

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND VIRGINIA 23261

October 13, 1992

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

Serial No. 92-662
NL&P/MAE: R4
Docket No. 50-338
License No. NPF-4

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 1
TEMPORARY WAIVER OF COMPLIANCE
TURBINE THROTTLE VALVES 1 AND 3

Technical Specification surveillance requirements 4.7.1.7.2.a & b direct that the turbine overspeed protection system shall be demonstrated operable at least once per 31 days by cycling each of the turbine control valves through one complete cycle. Due to the recent failure of one of the four turbine throttle valves (throttle valve 1) to the closed position, a waiver of the Technical Specification surveillance requirement to cycle throttle valves 1 and 3 is requested for the duration of the coastdown for North Anna Unit 1. The coastdown began September 8, 1992 and will end when the refueling outage begins. The refueling outage is currently scheduled to begin on January 2, 1993. The two remaining throttle valves as well as the four reheat stop valves and the four reheat intercept valves will continue to be tested in accordance with the Technical Specification surveillance requirements.

The steam supplied to the high pressure turbine is controlled by four throttle valves (or stop valves) and four governor valves as shown in Attachment 1. The actuator stem on throttle valve 1 recently failed. The valve failed closed, which is the safe position, and is clamped to ensure it remains closed. The actuator stem connects the throttle valve disc to the actuator. The purpose of the turbine throttle valves is to provide turbine overspeed protection. These valves receive a close signal on turbine trip. It is not desirable at this time to repair the valve due to possible personnel safety concerns and an increased potential to induce plant transients. The turbine manufacturer (Westinghouse) has recommended that throttle valve 3 not be cycled as required by surveillance requirements 4.7.1.7.2.a & b because closing this valve would cut off all steam to the steam chest associated with governor valves 1 and 3. This would isolate nozzle chambers 1 and 3 on the high pressure turbine. Nozzle chamber 4 is already isolated as a result of the closure of governor valve 4, due to the normal coastdown process. The closure of throttle valve 3 would cause the first stage blades of the high pressure turbine to exceed design conditions.

The basis for waiving the throttle valve surveillance requirements is the same as that previously approved by the NRC for a similar requirement on the four turbine governor valves. On August 10, 1990, the NRC granted license amendment numbers 136 and 119 to North Anna Power Station Units 1 and 2 respectively. These amendments eliminated turbine governor valve testing, as required by surveillance requirements 4.7.1.7.2.a & b, during the end-of-cycle power coastdown between 335 MWe (87% full power) and 386 MWe (40% full

power). The North Anna Units 1 and 2 high pressure turbines require elimination of governor valve testing during coastdown to prevent the first stage turbine blades from being subjected to excessive loading. The turbine blade over stressing is a result of a double shock blade loading condition which occurs when steam is passed through alternate nozzle chambers to the control stage blading. A probabilistic risk assessment (PRA) considered a coastdown of up to 75 days and determined that the probability of a turbine generated missile was acceptable. This was based on the NRC reliability criteria guidelines for unfavorably oriented turbines as discussed in the letter and enclosure from C. E. Rossi of the NRC to J. A. Martin of Westinghouse Electric Corporation, dated February 2, 1987, hereafter referred to as the NRC guidelines.

The PRA discussed above was reevaluated using plant specific frequency of system separation data and considered a coastdown of up to 135 days. The annual probability of turbine missile ejection was determined to be $1.75\text{E-}06$, which is less than a probability of $1.0\text{E-}05$ which is acceptable under the NRC guidelines. A safety evaluation has been performed to evaluate the extended coastdown to 135 days and was approved by the Station Nuclear Safety and Operating Committee.

The PRA has been further revised to reflect throttle valve 1 as closed, and not cycling throttle valve 3 and the four governor valves for the duration of the Unit 1 coastdown. The results of the PRA determined the probability of a turbine missile ejection as $1.9\text{E-}06$. This is acceptable under the NRC guidelines which allow the turbine to be loaded and brought on line with a probability of less than $1.0\text{E-}05$. The reliability of the throttle valves is high. A review of the surveillance testing records for the last nine years showed that none of the throttle valves have failed to perform their required function during surveillance testing.

