

November 13, 1996

Mr. Donald Schnell  
Senior Vice President - Nuclear  
Union Electric Company  
Post Office Box 149  
St. Louis, Missouri 63166

SUBJECT: AMENDMENT NO. 118 TO FACILITY OPERATING LICENSE NO. NPF-30 -  
CALLAWAY PLANT, UNIT 1 (TAC NO. M96112)

Dear Mr. Schnell:

The Commission has issued the enclosed Amendment No. 118 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated July 18, 1996.

The amendment revises the surveillance requirements of Technical Specifications 3/4.7.7, 3/4.9.13 and the corresponding Bases. The changes implement an updated charcoal test methodology for the emergency exhaust system.

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

Sincerely,

Original Signed By

Kristine M. Thomas, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 118 to NPF-30  
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

|                 |                 |
|-----------------|-----------------|
| Docket File     | KThomas         |
| CGrimes, 011E22 | ACRS, TWFN      |
| JRoe            | PUBLIC          |
| JDyer, RIV      | EPeyton         |
| OGC, 015B18     | GHill (2), T5C3 |
| EAdensam        | PDIV-2/RF       |
| WBateman        | JKilcrease, RIV |
| WJohnson, RIV   | TLH3 (SE)       |
| TMarsh, SPLB    | CMiller, PERB   |
| LHurley, RIV    |                 |

200041

*Logged 7/31/96 #51*

DOCUMENT NAME: CAL96112.AMD

|      |           |         |          |           |           |
|------|-----------|---------|----------|-----------|-----------|
| OFC  | LA/PDIV-2 | BC/SPBL | BC/PERB  | OGC       | PM/PDIV-2 |
| NAME | EPeyton   | TMarsh  | CMiller  | RBachmann | KThomas   |
| DATE | 7/30/96   | 9/19/96 | 10/22/96 | 10/24/96  | 11/17/96  |

OFFICIAL RECORD COPY

9611210009 961113  
PDR ADOCK 05000483  
P PDR

**NRC FILE CENTER COPY**

09-1

November 13, 1996

Mr. Donald Schnell  
Senior Vice President - Nuclear  
Union Electric Company  
Post Office Box 149  
St. Louis, Missouri 63166

SUBJECT: AMENDMENT NO. 118 TO FACILITY OPERATING LICENSE NO. NPF-30 -  
CALLAWAY PLANT, UNIT 1 (TAC NO. M96112)

Dear Mr. Schnell:

The Commission has issued the enclosed Amendment No. 118 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated July 18, 1996.

The amendment revises the surveillance requirements of Technical Specifications 3/4.7.7, 3/4.9.13 and the corresponding Bases. The changes implement an updated charcoal test methodology for the emergency exhaust system.

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

Sincerely,

Original Signed By

Kristine M. Thomas, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 118 to NPF-30  
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

|                 |                 |
|-----------------|-----------------|
| Docket File     | KThomas         |
| CGrimes, 011E22 | ACRS, TWFN      |
| JRoe            | PUBLIC          |
| JDyer, RIV      | EPeyton         |
| OGC, 015B18     | GHill (2), T5C3 |
| EAdensam        | PDIV-2/RF       |
| WBateman        | JKilcrease, RIV |
| WJohnson, RIV   | TLH3 (SE)       |
| TMarsh, SPLB    | CMiller, PERB   |
| LHurley, RIV    |                 |

DOCUMENT NAME: CAL96112.AMD

*Logged 7/31/96 #51*

|      |           |         |          |            |           |
|------|-----------|---------|----------|------------|-----------|
| OFC  | LA/PDIV-2 | BC/SPBL | BC/PERB  | OGC        | PM/PDIV-2 |
| NAME | EPeyton   | TMarsh  | EMiller  | R Bachmann | KThomas   |
| DATE | 7/30/96   | 9/19/96 | 10/22/96 | 10/24/96   | 11/17/96  |

OFFICIAL RECORD COPY



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 13, 1996

Mr. Donald Schnell  
Senior Vice President - Nuclear  
Union Electric Company  
Post Office Box 149  
St. Louis, Missouri 63166

SUBJECT: AMENDMENT NO. 118 TO FACILITY OPERATING LICENSE NO. NPF-30 -  
CALLAWAY PLANT, UNIT 1 (TAC NO. M96112)

Dear Mr. Schnell:

The Commission has issued the enclosed Amendment No. 118 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated July 18, 1996.

The amendment revises the surveillance requirements of Technical Specifications 3/4.7.7, 3/4.9.13 and the corresponding Bases. The changes implement an updated charcoal test methodology for the emergency exhaust system.

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

Sincerely,

*Kristine M. Thomas*

Kristine M. Thomas, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. Amendment No. 118 to NPF-30  
2. Safety Evaluation

cc w/encls: See next page

Mr. D. F. Schnell

- 2 -

November 13, 1996

cc w/encl:

Professional Nuclear  
Consulting, Inc.  
19041 Raines Drive  
Derwood, Maryland 20855

Gerald Charnoff, Esq.  
Thomas A. Baxter, Esq.  
Shaw, Pittman, Potts & Trowbridge  
2300 N. Street, N.W.  
Washington, D.C. 20037

Mr. H. D. Bono  
Supervising Engineer,  
Site Licensing  
Union Electric Company  
Post Office Box 620  
Fulton, Missouri 65251

U.S. Nuclear Regulatory Commission  
Resident Inspector Office  
8201 NRC Road  
Steedman, Missouri 65077-1302

Mr. G. L. Randolph, Vice President  
Nuclear Operations  
Union Electric Company  
P.O. Box 620  
Fulton, Missouri 65251

Manager - Electric Department  
Missouri Public Service Commission  
301 W. High  
Post Office Box 360  
Jefferson City, Missouri 65102

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
Harris Tower & Pavilion  
611 Ryan Plaza Drive, Suite 400  
Arlington, Texas 76011-8064

Mr. Ronald A. Kucera, Deputy Director  
Department of Natural Resources  
P.O. Box 176  
Jefferson City, Missouri 65102

Mr. Neil S. Carns  
President and Chief Executive Officer  
Wolf Creek Nuclear Operating Corporation  
P.O. Box 411  
Burlington, Kansas 66839

Mr. Dan I. Bolef, President  
Kay Drey, Representative  
Board of Directors Coalition  
for the Environment  
6267 Delmar Boulevard  
University City, Missouri 63130

Mr. Lee Fritz  
Presiding Commissioner  
Callaway County Court House  
10 East Fifth Street  
Fulton, Missouri 65151

Mr. Alan C. Passwater, Manager  
Licensing and Fuels  
Union Electric Company  
Post Office Box 149  
St. Louis, Missouri 63166

Mr. J. V. Laux, Manager  
Quality Assurance  
Union Electric Company  
Post Office Box 620  
Fulton, Missouri 65251



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 118  
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Union Electric Company (UE, the licensee) dated July 18, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and 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 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 2.C.(2) of Facility Operating License No. NPF-30 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 118 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*Kristine M. Thomas*

Kristine M. Thomas, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: November 13, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 118 TO FACILITY OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE

3/4 7-18  
3/4 9-18  
B 3/4 7-4  
B 3/4 9-3

INSERT

3/4 7-18  
3/4 9-18  
B 3/4 7-4  
B 3/4 9-3

## PLANT SYSTEMS

### 3/4.7.7 EMERGENCY EXHAUST SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.7.7 Two independent Emergency Exhaust Systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With one Emergency Exhaust System inoperable, restore the inoperable Emergency Exhaust System to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.7.7 Each Emergency Exhaust System shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 continuous hours with the heaters operating;
- b. At least once per 18 months, or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire, or chemical release in any ventilation zone communicating with the system by:
  - 1) Verifying that the Emergency Exhaust System satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 1% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c, and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 9000 cfm  $\pm$  10%;

## PLANT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM D-3803-1989 when tested at 30°C and 70% relative humidity, for a methyl iodide penetration of less than 2%, and
  - 3) Verifying a system flow rate of 9000 cfm  $\pm$  10% during system operation when tested in accordance with ANSI N510-1975.
- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM D-3803-1989 when tested at 30°C and 70% relative humidity, for a methyl iodide penetration of less than 2%;
- d. At least once per 18 months by:
- 1) Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks of less than 5.4 inches Water Gauge while operating the system at a flow rate of 9000 cfm  $\pm$  10%,
  - 2) Verifying that the system maintains the Fuel Building at a negative pressure of greater than or equal to  $\frac{1}{4}$  inch Water Gauge relative to the outside atmosphere during system operation,
  - 3) Verifying that the system starts on a Safety Injection test signal, and
  - 4) Verifying that the heaters dissipate 37  $\pm$  3 kW when tested in accordance with ANSI N510-1975.
- e. After each complete or partial replacement of a HEPA filter bank, by verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing criteria of less than 1% in accordance with ANSI N510-1975 for a DOP test aerosol while operating the system at a flow rate of 9000 cfm  $\pm$  10%; and
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing criteria of less than 1% in accordance with ANSI N510-1975 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of 9000 cfm  $\pm$  10%.

## REFUELING OPERATIONS

### 3/4.9.13 EMERGENCY EXHAUST SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.9.13 Two independent Emergency Exhaust Systems shall be OPERABLE.

APPLICABILITY: Whenever irradiated fuel is in the fuel storage pool.

ACTION:

- a. With one Emergency Exhaust System inoperable, fuel movement within the fuel storage areas or crane operation with loads over the fuel storage areas may proceed provided the OPERABLE Emergency Exhaust System is in operation and discharging through at least one train of HEPA filters and charcoal adsorbers.
- b. With no Emergency Exhaust System OPERABLE, suspend all operations involving movement of fuel within the fuel storage areas or crane operation with loads over the fuel storage areas until at least one Emergency Exhaust System is restored to OPERABLE status.
- c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.9.13 The above required Emergency Exhaust Systems shall be demonstrated OPERABLE:

- a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 continuous hours with the heaters operating;
- b. At least once per 18 months, or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire, or chemical release in any ventilation zone communicating with the system by:
  - 1) Verifying that the Emergency Exhaust System satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 1% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c, and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 9000 cfm  $\pm$  10%;

## REFUELING OPERATIONS

### SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying, within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM D-3803-1989 when tested at 30°C and 70% relative humidity, for a methyl iodide penetration of less than 2%, and
  - 3) Verifying a system flow rate of 9000 cfm  $\pm$  10% during system operation when tested in accordance with ANSI N510-1975.
- c. After every 720 hours of charcoal adsorber operation, by verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM D-3803-1989 when tested at 30°C and 70% relative humidity, for a methyl iodide penetration of less than 2%;
- d. At least once per 18 months by:
- 1) Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5.4 inches Water Gauge while operating the system at a flow rate of 9000 cfm  $\pm$  10%;
  - 2) Verifying that on a Spent Fuel Pool Gaseous Radioactivity-High test signal, the system automatically starts (unless already operating) and directs its exhaust flow through the HEPA filters and charcoal adsorber banks and isolates the normal fuel building exhaust flow to the auxiliary/fuel building exhaust fan;
  - 3) Verifying that the system maintains the Fuel Building at a negative pressure of greater than or equal to 1/4 inch Water Gauge relative to the outside atmosphere during system operation; and
  - 4) Verifying that the heaters dissipate 37  $\pm$  3 kW when tested in accordance with ANSI N510-1975.
- e. After each complete or partial replacement of a HEPA filter bank, by verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 1% in accordance with ANSI N510-1975 for a DOP test aerosol while operating the system at a flow rate of 9000 cfm  $\pm$  10%; and
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the cleanup system satisfies the in-place penetration and bypass leakage testing criteria of less than 1% in accordance with ANSI N510-1975 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of 9000 cfm  $\pm$  10%.

