

June 27, 1989

Docket No. 50-483

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

Dear Mr. Schnell:

SUBJECT: AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-30
(TAC NO. 67897)

The Commission has issued the enclosed Amendment No. 47 to Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. This amendment revises the Technical Specifications in response to your application dated March 25, 1988 as supplemented by letters dated December 28, 1988 and March 31, 1989.

The amendment increases the allowed flow variations of the control room emergency ventilation system and reduces the control room pressurization requirement from 1/4 inch water gauge to 1/8 inch water gauge.

Copies of the Safety Evaluation and of the notice of issuance are also enclosed. The notice of issuance has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/s/

Thomas W. Alexion, Project Manager
Project Directorate III-3
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 47 to License No. NPF-30
2. Safety Evaluation
3. Notice of Issuance

cc w/enclosures:
See next page

cc
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PDC

CP4

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Surname: PKreutzer
Date: 6/14/89

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Mr. D. F. Schnell
Union Electric Company

Callaway Plant
Unit No. 1

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

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. STN-50-483

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Union Electric Company (UE, the licensee) dated March 25, 1988 as supplemented by letters dated December 28, 1988 and March 31, 1989, 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, 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:

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(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 47, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into the license. UE shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION



John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 27, 1989

ATTACHMENT TO LICENSE AMENDMENT NO 47.

OPERATING LICENSE NO. NPF-30

DOCKET NO. 50-483

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Corresponding overleaf pages are provided to maintain document completeness.

REMOVE

3/4 7-15

3/4 7-16

INSERT

3/4 7-15

3/4 7-16

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. 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 Control Room Emergency Ventilation 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 $2000 \text{ cfm} \begin{matrix} + 700 \\ - 200 \end{matrix}$ for the Filtration System and $2200 \text{ cfm} \begin{matrix} + 800 \\ - 400 \end{matrix}$ for the Pressurization System with $500 \text{ cfm} \begin{matrix} + 500 \\ - 50 \end{matrix}$ going through the Pressurization System filter adsorber unit;
 - 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 Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 1%; and
 - 3) Verifying a system flow rate of $2000 \text{ cfm} \begin{matrix} + 700 \\ - 200 \end{matrix}$ for the Filtration System and $2200 \text{ cfm} \begin{matrix} + 800 \\ - 400 \end{matrix}$ for the Pressurization System with $500 \text{ cfm} \begin{matrix} + 500 \\ - 50 \end{matrix}$ going through the Pressurization System filter adsorber unit during system operation when tested in accordance with ANSI N510-1975.
- d. 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 Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 1%;
- e. 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 $2000 \text{ cfm} \begin{matrix} + 700 \\ - 200 \end{matrix}$ for the Filtration System and $500 \text{ cfm} \begin{matrix} + 500 \\ - 50 \end{matrix}$ for the Pressurization System filter adsorber unit;

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying that on a Control Room Ventilation Isolation or High Gaseous Radioactivity test signal, the system automatically switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks;
 - 3) Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch Water Gauge relative to the outside atmosphere during system operation; and
 - 4) Verifying that the Pressurization System filter adsorber unit heaters dissipate 15 ± 2 kW in the Pressurization System when tested in accordance with ANSI N510-1975.
- f. 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 $2000 \text{ cfm} \begin{matrix} + 700 \\ - 200 \end{matrix}$ for the Filtration System and $500 \text{ cfm} \begin{matrix} + 500 \\ - 50 \end{matrix}$ for the Pressurization System filter adsorber unit; and
- g. 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 $2000 \text{ cfm} \begin{matrix} + 700 \\ - 200 \end{matrix}$ for the Filtration System and $500 \text{ cfm} \begin{matrix} + 500 \\ - 50 \end{matrix}$ for the Pressurization System filter adsorber unit.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY
CALLAWAY PLANT, UNIT-1
DOCKET NO. STN-50-483

1.0 INTRODUCTION

By letter dated March 25, 1988, Union Electric Company (UE), the licensee for Callaway Plant Unit No. 1, proposed a revision to Technical Specification (TS) 3/4.7.6, Control Room Emergency Ventilation Systems (CREVS). The proposed changes were found to be necessary because of difficulties identified when verifying the capability of the CREVS to comply with the flow tolerances and pressurization level indicated in the Final Safety Analysis Report (FSAR) and TS 3/4.7.6.

The proposed changes in TS 3/4.7.6 consist of: 1) increasing each control room pressurization system air handling unit flow rate from 2000 cfm \pm 10% to 2200 cfm with tolerances of 3000 cfm maximum and 1800 cfm minimum and increasing the corresponding pressurization filter unit flow rate from 500 cfm \pm 10% to 500 cfm with tolerances of 1000 cfm maximum and 450 cfm minimum; 2) increasing each control room filtration system air handling unit flow rate from 2000 cfm \pm 10% to 2000 cfm with tolerances of 2700 cfm maximum and 1800 cfm minimum, and 3) reducing the control room pressurization requirement from a positive pressure of greater than or equal to 1/4-inch water gauge (WG) relative to the outside atmosphere to a positive pressure of greater than or equal to 1/8-inch WG relative to the outside atmosphere.