By letter dated July 16, 1992, Virginia Power requested a temporary exemption from the requirements of 10 CFR Part 50, Appendix A, Criterion 2 (GDC-2), "Design Basis for Protection Against Natural Phenomena," for Phase I of the service water system restoration project for North Anna Units 1 and 2. The exemption will allow the removal of tornado missile shielding from the service water piping in the Unit 1 alley way between the service building and the quench spray building for a short period of time while Units 1 and 2 continue to operate. The service water restoration project exemption request has been evaluated for the affect of this waiver request and any increase in probability of a turbine missile ejection. The impact was found to be negligible.

SAFETY IMPACT AND POTENTIAL CONSEQUENCES

A safety evaluation has been performed for the proposed Technical Specification waiver. The turbine missile ejection probability fault tree was revised to reflect throttle valve 1 as shut and suspended testing of throttle valve 3. The results showed a negligible increase in the missile ejection probability. The overall probability for North Anna Unit 1 is $1.9\text{E-}06$ for an operating coastdown year, which reflects throttle valve 1 as closed, and not cycling throttle valve 3 and the four governor valves. This is bounded by the NRC guidance of $1.0\text{E-}05$ for unlimited operation and $1.0\text{E-}04$ for operation with repair to occur at the next scheduled outage. The present plant configuration is bounded by the NRC guidelines by a factor of 5 for unlimited operation and a factor of 50 for operation with repair to occur at the next scheduled outage.

SIGNIFICANT HAZARDS CONSIDERATION

The proposed waiver of cycling turbine throttle valves 1 and 3, as required by surveillance requirements 4.7.1.7.2.a and b, for the duration of the Unit 1 coastdown does not result in a significant hazards consideration.

1. The proposed waiver does not involve a significant increase in the probability or consequences of an accident previously evaluated. Only the surveillance requirement for cycling the two throttle valves will be waived. Throttle valve 1 is closed and in the safe position. No new accident precursors are introduced by this surveillance requirement waiver request.

The throttle valve testing performed to date has demonstrated the reliability of these valves. In addition, operability of the remaining two throttle valves, the reheat stop valves and the reheat intercept valves will be verified every 31 days throughout the coastdown period. Based on the results of the PRA, the probability of a turbine generated missile is bounded by the NRC guidelines.

2. The proposed waiver does not create the possibility of a new or different kind of accident from any accident previously evaluated. Since the implementation of the proposed change to the surveillance requirements will require no hardware modification (i.e., alterations to the plant configuration), operation of the facility without these surveillance requirements does not create the possibility for any new or different kind of accident which has not already been evaluated in the Updated Final Safety Analysis Report (UFSAR).

Waiving the surveillance requirements for the two throttle valves will not result in any physical alteration to any plant system, there would not be a change in the method by which any safety related system performs its function. The design and operation of the turbine overspeed protection, to include the turbine trip capability, and turbine control systems remain unchanged.

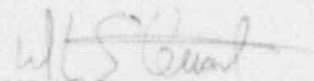
3. The proposed waiver does not involve a significant reduction in the margin of safety. The design and operation of the turbine overspeed protection and turbine control systems are not being changed. Throttle valve 1 is closed and throttle valve 3 has demonstrated its reliability by successfully completing the required surveillance testing every 31 days. The results of the accident analyses which are documented in the UFSAR continue to bound operation under the proposed testing waiver, so that there is no safety margin reduction.

ENVIRONMENTAL CONSEQUENCES

Approval of a temporary waiver as described above will not change the types of any effluents that may be released offsite, nor create a significant increase in individual or cumulative occupational radiation exposure. The proposed waiver involves only surveillance requirements. Therefore, the consequences of accidents related to or dependent on the turbine overspeed protection system remain unaffected.

This waiver request has been reviewed and approved by the Station Nuclear Safety and Operating Committee. If you have any questions or require additional information, please contact us.

