



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-338/92-14 and 50-339/92-14

Licensee: Virginia Electric & Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060

Docket Nos.: 50-338 and 50-339 License Nos.: NPF-4 and NPF-7

Facility Name: North Anna 1 and 2

Inspection Conducted: May 17 - June 20, 1992

Inspectors: *A. Raff* 7/16/92
M.S. Lesser, Senior Resident Inspector Date Signed
A. Raff 7/16/92
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P.E. Fredrickson, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine inspection by the resident inspectors involved the following areas: operations, maintenance, surveillance, engineered safety feature walkdown, fire protection/prevention program, licensee event report followup, and action on previous inspection findings. Inspections of licensee backshift activities were conducted on the following days: May 22, 24 and 31.

Results:

In the area of operations, the shutdown and startup of Unit 2 in support of a mini-outage were well performed (paragraph 2).

In the area of maintenance, the licensee took positive actions to apply Surry's unexpectedly high IPE results, with respect to flooding, to North Anna. Based on the results, improvements and modifications were initiated to lessen the likelihood and consequences of flooding (paragraph 4.a).

In the area of maintenance, three similar failures of safety related circuit breakers were identified over the last several months. As a result the licensee has increased surveillances on

installed breakers and has initiated action to replace breakers of this type. Based on the similarity of the breaker's failure mechanism, an inspector followup item was opened pending completion of the licensee's reportability evaluation and corrective action (paragraph 4.e).

In the area of surveillance, the licensee's corrective action for missed surveillances in response to violation 50-338,339/92-04-03 includes extensive reviews of electrical circuitry to ensure complete testing. During this inspection period, five surveillance requirements were identified by the licensee as not fully tested. Appropriate TS actions were entered and testing was completed (paragraph 5.b).

In the area of surveillance, the inspectors identified one instance where drawings were used to install test equipment in the field which were not properly stamped and verified to be the latest revision (paragraph 5.b).

In the area of surveillance, an inspector followup item was opened concerning the testing of the control room habitability system. Also, during testing a safety-related valve was found out-of-position (paragraph 7).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- L. Edmonds, Superintendent, Nuclear Training
- *R. Enfinger, Assistant Station Manager, Operations and Maintenance
- *E. Harrell, Vice President, Nuclear Services
- J. Hayes, Superintendent of Operations
- D. Heacock, Superintendent, Station Engineering
- G. Kane, Station Manager
- *P. Kemp, Supervisor, Licensing
- *W. Matthews, Superintendent, Maintenance
- *J. O'Hanlon, Vice President, Nuclear Operations
- D. Roberts, Supervisor, Station Nuclear Safety
- R. Saunders, Assistant Vice President, Nuclear Operations
- D. Schappell, Superintendent, Site Services
- R. Shears, Superintendent, Outage and Planning
- *J. Smith, Manager, Quality Assurance
- A. Stafford, Superintendent, Radiological Protection
- J. Stall, Assistant Station Manager, Nuclear Safety and Licensing

Other licensee employees contacted included engineers, technicians, operators, mechanics, security force members, and office personnel.

NRC Resident Inspectors

- *M. Lesser, Senior Resident Inspector
- *D. Taylor, Resident Inspector

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status

Unit 1 - The unit operated the entire inspection period at or about 95 percent, which is the limit by license condition due to extensive SG tube plugging.

Unit 2 - The unit began the inspection period at 100 percent power. On May 22, the unit began a shutdown to Mode 3 to correct several equipment problems identified since the startup from the refueling outage in April. The major work accomplished during this shutdown was associated with identifying and correcting a problem with the turbine lube oil system. This problem was observed during the Unit 2 startup,

following the refueling outage, when a turbine trip occurred when the AC bearing oil pump was secured by procedure. At that time, the turbine was brought back to speed and the AC bearing oil pump was needed to supplement the shaft driven pump while at power. During this outage, the licensee identified the problem to be associated with a check valve downstream of the oil ejector used to provide NPSH to the shaft driven pump. A pin in the check valve was found to be misaligned allowing the valve disk to drop. The disk bottom would not clear the pipe which prevented the valve from opening. The pin was subsequently replaced.

