Docket Nos. 50-280
and 50-281

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Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
P. O. Box 26666
Richmond, Virginia 23261

January 17, 1984

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No.92 to Facility Operating License No. DPR-32 and Amendment No. 91to Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated October 28, 1980, as supplemented February 3, July 29, and November 10, 1982.

These amendments revise the Technical Specifications to add new limiting conditions for operation and surveillance requirements which address engineered safety feature filter systems and the bottled air system for the main control room.

A copy of our Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next regular monthly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY

Joseph D. Neighbors, Project Manager
Operating Reactors Branch #1
Division of Licensing

Enclosures:
1. Amendment No.92 to DPR-32
2. Amendment No.91 to DPR-37
3. Safety Evaluation

cc: w/enclosures:
See next page



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

January 17, 1984

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Vice President - Nuclear Operations
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cc: w/enclosures:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 92
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated October 28, 1980, as supplemented February 3, July 29, and November 10, 1982 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-32 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.92 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 17, 1984

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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 91
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated October 28, 1980, as supplemented February 3, July 29, and November 10, 1982 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 91, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 17, 1984

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO.92 TO FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO.91 TO FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Revise Appendix A as follows:

| Remove Pages | Insert Pages |
|---|---|
| i | i |
| ii | ii |
| iii | iii |
| 3.7-20 | 3.7-20 |
| 3.10-4 | 3.10-4 |
| 3.10-5 | 3.10-5 |
| 3.10-6 | 3.10-6 |
| 3.19-1 | 3.19-1 |
| --- | 3.19-2 |
| --- | 3.22-1 |
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| 4.12-2 | 4.12-2 |
| 4.12-3 | 4.12-3 |
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| --- | 4.20-5 |

# TECHNICAL SPECIFICATIONS
## TABLE OF CONTENTS

TABLE 3.7-5

AUTOMATIC FUNCTIONS OPERATED FROM RADIATION MONITORS ALARM

| MONITOR CHANNEL | AUTOMATIC FUNCTION AT ALARM CONDITIONS | MONITORING REQUIREMENTS | ALARM SETPOINT μCi/cc |
|---|---|---|---|
| 1. Process vent particulate and gas monitors (RM-GW-101 & RM-GW-102) | Stops discharge from containment vacuum systems and waste gas decay tanks (shuts Valve Nos. RCV-GW-160, FCV-GW-260, FCV-GW-101) | See Specifications 3.11 and 4.9 | Particulate $\leqq 4 \times 10^{-8}$<br>Gas $\leqq 9 \times 10^{-2}$ |
| 2. Component cooling water radiation monitors (RM-CC-105 & RM-CC-106) | Shuts surge tank vent valve HCV-CC-100 | See Specifications 3.13 and 4.9 | ≦ Twice Background |
| 3. Liquid waste disposal radiation monitors (RM-LW-108) | Shuts effluent discharge valves FCV-LW-104A and FCV-LW-104B | See Specifications 3.11 and 4.9 | $\leqq 1.5 \times 10^{-3}$ |
| 4. Condenser air ejector radiation monitors (RM-SV-111 & RM-SV-211) | Diverts flow to the containment of the affected unit (Opens TV-SV-102 and shuts TV-SV-103 or opens TV-SV-202 and shuts TV-SV-203) | See Specifications 3.11 and 4.9 | ≦ 1.3 |
| 5. Containment particulate and gas monitors (RM-RMS-159 & RM-RMS-160, RM-RMS-259 & RM-RMS-260) | Trips affected unit's purge supply fans, closes affected unit's purge air butterfly valves (MOV-VS-100A, B, C & D or MOV-VS-200A, B, C & D) | See Specifications 3.10 and 4.0 | Particulate $\leqq 9 \times 10^{-9}$<br>Gas $\leqq 1 \times 10^{-5}$ |
| 6. Manipulator crane area monitors (RM-RMS-162 & RM-RMS-262) | Trips affected unit's purge supply fans, closes affected unit's purge air butterfly valves (MOV-VS-100A, B, C & D or MOV-VS-200A, B, C & D) | See Specifications 3.10 and 4.9 | ≦ 50 mrem/hr |

12. A spent fuel cask or heavy loads exceeding 110% of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

13. A spent fuel cask shall not be moved into the Fuel Building unless the Cask Impact Pads are in place on the bottom of the spent fuel pool.

14. Two trains of the control and relay room emergency ventilation system shall be operable. With one train inoperable for any reason, demonstrate the other train is operable by performing the test in Specification 4.20.A.1. With both trains inoperable, comply with Specification 3.10.B.

B. If any one of the specified limiting conditions for refueling is not met, refueling of the reactor shall cease, work shall be initiated to correct the conditions so that the specified limit is met, and no operations which increase the reactivity of the core shall be made.

C. After initial fuel loading and after each core refueling operation and prior to reactor operation at > 75% of rated power, the movable incore detector system shall be utilized to verify proper power distribution.

D. The requirements of Specification 3.0.1 are not applicable.

Basis

Detailed instructions, the above specified precautions and the design of the fuel handling equipment, which incorporates built-in interlocks and safety features, provide assurance that an accident, which would result in a hazard to public health and safety, will not occur during refueling operations. When no change is being made in core geometry, one neutron detector is sufficient to monitor the core and permits maintenance of the out-of-function instrumentation. Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition. Containment high radiation levels and high airborne activity levels automatically stop and isolate the Containment Purge System. The fuel building ventilation exhaust is diverted through charcoal filters whenever refueling is in progress. At least one flow path is required for cooling and mixing the coolant contained in the reactor vessel so as to maintain a uniform boron concentration and to remove residual heat.

The shutdown margin established by Specification A-9 maintains the core subcritical, even with all of the control rod assemblies withdrawn from the core. During refueling, the reactor refueling water cavity is filled with approximately 220,000 gal of water borated to at least 2,000 ppm boron. The boron concentration of this water is sufficient to maintain the reactor subcritical by approximately 10% W k/k in the cold shutdown condition with all control rod assemblies inserted and also to maintain the core subcritical by approximately 1% with no control rod assemblies inserted into the reactor. Periodic checks of refueling water boron concentration assure the proper shutdown margin. Specification A-10 allows the Control Room Operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

In addition to the above safeguards, interlocks are used during refueling to assure safe handling of the fuel assemblies. An excess weight interlock is provided on the lifting hoist to prevent movement of more than one fuel assembly at a time. The spent fuel transfer mechanism can accommodate only one fuel assembly at a time.

Upon each completion of core loading and installation of the reactor vessel head, specific mechanical and electrical tests will be performed prior to initial criticality.

The fuel handling accident has been analyzed based on the activity that could be released from fuel rod gaps of 204 rods of the highest power assembly* with a 100-hour decay period following power operation at 2550 MWt for 23,000 hours. The requirements detailed in Specification 3.10 provide assurance that refueling unit conditions conform to the operating conditions assumed in the accident analysis.

Detailed procedures and checks insure that fuel assemblies are loaded in the proper locations in the core. As an additional check, the movable incore detector system will be used to verify proper power distribution. This system is capable of revealing any assembly enrichment error or loading error which could cause power snapes to be peaked in excess of design value.

---

*Fuel rod gas activity from 204 rods of the highest power 15 x 15 assembly is greater than fuel rod gap activity from 264 rods of the highest power 17 x 17 demonstration assembly.

## 3.19 MAIN CONTROL ROOM BOTTLED AIR SYSTEM

### Applicability

Applies to the ability to maintain a positive differential pressure in the main control room.

### Objective

To specify functional requirements for the main control room bottled air system.

### Specification

A. Requirements

A bottled dry air bank shall be available to pressurize the main control room to a positive differential pressure with respect to adjoining areas of the auxiliary, turbine, and service buildings for one hour. A minimum positive differential pressure of 0.05 inches of water must be maintained when the control room is isolated under accident conditions. This capability shall be demonstrated by the testing requirement delineated in Technical Specification 4.1.

B. Remedial Action

If the requirements of Specification 3.19.A are not met, the unit shall be placed in the hot shutdown condition within 8 hours; except that if tests during the 8-hour period demonstrate that the emergency control room ventilation system is functional, the unit shall be brought within the requirements of Specification 3.19.A or placed in the hot shutdown condition within 24 hours.

If the requirements of Specification 3.19.A are not met within 48 hours after achieving hot shutdown condition, the unit shall be placed in the cold shutdown condition.

Basis

Following a design basis loss of coolant accident, the containment will be depressurized to subatmospheric condition in less than 1 hour; thus, terminating leakage from the containment. The main control room is maintained at a positive differential pressure using bottled air during the period when containment leakage may exist to prevent contamination.

## 3.22 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

### Applicability

Applies to the ability of the safety-related system to remove particulate matter and gaseous iodine following a LOCA or a refueling accident.

### Objective

To specify requirements to ensure the proper function of the system.

### Specification

A. Whenever either unit's Reactor Coolant System temperature and pressure is greater than 350°F and 450 psig, respectively, two auxiliary ventilation exhaust filter trains shall be operable with:

1. Two filter exhaust fans;

2. Two HEPA filter and charcoal adsorber assemblies.

B. With one train of the exhaust filter system inoperable for any reason

1. Return the inoperable train to an operable status within 7 days or be in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 48 hours.

