



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

Report Nos.: 50-338/92-23 and 50-339/92-23

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: October 18 - November 21, 1992

Inspectors: *A. B. Ruff for* 12/11/92
M.S. Lesser, Senior Resident Inspector Date Signed
A. B. Ruff for 12/11/92
D.R. Taylor, Resident Inspector Date Signed

Accompanying Inspector: A. B. Ruff

Approved by: *P.E. Fredrickson for* 12/11/92
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, minor modifications, maintenance, surveillances, engineered safety feature walkdown, licensee event report followup, action on previous inspection findings and licensee evaluation of changes. Inspections of licensee backshift activities were conducted on the following days: October 31, November 3 and 19.

Results:

In the area of Safety Assessment/Quality Verification, the licensee has not maintained a program to thoroughly evaluate changes to the environs for potential hazards. The licensee, however, is in the process of developing a program and will update Chapter 2 of the UFSAR when the review is complete (para 10).

In the area of operations, the licensee investigated and resolved an issue where the EDG governor load limits were found incorrectly adjusted. The licensee was able to prove that the EDG's remained operable and completed enhancements to preclude repetition (Para 3.c).

In the area of engineering/technical support, the licensee demonstrated a high degree of commitment to resolve time response problems with the turbine drive AFW pumps. The governors were modified to change the ramp acceleration time from 30 seconds to 15 seconds (para 4.a).

In the area of maintenance, the licensee's overall planning and execution of the turbine trip valve repair was excellent. All aspects of plant and personnel safety were thoroughly considered to allow the work to be performed on-line (para 5.c).

In the area of surveillance, the licensee's ongoing surveillance review identified inadequate testing associated with the automatic AFW pump start circuitry. A temporary waiver of compliance was approved by the NRC to exempt testing on Unit 1 until the next shutdown (para 6.a).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

L. Edmonds, Superintendent, Nuclear Training
*R. Enfinger, Assistant Station Manager, Operations and Maintenance
J. Hayes, Superintendent of Operations
D. Heacock, Superintendent, Station Engineering
*G. Kane, Station Manager
*P. Kemp, Supervisor, Licensing
B. McBride, Station Coordinator Emergency Planning
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 is approaching end-of-core life and continued to operate in coastdown, ending the period at 55% power. Unit 2 operated the duration of the inspection period at 100% power.

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.

a. Missed Fire Hose Station Inspection

During a plant tour on October 20, the inspectors identified that the fire hose inspection station, T-H-22E, in the Unit 2 Service Building walkway, had not been inspected for the months of September or October. Monthly inspections are indicated on a tag attached to the hose station. This was reported to the Shift Supervisor and DR N-92-1995 was written to resolve the concern. The inspectors determined that associated procedure 2-FMP-2.2, which inspects service, turbine, and diesel building fire protection equipment, was completed on September 25. However, an existing PAR, which had previously changed the procedure, was not attached to the core procedure thus causing the inspections to be missed. The licensee immediately inspected the equipment and found no deficiencies. The inspectors verified that the equipment in question was not listed in Table 16.2-3 of the UFSAR which establishes the minimum surveillances required by the fire protection program and, therefore, the error had minimal regulatory significance. The inspectors noted that the PAR was approximately 2 years old and had not been incorporated into a revised version of the procedure. The licensee has been successful in reducing the PAR backlog in other departments, however, had not placed high priority on fire protection procedures and this appeared to contribute to the error. Following this incident, the licensee initiated action to improve the fire protection procedures.

b. Protected Area Lighting Survey

On November 3, the inspectors conducted a backshift inspection and observed a security officer perform a lighting survey of the protected area roof tops. A calibrated meter was used to determine foot candles of light at various points. The officer noted several inoperable lights and appropriately took additional readings in affected areas. One particular area was noted to have 5 inoperable lights. The security officer took several readings in that area but did not initially recognize that they were below the minimum acceptance criteria. Review by the supervisor identified the deficient condition and appropriate compensatory measures were ordered.