## PLANT SYSTEMS

### BASES

---

#### ULTIMATE HEAT SINK (Continued)

The limitations on minimum water level and maximum temperature are based on providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature and are consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

#### 3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

The OPERABILITY of the Control Room Emergency Ventilation System ensures that: (1) the ambient air temperature does not exceed the allowable temperature for continuous-duty rating for the equipment and instrumentation cooled by this system, and (2) the control room will remain habitable for operations personnel during and following all credible accident conditions. Operation of the system with the heaters operating to maintain low humidity using automatic control for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the charcoal adsorbers and HEPA filters. The OPERABILITY of this system in conjunction with Control Room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rems or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix A, 10 CFR Part 50. ANSI N510-1975 will be used as a procedural guide for in-place surveillance testing. ASTM D-3803-1989 will be used as a procedural guide for the laboratory testing of carbon samples.

#### 3/4.7.7 EMERGENCY EXHAUST SYSTEM

The OPERABILITY of the Emergency Exhaust System assures that radioactive materials leaking from the ECCS equipment within the pump room following a LOCA are filtered prior to reaching the environment. Operation of the system with the heaters operating to maintain low humidity using automatic control for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the charcoal adsorbers and HEPA filters. The operation of this system and the resultant effect on offsite dosage calculations was assumed in the safety analyses. ANSI N510-1975 will be used as a procedural guide for surveillance testing. ASTM D-3803-1989 will be used as a procedural guide for the laboratory testing of carbon samples.

## REFUELING OPERATIONS

### BASES

---

removal capability. With the reactor vessel heat removed and at least 23 feet of water above the reactor vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate emergency procedures to cool the core.

#### 3/4.9.9 CONTAINMENT VENTILATION SYSTEM

The OPERABILITY of this system ensures that the containment purge penetrations will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

#### 3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL and STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gas activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis.

#### 3/4.9.12 SPENT FUEL ASSEMBLY STORAGE

The restrictions placed on spent fuel assemblies stored in Region 2 of the spent fuel pool ensure inadvertent criticality will not occur.

#### 3/4.9.13 EMERGENCY EXHAUST SYSTEM

The limitations on the Emergency Exhaust System ensure that all radioactive materials released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. Operation of the system with the heaters operating to maintain low humidity using automatic control for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analyses. ANSI N510-1975 will be used as a procedural guide for surveillance testing. ASTM D-3803-1989 will be used as a procedural guide for the laboratory testing of charcoal samples.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 118 TO FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By letter dated July 18, 1996, Union Electric Company (UE), requested changes to the Technical Specifications (TS) (Appendix A to Facility Operating License No. NPF-30) for the Callaway Plant, Unit 1. The proposed amendment would revise the surveillance requirements of TS 3/4.7.7, 3/4.9.13 and the corresponding Bases. Specifically, the amendment would change the acceptance criteria for the testing of carbon samples from the auxiliary/fuel building emergency exhaust system charcoal adsorbers. ASTM D-3803-1989 would be adopted as the laboratory testing standard for charcoal samples from the charcoal adsorbers in the auxiliary/fuel building emergency exhaust system.

2.0 EVALUATION

The proposed TS amendment changes the testing requirements used to determine the operability of the charcoal in the auxiliary/fuel building emergency exhaust system. The charcoal is provided to remove iodine from the air as it passes through the emergency exhaust system.