2. When one train of the exhaust filter becomes inoperable the operability of the other train shall be demonstrated immediately. The operability of the other train shall be demonstrated by performing the test in Specification 4.12.A.1.

Basis

The purpose of the filter trains located in the auxiliary building is to provide standby capability for removal of particulate and iodine contaminants from the exhaust air of the charging pump cubicles of the auxiliary building, fuel building, decontamination building, safeguards building adjacent to the containments, and the reactor containment (during shutdown) which discharge through the ventilation vent and could require filtering prior to release. During normal plant operation, the exhaust from any one of these areas can be diverted, if required, through the auxiliary building filter trains remotely from the control room. The safeguards building exhaust and the charging pump cubicle exhaust are automatically diverted through the filter trains in the event of a LOCA (diverted on safety injection system signal). The fuel building exhaust and purge exhaust are aligned to continously pass through the filters during spent fuel handling.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment.

## 3.23 CONTROL AND RELAY ROOM VENTILATION SUPPLY FILTER TRAINS

### Applicability

Applies to the control and relay room emergency ventilation system.

### Objective

To specify requirements to ensure the proper function of the control and relay room emergency ventilation system.

### Specification

A. Both trains of the control and relay room emergency ventilation system shall be operable whenever either unit is above cold shutdown.

B. With one train of the control and relay room emergency ventilation system inoperable for any reason, restore the inoperable train to a operable status within 7 days or be in at least Hot Shutdown within the next 6 hours and in Cold Shutdown within the following 48 hours.

### Basis

When the supply of compressed bottled air is depleted, the control room and relay room emergency ventilation system is manually started to continue to maintain the control room pressure at the design positive pressure so that all leakage is outleakage. One train of the control room emergency ventilation consists of one fan powered from an independent emergency power source.

The control and relay room emergency ventilation system is designed to filter the intake air to the control room pressure envelope, which consists of the control room, relay rooms, and emergency switchgear rooms during a LOCA.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine to the control room. The in-place test results should indicate a system leaktightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99.5 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 95 percent for expected accident conditions. The control room dose calculations assume only 90 percent iodine removal efficiency for the air passing through the charcoal filters. Therefore, if the efficiencies of the HEPA filters and charcoal adsorbers are as specified, at the temperatures, flow rates and velocities within the design values of the system, the resulting doses will be less than the allowable levels stated in Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50.

If the system is found to be inoperable, there is no immediate threat to the control room, and reactor operation may continue for a limited period of time while repairs are being made. If they system cannot be repaired within the specified time, procedures are initiated to establish conditions for which the filter system is not required.

## 4.12 AUXILIARY VENTILATION EXHAUST FILTER TRAINS

### Applicability

Applies to the testing of safety-related air filtration systems.

### Objective

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

### Specifications

A. Tests and Frequency

1. Each redundant filter train circuit shall be operated every month if it has not already been in operation.

2. At least once per refueling cycle, the operability of the entire safety-related portion of the auxiliary ventilation system shall be demonstrated.

3. Auxiliary ventilation system exhaust fan flow rate through each filter train in the LOCA mode of operation shall be determined initially, after any structural maintenance on the HEPA filter or charcoal adsorber housings, once per refueling cycle, i.e. approximately 18 months, or after partial or complete replacement of the HEPA filters or charcoal adsorbers.

   The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975.

4. A visual inspection of the filter train and associated components shall be conducted before each in-place air flow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of Section 5 of ANSI N510-1975.

5. An air distribution test accross the prefilter bank shall be performed initially and after any major modification, major repair, or maintenance of the air cleaning system affecting the filter bank flow distribution. The air distribution test shall be performed with an anemometer located at the downstream side and at the center of each carbon filters.

6. In-place cold DOP tests for HEPA filter banks shall be performed:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system;

   d. After each complete or partial replacement of the HEPA filter cells; and

   e. After any structural maintenance on the filter housing.

   The procedure for in-place cold DOP tests shall be in accordance with ANSI N510-1975, Section 10.5 or 11.4. The flow rate during the in-place cold DOP tests shall be 36,000 CFM ±10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

7. In-place halogenated hydrocarbon leakage tests for the charcoal adsorber bank shall be performed:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

c. Following painting, fire, or chemical release in any ventilation zone communicating with the system;

d. After each complete or partial replacement of charcoal adsorber trays; and

e. After any structural maintenance on the filter housing.