On May 24, the unit entered Mode 2 following a successful outage. The inspectors observed the startup and noted the evolution to be well controlled by the licensee. The unit remained at or near 100 percent power the remainder of the period.

3. Operational Safety Verification (71707)

The inspectors conducted frequent visits to the control room to verify proper staffing, operator attentiveness and adherence to approved procedures. The inspectors attended plant status meetings and reviewed operator logs on a daily basis to verify operational safety and compliance with TS and to maintain awareness of the overall operation of the facility. Instrumentation and ECCS lineups were periodically reviewed from control room indications to assess operability. Frequent plant tours were conducted to observe equipment status, fire protection programs, radiological work practices, plant security programs and housekeeping. Deviation reports were reviewed to assure that potential safety concerns were properly addressed and reported. Selected reports were followed to ensure that appropriate management attention and corrective action was applied.

On June 5, the inspectors toured the electrical switchyard and observed operators perform a switching order for the purpose of gassing a circuit breaker. The inspectors noted that the shift supervisor was properly kept informed of activities and that good communications were observed for the work. Proper precautions for general switchyard evolutions were also observed. Components were noted to be clearly labelled and sensitive equipment was posted as a high risk area.

No violations or deviations were identified.

4. Maintenance Observation (62703)

Station maintenance activities were observed/reviewed to ascertain that the activities were conducted in accordance

with approved procedures, regulatory guides and industry codes or standards, and in conformance with TS requirements.

a. Plant Flood Protection

The inspectors reviewed the licensee's actions taken in response to the unexpectedly high IPE results obtained at Surry Power Station for plant flooding events. Although North Anna's IPE has not been completed, the licensee identified the differences between the plants and qualitatively concluded that the turbine building flooding event would not be severe because of the differences in the CW System. Specifically at North Anna, the intake structure is at a lower elevation than the turbine building basement and CW is pumped to the main condensers, while at Surry, CW flows through the system by gravitational forces. With a high water level condition in the turbine building basement, the CW pumps will trip and the CW pump discharge valves will isolate. These design features form the basis for the licensee's preliminary conclusions. Nevertheless, the licensee initiated a review of maintenance and testing programs on flood protection equipment. The following elements were identified by the licensee to be in place and adequate:

- 1-EPM-0801-01, Testing the Flood Control System, provides instructions for verifying operability of the water level logic via installed test cabinets on an 18 month frequency.
- PM had been established on the major sump pumps.

The following elements for improvement were identified:

- Sump water level switches and alarms are not covered by PM nor are instrument rack room and quench spray basement sump pumps. Work orders are being developed.
- The turbine building high volume sump pumps were normally deenergized as a precaution to prevent oil discharge to the environment. The licensee has since energized the pumps and is currently deciding whether or not to operate them in automatic.
- Charging pump cubicle floor drains are piped to the auxiliary building sump, however, they are all cross connected. Backflow preventer valves were installed to prevent flooding in one area from affecting all six charging pumps.

Modifications involving improved SW pump discharge vacuum breakers, expansion joint shields and flood dikes in the chiller room are currently being evaluated.

The inspectors considered the licensee's actions to be good in that insight from the Surry IPE is being proactively applied prior to completion of the North Anna IPE.

b. Valve Repack

The inspectors observed valve repacking on 2-VP-12, Air Ejector Discharge Valve, under work order 5900147147. The valve packing gland had been injected with a sealing compound and had become difficult to operate. The licensee closely monitored air ejector flow rate during the evolution, conservatively declared the air ejector radiation monitor inoperable and completed the required action. Additional precautions included frisking the old packing for potential contamination and oversight of the job by supervisory and SRO personnel. The maintenance procedure and packing control form were adequate.

c. Inoperable Protection Channel

On June 15, the licensee identified that the Unit 1 $\Delta T/T_{ave}$ Protection Channel II was inoperable when the OTAT setpoint failed to respond during an RCS temperature increase. The inspectors observed that the licensee properly placed the channel in trip and observed troubleshooting of the channel. Inconsistent responses to testing were obtained for the lead/lag card which was subsequently replaced. The channel was then satisfactorily tested using ICP-RC-1-T-1422, $\Delta T/T_{ave}$ Protection Channel II, and declared operable.