The inspectors reviewed several surveys from previous weeks and determined that lighting in this particular area has been acceptable.

c. EDG Load Limit Settings Found Mispositioned

On October 21, the licensee tested the 1H EDG. During the test, lubrication oil, which had leaked onto the turbocharger inlet insulation, ignited and was immediately extinguished by operators running the engine. The operators described the flame as minor and there was no need for the fire brigade to respond. The licensee completed the test with no other problems. The licensee identified the leak to be from a cover gasket on the front of the engine. Interim corrective action was to replace the oil-soaked insulation, install a covering on the insulation and retorque the front cover bolts. The licensee replaced the insulation on all EDG's. The long term repair will be to change the cover gasket during the next refueling outage.

On November 10, the licensee identified that the Unit 2H and J EDG governor load limit knobs were not at the "maximum fuel" setting. The licensee conservatively declared both EDG's inoperable, entered the action statement of TS 3.8.1.1.e, and immediately repositioned the knobs correctly.

The load limit acts as an internal governor mechanical stop to limit fuel rack movement. The licensee did not know at what specific setting fuel rack movement is inhibited, thus the conservative declaration of inoperability.

The inspectors reviewed the circumstances of the event. EDG room entry records were reviewed by both the licensee and the inspectors. It was concluded, most likely, that the EDG insulation workers inadvertently moved the knobs while conducting work. The load limit setting is verified by an operator once every 12 hours. The licensee was able to identify through record review and personnel interviews when it was last observed to be in the correct setting. The total time between the last verification and identification of the incorrect setting was estimated to be 5-6 hours. The licensee did not consider the event to be reportable because it was within the TS time limits for having both EDG's inoperable. The inspectors questioned this because the plant had been in a condition outside the design basis. The licensee re-evaluated the reportability aspect and on November 12, reported the event to the NRC in accordance with 10 CFR 50.72.

On November 13, the licensee performed a test to identify the specific load limit setting which actually renders the EDG's inoperable. With the 2H engine not running, the fuel rack was manually moved to the "maximum fuel" position. The load limit knob was then adjusted until the fuel rack started to move toward the "minimum fuel" position. The setting was observed to be more

limiting than the November 10 settings, which proved that the 2H EDG was operable during the November 10 event. On November 16, the licensee withdrew the 10 CFR 50.72 notification. The licensee intends to perform a similar test on the 2J EDG.

The inspectors verified that the licensee has adequate training in place to ensure that personnel are trained to reduce the possibility of bumping or contacting safety related components. Following this incident, the licensee installed protective plexiglass covers over the face of the governor. With the exception of the initial determination of reportability, the inspectors considered the licensee's investigation and resolution of the issue to be good.

d. Auxiliary Shutdown Panel Instrumentation Check

The inspectors reviewed DR 92-315 documented failure of LI-1477B, auxiliary shutdown SG wide range level to meet acceptance criteria of 1-PT-1, Auxiliary Shutdown Panel Monitoring Instrumentation Check. The licensee appropriately entered the 30 day action of TS 3.3.3.5 as a result.

The surveillance checks the auxiliary shutdown panel monitoring channels for proper operation by comparing instrument readings on the panel to other instrument readings measuring the same parameter. The wide range SG level on the auxiliary shutdown panel is compared to control room narrow range level readings. To make the comparisons, calculations are performed to convert the narrow range to an equivalent wide range level. If the two values are within 5% of each other, the test is considered satisfactory. For the test performed on November 14, the levels were just over the 5% tolerance. To correct the problem, the licensee refined their calculations. Specifically, correction factors based on SG pressure were revised to make the increment for pressures smaller thereby giving a more accurate assessment of actual conditions. The inspectors discussed the old and revised calculations with the licensee. Following a change to the procedure on November 18, the PT was re-performed satisfactory and the action statement cleared.

No violations or deviations were identified.