The procedure for in-place halogenated hydrocarbon leakage tests shall be in accordance with ANSI N510-1975, Section 12.5. The flow rate during the in-place halogenated hydrocarbon leakage tests shall be 36,000 CFM ±10 percent. The flow rate shall be determined by recording the flow meter reading in the control room.

8. Laboratory analysis on in-place charcoal samples shall be performed:

a. Initially, whenever a new batch of charcoal is used to fill adsorbers trays;

b. At least once per refueling cycle, i.e., approximately every eighteen months;

c. After 720 hours of system operation; and

d. Following painting, fire, or chemical release in any ventilation zone communicating with the system or after any structural maintenance on the HEPA filter or charcoal adsorber housings.

The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in Specification 4.12.B.7.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

   a. Initially;

   b. At least once per refueling cycle thereafter for systems maintained in a standby status and after 720 hours of system operation; and

   c. After each complete or partial replacement of filters or adsorbers.

B. Acceptance Criteria

1. The minimum period of air flow through the filters shall be 15 minutes per month.

2. The system operability test of Specification 4.12.A.2 shall demonstrate automatic start-up, shutdown and flow path alignment.

3. The air flow rate determined in Specification 4.12.A.3 shall be:

   a. 36,000 cfm ±10 percent with system in the LOCA mode of operation.

   b. The ventilation system shall be adjusted until the above limit is met.

4. Air distribuiton test across the prefilter-bank shall show uniformity of air velocity within ± 20 percent of average velocity. The ventilation system shall be adjusted until the limit is met.

5. In-place cold DOP test on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leakage sources shall be identified, repaired, and retested. Any HEPA filters found defective shall be replaced.

6. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hydrocarbon removal. Leakage sources shall be identified, repaired, and retested.

7. Laboratory analysis on in-place charcoal samples shall show at least 96 percent methyl iodide removal at 0.125 sec. residence time, $1.75 \pm 0.25$ mg/m$^3$ inlet methyl iodide concentration, relative humidity equal to $95 \pm 2$ percent, and air temperature equal to $30 \pm 0.5^{\circ}$C.

   a. Laboratory analysis of charcoal adsorbers shall be available within 31 days of sampling.

   b. If the test results are unacceptable, all the adsorbent in the affected filter shall be replaced with new adsorbent qualified in accordance with Table 5.1 of ANSI N509-1976.

8. The pressure drop across filter cells and adsorbers shall not exceed 7.0 inches W. G. If this condition cannot be met, new filter cells shall be installed.

Basis

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years, even under continuous flow conditions. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcal adsorbers of less than 7 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Operation of the filtration system for a minimum of 15 minutes a month prevents moisture buildup in the filters and adsorbers.

The frequency of tests and sample analysis of the degradable components of the system, i.e., the HEPA filter and charcoal adsorbers, is based on actual hours of operation to ensure that they perform as evaluated. System flow rates and air distribution do not change unless the ventilation system is radically altered.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemical, or foreign material, the same tests and sample analysis are performed as required for operational use.

The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99.5 percent removal of DOP particulates. The heat release from operating ECCS equipment limits the relative humidity of the exhaust air to less than 80 percent even when outdoor air is assumed to be 100 percent relative humidity and all ECCS leakage evaporates into the exhaust air stream. The laboratory carbon sample tests are required to indicate a radioactive methyl iodide removal efficiency of at least 96 percent at a relative humidity equal to 95$\pm$2 percent. The offsite dose calculations for LOCA and fuel handling accidents assume 90 percent and 70 percent, respectively, iodine removal efficiency for the air passing through the charcoal filters. Therefore, the efficiencies of the HEPA filters and charcoal adsorbers are demonstrated to be as specified, at flow rates, temperatures, velocities, and relative humidities which are less than the design values of the system, the resulting doses will be less than 10 CFR 100 guidelines for the accidents analyzed. The demonstration of bypass 1% and demonstration of 96 percent methyl iodide removal efficiency will assure the required capability of the filters is met or exceeded.

## 4.20 CONTROL ROOM AIR FILTRATION SYSTEM

### Applicability

Applies to the testing of safety-related air filtration systems of the control room and relay room.

### Objective

To verify that leakage efficiency and iodine removal efficiency are within acceptable limits.

### Specification

A. Tests and Frequency

1. The control room air filtration system flow rate test shall be performed:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation;

   d. After each complete or partial replacement of the HEPA filter or charcoal adsorbers; and

   e. After any structural maintenance the HEPA filter or charcoal adsorber housings; and

   f. After any major modification or repair of the air cleaning system.

2. The procedure for determining the air flow rate shall be in accordance with Section 9 of the ACGIH Industrial Ventilation document and Section 8 of ANSI N510-1975. A visual inspection of the filter train and its associated components shall be conducted before each in-place airflow distribution test, DOP test, or activated charcoal adsorber leak test in accordance with the intent of Section 5 of ANSI N510-1975.

3. In-place cold DOP tests for HEPA filter banks shall be performed:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation;

   d. After each complete or partial replacement of the HEPA filter cells; and

   e. After any structural maintenance of the filter housing.

4. The procedure for in-place cold DOP tests shall be in accordance with ANSI N510-1975, Section 10.5 or 11.4. The flow rate during this test shall be that value determined under Specification 4.20.A.1 and shall be within the range specified in Specification 4.20.B.1.

5. In-place halogenated hydrocarbon leakage tests for the charcoal adsorber bank shall be performed:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

   c. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation;

   d. After each complete or partial replacement of charcoal adsorbers trays; and

   e. After any structural maintenance on the filter housing.

6. The procedure for in-place halogenated hydrocarbon leakage tests shall be in accordance with ANSI N510-1975 Section 12.5. The flow rate during this test shall be that value determined under Specification 4.20.A.1 and shall be within the range specified in Specification 4.20.B.1.

7. Laboratory analysis on charcoal samples shall be performed:

   a. Initially, whenever a new batch of charcoal is used to fill adsorber trays;

   b. At least once per refueling cycle, i.e., approximately every eighteen months;

   c. After 720 hours of system operation; and

   d. Following painting, fire, or chemical release in any ventilation zone communicating with the system during system operation.

8. The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in Specification 4.20.B.4.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

   a. Initially;

   b. At least once per refueling cycle, i.e., approximately every eighteen months; and

   c. After each complete or partial replacement of filters or adsorbers.

10. Each filter train circuit shall be operated every month. Filter Train Operation shall be initiated manually from the control room.

B. Acceptance Criteria

1. Fan flow tube test shall show a flow rate through any single filter train of 1000 ± 10 percent cfm.

2. In-place cold DOP tests on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leaking sources shall be identified, repaired and retested. Any HEPA filter found defective shall be replaced.

3. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hydrocarbon removal. Leakage sources shall be identified, repaired and retested.

4. Laboratory analysis on in-place charcoal samples shall show at least 96 percent methyl iodide removal, at 0.125 sec. residence time, with $1.75 \pm 0.25$ mg/m$^3$ inlet methyl iodide concentration, relative humidity equal to $95 \pm 2$ percent, and air temperature equal to $30 \pm 0.5^{\circ}$C. The laboratory analysis shall be available within 31 days of sampling. If the test results are unacceptable, all adsorbent in the filter shall be replaced with new adsorbent qualified in accordance with Table 5.1 of ANSI N509-1976.

5. The pressure drop across filter cells and adsorbers shall not exceed 5.0 inches W. G. at design flow rate. If this condition cannot be met, new filter cells shall be installed.

6. The minimum period of air flow through the filter shall be 15 minutes per month.

Basis

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 5 inches of water will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Operation of the filtration system for a minimum of 15 minutes a month prevents moisture buildup in the filters and adsorbers.

The frequency of tests and sample analysis and necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from fumes, chemicals, or foreign material, the same tests and sample analysis are performed as required for operational use.

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

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

## RELATED TO AMENDMENT NO. 92 TO FACILITY OPERATING LICENSE NO. DPR-32

## AND AMENDMENT NO. 91 TO FACILITY OPERATING LICENSE NO. DPR-37

## VIRGINIA ELECTRIC AND POWER COMPANY

## SURRY POWER STATION, UNIT NOS. 1 AND 2

## DOCKET NOS. 50-280 AND 50-281

### Introduction

By a letter dated August 31, 1976, and subsequently revised in letters dated May 9, 1977; October 28, 1980; February 3, June 7, July 29, August 5, and November 10, 1982; Virginia Electric Power Company (VEPCO) proposed to amend its operating licenses DPR-32 and DPR-37 for Surry Power Station, Unit Nos. 1 and 2, by submitting a revision to the Appendix A Technical Specifications. The proposed changes were submitted in response to our December 10, 1974 request and consist of the addition to Technical Specifications (TS) 3.22, 3.23, and 4.20, and the revisions to existing TS 3.19 and 4.12.

### Discussion

Our letter of December 10, 1974 to VEPCO indicated the need for Surry, Unit Nos. 1 and 2, TS to include additional items to assure that safety related air filter systems would function reliably, when required, at a degree of efficiency equal to or greater than that assumed in previously performed accident analyses. VEPCO responded to our request on August 31, 1976 and following discussions with the NRC staff modified their response in letters dated May 9, 1977; October 28, 1980; February, June 7, July 29, August 5, and November 10, 1982.

VEPCO's proposed changes to the TS include:

1. addition of TS 3.22 and 3.23 which address the auxiliary ventilation exhaust and the control room ventilation supply filter trains, respectively;
2. revision of TS 4.12 so that it addresses only the auxiliary ventilation exhaust filter train and the addition of a new TS 4.20 which addresses the control room ventilation supply filter trains; and
3. modification of TS 3.19 to prevent potential duplication and inconsistencies with TS 3.23.

VEPCO's proposal includes the expansion of present TS for the control room air filtration system and the auxiliary ventilation exhaust filter trains such that the frequency of tests are increased and the number of tests performed to establish the system's operability are also increased.

The changes were proposed by VEPCO so that the specified filter test program would conform to the objectives of the model TS included in our letter of December 10, 1974.

Evaluation

Our evaluation was based upon Positions C.5 (in-place testing criteria) and C.6 (laboratory testing criteria for activated charcoal) of Regulatory Guide 1.52, Revision 2, "Design, Testing, and Maintenance Criteria for Atmospheric Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants," and on the Standard TS for ESF air filtration systems for Westinghouse nuclear reactors (NUREG-0452). The TS proposed by VEPCO include TS 3.22 and 3.23, which specify required operator action if the particular ESF filter system is found inoperable, and TS 4.12 and 4.20 which increase the frequency and the number of tests to be performed to demonstrate that the system is operable from the

required tests and frequencies presently specified in TS 4.12. In addition, TS 3.19 is revised to avoid potential duplication and inconsistencies with TS 3.23.

The following sections discuss TS which were added or revised.

Main Control Room Bottled Air System (TS 3.19)

If the bottled air system is found to be inoperable by tests specified in TS 4.1, TS 3.19 requires that the unit be placed in the hot shutdown condition within 8 hours. If, however, during those 8 hours the control room ventilation supply filter trains are tested and found operable, then the unit has 24 hours before it must be in the hot shutdown condition if the bottled air system is not made operable within that time. The licensee has proposed to delete the final sentence of TS 3.19, which further specifies a transition to cold shutdown after an additional 48 hours if the system is not made operable. This deletion prevents possible inconsistency between TS 3.19 and the proposed TS 3.23.

Evaluation and Findings

The main control room bottled air system has the same safety function as the control room ventilation supply filter trains, i.e., to pressurize the control room with respect to surrounding air volumes. The bottled air supply is incapable of being contaminated by either radioactive releases within the plant or toxic gases released outside the plant, but is limited to the one-hour supply of bottled air contained in the system. If the bottled air system is found

inoperable, then the control room ventilation supply filter trains will be tested. Should that system also be found inoperable, then further action will be dictated by TS 3.23. If that system is found to be operable, then it can be relied upon to protect the control room operators during the period of hot shutdown.

The staff finds that specification of the transition from hot to cold shutdown has been properly included in the new proposed TS 3.23, and should be deleted from TS 3.19 to prevent both duplication and possible inconsistency.

Auxiliary Ventilation Exhaust Filter Trains (TS 3.22 and 4.12)

The present Surry Technical Specifications do not have a TS which addresses the auxiliary ventilation exhaust filter trains. VEPCO has proposed TS 3.22 which details the conditions under which the system must be operable. TS 3.22 also details what actions must be taken by the plant operator if the filter train is inoperable.

VEPCO has proposed, in TS 3.22, that both filter trains must be operable whenever the reactor coolant temperature and pressure is greater than 350$^{o}$F and 450 psig, respectively. With one exhaust filter system inoperable, VEPCO has proposed that continued reactor operation may continue for up to 7 days. If the inoperable train is not made operable within the 7 days, then the reactor must be in hot shutdown within the next 6 hours and in cold shutdown within the following 48 hours. VEPCO has also proposed that when one exhaust filter train becomes inoperable, the other train will be demonstrated immediately and daily thereafter.

The present TS 4.12 addresses ventilation filter tests and covers both the auxiliary building ventilation and the control room air filtration systems. In the revision to TS 4.12 proposed by VEPCO, this specification will address only the auxiliary ventilation exhaust filter trains. A new proposed TS 4.20 will address the control room filtration system.

The present TS 4.12 specifies in-place tests of HEPA filters and charcoal adsorbers once per 12-18 months. The acceptance criteria for these tests are 99.5% removal of DOP and 99% removal of the freon for the HEPA filter and charcoal adsorber, respectively. Once every three years, a sample of the charcoal adsorber is to be taken and analyzed. The charcoal is considered acceptable if the sample shows a removal efficiency of 99% or greater for elemental iodine.

VEPCO has proposed to increase both the frequency and the number of tests to be performed on the system to verify its operability. In-place cold DOP leak tests for the HEPA filters and halogenated hydrocarbon leak tests for the charcoal adsorbers are now proposed to be performed in accordance with ANSI N510-1975 following painting, fire or chemical release in any ventilation zone communicating with the filter system, after each complete or partial replacement of the HEPA filter or charcoal adsorber trays as appropriate, and after any structural maintenance on the filter housing. These requirements are in addition to the requirement for tests once per refueling cycle. The acceptance criteria for removal of the DOP and the halogenated hydrocarbon, as proposed by VEPCO, remain the same at 99.5% and 99%, respectively. The licensee has proposed that laboratory

analysis on the in-place charcoal samples be performed initially, whenever a new batch of charcoal is used to fill the adsorber trays, once per refueling cycle, after 720 hours of system operation, following painting, fire, or chemical release in any ventilation zone communicating with the system or after any structural maintenance on the HEPA filter or charcoal adsorber housings. The laboratory analysis for the charcoal adsorber has been proposed to show 96% removal of methyl iodine when tested using the procedures of ASTM D3803 with a residence time of 0.125 seconds, a methyl iodine inlet concentration of 1.75 $\pm$ 0.25 mg/m$^3$, at a relative humidity of 80% $\pm$ 3% and an air temperature of 30$^{\circ}$C $\pm$ 0.5$^{\circ}$C. The licensee also proposed that the laboratory analysis of the charcoal adsorber shall be available within 31 days of sampling and that if the laboratory results are unacceptable, all the adsorbent in the affected filter shall be replaced with new adsorbent qualified in accordance with Table 5.1 of ANSI N509-1976.

VEPCO has expanded the number of tests to be performed on the system to include monthly operation of the system for 15 minutes; a demonstration of automatic startup, shutdown and flow path alignment once per refueling cycle; determination of flow rate to be 36,000 cfm $\pm$ 10% after any structural maintenance on the HEPA filter or the charcoal adsorber, once per refueling cycle, or after partial or complete replacement of HEPA filter or charcoal adsorbers; visual inspection of the filter train and its associated components in accordance with the intent of ANSI N510-1975 before each in-place air flow distribution test, DOP test, or halogenated hydrocarbon leak test; pressure drop once per refueling cycle, after 720 hours of system operation, and after each complete or partial replacement

of HEPA filters or charcoal adsorbers with an acceptable value being less than 7 inches water gauge; and performance of an air distribution test across the prefilter bank after any major modification, repair or maintenance of the air cleaning system affecting filter bank flow distribution with an acceptable distribution being an uncertainty of air velocity within ± 20% of the average velocity.

Evaluation and Findings

The filter system covered by TS 3.22 and 4.12 is a system which has been modified from that presented in the Surry Final Safety Analysis Report (FSAR). The changes to this system were described in VEPCO's letters to the NRC dated August 9, 1979 and May 29, 1982. Based upon information presented in these letters, the filter system will be utilized to filter the safeguards and charging pump cubicles in the event of a LOCA, the containment purge in the event of a fuel handling accident inside containment, and the fuel building exhaust in the event of a fuel handling accident inside this building. We conclude that it is acceptable for this filter system to be operable when the reactor coolant system's temperature and pressure is greater than 350°F and 450 psig, because the containment purge is covered in TS. 3.11 and refueling exhaust is covered in TS. 3.10.

VEPCO proposed to demonstrate daily the operability of the one train if the other train is inoperable. We have previously taken the position with other licensees that a daily demonstration of the operability of a system does not increase the

likelihood of its availability during a period of need. If anything, it may contribute to the increase likelihood that such a system may not be available. Therefore, the staff has deleted the requirement for daily demonstration of the available train as being operable. We have discussed this modification to VEPCO's proposed TS 3.22 and they have accepted our position. With these modifications to TS 3.22, the proposed LCO is acceptable.

In TS 4.12, VEPCO proposed that the laboratory analysis of the charcoal adsorber be performed at a relative humidity of 80 $\pm$ 3%. VEPCO presented the staff an analysis which showed that the worst relative humidity that the adsorbers would see would be 76%. However, in response to our question, VEPCO indicated that for fuel handling accidents inside and outside containment, the adsorber could be treating air with a relative humidity of 95%. Therefore, the laboratory analysis proposed in TS 4.12.B.7 should be performed at a relative humidity of 95 $\pm$ 2%. We discussed this with VEPCO and they have agreed to perform the laboratory analysis at the 95% relative humidity. With this change, the proposed TS 4.12 is judged to be acceptable.

Control Room Ventilation Supply Filter Trains (TS 3.23 and 4.20)

VEPCO has proposed to add TS 3.23, which addresses the control ventilation supply filter trains. Presently, there is not a TS which addresses this system. VEPCO has proposed that these trains must be operable whenever either unit's reactor coolant system temperature and pressure is greater than 350$^{o}$F and 450 psig, respectively. With one train inoperable, reactor operation may continue for up

to 7 days. At the end of the 7 days, the reactor must be in the hot shutdown condition within 6 hours and in cold shutdown within the following 48 hours if the inoperable system is not made operable.

As noted above, TS 4.12 previously addressed the control ventilation supply filter system in addition to the auxiliary ventilation exhaust filter train. The licensee has proposed TS 4.20 to address only the control room system.

The present testing requirements for the control ventilation supply filter system are the same as those presented above for the auxiliary ventilation exhaust filter train. VEPCO has proposed that the in-place DOP leak tests and the in-place halogenated hydrocarbon tests be performed at the same frequency as was proposed for the auxiliary ventilation exhaust filter train. VEPCO has proposed that laboratory analysis of charcoal adsorbers be performed at the same frequency as the auxiliary ventilation exhaust filter train except that for the control room system no test will be performed after any structural maintenance on the HEPA filter or charcoal adsorber housings.

VEPCO has also proposed that tests such as air filtration system flow rate; monthly operation of the system for 15 minutes; visual inspection of the filter train and its associated components prior to each in-place air distribution test, DOP test or halogenated hydrocarbon leak test; and pressure drop be conducted at the same frequency as the tests for the auxiliary ventilation exhaust filter trains except the air flow rate test shall also be performed following painting, fire, or chemical release in any ventilation zone communicating with the system and that the pressure drop test will not be performed after 720 hours of system operation.

The acceptance criteria proposed for the control room system tests are the same as for the auxiliary ventilation exhaust filter trains except that (1) the proposed flow rate at which the system is to be tested is a range of 750 to 1100 cfm, (2) laboratory analysis of the charcoal adsorber shall show a removal rate of 96% for methyl radioiodine when tested at a relative humidity of 95 $\pm$ 1%, and (3) the acceptable pressure drop is 5 inches water gauge.

The tests will be performed in accordance with ANSI N510-1975 as proposed for the auxiliary ventilation exhaust filter trains and laboratory analysis of the charcoal will be performed in accordance with ASTM D3803.

Evaluation and Findings

VEPCO has proposed that this system needs to be operable only when either unit's reactor coolant system is at a temperature and pressure greater than 350$^{o}$F and 450 psig. However, it is important to protect the control room operators at all times. Potential accidents which could occur with the reactor coolant system below this temperature and pressure are the fuel handling accidents inside containment and in the fuel handling building. Therefore, Item A of TS 3.23 should reflect this potential situation by indicating that this system must be operable at all times. We have discussed this with VEPCO and they are in agreement.

VEPCO has agreed that Item A of TS 3.23 should be modified to state that both trains of the system shall be operable whenever either unit is above cold shutdown. To cover the case of refueling, a new Item 14 has been added to TS 3.10.A. This addition states that both trains of the control ventilation system shall be

operable during refueling operations and that if one train is inoperable, the remaining train must be demonstrated as operable by preforming the test of TS 4.20.A.1. This addition to TS 3.10 also requires that refueling of the reactor must cease and no operation which increases reactivity of the core shall be made if both trains are inoperable. This modification and addition eliminates the staff's original concern with respect to refueling operations and the operability of the control room ventilation supply filter trains.

We find the proposed testing frequency and the acceptance criteria for the tests to be acceptable with the following exceptions:

1. The proposed range of flow rates for the system to be tested at is not acceptable. The maximum insult to the charcoal adsorber will occur at the highest flow rate. Therefore, the appropriate flow rate to use is 1000 cfm ± 10%.
2. The laboratory analysis of the charcoal adsorber should be performed at a relative humidity of 95 ± 2% in accordance with ASTM D3803 rather than 95 ± 1%.

We discussed these differences with VEPCO and they have agreed to the modification listed in Items 1 and 2 above. With these changes, the proposed TS 3.23 and 4.20 are acceptable.

Summary

We have concluded that the proposed changes to TS 3.19 and 4.12 and the addition to TS 3.22, 3.23 and 4.20 to the Surry TS, when modified by our comments, are acceptable.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Conclusion

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: January 17, 1984

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