d. Instrument Air Malfunctions

The inspectors followed licensee actions to resolve several recent instances where IA pressure was lost due to failures of the air drying towers to properly switch. The air drying towers are located on the discharge of each IA receiver and consist of two tanks containing a moisture removing desiccant. One tower is in service while the other tower is being regenerated with a reverse surge flow. Dewpoint and pressure sensors determine when tower switching is required and 3-way control solenoid valves are used to accomplish the switch. The switching failures have caused the regenerating tower to blowdown excessively and drop IA header pressure. Typically,

backup compressors have automatically started to recover pressure.

The licensee determined that the wrong type of desiccant had been used during a recent changeout. The new desiccant was a finer texture which became powdery during the purge cycle. This caused clogging of the purge muffler and the dewpoint sensors to prevent proper switchover.

It appears that a maintenance planning error resulted in ordering the wrong type desiccant. Management attention to the problem was good. The system engineer was directed to resolve the issue and monitor system performance. To date, the desiccant in one set of air drying towers has been replaced and appears to be functioning correctly. The licensee has written a work order to replace the desiccant in the second set of towers.

e. Klockner Moeller Circuit Breaker Failures

The inspectors reviewed the licensee's actions regarding three similar failures of safety related circuit breakers. On April 26, the breaker for 2-SI-MOV-2063A, A LHSI Pump Supply to CH Pump, was found tripped (DR 92-1199). On May 17 the breaker for 2-CH-MOV-2287C, C CH Pump Alternate and Loop Fill Discharge Isolation Valve, was found tripped (DR 92-1315). On June 16 the breaker for 2-SI-MOV-2867A, BIT HHSI Inlet Isolation Valve, was found tripped (DR 92-1448). In each case the breakers were discovered tripped when operators identified that control board valve position indication had deenergized.

Essentially identical failures with the latching mechanism were discovered in each case. A plastic pivot arm in the latching mechanism had cracked under spring tension causing the breaker to trip and prevented reset. The breakers are molded case Klockner Moeller Model NZM6-63 rated for 600 VAC, 60 HP and 63A (used in 480 VAC application).

Following the second failure, the breaker was sent to the manufacturer for a root cause analysis which to date has not been accomplished. Following the third failure, the inspectors questioned the licensee's evaluation for reportability under 10 CFR 21. An evaluation done after the second failure was determined not reportable based on the licensee's conclusion that a substantial safety hazard did not exist. This included Nuclear Network polling and discussions with the manufacturer in which no other failures were identified. The inspectors pointed

out a substantial safety hazard could be created by the common mode failure and that the events appeared to meet the reporting criteria. The licensee agreed to continue the evaluation contingent upon the manufacturers root cause analysis.

The licensee's established surveillance program for identifying tripped breakers is encompassed by control board walkdowns of valve positions at shift turnover (every 12 hours). As a result of the recent failures, the licensee has decided to increase the walkdowns to every 6 hours. The licensee stated that control power and valve position indication come off the circuit breaker. The inspectors questioned if all vulnerable breakers could be checked by control room indications. In response, the licensee identified a population of safety related loads which could not. The licensee is implementing a plan to periodically survey these breakers locally for a tripped condition. The licensee has also initiated action to prioritize replacement of the approximate 300 circuit breakers.

Pending completion of the licensee's reportability evaluation, and replacement action, this is identified as Inspector Followup Item 50-335/92-14-01: Klockner Moeller Breaker Failures.

No violations or deviations were identified.