4. Minor Modifications (37828)

a. Turbine Driven AFW Pump Governor Modifications

The inspectors reviewed DC 92-315 associated with governor modification for the Unit 2 turbine driven AFW pump. The new governor was installed on October 19 after time response testing of the existing governor failed its acceptance criteria to reach rated conditions within 57 seconds. The licensee had recently identified time response problems with the existing governor and

had been testing the pump on an increased frequency to assure operability (IFI 50-339/92-18-01).

The existing Woodward Model PG-PL governor was supplied with a 30 second ramp rate bushing to control turbine acceleration. This feature was added in 1990 to prevent turbine overspeeds and piping over pressurization which resulted from fast starts. The ramp rate bushing has a 0.031-0.034 inch orifice to control hydraulic oil flow, gradually bringing the turbine up to speed in 30 seconds. DC 92-315 modifies the ramp rate bushing to 15 seconds by changing the orifice size to 0.045-0.049 inch. Post modification testing showed the turbine to start up on its first attempt in 27.7 seconds. The licensee bench tested this governor at the vendor's facility the previous week. Test results and recent licensee experience show that "warm" starts result in quicker response times. The longer times for "cold" starts appears to be related to the effects of ambient temperature steam supply piping and the resultant pressure loss as steam condenses.

The new governor has resulted in faster starting times. On October 26, a modified governor was installed on Unit 1 and successfully tested. "Cold" start tests were performed two weeks later on each unit to verify the adequacy of the modification. The inspectors noted a high degree of management commitment to resolve the time response concerns.

b. Service Water Restoration Project (DC-91-009-1)

Due to continuing problems with piping corrosion, the licensee is planning to perform extensive restoration and refurbishment activities on certain portions of the SW System during the Unit 1 refueling/SGRP outage commencing January 2, 1993. The inspectors reviewed the DC, the safety evaluation and attended various meetings on the subject and will monitor and inspect licensee project implementation.

The initial scope of the project, (Phase I, Stage 1) involves refurbishment of approximately 800 linear feet of 24 inch concrete encased piping and replacement of approximately 160 linear feet of buried piping. Phase I of the project will continue through several refueling outages into 1995 and ultimately will involve 1500 feet of encased piping and 600 feet of replacement piping.

During the upcoming outage, the licensee will accomplish the work as follows:

1. Excavation of buried piping will begin approximately 1 month before the outage. The licensee has requested an exemption from the requirements of GDC-2 (Design basis protection against natural phenomena) in order to perform this.

2. The licensee will use the Action Statement of TS 3.7.4.1 to remove headers from service one at a time, in order to weld plugs in the lines to isolate Unit 2 loads from Unit 1. The TS allows up to 168 hours of outage time for major repairs to the system. The action statement will be entered 6 times during the course of the refueling outage to install, relocate and remove plugs.
3. The licensee also requested exemption from 10 CFR 50.49, Environmental Qualification of Equipment, regarding the Unit 2 Control Room chillers. The chillers' qualification relies on the availability of backup chillers (Unit 1 control room chillers) which will not have a source of SW during the project.
4. The piping to be refurbished will initially be cleaned by abrasive blasting.
5. A combination of visual, mechanical and UT inspections will be performed to assess the condition of the piping.
6. Pitted areas requiring base metal repair will be filled by welding.
7. Less significant pits will be filled with epoxy patch compound.
8. Two coats of 100% solids epoxy coating will be applied over the piping.
9. Piping to be replaced will be cut out and new piping welded into place. The new piping will also be coated with protective epoxy.

The licensee's submittal includes several proposed contingency and compensatory measures to reduce the possibility of construction mishaps and minimize the consequences of postulated accidents. The licensee also included in their submittal, the results of a PRA to which determined the core damage frequency from loss of SW scenarios.

