281/98201-17	IFI	Battery surveillance test (Section E8.19).
50-280, 281/98201-18	IFI	Fuse control (Section E8.20).
50-280, 281/98201-20	IFI	Unqualified coatings (Section E8.22).
50-280, 281/98008-00	LER	Auxiliary ventilation fans in a condition outside design basis for certain accidents (Section E8.23).
50-280, 281/98007-03	NCV	Emergency Ventilation Filtration System outside design basis for certain scenarios for certain periods of time (Section E8.23).

Discussed

50-280, 281/98201-01	IFI	LHSI pump NPSH (Section E8.3).
50-281/98201-03	URI	Unit 2 LHSI pump minimum flow (Section E8.5).
50-280/98201-04	IFI	Motor thermal overload for 1-SI-P-1B (Section E8.6).
50-280, 281/98201-05	IFI	Adequacy of 4160 VAC electrical cables to withstand fault current (Section E8.7).
50-280, 281/98201-08	URI	EDG battery transfer switch (Section E8.10).
50-280, 281/98201-09	URI	DC tie breaker (Section E8.11).
50-280, 281/98201-19	IFI	RS System flow (Section E8.21).