Callaway TS Surveillance Requirements 4.7.7.b.2, 4.7.7.c, 4.9.13.b.2 and 4.9.13.c presently specify regulatory position C.6.a of Regulatory Guide (RG) 1.52, Revision 2, "Design, Testing, and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants," dated March 1978, as the requirement for the laboratory testing of the charcoal. RG 1.52 references ANSI N509-1976, "Nuclear Power Plant Air Cleaning Units and Components." ANSI N509-1976 specifies that testing is to be performed in accordance with paragraph 4.5.3 of Military Specification RDT M 16-1T, "Gas Phase Adsorbents for Trapping Radioactive Iodine and Iodine Components" (year not specified) at 80°C and with a 25°C pre- and post-test sweep. The essential elements of this test are:

- 70 percent relative humidity (RH) for air filtration systems designed to control the RH to 70 percent (i.e., filtration systems with heaters)
- A 5 hour pre-test charcoal sample equilibration at 25°C and 70 percent RH
- A 2 hour injection of challenge gas at a test medium temperature of 80°C and 70 percent RH
- A 2 hour post-test sweep at 25°C and 70 percent RH
- Methyl iodide penetration of less than 1 percent

9611210013 961113  
PDR ADOCK 05000483  
PDR

The licensee proposed to change Callaway TS Surveillance Requirements 4.7.7.b.2, 4.7.7.c, 4.9.13.b.2 and 4.9.13.c to reference ASTM D 3803-1989, "Standard Test Method for Nuclear-Grade Carbon," as the requirement for the laboratory testing of the charcoal. ASTM D-3803-1989 is updated guidance based on ASTM D3803-1979, which is updated guidance based on RDT M 16-1T. The essential elements of the proposed TS change for testing per ASTM D 3803-1989 are:

- 70 percent RH
- A 2 hour pre-test thermal stabilization at 30°C
- A 16 hour pre-test charcoal sample equilibration at 30°C and 70 percent RH
- A 2 hour equilibration of the sample at 30°C and 70 percent RH
- A 1 hour injection of challenge gas at a test medium temperature of 30°C and 70 percent RH
- A 1 hour post-test sweep at 30°C and 70 percent RH
- Methyl iodide penetration less than 2 percent

The major differences between the current TS and the proposed TS change requirements for carbon testing are:

| MAJOR DIFFERENCES             | Proposed  | Current          |
|-------------------------------|-----------|------------------|
| Test Temperature              | 30°C      | 25°C, 80°C, 25°C |
| Total Pre-Test Equilibration  | 18 hours  | 5 hours          |
| Methyl Iodide Penetration     | 2 percent | 1 percent        |
| Tolerances of Test Parameters | Smaller   | Larger           |

These differences will be addressed individually and will be shown to be more conservative than the present TS requirements.

As stated above, the licensee proposed to challenge the representative carbon samples at 30°C rather than 80°C. Information Notice 86-76, "Problems Noted in Control Room Emergency Ventilation Systems," indicated that laboratory testing of charcoal at a temperature higher than that expected during the course of an accident could result in an overprediction of the capability of the charcoal to remove methyl iodine. The quantity of water retained by charcoal (carbon) is dependent on temperature. Generally, the higher the temperature the less water retained. The water retained by the carbon decreases the efficiency of the carbon to adsorb other contaminants. At 30°C and 95 percent RH, carbon will retain about 40 weight percent water. At 80°C and 95 percent RH, carbon retains only about 2 to 3 weight percent water. Therefore, the lower temperature test medium of the proposed TS will yield more conservative results than the present TS.

ASTM D 3803-1989 specifies a test temperature of 30°C for both the pre- and post-test sweep instead of the 25°C required by ANSI N509-1976. There is little difference in the adsorption behavior of carbon between these two

temperatures. The 25°C parameter is more conservative. The increase from 25°C to 30°C does not represent a significant decrease in the test results.

Pre-test humidity equilibration is achieved by sweeping air of the appropriate humidity through the test carbon. The present TS reference to ANSI N509-1976 (RDT M 16-1T) requires that for new charcoal, the charcoal be equilibrated to 25°C and 70 percent RH. The methyl iodide test medium would then be instantaneously introduced at 80°C. Testing the charcoal with such thermal step changes is technically incorrect because it causes condensation on the charcoal sample. Condensation on the charcoal sample itself ("wetting the bed") makes the test invalid. This is supported by paragraph 12.41. of ASTM D-3803-1979, which states with respect to relative humidity of the test medium that "tests at saturation or above give very erratic results." Because of this, the ASTM D-3803-1989 standard includes a 2 hour pre-test thermal-only stabilization at 30°C and specifies a temperature of 30°C for all phases of the test. Therefore, ASTM D-3803-1989 is a better test because it solves the problem of the formation of condensation on the charcoal sample.

The ASTM D-3803-1989 standard is more stringent than the RDT M 16-1T standard since it has smaller tolerances for various parameters of the test protocol that result in more acceptable reproducibility of the test and it requires that the carbon sample be pre-test equilibrated for a much longer duration. The longer pre-equilibration is conservative since it will completely saturate the representative carbon sample to the condition to which the subject charcoal adsorbers are expected to be exposed during design basis conditions. During the pre-equilibration, the charcoal is exposed to a flow of air controlled at the test temperature and RH before the challenge gas is fed through the charcoal. The purpose of the pre-equilibration phase of the test is to ensure that the charcoal has stabilized at the specified test temperature and RH for a period of time which results in the charcoal adsorbing all the available moisture before the charcoal is challenged with methyl iodide. Therefore, the measured methyl iodide removal efficiency is lower than it is if pre-equilibration is not performed. The current testing at 80°C thermally regenerates the charcoal causing the test to provide results which over predict the capability of the charcoal. Hence, the proposed testing in accordance with ASTM D-3803-1989 standard would result in a more realistic prediction of the capability of the charcoal.

The licensee proposed a higher limit for the methyl iodide penetration through carbon samples taken from the charcoal adsorbers while still claiming an adsorption efficiency of 90 percent for radioiodine. Although the proposed 2 percent penetration acceptance criterion is less conservative than the current 1 percent penetration, the RDT M 16-1T standard when used with a 1 percent penetration is less conservative than the ASTM D 3803-1989 standard when used with a 2 percent penetration because the ASTM standard is a much more stringent test. Therefore, the staff concludes that an adequate safety margin exists when the proposed ASTM D-3803-1989 standard is used to credit a charcoal filter adsorption efficiency of 90 percent for radioiodine to conform with the 10 CFR Part 100 and GDC 19 limits.

The requested changes revise Callaway TS Surveillance Requirements 4.7.6.c.2, 4.7.6.d, 4.9.13.b.2, and 4.9.13.c for charcoal filter laboratory testing such that existing test methodology in the TS is revised to reflect current NRC guidance on laboratory testing of charcoal. The staff has evaluated this change and concludes that the testing methodology proposed by the licensee adequately demonstrates the operability of charcoal in the auxiliary/fuel building emergency exhaust system and is therefore acceptable.

In the licensee's July 18, 1996 submittal, the following statements were made:

This amendment request does not involve a change in assumption of the efficiency for the emergency exhaust system units FGG02A,B. The current analysis for the fuel handling accident and the LOCA assume a 90% efficiency. This change in test protocol and the design residence time of  $\geq 0.25$  seconds would allow future changes to the charcoal filter efficiency of up to 95%. Any changes would be done under the criteria of 10CFR50.59.

The staff's review of the licensee's submittal did not include a review of the accuracy of this information as it did not pertain to the licensee's request; i.e., it was outside the scope of the request. Therefore, approval of the amendment request does not mean the staff has reviewed and approved the licensee's position that future changes in system efficiency can be made under the criteria of 10CFR50.59.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Missouri State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes surveillance requirements. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (61 FR 42285). Accordingly, the amendment meets 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 the amendment.

## 5.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: J. Segala  
K. Thomas

Date: November 13, 1996