5. 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. EDG Fuel Injection Pump Replacement

On October 28, the licensee removed the 2H EDG from service for various maintenance activities including engine coolant changeout

in preparation for winter. Following completion of the work, the engine was run for a post-maintenance checkout. Fuel oil leaks were observed by the licensee around the number one cylinder fuel injection pump. The inspectors witnessed subsequent fuel injection pump replacement under work order 5900154849 on October 30. Initial plunger stroke measurements were out-of-tolerance and required the removal of a shim. Following this, the engine was tested satisfactorily.

b. LHSI Relief Valve Gag

The inspectors reviewed licensee corrective actions following a LHSI pump test on October 13 where discharge relief valve 2-SI-RV-2845B lifted and failed to fully reseat. The peak pressure during the test was 345 psig while the relief valve leaked about 1-2 gpm until the pump was secured and pressure dropped below 173 psig. The inspectors have documented chronic problems with LHSI system pressure surges as indicated in URI 50-338/91-22-02.

Relief Valve 2-SI-RV-2845B is a valve common to both trains of LHSI; therefore, isolation and repairs could not be performed without rendering the system inoperable. Since there is one additional relief valve on each train, the licensee implemented Temporary Modification N2-92-1027 to take credit for these and gag shut 2-SI-RV-2845B. This would eliminate the adverse consequences of a radioactive release if 2-SI-RV-2845B failed to shut until repairs could be made.

The inspectors reviewed JCO 92-06 and its associated safety evaluation for adequacy. The three relief valves are installed to protect piping from over pressurization from the reactor coolant system via check valve back leakage. The licensee's JCO requires that an open path be maintained to either one of the other two relief valves, 2-SI-RV-2845A or C via Cold Leg Injection MOV's 2-SI-MOV-2864A or B. These MOV's are normally open and would only be closed following an accident and a safety injection realignment to hot leg recirculation. Since the reactor coolant system would be depressurized at that point, a relief valve would not be needed.

The inspectors considered the licensee's safety evaluation to be acceptable, however, noted that this latest problem is yet another consequence of continued challenges to the LHSI relief valves due to pressure spikes and inadequate venting. Previous problems have included stuck open relief valves due to improper blowdown ring settings and a cracked vent line due to excessive pipe movement.

c. Turbine Throttle Valve Repair

During the last inspection period, report 50-338,339/92-22, the licensee requested and was granted by NRC, a one time waiver to

exempt the testing requirements of TS surveillance 4.7.1.7.2. The waiver exempted testing throttle valves 1-MS-TV-1 and 1-MS-TV-3 due to 1-MS-TV-1 failing in the closed position. The waiver allowed the licensee to complete their planning effort in order to repair the valve. On October 27, after extensive planning, the licensee began the repairs. The inspectors attended the pre-job briefing and followed and observed the maintenance. Adequate precautions were taken which included the contingencies in case of EHC isolation valves leaking. Leak by of the isolation valves had the potential to cause a loss of EHC to the other throttle valves and subsequently cause a turbine trip. The valve was removed by disconnecting the valve actuator and spring housing from the linkage support and moving the assembly to a suitable work area on the turbine deck. Upon valve disassembly, the licensee discovered that the upper knuckle was not torqued to the actuator shaft and a spacer located between the connecting rod and valve link did not fit into a rabbit-fit of the link as required. The licensee indicated that this may have contributed to the valve's failure. During reassembly, difficulty was experienced in fabricating a new spacer of correct size. The spacer size was critical because it effected both pin alignment and dashpot setting. These two attributes had tight tolerances and changing the spacer size to meet dashpot setting adversely affected pin alignment. However, the licensee had anticipated this problem and after several attempts a spacer sizing was fabricated which allowed both tolerances to be met.

On October 31, after completing repairs, the valve was returned to service and TS surveillance 4.7.1.7.2 was successfully completed for 1-MS-TV-1 and 1-MS-TV-3. The inspectors considered the overall planning and execution of the maintenance to be excellent. The procedure worked well and the coordinated effort of the disciplines involved with the maintenance was good.

d. Freeze Seal Isolation For 1-CC-458

On November 5, the inspectors observed the licensee apply a freeze seal to a 12 inch component cooling water pipe in order to isolate the system to repair seat leakage for manual valve 1-CC-458. Maintenance Engineering coordinated the effort using MMP-C-FS-2, Freeze Seal Isolation Using Freeze Seal Engineering. This procedure uses the vendor, Freeze Seal Engineering, to establish and maintain the seal. Liquid nitrogen was supplied from a large tank which was towed to the site by truck. The capacity was adequate to establish and maintain the seal for approximately two days.

The inspectors verified that the licensee had established a written contingency plan which included adequate steps to prevent flooding in the event of a failed seal. The inspectors also verified that the freeze seal chamber temperature and nitrogen pressure were recorded at 15 minute intervals.

Upon valve disassembly, the disc of 1-CC-458 was observed to be gouged due to possible misalignment with the seat. An attempt to lap the disc was unsuccessful and a new disc was machined. The evolution was accomplished safely with good management involvement and oversight.

e. Cold Weather Preparations

The inspectors reviewed portions of the licensee's preparations for cold weather. The program is implemented in the form of PM's to check out the operation and adequacy of various equipment such as heat tracing, ventilation, space heating, pipe insulation and doors. EDG engine coolant is also changed to add an antifreeze solution. The inspectors verified that the PM's had been scheduled and completed. The inspectors reviewed a QA assessment of the program. No significant problems were identified.

No violations or deviations were identified.

6. Surveillance Observation (61726)

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

a. AFW Pump Start Circuit Time Response Testing

On October 21 at 12:45 pm, the licensee determined that time response surveillance testing on portions of the Unit 1 AFW Pump automatic starting circuit was not properly conducted. Specifically, the automatic start relays associated with "station blackout" and "main feed pump trip" had not been time response tested to function in ≤ 60 seconds as required by 18 month TS surveillance 4.3.2.1.3. The licensee entered the 24 action statement of TS 4.0.3 and successfully completed testing of the "station blackout" relays later in the day.

However, the licensee identified concerns with safely testing the "main feed pump trip" relays while at power. In order to prevent a main turbine trip during the test, electrical leads would need to be lifted and subsequently landed. The licensee considered that an error or arc on the contacts during this evolution represented a potential for a turbine trip and resultant reactor trip. The licensee, therefore, requested a one time temporary waiver of compliance to exempt the need to time response test these relays until the end of the Unit 1 operating cycle on January 2, 1993. The basis for the waiver included the following aspects:

1. AFW start on "main feed pump trip" is anticipatory and not

relied upon in the accident analysis. Steam generator low-low level will also cause an AFW start.

2. The relays were functionally tested (although not timed) in March 1991 during the 18 month test. The inspectors reviewed 1-PT.71.4, AFW Pump Time Response and Logic Test, to verify this.
3. The unit currently is at 70% power in coastdown, significantly below its full power rating.
4. The HFA relays are historically reliable and are used throughout the plant. The licensee was able to review the plant events records for an August 1991 safety injection and determined that at least one train of relays actuated well within the response time acceptance criteria.

The inspectors reviewed the licensee's actions. The licensee has been involved in an extensive and detailed review of surveillances for several months due to NRC concerns regarding surveillance test adequacy. This review to date has identified numerous examples of improper overlap or inadequate testing (URI 50-339/92-04-03). Subsequent to identification of each example, the licensee appropriately tested the component and reported the event to the NRC. This particular concern with the AFW start relays was identified several months ago and the respective Unit 2 circuits were tested as the unit was in a refueling outage. The licensee recognized the lack of time response test data on Unit 1 at the time; however, inappropriately considered that the surveillance could be met. This was based upon the logic that it would be reasonable to assume that a test engineer would have identified a "significant" time delay during functional testing. However, the licensee subsequently questioned this as a weak argument following recent concerns with turbine driven AFW pump governor time response (para 4.a).

The NRC approved the licensee's waiver of compliance, however, required that an emergency TS change be processed. The licensee subsequently submitted the TS change on October 26, 1992.

b. Relay and Breaker Testing

On October 28, the inspectors witnessed electrical testing for the Unit 2 A RHR pump. The licensee used 2-PT-84.1D, Channel Calibration and Integrated System Functional Test of Protective Relays for Breaker 25H14, to perform the testing which satisfies in part TS surveillances 4.8.2.5.a.1 for containment penetration conductor overcurrent protection. The procedure tested the setpoints for overcurrent protective relays and functionally verified operation of the circuit breaker from the relays and from both the control room and the 10 CFR 50 Appendix R switch. The

procedure had recently been upgraded and thoroughly tested the equipment.

c. 1J EDG Fast Start

On November 4, the inspectors observed the performance of 1-PT-82.2B, 1J Diesel Generator Test (Simulated Loss of Off-Site Power). The test demonstrates the availability of the 1J EDG to reach TS required conditions of 900 rpm, 4160 ± 420 volts, and 60 ± 1.2 Hz within 10 seconds. Further, the EDG is loaded to 2500-2600 KW within 60 seconds. No performance problems were identified with the test and operators and technicians exhibited good self check practices. However, prior to test performance, operators were required to PAR the procedure because a previous revision to the procedure had failed to adequately review changes that were made to insure the procedure would work as written. The inspectors considered the pre-evolution review by operators to be a good practice, but questioned how often PARs were required prior to test performance. Based on conversations with operators and because the inspectors have noted an improvement with procedure quality in general, no concerns resulted.

d. Steam Dump Functional Check

On November 10, the inspectors observed the performance of 1-IPM-MS-T-408, Rev 1, Functional Check of Condenser Steam Dump System. The test was developed in response to a September 20, 1991, reactor trip and safety injection and is performed on a six month basis. The procedure verifies that all of the steam dump valves will cycle or trip open when a simulated signal is provided to the controlling circuit. Prior to the functional check, the steam dump isolation and bypass valves were shut to isolate steam to the valves being tested. The operators and instrument technicians performing the test were cautious when performing steps that had the potential to effect plant parameters and communications were good. No concerns were identified.

7. ESF System Walkdown (71710)

The inspectors performed a walkdown of the EDG fuel oil system for both units. The inspectors referred to drawings 11715-FB-035A and procedures 1(2)-OP-6.8A, Valve Checkout-Emergency Generator Fuel System and 1-OP-53.1A, Valve Checkoff-Fuel Oil Storage and Transfer. The material condition of the system was very good with very few outstanding work requests. The components were clearly labeled. Some minor inaccuracies such as improperly depicted valve positions were noted on drawings. These discrepancies were forwarded to the licensee for resolution.

The inspectors reviewed testing of the system and determined the following:

1. The fuel oil transfer pumps are included in the IST program, however, are not flow tested due to a lack of instrumentation. In its September 18, 1991 letter to the NRC, the licensee committed to installing flow instrumentation by March 31, 1993.
2. Procedures are adequate to verify the fuel oil transfer pumps function in accordance with TS 4.8.1.1.2.a.3.
3. The licensee is adequately sampling the fuel oil to verify that chemistry parameters are within specification in accordance with TS 4.8.1.1.2.b.
4. Procedures are adequate to verify fuel oil supply check valves are periodically verified to partially stroke open in accordance with the IST program.
5. The last 10 year cleaning of the underground fuel oil storage tanks was properly performed in accordance with TS 4.8.1.1.4 in 1990.

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.

(Closed) LER 50-339/92-15: Missed Surveillance on the H₂ System Trouble or High Hydrogen Annunciator Alarm Due to Incorrect Relay Configuration

Following performance of a channel calibration, the licensee determined that the main control room annunciator for containment analyzer, 2-46-H2A-201-1, was inoperable due to relay CR-1 being incorrectly wired. The wiring deficiency resulted in blocking the actuation of the control room annunciator. This relay was determined to have been miswired during replacement of the relay in August of 1989. This item had not been previously identified because the calibration procedure was inadequate. To correct the condition, the licensee rewired the relay, performed a channel calibration, revised the procedure and discussed the item with I&C personnel. The inspectors reviewed this item at the time of its occurrence and determined that a high hydrogen condition would most likely have been identified by observing hydrogen concentration gages. No safety concerns were identified.

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

- a. (Closed) IFI 50-339/92-18-01: Response Trending of Turbine Driven AFW Pump

Partial followup of this item was documented in Report 50-338,339/92-22. The licensee determined that its time response testing of the turbine driven AFW pump was not an adequate as-found test because the steam admission piping was warm and not representative of the typically cold pipe temperatures. This caused initial steam flow on "cold" starts to condense and a much longer time for the turbine to accelerate to rated speed. The licensee modified the turbine governors as discussed in paragraph 4.a.

- b. (Closed) URI 50-339/92-17-03: Valve 2-SI-377B Weld Failure

The concern involved repetitive weld failures on this particular 1/2 inch tubing and the licensee's threshold for performing a detailed evaluation of such failures. The licensee added a note to maintenance procedure O-MCM-1801-01, Welding Safety Related and Seismic Related Equipment, to require a maintenance engineer to determine if a metallurgical examination on a failed weld is to be performed prior to repairs. The licensee also recently demonstrated heightened sensitivity by performing a cause failure analysis of a socket weld through-wall leak on a 2 inch SW pipe to CH pump coolers. The leak was attributed to stress corrosion cracking resulting from a combination of excessive stress at a flanged joint, a susceptible material and a corrosive environment.

- c. (Closed) Violation 50-338,339/91-10-03: Failure to Meet Surveillance Requirements of IST Program With Three Examples

This violation involved failure to implement requirements of the IST program. To correct the three examples cited by the violation applicable procedures were changed and testing was completed. In addition and as an enhancement to the IST program, a test procedure cross reference and an IST bases document was developed. The cross reference data base provides a reference which matches a requirement for testing to a specific procedure which meets the requirement. The bases document was developed to facilitate proper identification and understanding of the IST program scope. For each component which has the potential to fall into the program, an evaluation was performed using the criteria established in the bases document and a determination was made as to whether the component requires testing under IST.

After the bases document was developed, the licensee compared the document with their current IST program document and identified differences. The differences included initial and additional testing of components, and deletions to the program. The inspectors reviewed the components for which additional testing

was called for and questioned why these components were not tested as they were identified. Upon further discussion and review, the inspectors determined that the licensee had evaluated the additions, but had not prioritized implementation of each. The inspectors stressed the importance of timely review of each addition for compliance with ASME XI requirements. The licensee is working to implement a revision to the IST program which will address these differences. An action plan for implementation is also being developed.

The inspectors concluded that the cross reference and bases documents are positive additions to the IST program.

10. Licensee Evaluations of Changes to the Environs Around Licensed Reactor Facilities (TI 2515/112)

When the management of a nuclear power plant facility made application for a license, the FSAR, the SERs based on the FSAR, and related technical information that was submitted to the NRC were factors and commitments in support of that license application. Consistent with the State of Consideration accompanying the rulemaking of Section 50.71(e) of Title 10 of the Code of Federal Regulations (10 CFR 50.71(e)), appropriate chapters of the FSAR, such as Chapters 2, 3, and 13, should be updated when significant changes to the areas around the reactor site have occurred. Recent events such as discovery of new natural gas well at one facility or the proposed construction of an airport near another raise concerns that licensees may not be fulfilling existing requirements of 10 CFR 50.71(e) for evaluation of new hazards and updating the FSAR to accurately reflect the current site conditions.

