

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 25, 1994

Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 94-027A
NAPS/JHL/MAE R12
Docket No. 50-339
License No. NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 2
UPDATED REPLY TO A NOTICE OF VIOLATION AND
PROPOSED IMPOSITION OF CIVIL PENALTY (EA 93-262)

As requested by your letter dated February 14, 1994, our February 1, 1994 Reply to the Notice of Violation (IR 93-28) has been updated and is provided as an attachment to this letter. Updated information is noted by a change bar in the margin.

As previously stated in our February 1, 1994 Reply to the Notice of Violation, recurring violations are of particular concern to us. We expect to learn from past experience and take the necessary corrective actions to prevent recurrence. The original concern was identified by Virginia Power as an operating experience issue and has been aggressively pursued. Corrective actions from these events included, 1) use of increasingly precise valve positioning techniques, 2) use of increasingly accurate flow measurement instrumentation, 3) increasing the understanding of flow rate measurement applications and uncertainties, 4) prompt action to re-establish acceptable flow rates, 5) revising the Technical Specification flow balance band and 6) continued performance of high head safety injection flow balance testing, although not required by Technical Specifications, in order to verify design basis flow requirements are established. We are fully committed to providing aggressive management oversight to fully understand and resolve this issue.

If you have any further questions, please contact us.

Very truly yours,



W. L. Stewart
Senior Vice President - Nuclear

Attachment

1. Updated Reply to the Notice of Violation

JEH

cc: Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Mr. R. D. McWhorter
NRC Senior Resident Inspector
North Anna Power Station

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by W. L. Stewart who is Senior Vice President - Nuclear, of Virginia Electric and Power Company. He is duly authorized to execute and file the foregoing document in behalf of that Company, and the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 25TH day of February, 1994.

My Commission Expires: May 31, 1994.

Vicki L. Hull
Notary Public

(SEAL)

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**UPDATED REPLY TO A NOTICE OF VIOLATION AND
PROPOSED IMPOSITION OF CIVIL PENALTY (EA 93-262)
INSPECTION REPORT NOS. 50-338/93-28 AND 50-339/93-28**

NRC COMMENT

During an NRC inspection conducted on October 14 - October 20, 1993, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282 and 10 CFR 2.205. The particular violation and associated civil penalty are set forth below:

Technical Specification (TS) 4.5.2.h requires that under certain circumstances prior to entering Mode 3 each Emergency Core Cooling System (ECCS) subsystem be demonstrated operable by performing a flow balance test to verify for high head safety injection lines with a single pump running that, a) the sum of the injection line flow rates, excluding the highest flow rate, be greater than or equal to 359 gpm, b) the total pump flow rate be less than or equal to 660 gpm (650 gpm prior to issuance of Amendment 151 on August 4, 1993) and , c) for cold leg injection balancing, a value of greater than or equal to 48.3 gpm will be used for simulated seal injection flow during balancing.

Contrary to the above:

- (1) For the period from October 25, 1993, when Unit 2 entered Mode 3, to November 8, 1993, the ECCS subsystems were not demonstrated operable in accordance with TS 4.5.2.h. Specifically, on October 14, 1993, the sum of the injection line flow rates, excluding the highest flow rate were adjusted such that the sum was 384 gpm. On November 8, 1993, the measurement and data analysis methods used for reaching this conclusion that the flow rate had been adequately restored were demonstrated to be faulty. Specifically, the instrumentation used on October 14, 1993 to demonstrate compliance with TS 4.5.2.h was determined to have an error band greater than assumed in the October 14, 1993 analysis of the measurements such that the adjusted flow rate was not demonstrated to be greater than or equal to 359 gpm.
- (2) For operating cycle 9 from April 21, 1992 to September 7, 1993, when Unit 2 was in Mode 3 or higher for part of that time, the ECCS subsystems were not demonstrated operable in accordance with TS 4.5.2.h. On November 8, 1993, the test instrumentation used on April 10 and 11, 1992 to demonstrate compliance with TS 4.5.2.h was determined to have an error band greater than was assumed in the analysis of the April 1992 measurements.

Specifically, considering the test instrumentation indicated flow rates measured on April 10 and 11, 1992, and the greater error band, the A and B centrifugal charging pumps were not demonstrated to be operable.

This is a Severity Level IV violation (Supplement I)
Civil Penalty-\$15,000

REPLY TO A NOTICE OF VIOLATION

1. **ADMISSION OR DENIAL OF THE ALLEGED VIOLATION**

The violation is correct as stated.

2. **REASONS FOR THE VIOLATION**

A detailed root cause evaluation of the event is currently in progress. The preliminary cause of this event is flow measurement inaccuracies associated with the "strap on" ultrasonic test instrumentation used during the Unit 2 high head safety injection flow balance test.

Previously accounted for uncertainties with ultrasonic test instrumentation for balancing the Unit 2 high head safety injection flow were larger than previously believed due to unfavorable system piping geometries. This instrument inaccuracy caused the high head safety injection system to be outside Technical Specification surveillance requirements.

Although there was failure to meet Technical Specification 4.5.2.h requirements, the applicable safety analysis limits were met.

3. **CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED**

The cold leg safety injection throttle valves were adjusted so that the sum of the two lowest flow rates was equal to 384 gpm and the total pump flow was less than or equal to 660 gpm using "strap-on" ultrasonic instrumentation.

Loctite 290 Threadlocker® was installed on each of the cold leg safety injection throttle valves stem to yoke bushing to prevent valve stem movement since flow is sensitive to minor adjustments.

The cold leg safety injection throttle valves were radiographed to confirm that they were in an "as built" condition with respect to the disc, disc nut and stem arrangement. The valve's vendor verified that the valves were intact.

Previously unaccounted for uncertainties in the Unit 2 high head safety injection flow balance measurements due to unfavorable system piping geometries was identified. Subsequently, reactor coolant pump seal injection flow rates were adjusted to allow the high head safety injection flow balance to meet the requirements of Technical Specification 4.5.2.h.

Enforcement Discretion was requested and approved from meeting the requirements of Technical Specifications 4.5.2.h.1.b and 4.5.2.h.1.c to re-establish acceptable high head safety injection flow rates. An Emergency Technical Specification change was requested and approved to eliminate TS 4.5.2.h.1.c which specified the simulated reactor coolant pump seal injection flow requirement for cold leg flow injection balancing.

Licensee Event Report 50-339/93-007-00 was submitted on November 12, 1993 documenting the failure to meet Technical Specification 4.5.2.h requirements.

This event was reviewed for applicability to North Anna Unit 1. The review determined that Unit 1 continued to comply with Technical Specification 4.5.2.h requirements.

Other plant systems that use the ultrasonic test instrumentation to meet surveillance requirements were reviewed. It was determined that surveillance requirements for the affected plant systems continue to be met.

In order to fully evaluate the Root Cause Program, senior management directed the Quality Assurance Department and the Corporate Nuclear Safety Section to perform assessments. The Quality Assurance Department Assessment focused on adherence to the Root Cause Program and the Corporate Nuclear Safety Assessment focused on the programmatic effectiveness. The results of the assessments are as follows:

1. The appropriate level of detail required for each root cause evaluation was not clearly stated.
2. Some of the personnel performing the root cause evaluations had insufficient training and experience to ensure the consistent application of the root cause methodology.
3. The root cause process documented in the Virginia Power Root Cause Program Manual was cumbersome and difficult to follow.

Based on the results of the assessments, the following actions have been taken:

1. Past station performance was reviewed to verify that significant recurring problems are receiving adequate root cause evaluations. Items identified by this review were added to the Integrated Trending Program which is used to highlight the most significant nuclear safety, regulatory compliance and plant reliability issues to senior management.
2. Root cause facilitators are being assigned to root cause teams performing the most detailed (Level III) root cause evaluations. These facilitators will ensure that a systematic and thorough evaluation is performed using the root cause methodology.
3. A task team has been established to resolve the programmatic concerns which were identified by the assessments.
4. A corporate root cause coordinator has been established to monitor the root cause evaluation, make program improvements, and monitor program effectiveness.

4. **CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS**

A detailed root cause evaluation, in accordance with the Virginia Power Root Cause Program Manual, is currently being performed to determine the cause of the event. Potential causes being evaluated include throttle valve cavitation, check valves sticking/flow blockage, safety injection flow diversion during testing, throttle valve movement and branch line flow measurement errors. The detailed root cause evaluation and management's review of the recommendations provided in the root cause evaluation will be completed by March 31, 1994. Corrective actions and schedules to prevent recurrence of this event will be established by April 29, 1994. Management will inform the NRC Resident Inspectors of the results of the root cause evaluation and the corresponding corrective action plan. An industry operating experience entry will be issued by May 16, 1994, following the completion of the root cause evaluation and approval of a corrective action plan.

Further evaluation of the Technical Specifications has been conducted. It has been determined that Technical Specification 4.5.2.h will be revised to allow the use of additional margins in the safety analysis. A Technical Specification change will be submitted by April 29, 1994.

In addition to the completed Root Cause Program enhancements discussed in section 3 above, the following additional enhancements to the Root Cause Program are currently scheduled to be completed by June 30, 1994.

1. A root cause coordinator will be established to assist in root cause evaluations led by station personnel. The coordinator will monitor the root cause evaluations to ensure program effectiveness.
2. The Root Cause Program will be simplified and clarified by modifying the Virginia Power Root Cause Program Manual and implementing procedures as appropriate.

5. **THE DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED**

Full compliance with Technical Specification 4.5.2.h has been achieved.