The licensee provided additional information in its submittals dated December 28, 1988 and March 31, 1989 in response to the staff's requests dated November 18, 1988 and February 2, 1989.

2.0 BACKGROUND

The proposed technical specification changes address the safety-related ventilation system associated with maintaining control room habitability. The licensee has provided the following background information on the proposed changes.

TS 3/4.7.6 ensures a sufficient positive pressure envelope of filtered air in the control room to ensure habitable conditions under accident conditions. The sufficient positive pressure envelope is created by the pressurization system discharging outside filtered air into the portions of the control building which provide the suction for the control room filtration system which provides continual filtering of control room air. The control building and

the rooms containing filter adsorber units for the control room filtration system and control room air conditioning equipment (inside the auxiliary building, adjacent to the control room) are serviced by the control room pressurization fans. These rooms are defined as part of the control room envelope as stated in FSAR Section 6.4.2.1. A separate ventilation system is provided to maintain the auxiliary building at a negative pressure. The design of the control room pressurization system and the ability to maintain control room habitability are described in FSAR Sections 6.4 and 9.4.

The purpose of the CREVS is to protect the operators so they can achieve and/or maintain the plant in a safe shutdown condition following a design bases accident (DBA). The requested allowed decrease in control room pressurization level from 1/4-inch WG to 1/8-inch WG does not result in an increase in the unfiltered leakage rate of potentially contaminated air during accident conditions and, therefore, does not adversely affect the control room habitability. The proposed changes to TS 3/4.7.6 have been evaluated for impact upon design bases associated with radiation exposure of control room personnel according to requirements of General Design Criteria (GDC) 19 of Appendix A to 10 CFR Part 50 and postulated hazardous chemical releases that could render the control room environment unsuitable for occupancy per GDC 19.

The control room dose calculations assume no unfiltered leakage into the control room from control room ingress and egress due to the utilization of a two-door vestibule configuration. However, 300 cfm of unfiltered leakage is assumed by other paths into the control building.

Information is contained in FSAR Section 9.4.1.2.3 concerning a potential 80 cfm leakage into the control room when the control room is isolated but not pressurized. This information was provided in a response to Atomic Energy Commission (AEC) question, Item 6.7, submitted in Revision 2 of the SNUPPS Preliminary Safety Analysis Report (PSAR), September 1974. The AEC question requested identification of potential leakage paths, contributions from each pathway and pressure differential estimates due to wind, temperature differences, barometric variations and ventilation units servicing spaces adjacent to the control room. To perform this analysis, in lieu of lack of guidance on pressure and criteria to be utilized in the AEC question, a positive pressure of 1/4-inch WG was selected based on consistency with the control room pressurization capability (not corresponding to the environmental conditions postulated to occur at the site). These conditions were not required to be postulated for analysis of control room habitability and thus were not a design basis or licensing basis for the Callaway Plant Unit 1. Therefore, potential unfiltered leakage under these hypothetical adverse external environmental conditions do not need to be considered.

3.0 DISCUSSION

The licensee stated the following in support of the proposed changes:

FSAR Section 2.2 analysis is still valid for the postulated hazardous chemical releases. It concludes that there are no onsite or offsite hazards which have an adverse effect on the plant structures or control room habitability at the Callaway Plant site.

The comparison of the design to Regulatory Guides (RGs) 1.78 and 1.95 as presented in FSAR Tables 6.4-1 and 6.4-2 is still valid. The flow variations under worst case conditions will increase the air exchange rate in the control room from 0.25 volume changes per hour to 0.336 volume changes per hour, and this increased rate has been evaluated and demonstrated to not have an adverse effect on control room habitability. Also RG's 1.78 and 1.95 indicate that 1/8-inch WG positive pressure is sufficient to prevent unprocessed contaminants from entering the control room and Standard Review Plan (SRP) Section 6.4, Revision 2, recommends at least 1/8-inch WG positive pressure relative to all surrounding air spaces. The proposed positive pressure differential of 1/8-inch WG inside control room complies with the above guidelines.

Calculations demonstrate that under worst case conditions, the control room doses are still bounded by those given in Table 15.6-8 of the FSAR, Revision 0L-0. The method used for dose calculation does not require the control room to be pressurized to the full value of 1/4-inch WG above atmospheric pressure. The method only assumed that the control room is maintained at a positive pressure allowing no inleakage. Pressurization to a value of 1/8-inch WG above atmospheric pressure, as recommended by the SRP, is sufficient to maintain control room habitability. This pressure differential is sufficient to counteract wind effects, thermal column effects and barometric pressure changes under worst case conditions.

Charcoal from the pressurization and filtration system filter units is tested per the criteria of RG 1.52, Revision 2, March 1978, Position C.6.a and C.6.b for a methyl iodine penetration of less than 1%. The corresponding assigned efficiencies per the aforementioned RG and Generic Letter No. 83-13, March 2, 1983, are 95%. Accident analysis assumes 90% charcoal efficiency for added conservatism. The revised flow rates for the pressurization system are within the filter unit design flow of 1000 cfm so the system complies with RG 1.52 Position 3i of 0.25 seconds residence time. The upper flow rate of 2700 cfm for the filtration system will comply with testing of residence time per ANSI 510, 1976 of 0.25 seconds \pm 20%. The actual residence time will be 0.20 seconds at 2700 cfm which is within the above acceptance criteria.