Very truly yours,



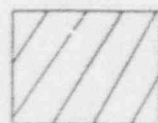
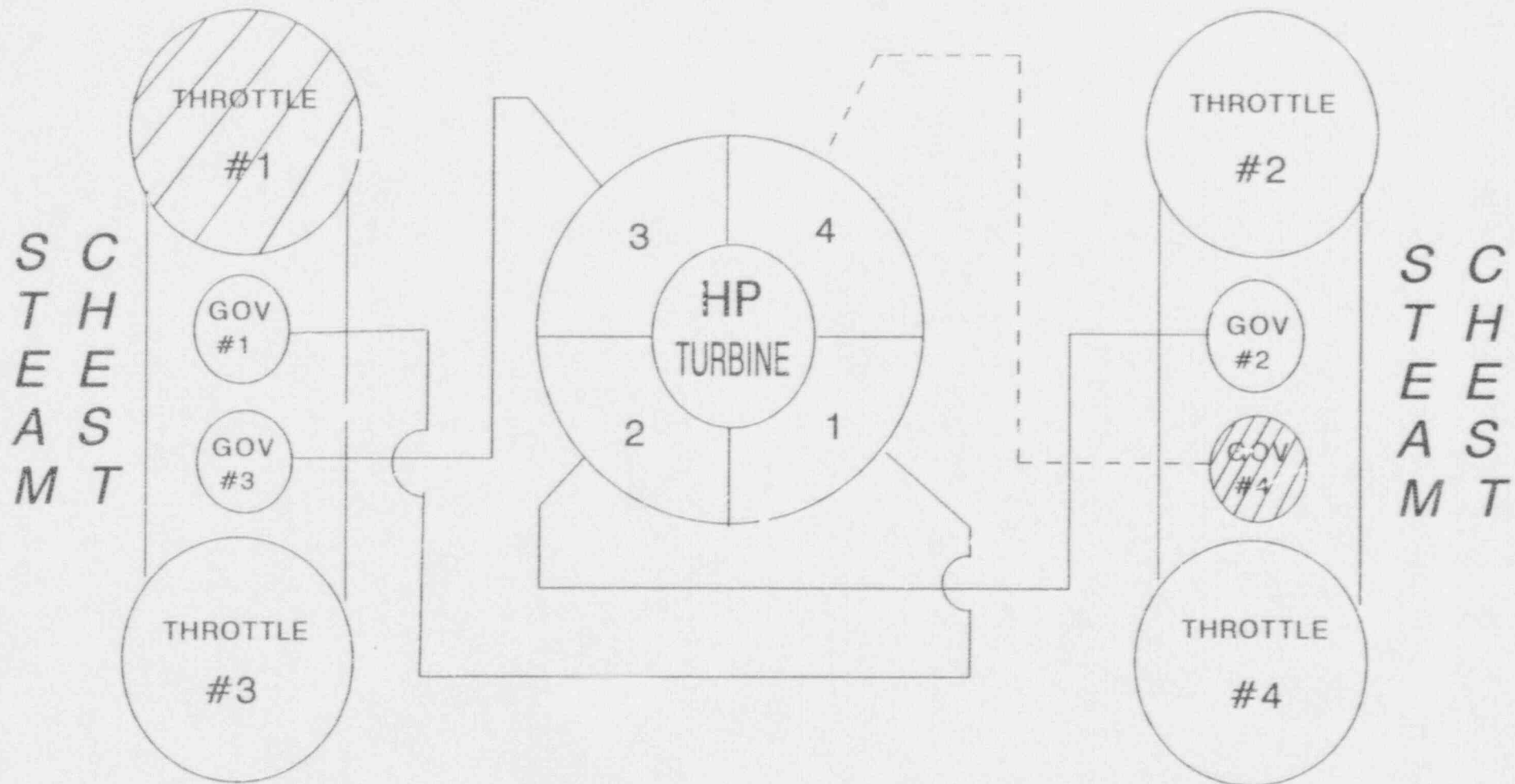
W. L. Stewart
Senior Vice President - Nuclear

Attachment

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

Mr. M. S. Lesser
NRC Senior Resident Inspector
North Anna Power Station

ATTACHMENT 1
NORTH ANNA UNIT #1
STEAM CHEST ARRANGEMENT



VALVE SHUT

- 1) THROTTLE #1
FAILED SHUT
- 2) GOV #4 SHUT DUE
TO COASTDOWN