VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 4, 1982

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Serial No. 628
NO/RCC/jmj/SP4
Docket No. 50-338
License No. NPF-4

Gentlemen:

REACTOR COOLANT SYSTEM LOOSE PARTS RECOVERY PROGRAM
NORTH ANNA POWER STATION UNIT NO. 1

In our letter, Serial No. 601 dated October 26, 1982, we informed you that we would be providing you a report on our efforts to search for and retrieve loose parts from the Reactor Coolant System (RCS) at North Anna Unit No. 1. This letter provides a review of the actions Vepco has taken to retrieve known loose parts and to search for potential loose parts which could have been generated during work activities associated with the current outage.

If you have any questions or require additional information, please contact us at your earliest convenience.

Very truly yours,

W. L. Stewart

W. L. Stewart

cc: Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
Washington, D.C. 20555

Mr. James P. O'Reilly, Regional Administrator
Region II
Atlanta, Georgia 30303

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RECOVERY OF LOOSE PARTS DURING NORTH ANNA UNIT 1 OUTAGE

1.0 INTRODUCTION

During the Cycle III-IV North Anna Unit 1 outage, an extensive search and retrieval operation was performed to remove loose parts from the reactor coolant system. This search and retrieval operation was conducted both to ensure removal of loose parts which were known to have migrated from their correct location in the reactor coolant system and to prevent loose parts which may have been created during the repairs performed at North Anna Unit 1 from remaining in the reactor coolant system.

2.0 REMOVAL OF LOOSE PARTS

2.1 Control Rod Guide Tube Split Pins

Near the end of North Anna Unit 1, Cycle III, the plant loose parts monitoring system identified noise originating in the "A" and "C" loop steam generators. When these steam generators were opened for inspection, metal fragments were found on the hot leg side of both the "A" and "C" steam generators. These fragments were identified by Westinghouse as part of two control rod guide tube split pin nuts. As a result of this finding, a program was initiated to replace all of the North Anna Unit 1 control rod guide tubes including the split pin nuts (Reference 1). During this replacement program, examination of the split pins confirmed that only two failures had occurred prior to initiation of the replacement program.

Examination of the metal fragments found in steam generators "A" and "C" in conjunction with examination of the reactor upper internals indicated that one split pin nut fragment was unaccounted for. Radiographic examinations of steam generator drain lines was performed which indicated the presence of a metal fragment in the 2 inch drain line of the "C" loop hot leg. This fragment was removed and determined to be the missing split pin nut fragment.

2.2 Loop "A" Cold Leg Stop Valve Guide Bar

During maintenance of the "A" loop cold leg stop valve, one of the valve guide bars was found to be missing (Reference 1). It was determined that this valve guide would have migrated to the bottom of the reactor vessel. The reactor vessel lower internals were removed to perform a search of this area to recover the valve guide pieces. Six pieces of the valve guide bar were recovered; four pieces from the bottom of the vessel and two pieces on the lower core plate. Each piece of the guide bar was photographed and these photographs were used to verify that all of the guide bar had been retrieved.

2.3 Thermal Sleeve

As noted in Reference 1, the six inch loop "A" cold leg safety injection line thermal sleeve was found to be missing during the thermal sleeve radiographic examinations conducted at North Anna Unit 1. This sleeve was also retrieved from the bottom of the reactor vessel.

3.0 GENERAL SEARCH AND RETRIEVAL OPERATIONS

Extensive operations have been performed at North Anna Unit 1 both to remove loose parts which were known to be present in the reactor coolant system as discussed above and to ensure that any potential loose parts created by repair procedures performed at North Anna Unit 1 during the outage were removed. These search and retrieval operations include:

1) Removal of the upper internals and examination of the internals during the process of replacing the control rod guide tubes.

2) Removal of the lower internals and cleaning of the bottom of the reactor vessel and the core plate. These areas were examined by video during these operations to ensure removal of loose parts.

3) Visual examination of all fuel assemblies both as they were removed from the reactor core and during the core reloading. The bottom nozzles of irradiated fuel being reinserted into Cycle IV were also inspected with a video camera.

4) Debris from the flow splitter plate removal was removed from the intermediate leg of each loop by a thorough flush through the drain lines from the loop. Cleanliness was confirmed by video examination after the flushing operation.

5) The steam generator tube sheets in steam generators "A" and "C" were cleaned after completion of tube end repair process described in Reference 2. The acceptable cleanliness of this area was confirmed by visual examination of the channel heads and reactor coolant loops down to the hot leg loop stop valves on loops "A" and "C".

This program is designed to clean or inspect all areas where loose parts or potential loose parts have been postulated to collect including any small steam generator tube end pieces which may have been released into the reactor coolant system as a result of the peening which occurred in steam generators "A" and "C".

In addition to recovery of the larger pieces known to be in the reactor coolant system as discussed in Section 2 of this report, a number of small pieces of debris have been removed. This debris has included wire fragments, metal chips, and tie wraps. Unidentifiable debris will be sent to Westinghouse for analysis and identification.

4.0 CONCLUSION

An extensive search and retrieval operation has been performed at North Anna Unit 1 to retrieve loose parts. Confirmation of removal of the relatively large loose parts known to have been in the reactor coolant system as discussed in Section 2, in conjunction with the general retrieval and examination program described in Section 3, provide assurance of removal of loose parts from the system.

References:

1. Letter to Harold R. Denton, Serial No. 574, dated 10/12/82.

2. Letter to Harold R. Denton, Serial No. 601, dated 10/26/82.

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