In accordance with the TI, the inspectors reviewed the issues discussed in Chapter 2 of the North Anna UFSAR, such as Section 2.1, Geography and Demography, which include exclusion area control, population areas within various radii of the site, transient population, and parks; and Section 2.2, Nearby Industrial, Transportation, Military Installation. As a result of this review the inspectors assessment is that the majority of the information in these sections are based on the licensing justification when the plant was licensed. Several of the discussions relating to population distributions discussed in these sections, are based on a 1970 Census, and projected transient population increase for the Lake Anna recreation area and a Disneyland style recreation and entertainment center (Kings Dominion) in Hanover County.

The licensee's controlling procedure for updating the UFSAR is Nuclear Standard LINS-2802, Revision 1, dated April 17, 1992, Preparation and Control of UFSAR Updates. The review of this standard showed that the general requirements section states that UFSAR shall describe the current licensing basis and that changes to the licensing basis may occur as a result of NRC-issued regulation, orders, amendments, or SER, or as a result of changes approved by SNSOC in accordance with 10 CFR 50.59 items. The general requirement section does not specifically address changes to the environs around the facility.

Discussions with responsible licensing personnel indicated that some of the information discussed in Chapter 2 of the UFSAR is current in their EP, which has been provided to the NRC. As part of the emergency planning, the licensee contracted a reassessment of evacuation routes and this study reviewed and included population data based on the 1990 population census and the increase of transient population as a result of the Lake Anna recreation facility. In part, as a result of the same NRC inspection at their Surry Plant (NRC Inspection Report 50-280,281/92-15 dated August 4, 1992), the licensee solidified their position to re-assess the Chapter 2 information and included it in phase 2 of their UFSAR quality review. The data in Chapter 2 will be evaluated as part of this review. It was anticipated that the necessary updating of information for this chapter would be implemented in 1993. Pending this review by the licensee and further assessment by the NRC, this is identified as IFI 50-338,339/92-23-01, UFSAR Update Process for Non-Plant Type Modifications or Changes to the Environs on or Around the Facility.

11. Exit (30703)

The inspection scope and findings were summarized on November 25, 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</u> | <u>Number</u> | <u>Description and Reference</u> |
|-------------|------------------|--|
| IFI | 338,339/92-23-01 | UFSAR Update Process for Non-Plant Type Modifications or Changes to the Environs on or Around the Facility. (Paragraph 10) |

11. Acronyms and Initialisms

| | |
|----------------|--|
| AFW | Auxiliary Feedwater |
| ASME | American Society of Mechanical Engineers |
| CFR | Code of Federal Regulations |
| CH | Charging |
| DC | Design Change |
| DR | Deviation Report |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| EHC | Electro-Hydraulic Control |
| EP | Emergency Plan |
| ESF | Engineered Safety Features |
| FSAR | Final Safety Analysis Report |
| GDC | General Design Criteria |
| GPM | Gallons Per Minute |
| H ₂ | Hydrogen |
| H _z | Frequency |

| | |
|-------|--|
| IFI | Inspector Followup Item |
| IST | Inservice Testing |
| JCO | Justification for Continued Operation |
| KW | Kilowatt |
| LCO | Limiting Conditions for Operation |
| LER | Licensee Event Report |
| LINS | Licensing Nuclear Standard |
| LHSI | Low Head Safety Injection |
| MOV | Motor-Operated Valve |
| NRC | Nuclear Regulatory Commission |
| PAR | Procedure Action Request |
| PM | Preventive Maintenance |
| PRA | Probabilistic Risk Assessment |
| PSIG | Pounds Per Square Inch Gage |
| QA | Quality Assurance |
| RHR | Residual Heat Removal |
| RPM | Resolution Per Minute |
| SER | Safety Evaluation Report |
| SG | Steam Generator |
| SGRP | Steam Generator Replacement Program |
| SNSOC | Station Nuclear Safety and Operating Committee |
| SW | Service Water |
| TI | Temporary Instructions |
| TS | Technical Specification |
| UFSAR | Updated Final Safety Analysis Report |
| URI | Unresolved Item |
| UT | Ultrasonic Test |