



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 150 AND 134 TO

FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated August 29, 1991, the Virginia Electric and Power Company (the licensee) requested changes to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The proposed changes would revise the NA-1&2 TS 3.3.2, Table 3.3-4, Engineered Safety Feature Actuation System (ESFAS) Instrumentation Trip Setpoints for station blackout, loss of voltage and undervoltage trip setpoints, and allowable values. During a design basis event, the engineered safety feature (ESF) systems are supplied electrical power by the emergency diesel generators (EDGs), which provide full capacity back-up supplies. The ESF electrical equipment is prevented from operating in a reduced voltage condition by anticipatory undervoltage trip delays which strip the emergency buses of electrical loads, start the EDGs, and then permit reloading the necessary ESF loads. The setpoints for these relays are subject to the NA-1&2 TS controls. A discussion of the licensee's proposed changes for the setpoints as listed above is provided below.

2.0 DISCUSSION

The trip setpoint specified for undervoltage protection of the auxiliary feedwater pumps in TS 3/4.3.2 Table 3.3-4, Item 6.e, is currently listed as $\geq 57.5\%$ of transfer bus voltage. This would be changed to ≥ 2392 volts on the transfer bus, which is the actual voltage represented by 57.5% of 4160 volts (nominal voltage of the transfer buses). The allowable value is similarly presented as $\geq 52.5\%$ of transfer bus voltage and would be changed to ≥ 2184 volts on the transfer bus, which is equal to 52.5% of 4160 volts. These changes will promote clarity and facilitate the use of the NA-1&2 TS.

The trip setpoint values, time delays, and the tolerance values listed in TS 3/4.3.2, Table 3.3-4, Items 7.a and 7.b would also be modified by the proposed changes. These proposed values represent the minimum voltage and appropriate time delays required for the actuation of the loss of power sensing relays and are based on two considerations. The first consideration is to ensure that

during sustained reduced voltage situations, adequate voltage is provided to the ESF equipment for continued operation, and that the equipment control power voltage is adequate to operate equipment control relays and contacts. The second consideration is to minimize the possibility of disconnecting the emergency buses from the offsite power source during short-term voltage drops, such as those caused by energizing large electrical loads. The proposed trip setpoint voltage limits and tolerance values have been developed with these considerations to include relay drift, and conform to the licensee's current undervoltage/degraded voltage analyses and methodology. The trip setpoint changes would ensure that the maximum analyzed relay drift would not result in the actual emergency bus voltage deviating from the degraded voltage analysis assumptions during a normal surveillance interval. The proposed voltage limits for loss of voltage and degraded voltage (Items 7.a and b.) and the tolerance for loss of voltage (Item 7.a) are more restrictive than the current specification. The tolerance value for degraded voltage (Item 7.b) appears to be less restrictive, however, a change of +7 volts on the 4160 volt emergency buses results in the minimum discernible variance of the test instrumentation. Bus voltage is determined by measuring the voltage output from a potential transformer with a voltage ratio factor of 60.6-to-1. Therefore, a change of 7 volts on the 4160 volt primary side would result in a secondary side change of only 0.1 volt.

The allowable values voltage limits, time delays, and tolerance values listed in TS 3/4.3.2, Table 3.3-4, Items 7.a and 7.b would also be modified by these changes. These provide the minimum voltage and appropriate time delay values for the TS surveillance of undervoltage protection devices.

The proposed allowable value voltage limits and tolerance values have been developed in accordance with the licensee's current undervoltage/degraded voltage (GDC-17) analyses and methodology. The proposed voltage limits for loss of voltage and degraded voltage (Items 7.a and b.) are more restrictive than the current specification and conform to the licensee's current undervoltage/degraded voltage analyses and methodology.

The time delay for the degraded voltage (Item 7.b) allowable value would also be reduced from 75 ± 3 seconds to ≤ 63 seconds. This is more restrictive than the existing specification and ensures that the EDGs will be supplying power to the emergency buses within 74 seconds. The trip setpoint values contain adequate margins to prevent unnecessary disconnection from the offsite power source during transient, reduced voltage situations. Therefore, it is not necessary to specify an upper boundary for the allowable values.

The allowable values for these items represent actual emergency bus voltage and time delay values. Relay drift would be accounted for in calculating the surveillance test acceptance criteria. The surveillance test acceptance criteria would specify a range of values, which include the appropriate delay drift allowances calculated to protect both ESF equipment from undervoltage situations and minimize the possibility of disconnecting the emergency buses from the offsite power source during short-term voltage drops. Therefore, the proposed changes to the NA-1&2 allowable values for Items 7.a

and 7.b from bands defined by specific values with plus-or-minus deviations would be changed to greater-than-equal-to given minimum values, as well as providing new minimum values based on the current licensee's current undervoltage/degraded voltage (GDC-17) analyses and methodology.

3.0 EVALUATION

The new values for the trip setpoints and the allowable values would ensure the continued protection of the ESF equipment from undervoltage conditions, while minimizing the possibility of unnecessary disconnection from the preferred offsite power sources. The values for the trip setpoints and the allowable values are at least as or more restrictive than the existing specification and are consistent with the regulatory basis for the loss of power and degraded voltage protection and the NA-1&2 loss of offsite power (GDC-17) analysis. The changes to Item 6.e only affect the nomenclature of the trip setpoints and allowable values. The changes to Items 7.a and 7.b, trip setpoints and the allowable values, would ensure undervoltage protection to the safety-related equipment and conform to the loss of offsite power analysis. The assumptions used in the accident analysis require undervoltage protection to be actuated before voltage on the buses drops below a given value. The TS instrument trip setpoints are derived from this value with added conservatism. The trip setpoints are at least as restrictive as the current requirements and the allowable values define actual measured bus voltages required by current loss of offsite power analyses to ensure that ESF operability has been maintained. Therefore, the accident analysis assumptions remain bounding and safety margins remain unchanged. Based on all of the above, the staff finds the proposed changes to be acceptable.

4.0 IMPLEMENTATION

TS 3.3.2.1 requires ESFAS surveillance testing to be performed every 18 months. Establishing new setpoints for the 4160 volt emergency bus undervoltage trip setpoints and the performance of associated post-maintenance testing is not desired during power operations because of the increased possibility of inadvertent disconnection of the emergency buses from the preferred offsite power sources. Therefore, the licensee has requested that the amendments become effective with their issuance, with implementation required prior to restart after the next NA-1&2 refueling outages. Currently, the NA-1 refueling outage is scheduled for April 18, 1992 through June 30, 1992, and the NA-2 refueling outage is scheduled from February 1, 1992 through April 14, 1992. The staff finds the licensee's request to be acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comment.

6.0 ENVIRONMENTAL CONSIDERATION

These amendments change a surveillance requirement. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding (56 FR 47245). Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: L. Engle

Date: November 29, 1991