5. Surveillance Observation (61726)

The inspectors observed/reviewed TS required testing and verified that testing was performed in accordance with procedures, that test instrumentation was calibrated, that LCO's were met and that any deficiencies identified were properly reviewed and resolved.

a. Slave Relay Testing

The inspectors observed the licensee perform 2-PT-36.5.3A, SSPS Output Slave Relay Testing, on May 21. The procedure tests six slave relays associated with containment isolation, containment spray and RWST switchover to recirculation. In some cases, the final actuation device is blocked and a representative contact is verified to actuate. Communications were established using headsets between the instrument racks and test personnel in the control room. The evolution was well controlled.

b. Incomplete Surveillance Testing

As part of corrective action for violations cited in report 50-338,339/92-04 on surveillances, the licensee initiated a detailed review of complex surveillances involving electrical drawing verification. The review checks that all components in a circuit are being included in a surveillance test. The following problems were identified by the licensee this reporting period:

(1) PORV Channel Calibration

The inspectors reviewed actions associated with DR-N-9~1348 which documented a QA finding that the channel calibration test for the pressurizer PORVs had been incomplete. The alarm associated with the opening of a PORV had not been verified to function during the test as required by the TS definition of channel calibration. The licensee entered a 24 hour action requirement per TS 4.0.3. The inspectors later witnessed testing of the Unit 2 PORVs and proper actuation of alarms. The licensee also properly tested the Unit 1 PORVs.

(2) EDG Testing

On June 8, the licensee declared all four EDG's inoperable following a surveillance requirement review which identified a portion of the EDG fast start circuitry that was not included in response time testing required by TS. Specifically, TS requires the EDGs be started, and come up to speed, voltage and frequency in ± 10 seconds. When performing a fast start, the licensee would time the start from the point at which a diesel room CO₂ trouble alarm would energize. This omitted a portion of the circuitry from the 27W relay to the CO₂ relay. Several relays are energized between these two relays and represent an undetermined amount of time which was not included in the ten second requirement for reaching EDG rated conditions. As a result of the problem, the licensee entered TS 4.0.3 which allows up to 24 hours to complete a missed surveillance.

To correct the conditions, the licensee developed a test to check the time interval between energization of the 27W relay and CO₂ trouble alarm. For each EDG the resultant time was about .06 seconds as measured by the chart recorder. That time was added to the time to reach EDG rated conditions from previous testing. For all EDG's the ten second

specification was met and the EDGs were declared operable.

The inspectors observed the performance of the test for the 2H EDG. The test was noted to be well controlled; however, one concern was raised with the use of reference drawings to hook up test equipment. In order to get a signal for energizing the CO₂ trouble alarm (located in the CR) to the chart recorder (located in the Switchgear Room), the licensee used a combination of permanently installed wiring and temporary wiring. To determine where to tie into permanently installed wiring, the I&C technicians were using drawings that were marked "reference only" and not signed as being verified to the latest revision. The technicians stated that the drawings were being used only as reference to determine where to make the temporary connections, and that a continuity check of the wires proved the correct configuration. The inspectors noted that use of reference drawings is not in accordance with VPAP 601, Document Distribution and Control. This procedure requires drawings used for work to be either stamped Level 3 Controlled Working Copy, and initialed and dated each day of use, or verified each day to the latest revision and signed to that effect. The licensee's QA department recently identified a similar finding with the use of uncontrolled drawings in the field. The inspectors discussed this matter with licensee management and were informed that a Level 3 Working Copy stamp would be provided to I&C technicians for future use in marking drawings in the field. No other concerns were identified.

- (3) A CW screen wash pump was identified as not properly tested to load shed and lockout on an emergency bus undervoltage. The pump relays were subsequently tested satisfactorily under the requirements of TS 4.0.3.
- (4) Auxiliary SW pumps were not verified to load shed, restart and lockout the normal SW pumps on an emergency bus undervoltage. These pumps were also subsequently testing satisfactorily using TS 4.0.3.
- (5) SW pump building space heaters and ventilation fans were also not tested for proper load shedding. TS 4.0.3 requirement were used by the licensee to test the components and discovered that ventilation fan 2-HV-UH-70B remained operating for two minutes following an undervoltage signal. This load had not

been accounted for in the licensee's EDG loading analysis. Electrical Engineering review concluded that the additional load is within the bounds of the EDG analysis. The licensee intends to eliminate the two minute time delay.

c. Unit 2 AFW Pump PT

On May 22, the inspectors observed the performance of 2-PT-71.2, 2-FW-P-3A AFW Pump Test. The surveillance is required at least once per 31 days to verify the operability of 2-FW-P-3A and associated flow paths. The test is performed by flowing water from the CST through the AFW full flow recirculation line and back to the emergency CST. Pump differential pressure is measured to ensure the pump meets the criteria of the licensee's inservice testing program. Prior to the operability check, the operator noted the pump discharge pressure indicator's calibration had expired. I&C personnel were contacted and the operator verified that the calibration had been recently performed. A new calibration sticker was placed on the instrument prior to the pump start. No performance problems were noted with the test.

d. Turbine Driven AFW Pump

On May 19, the inspectors witnessed testing of the Unit 2 turbine driven AFW pump using 2-PT-71.1, 2-FW-P-2 AFW Pump Test. The turbine speed was initially below the required test speed and had to be adjusted. The as-found speed was, however, within the established acceptance band previously evaluated for operability concerns. Operators were not familiar with adjusting turbine speed and incorrectly manipulated the overspeed test device. The test device was returned to its original position and the pump test was completed satisfactory. DR-N-92-1336 was written to address this apparent training inadequacy.

No violations or deviations were identified.

6. Fire Protection/Prevention Program (64704)

On May 26, the inspectors witnessed the licensee conduct a fire brigade drill. The drill simulated a fire in the auxiliary boiler room. The inspectors observed the fire brigade scene leader to utilize 1-FS-ABR-1, Firefighting Strategy Auxiliary Boiler Room, in order to direct response activity. The inspectors verified that protective clothing and equipment were properly used, that both an attack hose line and a backup line were laid out, that effective communications were maintained, and that proper room entry was performed. The licensee's self-evaluation of the drill

identified some areas for improvement. The inspectors additionally noted that no effort was made to isolate fuel oil to the room in accordance with the strategy.

The inspectors identified a concern with the method in which drills are scheduled. The licensee's drill schedule for each fire brigade is published in a memorandum and the shift is made aware of the scheduled drill at the morning shift briefing. Section 3.3.5.d of the North Anna Fire Protection Program requires at least one drill per brigade to be unannounced. The inspectors determined that publishing the drill schedule precludes the ability to conduct unannounced drills. The licensee indicated that they would revise their policy for publishing drill schedules in order to provide for unannounced drills.

The inspectors walked down major components of the licensee's fire protection equipment with the fire protection representative. The condition of the equipment appeared to be in good shape. Labelling of some components such as deluge pull stations was insufficient as plastic labelling tape had peeled off. The deficiencies were pointed out to the licensee for correction.

No violations or deviations were identified.

7. ESF System Walkdown (71710)

The inspectors evaluated the CR habitability system by performing a detailed walkdown and review of the system. System equipment was inspected for general condition that might effect or degrade system performance, such as valve position, housekeeping, condition of hangers and supports, and instrumentation. The inspectors also performed a review of testing performed to verify system operability.

Each unit's CR habitability system consist of an emergency ventilation system, a bottled air pressurization system and two air conditioning systems. Together these systems are designed to maintain the CR envelope temperature to acceptable values and ensure that operator radiological doses do not exceed the limits of GDC-19.

The inspectors review concluded that the CR habitability system was being adequately maintained. Areas were clean and equipment appeared to be well maintained. However, during a review of surveillance testing requirements the inspectors noted the following inconsistencies between surveillance procedures, TS., operating logs, and regulatory guidance for testing of the habitability system.

The licensee's TS requires the CR emergency ventilation HEPA filter and charcoal absorber to satisfy the in-place testing acceptance criteria and use the test procedures of Regulatory Positions C.5.a, C.5.c, and C.5.d of Regulatory Guide 1.52 Revision 2, March 1978, except as shown in Specification 4.7.7.1.e and f. TS 4.7.7.1.e and f require HEPA filter banks and charcoal absorber to remove $\geq 99\%$ of the DOP and halogenated hydrocarbon refrigerant test gas respectively when performing system leak test (bypass leakage). The above bypass leakage efficiencies are inconsistent with Regulatory Guide 1.52 which requires a 99.95% efficiency. Based on this the inspectors questioned whether the bypass leakage was taken into account when calculating CR dose in accident analysis. A preliminary review by the inspectors indicated that the efficiencies (excluding bypass leakage) of the HEPA filter and charcoal absorber were consistent with Regulatory Guide 1.52. The licensee stated that testing was consistent with their TS.

