

VIRGINIA ELECTRIC AND POWER COMPANY

RICHMOND, VIRGINIA 23261

December 1, 2000

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

Serial No. 00-391B
NL&OS/ETS R0
Docket Nos. 50-338/-339
License Nos. NPF-4/-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION
HALON FIRE SUPPRESSION SYSTEM IN ESGR

In a telephone conference call with the NRC staff on August 16, 2000, the NRC requested additional information with regard to the design and operation of the manual Halon fire suppression system installed in the Emergency Switchgear Rooms (ESGR) of North Anna Units 1 and 2. In addition, the staff requested a detailed cost estimate to modify the Halon system to provide automatic actuation. During that call, we agreed to provide the design information in ninety days and a detailed cost estimate within 120 days. The system design and operation information was provided in a letter dated November 13, 2000 (Serial No. 00-391A). The attachment to this letter provides the detailed cost estimate for modifications required to provide automatic initiation of the Halon suppression system and our assessment of the relative benefit of performing such modifications.

We conclude that the limited benefit associated with modification of the Halon suppression system to automatic initiation is not commensurate with the projected cost. Furthermore, as acknowledged by the NRC in their questions, the licensing basis for North Anna is manual initiation of the Halon suppression system. If you have any further questions, please contact us.

Very truly yours,



William R. Matthews
Vice President – Nuclear Operations

Commitments made in this letter: None

A006

cc: U.S. Nuclear Regulatory Commission
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Mr. M. J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

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Attachment

**Cost Estimate to Upgrade the Halon Suppression System
To Automatic Actuation**

**Dominion Generation
North Anna Units 1 and 2**

Detailed Cost Estimate for Converting the Manual Halon Fire Suppression System to Automatic

At North Anna, the overall risk of core damage due to fires in the Emergency Switchgear (ESGR) was calculated to be $3.3E-6$ /year. The IPEEE analysis did not take credit for the manual Halon system because the material properties of the cables are such that the fires self-extinguish. Fires were found to damage cables in the immediate vicinity of the fire source but did not propagate. Thus, it is not expected that conversion from a manual to an automatic system would significantly reduce the calculated core damage frequency (CDF) and there would be no safety benefit in terms of the docketed core damage frequency.

Likewise, for the deterministic Appendix R evaluation, the ESGR is assumed to be consumed during a fire and provisions for safe shutdown are provided outside of the ESGR. Therefore, automatic initiation of the Halon suppression system will not affect the associated Appendix R evaluation.

The cost to modify the existing Halon suppression system has been estimated at \$300,000 for both ESGRs. A detailed breakdown of the cost estimate is included in the attached table and estimate summary. This estimate does not include personnel training and any long-term maintenance and testing of the new automatic actuation circuitry.

Even assuming the entire CDF associated with fires in the ESGR could be eliminated by an automatic Halon suppression system, the costs associated with modification are not commensurate with the benefit.

**Summary of Cost Estimate for Halon Suppression System
Upgrade for Automatic Actuation**

| COST CATEGORY | PRIOR | 2000 | 2001 | 2002 | 2003 | FUTURE | TOTAL |
|----------------------|--------------|-------------|-------------|-------------|-------------|---------------|--------------|
| ENGINEERING | | | 89.0 | | | | 89.0 |
| CONSTRUCTION | | | 182.0 | | | | 182.0 |
| STATION SUPPORT | | | 15.0 | | | | 15.0 |
| CAPITALIZED INTEREST | | | 10.0 | | | | 10.0 |
| TOTAL | | | 296.0 | | | | 296.0 |
| REMOVAL LABOR | | | 4.0 | | | | 4.0 |

NOTES:

1. The above costs are for both NAPS Units 1 and 2. Joint owner credits are not included.
2. Costs are based on present day dollars with implementation in 2001. If implementation occurs later than 2001, additional costs will be necessary for escalation and activity allocation rates.

ASSUMPTIONS:

1. This estimate was prepared based on conceptual information and scope of work as conveyed by the corporate fire protection group.
2. The system modification proposed will in fact achieve redundant indication before initiation.
3. The existing Fire Protection multiplexer panel where the new smoke detectors will connect will not require modification other than minor wiring modifications.
4. The existing wiring from the multiplexer panel to the detectors will require replacement. However, if it can be reused, approximately \$15,000 can be eliminated from the above project costs.
5. A new conduit will be necessary between the existing multiplexer panel and the new Halon Control panels. This conduit will require seismic support in the Emergency Switchgear Room (ESGR) and a new penetration between the ESGR and the Turbine Building.

SCOPE OF WORK:

1. Replace existing Halon Control Panels 1-FP-CP-100 and 2-FP-CP-100 located in the Turbine Building basement with vendor supplied control panels. Assume that no modifications will be required for the existing raceways that connect panels and that the existing cables can simply be reconnected to the new control panel and not require new cables due to length variations.
2. Replace 20 existing smoke detectors in the ESGR/Relay room /AC Room ceiling for each unit (40 total) with new programmable detectors. Assume that existing wiring will require replacement back to the local Fire Protection panel. However, only minor wiring modifications are assumed at the multiplexer panel. Note that the detector loop is single series conduit run from each unit's multiplexer.
3. Install a new 3/4" conduit raceway between the local multiplexer panel in the ESGR for each unit to the new Halon Panel in the Turbine Building basement. This conduit will be seismically installed due to the location in the ESGR and a new penetration from the ESGR to the Turbine Building.
4. Perform system verification and testing support including coordination of vendor representative for final testing.

