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

Report Nos.: 50-338/85-17 and 50-339/85-17

Licensee: Virginia Electric and Power Company
Richmond, VA 23261

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

Facility Name: North Anna 1 and 2

Inspection Conducted: June 11 - 13, 1985

Inspector: N. Economos 7/1/85 Date Signed

Approved by: J. J. Blake, Section Chief 7/1/85 Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 25 inspector-hours on site in the areas of service water pipe mechanical cleaning and welding, licensee action on previous open items, spent fuel storage rack work observation, and service water reservoir improvements.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

   Licensee Employees

   *M. L. Bowling, Assistant Station Manager
   *J. R. Adams, Project Management Engineer
   *W. D. Burns, Quality Control Coordinator
   *C. R. Swope, Supervisor - Quality Control
   *S. B. Dzialo, Station Engineering and Construction

   Other licensee employees contacted included technicians and office personnel.

   NRC Resident Inspector

   *M. Branch, Senior Resident Inspector

   *Attended exit interview

2. Exit Interview

   The inspection scope and findings were summarized on June 13, 1985, with those persons indicated in paragraph 1 above. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters (92702)

   (Open) Violation (339/84-34-01) Failure to Maintain Control over Welding and Welding Materials. This violation addressed certain inadequacies in the control of conditions around the area where welding was in progress. The inadequacies related to the control of filler metal stubs and the presence of certain defects observed in the root of weld FW-4A. The inspector reviewed the licensee's response of November 9, 1984, and observed conditions around areas where welding was in progress to ascertain whether corrective actions described in the letter of response were being implemented. The inspector concluded that the licensee had determined the full extent of the subject noncompliance, performed the necessary follow-up actions to correct the observed conditions and developed the necessary corrective actions to preclude recurrence of the unsatisfactory conditions during welding operations. However, in that the inspector did not review the final radiographs of the weld in question, this item will remain open pending review of the final radiographs.

4. Unresolved Items

   Unresolved items were not identified during this inspection.

5. Inspector Followup Items

(Closed) Inspector Followup Item (IFI) 339/84-34-03, Recirculation Spray HX Corrective Action. On February 6, 1985, the licensee's Engineering Department issued a report entitled "Proposed Recirculation Spray Heat Exchanger Closure Modifications". The purpose of this report was to review the present recirculation spray heat exchanger top and bottom closures, and propose modifications to minimize or eliminate crevice corrosion on lap rings, address the overpressure problem on the diaphragms and provide access for inspection of tube side conditions. Advantages and disadvantages of several design modifications were discussed including one which was recommended to the station. The revised design would replace the lap ring, ring flange, diaphragm and channel cover with a welded neck-flange, blind flange, joint rings and gasket. The report stated that the revised design would minimize the crevice corrosion concerns and eliminate the diaphragm overpressure concerns. This modification is expected to take approximately 30 weeks to complete following the approval of a design change by the station.

6. Spent Fuel Storage Racks (50095)

This work effort is a followup to that documented in report number 50-339/85-15. The modification is being performed per Design Change (DC) No. 82-19, Neutron Absorber Spent Fuel Storage Racks/NAPS/U1 & U2. This document states that the racks are designed to meet requirements for seismic Category I Structures. ASME Code Section III, Subsection NF, 1980 Edition, has been invoked for design and allowable stress considerations. Acceptance criteria, with regard to design, are based on the applicable sections of the NRC Position Paper on Fuel Storage Racks, Standard Review Plan (SRP) 3.8.4 and the aforementioned code. Other codes, standards and specifications invoked by reference were as follows:

- AISC Manual of Steel Construction, Eighth Edition, 1980
- AISI Stainless Steel Cold-Formed Structural Design Manual, 1974.
- USNRC SRP 3.8.4 - "Other Category I Structures"
- USNRC Regulatory Guide 1.92, "Combination of Modes and Spatial Components in Seismic Response Analysis", Rev. 1, February 1976
- USNRC Reg. Guide 1.122, "Development of Floor Design Response Spectra", 1978

At the time of this inspection, the racks were in storage. Discussions with cognizant personnel disclosed that on site QC inspection had been performed and identified some bent corners, dents, burs and certain weld conditions that caused them to issue a nonconformance report (NCR) which had not been resolved at the time of the inspection. The inspector observed rack S/N 16 and reviewed applicable drawings, 80E6278, Rev. 1 and 80D6273, Rev. 4, to verify weld location, size and appearance. Also, the inspector observed/

inspected selected support plate welds fabricated by the licensee's field construction group. In this work effort, the inspector reviewed welder and weld procedure qualification, filler metal certifications and quality records for the plate material used. In addition, for racks S/N 16 and 09, the inspector reviewed the vendor quality package including certificates of conformance and compliance, and vendor and site receipt inspection reports.

Within the areas inspected, no violations or deviations were identified.

7. Service Water System Piping Corrosion - Mechanical Cleaning (Hydrolazing) and Pipe Welding Units 1 and 2 (92706)

This work effort is a followup to that documented in Report 50-338, 339/85-02. At the time of this inspection, work in progress related to design change package (DCP), DCP 84-74, Rev. 3, Mechanical Cleaning of the Service Water Piping Gear Box and Seal Coolers Supply and Return Lines 1 and 2. The particular lines undergoing cleaning were identified as follows:

4-WS-C50-151-03
4-WS-C51-151-03
4-WS-C52-151-03
4-WS-C53-151-03

These lines are primarily low pressure, 100 psig, ANSI B31.7, Class-3 piping made of 4" diameter carbon steel material. Entry to the lines was made at predetermined locations, which were identified on approved piping sketches. Manpower and equipment for the job were provided by Daniel Company with field and project supervision provided by VEPCO Engineering and Construction Department. All welding, quality control, and NDE performed on these lines, prior to and after cleaning, is performed by VEPCO in accordance with installation specification NAS-1009, Rev. 5, Specification for Piping and Mechanical Equipment. Field welds observed at various stages of fabrication were as follows:

Weld #	Line #	Size	Condition
FW-50D	C52-151-Q3	4" X .233"	Welding Out
FW-50W	C51-151-Q3	4" X .233"	Fitup
FW-51W	C51-151-Q3	4" X .233"	Root
FW-51D	C52-151-Q3	4" X .233"	Complete

In addition, the inspector observed the liquid penetrant inspection of field weld FW-50D to verify compliance with code and procedure NDE-PT.1 requirements. Welder and weld procedure qualifications were reviewed for compliance with applicable code, ASME Section IX (80W81), requirements. Filler metal issue slips, storage conditions, and related quality records were reviewed and found in order.

Within these areas, the inspector noted the following:

- The licensee has elected not to inspect the ID of the pipe following the cleaning operation. Therefore, it is not known whether a given pipe section has experienced uniform wall degradation with pitting as predicted, or whether in addition to the above there are isolated areas where severe localized corrosion has diminished wall thickness to the point of violating minimum wall requirements. In discussing this observation with cognizant personnel the inspector understood that a monitoring program has been devised where designated pipe sections that have demonstrated susceptibility to accelerated corrosion attack will be monitored to determine post cleaning corrosion rates. In response, the inspector asked whether the population of the designated areas had been selected on some statistical basis that would provide a predetermined degree of confidence level on pipe integrity. The licensee representative responded that pipe locations were selected on the basis of previous failures in the system as previously stated.

Within the areas inspected, no violations or deviations were identified.

8. Service Water Reservoir Improvements, Buried Piping, Units 1 and 2, (92706)

The corrosive nature of the lake water at North Anna has resulted in degradation of the spray array support system which includes corrosion of the existing carbon steel pipe supports. Other concerns associated with the existing spray system include inefficient use of the service water (SW) reservoir's surface area for heat dissipation and inability of existing fiberglass piping and supporting guy wires, nozzles and risers to withstand the rigors of winter climate conditions. Also, previous chemical treatments designed to control the corrosive water have had adverse effects on the reservoir's clay liner, e.g., softening, suspension and increased turbidity. To alleviate these concerns the licensee has designed a new reservoir spray and bypass system. The new system will utilize the partially constructed Unit 3 and 4 pump house, which will be completed and serve as a valve house for the spray and winter bypass headers. All piping will exit the new valve house serving the two bypass headers and the eight spray headers in the new system. The final tie-in to the existing service water system will be in the buried return headers approximately 150 feet outside of the protected area. The licensee indicated that this design concept will provide a system with more efficient heat transfer characteristics, improved resistance to corrosion, lower maintenance requirements, better access for periodic inspection and improved operability. The new design will include a winter bypass system which will allow complete bypassing of the spray array during the winter months. To perform this task, the licensee has issued several Design Changes and Engineering Work Request packages.

Within these areas, the inspector reviewed DC 84-37, Service Water Reservoir Improvements, Buried Piping. This document addresses the installation of pipe which will be used to connect the new service water valve house to the existing buried service water lines. The new pipe added by this DC will run underground for about 400 feet. The licensee is using pipe from cancelled units 3 and 4. The pipe is 30 inch ID, SA-155 (P-1) material with 1 1/8" wall thickness. The buried piping has been designated as Q.A. Category I,

Seismic Class I, Quality Group C. It will be installed in accordance with the existing specification NAS-1009 "Installation of Piping and Mechanical Equipment". This specification covers design, analysis and installation of the buried pipe to suit the requirements of ANSI B31.7.

In order to avoid the need for post weld thermal treatment of the weld joints in the buried pipe, the area in the vicinity of each weld joint is being counterbored, thereby reducing the wall thickness from 1 1/8" to approximately 3/4" wall thickness. The inspector observed the machining of a pipe section, P.O. No. 2323N-20, 106484-601, EGGW-16 and reviewed related quality records to verify compliance of the material to applicable code requirements.

Within the areas inspected, no violations or deviations were identified.