0-PT-76.4, CR Bottled Air System Pressurization Test, verifies the CR can be maintained at a pressure of $+ .05^*$ water with respect to adjacent outside areas. The inspectors' review of the last test, performed 3/2/92, noted that the first attempt of the test was unsuccessful. DP readings between the CR and the Unit 2 MER; and the CR and shop areas were below the $.05^*$ water minimum. Turbine building ventilation had to be realigned to meet adjacent area DP requirements. Based on the above, the inspectors questioned the ability of the bottled air system to pressurize the CR to the required pressure under all allowed turbine building ventilation alignments.

Further review by the inspectors identified that CR habitability, including the bottled air system, has been the subject of a number of NRC inspections. One of the latter, report 50-338,339/90-15 closed an outstanding IFI regarding the same question as mentioned above. To ensure that design functions of the CR bottled air system would be met, the licensee initiated and performed weekly 1-PT-76.4.1, CR Pressure Envelope Ventilation Check. The PT is no longer performed weekly; however, other controls are in place. These include daily logs of CR to adjacent area DPs to ensure a minimum DP is met, and minimum and maximum specifications for the CR to turbine building DP. Whenever the areas are found out of specification, 1-PT-76.4.1 is used to realign the turbine building ventilation to achieve an in-specification condition.

The inspectors noted that 1-PT-76.4.1 was performed two days prior to performing the air bottle pressurization

test; however, the test still failed. The inspectors also noted a maximum specification for the DP between the CR and turbine building of .17" water. Discussion with the licensee indicated that the maximum specification was in place because of the effects the turbine building ventilation alignment has on adjacent areas. Too high of a DP between the CR and turbine building can cause the DP between the CR and other areas to become out of specification. On several occasions during the inspection period the inspectors noted the CR to turbine building to be at or just above the .17" water specification. The inspectors were concerned that the operability of the CR habitability system may be questionable whenever adjacent area differential pressure is outside the acceptable band; however, no examples were identified where the TS actions statements were exceeded. Based on the last bottled air test results and the dynamics of the ventilation system, the inspectors will continue to review the licensee's controls to ensure the ability of the bottled air system to meet its design criteria.

In addition to the above conditions the inspectors noted the following performance problems and inconsistencies associated with the last bottled air pressurization test.

- 02-CA-014, air supply isolation valve to 2HV-SOV-2306A and 2HV-TV-2306A was found out-of-position (shut) during performance of the test. This represents a loss of control of system status which could have prevented one side of a redundant safety related air supply header from performing its intended function. The licensee determined that the valve had been left shut following maintenance several days earlier. Since both units were shutdown at the time and the system was not required to be operable, the safety significance of the problem was reduced.
- TS requires at least 84 bottles of air shared between units at a minimum pressure of 2300 psig. A monthly surveillance also requires a minimum pressure of 2300 psig. A monthly surveillance also requires a minimum pressure of 2300 psig. The initial conditions of the test requires a minimum of 102 bottles of air at 2325 psig. Both these initial conditions are technically less conservative than the TS for testing purposes. The licensee noted that the bottled air system had been upgraded several years ago by the addition of 18 bottles because the system could not meet its design criteria with 84 bottles. To date TS have not been revised to reflect this condition. However, a proposed TS amendment has been initiated to change the TS to be consistent with current system conditions. The inspectors were informed

that the amendment request was on hold until the NRC issues a Generic Letter on CR habitability due out in August. The inspectors did note that the licensee has adequate controls and surveillances in place to ensure that 102 bottles of air remain in service at a minimum pressure of 2325 psig. However, the licensee indicated that the system would not be declared inoperable until pressure dropped below 2300 psig.