| Nuclear Business Unit | | | | | | | | | | | | | | | | | Total | Project |
|--|--------|--------------|-------------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|---------------|
| Option I - (esc) - CAPITAL PROJECT | | | | | | | | | | | | | | | | | 12/31/01 | Total |
| IR# / WBS Element | | | | | | | | | | | | | | | | | 2001 | Total |
| Project Name | | | | | | | | | | | | | | | | | | |
| Joint Ownership: | | YES | | | | | | | | | | | | | | | | |
| Completion Date (MM/YYYY) | | 12/31/01 | | | | | | | | | | | | | | | | |
| Category | WBS | Bal 12/31/99 | Bal 6/30/00 | Projection of Last 6 Months of 00 | Jan-2001 | Feb-2001 | Mar-2001 | Apr-2001 | May-2001 | Jun-2001 | Jul-2001 | Aug-2001 | Sep-2001 | Oct-2001 | Nov-2001 | Dec-2001 | 12/31/01 2001 | Project Total |
| Capitalized Interest (AFUDC) | I | 0 | 0 | 0 | 41 | 124 | 207 | 290 | 373 | 456 | 957 | 1,427 | 1,436 | 1,436 | 1,436 | 1,436 | 9,621 | 9,621 |
| Engineering | .1.1 | | | | | | | | | | | | | | | | | |
| VP Labor | | 0 | 0 | 0 | 11,607 | 11,607 | 11,607 | 11,607 | 11,607 | 11,607 | 11,607 | 0 | 0 | 0 | 0 | 0 | 81,250 | 81,250 |
| Other VP Labor Charges | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material Surcharge | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Contractors | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Non-CCS Contractor Charges | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Services | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other / contingency | | 0 | 0 | 0 | 1,161 | 1,161 | 1,161 | 1,161 | 1,161 | 1,161 | 1,161 | 0 | 0 | 0 | 0 | 0 | 8,125 | 8,125 |
| Subtotal Engineering | | 0 | 0 | 0 | 12,768 | 12,768 | 12,768 | 12,768 | 12,768 | 12,768 | 12,768 | 0 | 0 | 0 | 0 | 0 | 89,375 | 89,375 |
| NSS Construction | .1.2.1 | | | | | | | | | | | | | | | | | |
| VP Labor | | 0 | 0 | 0 | 1,277 | 1,277 | 1,277 | 1,277 | 1,277 | 1,277 | 2,554 | 1,277 | 0 | 0 | 0 | 0 | 11,491 | 11,491 |
| Other VP Labor Charges | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material: Non-Stock | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material: Stock | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25,630 | 0 | 0 | 0 | 0 | 0 | 25,630 | 25,630 |
| Material Surcharge | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,664 | 0 | 0 | 0 | 0 | 0 | 6,664 | 6,664 |
| Contractors | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 89,881 | 0 | 0 | 0 | 0 | 0 | 89,881 | 89,881 |
| Activity Allocation | | 0 | 0 | 0 | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 625 | 0 | 0 | 0 | 0 | 5,000 | 5,000 |
| Services | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,000 | 0 | 0 | 0 | 0 | 0 | 10,000 | 10,000 |
| Other / contingency | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33,200 | 0 | 0 | 0 | 0 | 0 | 33,200 | 33,200 |
| Subtotal NSS Construction | | 0 | 0 | 0 | 1,902 | 1,902 | 1,902 | 1,902 | 1,902 | 1,902 | 168,553 | 1,902 | 0 | 0 | 0 | 0 | 181,866 | 181,866 |
| Non-NSS Construction | .1.2.2 | | | | | | | | | | | | | | | | | |
| Subtotal Non-NSS Construction | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal Construction | | 0 | 0 | 0 | 1,902 | 1,902 | 1,902 | 1,902 | 1,902 | 1,902 | 168,553 | 1,902 | 0 | 0 | 0 | 0 | 181,866 | 181,866 |
| Station Support | .1.3 | | | | | | | | | | | | | | | | | |
| VP Labor | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other VP Labor Charges | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material Surcharge | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Contractors | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Activity Allocation | | 0 | 0 | 0 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 0 | 0 | 0 | 0 | 14,800 | 14,800 |
| Services | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other / contingency | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal Station Support | | 0 | 0 | 0 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 1,850 | 0 | 0 | 0 | 0 | 14,800 | 14,800 |
| Subtotal Software | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Land and Land Rights | .4 | | | | | | | | | | | | | | | | | |
| Subtotal Expenditures | | 0 | 0 | 0 | 16,520 | 16,520 | 16,520 | 16,520 | 16,520 | 16,520 | 183,171 | 3,752 | 0 | 0 | 0 | 0 | 286,041 | 286,041 |
| Joint Ownership | .7 | | | | | | | | | | | | | | | | | |
| Subtotal Dominion Resources w/o Capitalized Interest | | 0 | 0 | 0 | (1,916) | (1,916) | (1,916) | (1,916) | (1,916) | (1,916) | (21,248) | (435) | 0 | 0 | 0 | 0 | (33,181) | (33,181) |
| Total Dominion Resources w/Capitalized Interest | | 0 | 0 | 0 | 14,603 | 14,603 | 14,603 | 14,603 | 14,603 | 14,603 | 161,923 | 3,317 | 0 | 0 | 0 | 0 | 252,860 | 252,860 |
| Cost of Removal | .8 | | | | | | | | | | | | | | | | | |
| Contractors | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,500 | 0 | 0 | 0 | 0 | 0 | 3,500 | 3,500 |
| Other / contingency | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 875 | 0 | 0 | 0 | 0 | 0 | 875 | 875 |
| Subtotal Cost of Removal | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,375 | 0 | 0 | 0 | 0 | 0 | 4,375 | 4,375 |
| Salvage | .9 | | | | | | | | | | | | | | | | | |
| Subtotal Salvage | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |