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Vice President

March 25, 1988

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

Gentlemen: ULNRC-1747

DOCKET NUMBER 50-483
CALLAWAY PLANT
REVISION TO TECHNICAL SPECIFICATION 3/4.7.6
CONTROL ROOM EMERGENCY VENTILATION SYSTEM

Union Electric Company is transmitting an application for amendment to Facility Operating License No. NPF-30 for Callaway Plant.

This amendment application request involves increasing the allowed flow variations of the control room emergency ventilation system, filtration air handling units, pressurization air handling units, and pressurization filter units and reducing the control room pressurization requirement from 1/4 inch water gauge (w.g.) to 1/8 inch w.g. These changes are necessary because of difficulties identified when verifying the capability of the emergency ventilation system to comply with the flow tolerances and pressurization level indicated in Technical Specification 3/4.7.6. This condition is caused by the changes in filter loading as particulate accumulates over time. This filter loading, as conditions go from clean to dirty, makes the flow rate tolerance of ± 10% as specified in the surveillance requirement difficult to achieve and maintain.

Attachments 1, 2, and 3 contain the Safety Evaluation, the Significant Hazards Evaluation, and the Proposed Technical Specifications Changes in support of this amendment request. The proposed changes will become effective for Union Electric

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Mailing Address: P.O. Box 149, St. Louis, MO 63166

implementation upon NRC approval. Enclosed is a check for the $150.00 application fee (Attachment 4) as required by 10CFR170.21.

Very truly yours,

Donald F. Schnell

Donald F. Schnell

JMC/dls

Attachments:
1. Safety Evaluation
2. Significant Hazard Evaluation
3. Proposed Technical Specification Changes
4. Application Fee

STATE OF MISSOURI)
) S S
CITY OF ST. LOUIS)

Donald F. Schnell, of lawful age, being first duly sworn upon oath says that he is Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Donald F. Schnell
Donald F. Schnell
Vice President
Nuclear

SUBSCRIBED and sworn to before me this 25th day of March, 1988.

Barbara J. Pfeff
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NOTARY PUBLIC, STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 22, 1989
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SAFETY EVALUATION

This technical specification change involves increasing the allowed flow variations of the control room emergency ventilation system, filtration air handling units, pressurization air handling units, and pressurization filter units and reducing the control room pressurization requirement from 1/4 inch water gauge (w.g.) to 1/8 inch w.g. These changes are necessary because of difficulties identified when verifying the capability of the control room emergency ventilation system to comply with the flow tolerances and pressurization level indicated in the FSAR and Technical Specification 3/4.7.6. This condition is caused by the changes in filter loading as particulate accumulates over time. These changes and their respective safety evaluation are discussed hereinafter.

During the emergency mode of operation, the control room normal ventilation system is secured, and all air flow paths into and out of the control room, except for the emergency ventilation system, are isolated. The control room ventilation isolation signal also automatically bypasses portions of the control room air-conditioning system flow through the associated particulate filter/charcoal adsorber train for cleanup and initiates operation of the control room pressurization system. The control room pressurization system draws in outside air, processing it through a particulate filter/charcoal adsorber train for cleanup. This outside air is diluted with air drawn from the cable spreading rooms and the electrical equipment floor levels and distributed back into those spaces for further dilution. The control room filtration system takes a portion of air from the exhaust side of this system, upstream of the outside air intake, for dilution with portions of the exhaust air from the control room air-conditioning system and processes it through the control room filtration system adsorption train for additional cleanup. This air is then further diluted with the remaining control room air-conditioning system return air, cooled, and supplied to the control room. This process will maintain the control room under a positive pressure assuring exfiltration from the control room, thus preventing any unprocessed contaminants from entering the control room. See Figure 1 for a sketch of the system flow paths.

Technical Specification 3/4.7.6 requires a surveillance to be performed periodically to show that filtration units FGK01A & B each provide 2000 CFM $\pm$ 10%; pressurization units CGK04A & B each provide 2000 CFM $\pm$ 10% with 500 CFM $\pm$ 10% passing through pressurization filter units FGK02A & B. In addition, the surveillance requires verification that the system maintains the control room at a positive pressure equal to or greater than 1/4 inch w.g. relative to the outside atmosphere. However, because of the filter loading changes the tolerance of $\pm$ 10% of flow is very difficult to measure and maintain. Provided below in Table 1 is a summary of the flow values required by the technical

specifications and the actual range of flow values achieved due to changes in filter loading. As evident from the table, the lower flow ranges are within the technical specification limits; however, the upper range of flows exceed the values used in the radiological consequence analysis of FSAR Chapter 15A, Rev. OL-0.

AIR FLOW RATES (CFM)

TABLE 1

	Tech Spec Flow (CFM)		Actual Flow (CFM)	
	Rated	Allowed Tolerance	Rated	Operational Flow Ranges
Filtration Unit	2000	1800-2200	2000	1800-2800
Pressurization Unit	2000	1800-2200	2200*	1800-3000
Pressurization Filter	500	450-550	500	450-1000

* The 2000 CFM rating in the technical specifications is inaccurate since each unit was designed for 2200 CFM.

All possible flow combinations through these units were evaluated which resulted in six separate cases for which dose calculations were performed using FSAR LOCA accident assumptions. The case which provides the limiting condition based on thyroid dose to control room personnel is as follows:

1. The initiation of a Control Room Ventilation Isolation Signal (CRVIS) during a LOCA causes both control room pressurization units to operate with each providing 450 CFM of filtered outside air. One control room filtration fan is assumed to fail immediately. The operator takes action to secure this train after 30 minutes.

2. Filtered flow from other areas of the control building through the A/C unit is 560 CFM.

3. Unfiltered air from other areas of the control building for 30 minutes after CRVIS due to failure of one control room filtration unit is 560 CFM.

4. After 30 minutes, one train of the control room emergency ventilation system is secured and the other continues to operate providing 450 CFM of filtered outside air.

5. Recirculation flow from the control room is 1440 CFM.

Calculations demonstrate that under these worst case conditions, the control room doses are still bounded by those given in Table 15.6-8 of the FSAR, Rev. OL-0. The method used for dose calculation does not require the control room to be pressurized to the full value of 1/4 inch w.g. 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 w.g. above atmospheric pressure, as recommended by the Standard Review Plan (NUREG 0800, Revision 2), 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.

The purpose of the control room emergency ventilation system 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). FSAR Section 6.4.1 gives the safety design bases that the habitability systems are designed to meet, and Tables 6.4-1 and 6.4-2 give comparisons of the design to Regulatory Guides 1.78, dated June 1974 and 1.95, dated January 1977. The proposed changes to Technical Specification 3/4.7.6 have been evaluated for impact upon design bases associated with radiation exposure of control room personnel to requirements of GDC-19 and postulated hazardous chemical releases that would render the control room environment unsuitable for occupancy per GDC-19. Calculations show that the increase in flow variation and the change in control room pressurization does not cause the control room doses to exceed the GDC-19 values during the DBAs postulated in Chapter 15A of the FSAR. FSAR Section 2.2 evaluates the postulated hazardous chemical releases, and the analysis demonstrates 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 evaluation shows that hazardous chemicals are located at such a distance that an accidental release would not create a hazard at the pressurization intake. Therefore, any changes in flows or pressurization would not create a hazardous environment for control room personnel.

The comparison of the design to Regulatory Guides 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. The decrease in control room pressurization level from 1/4 inch w.g. to 1/8 inch w.g. does not adversely affect the control room habitability. This pressure differential will still assure exfiltration from the control room, thus preventing any unprocessed contaminants from entering the control room. Regulatory Guide 1.78 indicates a

positive pressure differential of 1/4 inch w.g. should be assumed in the control room when makeup air flow rate is calculated. However, both this regulatory guide and Regulatory Guide 1.95 indicate that 1/8 inch w.g. is sufficient to prevent unprocessed contaminants from entering the control room.

Pursuant to the above information, this amendment request does not adversely affect or endanger the health or safety of the general public and does not involve an unreviewed safety question.

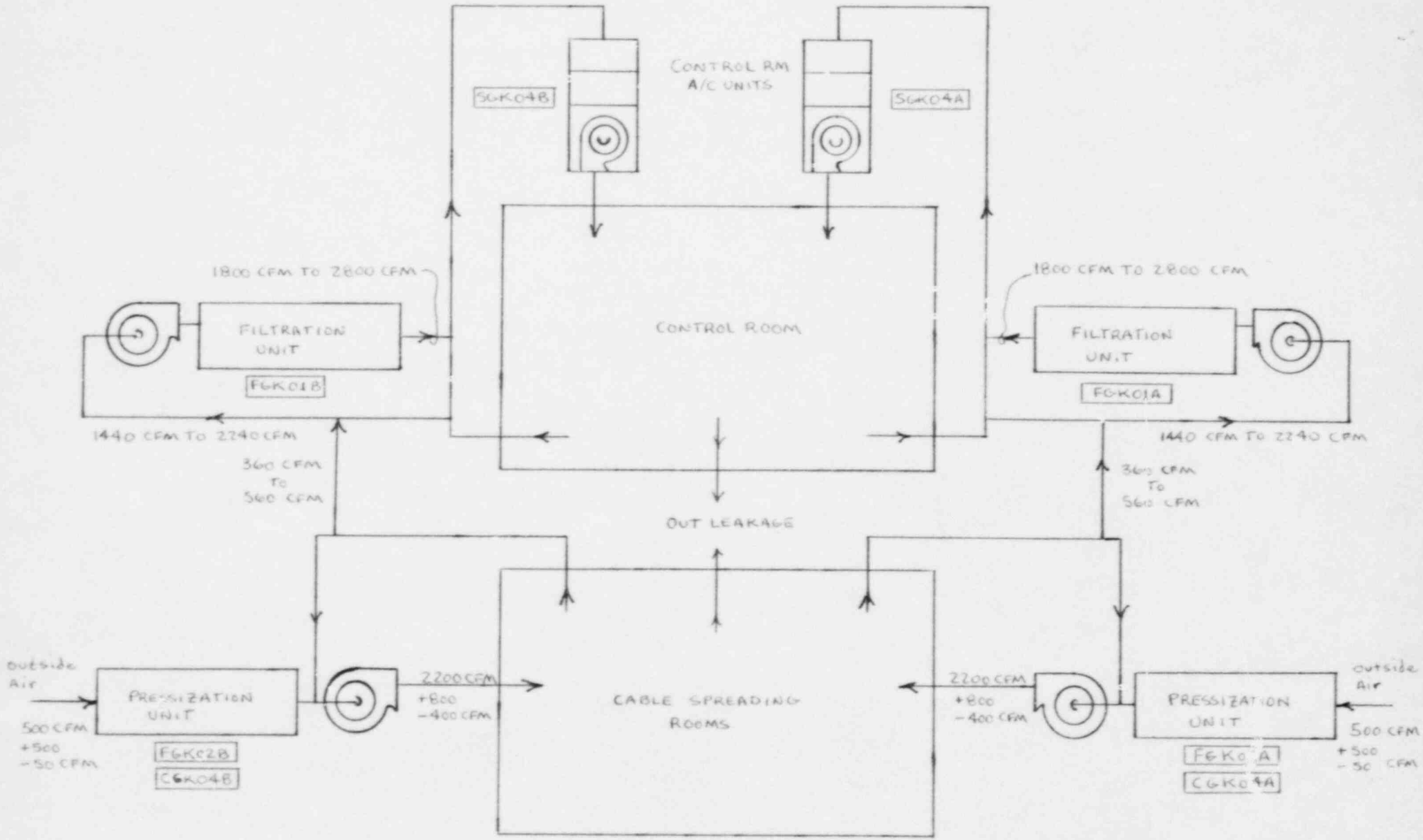

FIGURE-1

SIMPLIED SCHEMATIC OF

CONTROL BUILDING VENTILATION

SIGNIFICANT HAZARD EVALUATION

This technical specification change is requested to increase the allowed flow variations of the control room emergency ventilation system filtration air handling units, pressurization air handling units, and pressurization filter units and reduce the control room pressurization requirement from 1/4 inch w.g. to 1/8 inch w.g. These changes are necessary because of difficulties identified when verifying the capability of the emergency ventilation system to comply with the flow tolerances and pressurization level indicated in Technical Specification 3/4.7.6. This condition is caused by changes in filter loading as particulate accumulates over time. The following discussion addresses these changes and their corresponding significant hazards evaluation.

This change does not involve a significant increase in the probability or consequences of an accident previously evaluated. Calculations demonstrate that, under the worst case conditions, the increase in flow variations does not cause the control room personnel dose to exceed the GDC-19 values during the DBAs postulated in Chapter 15A of the FSAR. The control room personnel doses are still bounded by those given in Table 15.6-8 of the FSAR. The decrease in control room pressurization level from 1/4 inch w.g. to 1/8 inch w.g. does not adversely effect the control room habitability. This pressure differential will still assure exfiltration from the control room, thus preventing any unprocessed contaminants from entering the control room.

This change does not create the possibility of a new or different kind of accident from any accident previously evaluated. There is no change to the system or components, only a change to the variation in flow rates. These variations have been evaluated and demonstrated to not have any impact on the safety design bases that the habitability systems are designed to meet. A control room pressurization to 1/8 inch w.g., as recommended by the Standard Review Plan (NUREG 0800, Revision 2), is sufficient to counteract wind effects, thermal column effects and barometric pressure changes under worst case conditions.

This change does not involve a significant reduction in the margin of safety. This is based on the fact that changes in the flow rate variations have been evaluated and found to be bounded by the safety design bases in the FSAR. The increased flow rates will not cause the control room personnel doses to exceed GDC-19 values or render the control room environment unsuitable for occupancy during a postulated hazardous chemical release. The lowering of the control room pressurization from 1/4 inch w.g. to 1/8 inch w.g. does not reduce the margin of safety for control room habitability. A positive pressure differential is still maintained and is sufficient to assure that exfiltration from the control room occurs, thus preventing any unprocessed contaminants from entering the control room.

The changes to Technical Specification 3/4.7.6 do not alter the habitability systems compliance to Regulatory Guides 1.78 and 1.95. These regulatory guides offer information for evaluating the habitability of the control room during a postulated hazardous chemical release and an accidental chlorine release. The increased flow variations and decrease in pressurization have been demonstrated to still be bounded by these regulatory guides.

Based on the above discussions, the amendment request does not involve a significant increase in the probability or consequences of an accident previously evaluated; nor create the possibility of a new or different kind of accident from any accident previously evaluated; nor involve a reduction in the required margin of safety. Based on the foregoing, the requested amendment does not present a significant hazard.