At the close of the inspection period the inspectors had not completed their review of the system. In addition questions regarding HEPA filter and charcoal absorber efficiencies used in the accident analysis and the adequacy of the bottled air system to maintain positive control room pressure during an accident are still outstanding. Based on the above these items are being carried as Inspector Followup Item 50-338,339/92-14-02: Control Room Habitability Test Criteria.

No violations or deviations were identified.

8. LER Followup (92700)

The following LERs were reviewed and closed. The inspector verified that reporting requirements had been met, that causes had been identified, that corrective actions appeared appropriate and that generic applicability had been considered. Additionally, the inspectors confirmed that no unreviewed safety questions were involved and that violations of regulations or TS conditions had been identified.

- a. (Closed) LER 50-338/91-10: Auto Start of Emergency Diesel Generator 1J Due to Loss of Power From "A" RSST and Subsequent Start Due to Inadvertent Bypass of Air Start SOV.

The licensee revised the Control Operations Methods Manual to set the standard for the correct method of routing and terminating wires on a GE type HGA relay. In addition, the improper control wire routing was corrected and the EDG air start SOV replaced. The events were discussed with appropriate personnel.

- b. (Closed) LER 50-338/91-21: Missed Surveillance of Offsite AC Sources.

The LER documented a missed TS surveillance following a determination that the 1H EDG was inoperable. TS 3.8.1.1 requires verification of the AC offsite power sources within one hour when one EDG is declared inoperable. Maintenance personnel performed a surveillance on the 1H EDG battery and identified voltage for cell 19 to be less than the TS low limit, but failed to immediately notify

operations. Subsequent discussion with licensee management determined that low ICV rendered the EDG inoperable; however, the one hour TS surveillance time limit had already past.

To correct the condition, the licensee performed the offsite AC power source verification, discussed the issue with the appropriate personnel, and changed the battery PM procedure to ensure that operations is contacted immediately when unacceptable indications are identified.

- c. (Closed) LER 50-338/91-22: Unit Shutdown Due to Indeterminate Status of Steam Generators Following Eddy Current Data Re-Review

The licensee conducted a mid-cycle SG inspection following the shutdown and plugged all defective tubes. This included a more conservative rule-base for eddy current inspection. A detailed inspection of licensee programs was performed and documented in report 50-338,339/92-02.

- d. (Closed) LER 50-338/92-03: Residual Heat Removal System Overpressure Protection

In correspondence dated April 15, 1992, the licensee withdrew the LER after completing a comprehensive technical analysis of the RHR system overpressurization issue. The result of the analysis confirmed that the system and its relief valves meet the original design basis and were not vulnerable to the overpressure concerns raised by the original vendor correspondence. The inspectors reviewed the report and found it to be acceptable.

- e. (Closed) LER 50-339/92-05: Steam Generator Tube Defects

During the 1992 Unit 2 refueling outage, one hundred percent of the accessible tubes in the "A", "B" and "C" SGs were inspected using the standard eddy current bobbin probe. Additionally, augmented inspections were performed using a rotating pancake coil probe. As a result of these inspections, greater than 1 percent of the tubes in SGs "A" and "C" were identified as having pluggable indications. These inspection results required the two SGs to be classified as Category C-3 in accordance with TS 4.4.5.2. Most of the tube degradation is believed to be caused by primary water stress corrosion cracking and outside diameter stress corrosion cracking. All defective tubes were plugged. NRC inspection of the Unit 2 SG is documented in report 50-338,339/92-08.

- f. (Closed) LER 50-339/92-13: Failure to Place Inoperable Overpower Differential Temperature Setpoint Channel in Trip Within One Hour Due to Personnel Errors.

During the April 22, 1992 Unit 2 startup, because of inattentiveness, the referenced channel was logged outside of its tolerance by four operators without recognizing the problem. The operators were using hand held micro-computers to perform channel checks. Although the computer automatically alarms if a parameter is logged outside its required band, the computer had not been programmed to automatically alarm out-of-tolerance conditions between channels. The licensee repaired the inoperable channel and reprogrammed the computer to alarm at unsatisfactory channel checks for both out-of-tolerance conditions for the parameter and difference between channels. This was identified as a non-cited violation in report 50-338,339/92-13.

9. Action on Previous Inspection Items (92701, 92702)

- a. (Closed) IFI 50-338,339/90-29-05: Apparent SW and CC System TS Inadequacy.

TS amendment 152/136 was issued for Units 1 and 2, respectively, on December 13, 1991 to ensure the design basis for the SW system is met. The TS now requires two SW loops (shared between units) to be operable with each loop containing two pumps. Further, a statement is provided to require throttling SW to the CCHX if one pump is inoperable to ensure adequate SW is available to the RSHX. The amendment also added the requirements for SW operability in Modes 5 and 6.

TS amendment 159/140 was issued on May 12, 1992, to ensure the design basis for the CC system is met. The TS requires three shared CC subsystems to be operable in Modes 1-4 with each subsystem consisting of a CC pump and a CCHX. If both units are in Modes 5 or 6, two subsystems are required to be operable.

- b. (Closed) Unresolved Item 50-338/92-10-01: AFW Pump Start Logic Adequacy

The TS require two channels of AFW-start on station blackout on an undervoltage condition sensed on the transfer buses. The undervoltage relays are located on the transfer buses which supply normal power to their respective emergency bus. The intent, however, is not to start the AFW pumps upon a loss of power to the emergency buses but rather to start the pumps on a loss of power to the main feed pumps. The inspectors questioned the

adequacy of the logic since the main feed pumps are normally powered from the station service buses.

The inspectors discussed the design basis of the logic with the licensee. The inspectors also reviewed meeting minutes for the associated PPR 92-10 and a licensee memorandum discussing the PPR response.

The inspectors determined that the existing logic was adequate because if the station service buses lost normal power supply from the SST, supply would automatically be transferred to the RSST. Since the RSST would also be supplying power to the transfer buses, the undervoltage relays would be sensing the ultimate source of power to the main feed pumps. Further loss of power to the RSST would start the AFW pumps.

- c. (Open) Unresolved Item 50-338,339/92-04-03: Indepth Review of TS Surveillance Procedures

The licensee identified several more examples of incomplete surveillance tests as part of this on-going effort. These are discussed in more detail in paragraph 5.b. The item remains open pending the completion of the licensees' review.

10. Exit (30703)

The inspection scope and findings were summarized on June 23, 1992, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
IFI 50-338/92-14-01	Klockner Moeller Breaker Failures (para 4.e)
IFI 50-338/92-14-02	Control Room Habitability Test Criteria (para 7)

11. Acronyms and Initialisms

AC	Alternating Current
AFW	Auxiliary Feedwater
BIT	Boiler Injection Tank
CA	Compressed Air
CC	Component Cooling
CCHX	Component Cooling Heat Exchanger

CH	Charging
CR	Control Room
CST	Condensate Storage Tank
CW	Circulating Water
DOP	Diocetyl Phthalate
DP	Differential Pressure
DR	Deviation Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
GDC	General Design Criteria
GE	General Electric
HEPA	High Efficiency Particulate Air
HHSI	High Head Safety Injection
HP	Horse Power
I&C	Instrumentation & Control
IA	Instrument Air
ICV	Individual Cell Voltage
IFI	Inspector Follow-up Item
IPE	Individual Plant Examination
LCO	Limiting Condition for Operation
LER	Licensee Event Report
MER	Mechanical Equipment Room
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
OTAT	Over Temperature Delta Temperature
PM	Preventive Maintenance
PORV	Power Operated Relief Valve
PPR	Potential Problem Report
PT	Periodic Test
QA	Quality Assurance
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RSHX	Recirculation Spray Heat Exchanger
RSST	Reserve Station Service Transformer
RWST	Refueling Water Storage Tank
SCFM	Standard Cubic Feet/Minute
SG	Steam Generator
SOV	Solenoid-Operated Valve
SRO	Senior Reactor Operator
SSPS	Solid-State Protection System
SST	Station Service Transformer
SW	Service Water
TS	Technical Specifications
TV	Trip Valve
VAC	Volt Alternating Current
$\Delta T/T_{ave}$	Delta Temperature/Average Temperature