The pressurization unit fans and associated ductwork are located in the control building and the filtration units are located in an area adjacent to the control room, but inside the auxiliary building. Both areas are serviced by the control building pressurization fans. Since no change has been requested which would decrease the pressure in these areas during an emergency, there is no increased potential for unfiltered air inleakage to the control room envelope due to leakage through dampers, seams, and housing access doors in ducts located upstream of pressurization unit fans and downstream of filtration units located outside the control room envelope.

No change is requested which would change seal design inleakage limitations or increase seal degradation over the test interval. The control room isolation dampers are designed for leak-tightness, in accordance with the existing FSAR Section 9.4.1.2.2.

The effects of errors in measuring respective pressure differentials between the control room and the outside atmosphere will be minimized by administratively controlled Surveillance Procedure OSP-GK-0002, Control Building Pressure Test, which will incorporate limitations or correction factors for wind speed and direction based on guidance from the ASHRAE 1985 Handbook of Fundamentals, Chapter 14.

4.0 EVALUATION

The staff has reviewed the above described change and supporting rationale and concurs with the licensee's conclusions. This review was conducted based on the guidelines of SRP Section 6.4. However, due to the complexity of the licensee's control room habitability system design compared to typical system design anticipated by the SRP and its references, a unique mathematical model of the iodine protection characteristics of this system was developed by the staff, based on SRP principles, for use in this review. The staff performed an independent analysis of the licensee's control room habitability design using this model. The analysis included the calculation of the degree of operator protection (iodine protection factor (IPF)) afforded by operation of the system, considering the entire range of component air flow rates and control room pressures allowed by the proposed TS and various postulated single failures. Based on this analysis, which involved consideration of 18 separate operational scenarios, a conservative IPF was arrived at by the staff for use in the staff radiological dose calculations for control room personnel.

The staff finds that the resulting value of the IPF is not decreased significantly with the proposed increase in flow variations and lower control room pressurization in comparison to the IPF without these changes (the methodology and other assumptions in the calculation would otherwise be unchanged). The staff has calculated the potential radiation doses to control room operators following a design basis accident (DBA). The resultant doses (15 rem to the thyroid and 3.6 rem to the whole body) are within the acceptance criteria of GDC 19 and SRP Section 6.4 of 30 rem to the thyroid and 5 rem to the whole body.

Based on the above evaluation, the staff finds that the proposed changes to the TS are consistent with the Standard Technical Specifications and within the acceptance criteria of GDC 19 and SRP Section 6.4 and, therefore, are acceptable.

5.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35 an environmental assessment and finding of no significant impact has been prepared and published in the

Federal Register on June 27, 1989 (54 FR 27084) . Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

6.0 CONCLUSION

The staff 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; and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: J. Raval, SPLB
C. Nichols, SPLB

Dated: June 27, 1989

UNITED STATES NUCLEAR REGULATORY COMMISSIONUNION ELECTRIC COMPANYDOCKET NO. 50-483NOTICE OF ISSUANCE OF AMENDMENT TOFACILITY OPERATING LICENSE

The U.S. Nuclear Regulatory Commission (Commission) has issued Amendment No. 47 to Facility Operating License No. NPF-30, issued to Union Electric Company, which revised the Technical Specifications for operation of the Callaway Plant, Unit 1, located in Callaway County, Missouri. The amendment was effective as of the date of issuance.

The amendment modified the Technical Specifications to increase the allowed flow variations of the control room emergency ventilation system and reduce the control room pressurization requirement from 1/4 inch water gauge to 1/8 inch water gauge.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission had made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment.

Notice of Consideration of Issuance of Amendment and Opportunity for Prior Hearing in connection with this action was published in the FEDERAL REGISTER on May 20, 1988 (53 FR 18187). No request for a hearing or petition for leave to intervene was filed following this notice.

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The Commission has prepared an Environmental Assessment related to the action and has determined not to prepare an environmental impact statement. Based upon the environmental assessment, the Commission has concluded that the issuance of this amendment will not have a significant effect on the quality of the human environment.

For further details with respect to the action see (1) the application for amendment dated March 25, 1988, and supplemented by letters dated December 28, 1988 and March 31, 1989, (2) Amendment No. 47 to License No. NPF-30, (3) the Commission's related Safety Evaluation dated June 27, 1989 and (4) the Environmental Assessment dated June 16, 1989. All of these items are available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street NW, and at the Callaway County Public Library, 710 Court Street, Fulton, Missouri 65251, and the John M. Olin Library, Washington University, Skinker and Lindell Boulevards, St. Louis, Missouri 63130. A copy of items (2), (3) and (4) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Projects III, IV, V and Special Projects.

Dated at Rockville, Maryland this 27th day of June 1989.

FOR THE NUCLEAR REGULATORY COMMISSION



Timothy G. Colburn, Acting Director
Project Directorate III-3
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation