

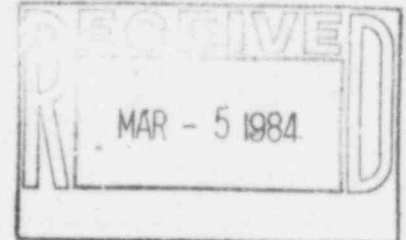
PUBLIC SERVICE COMPANY OF COLORADO

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OSCAR R. LEE
VICE PRESIDENT

March 2, 1984
Fort St. Vrain
Unit No. 1
P-84071

Mr. John T. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011



Docket No: 50-267

SUBJECT: 10 CFR 50, Appendix R
Exemption Request

- REFERENCES:
- (1) NRC Letter from R. P. Denise to
R. F. Walker (G-76046) dated June 18, 1976
 - (2) NRC Letter from W. P. Gammill to
C. K. Millen (G-79103) dated June 6, 1979
 - (3) PSC Letter from D. W. Warembourg to
T. Wambach (P-81181) dated July 2, 1981
 - (4) PSC Letter from O. R. Lee to
D. G. Eisenhut (P-81299) dated November 20, 1981
 - (5) PSC Letter from R. F. Walker to
R. P. Denise (P-75024) dated December 5, 1975
 - (6) PSC Letter from J. K. Fuller to
W. P. Gammill (P-78167) dated October 13, 1978
 - (7) PSC Letter from J. K. Fuller to
W. P. Gammill (P-78182) dated November 13, 1978

Dear Mr. Collins:

PURPOSE

The purpose of this letter is to request an exemption from the detailed requirements of 10 CFR Part 50, Appendix R, Sections III.G, III.J, III.L and III.O for the Fort St. Vrain Nuclear Generating Station.

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BACKGROUND

NRC Regulation 10 CFR Part 50.48(b), with an effective date of February 17, 1981, states in part:

"Except for the requirements of Sections III.G, III.J, and III.O, the provisions of Appendix R to this part shall not be applicable to nuclear power plants licensed to operate prior to January 1, 1979, to the extent that fire protection features proposed or implemented by the licensee have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCS 9.5-1 reflected in staff fire protection safety evaluation reports issued prior to the effective date of this rule, or to the extent that fire protection features were accepted by the staff in comprehensive fire protection safety evaluation reports issued before Appendix A to Branch Technical Position BTP APCS 9.5-1 was published in August 1976."

In Fort St. Vrain Licensing Amendment No. 14, Reference (1) dated June 18, 1976, the NRC staff issued a comprehensive safety evaluation report on the proposed fire protection improvements to be made to the Fort St. Vrain plant, including a detailed description of an Alternate Cooling Method (ACM) shutdown system to be installed at Fort St. Vrain. PSC made the required fire protection improvements in compliance with Licensing Amendment No. 14.

In Fort St. Vrain Licensing Amendment No. 21, Reference (2) dated June 6, 1979, the NRC staff issued a further safety evaluation report on the fire protection improvements implemented at Fort St. Vrain which concluded:

"These modifications have been reviewed as part of the Fort St. Vrain Stage 3 fire protection program and have been found to follow the applicable guidelines of Appendix A to BTP 9.5-1.

"We have also reviewed the plant locations in which the ACM along with its associated cable routing is located using the acceptance criteria that no single fire should be able to simultaneously result in failure of the ACM and the primary systems for cooling down the plant. From our review, we have concluded that the cable routing through an independent and separate duct bank between the new diesel generator power supply, and the equipment necessary to cool down the plant, satisfies the above requirement and is, therefore, acceptable."

Specifically with respect to the Fort St. Vrain ACM system, the Reference (2) NRC staff safety evaluation report stated:

"In addition, we have reviewed the design, installation and operational requirements of the Alternate Cooling Method and conclude that the ACM can provide all necessary functions to assure safe plant shutdown and emergency cooling under the degraded conditions caused by a large electrical fault or fire in the electrical system."

DISCUSSION

Based on the above background information, when 10 CFR Part 50.48 and Appendix R were issued in 1981, the Public Service Company of Colorado (PSC) concluded that only Sections III.G, III.J and III.O were applicable to Fort St. Vrain. Furthermore, Fort St. Vrain had an alternate shutdown capability which (1) complied substantially with the provisions of Section III.G.3, (2) had been previously reviewed and accepted by the NRC staff, and (3) could be utilized as an alternate to meeting the requirements elsewhere in Section III.G.

Even though neither Section III.G.3 nor 10 CFR Part 50.48(b) reference or indicate in any manner that utilizing the provisions of Section III.G.3 for an alternate or dedicated shutdown capability would invoke the further alternate or dedicated shutdown capability requirements in Section III.L, in a recent NRC audit of PSC's compliance with the requirements of Appendix R, the NRC's auditors indicated that if PSC was relying on the alternate or dedicated shutdown capability provisions of Section III.G.3 to meet the intent of the requirements of Section III.G, then Section III.L would also apply to Fort St. Vrain.

The requirements of 10 CFR Part 50, Appendix R, Sections III.G, III.J, III.L and III.O were written for light water reactors rather than for the Fort St. Vrain gas-cooled reactor, and are unnecessary for the protection of the public health and safety with respect to the occurrence of postulated fires at the Fort St. Vrain plant in the following respects:

Section III.G - Fire Protection of Safe Shutdown Capability

- a. Section III.G.1 requires that hot shutdown capability in the event of a fire be maintained at all times, and that cold shutdown capability in the event of a fire be restored within 72 hours. The hot and cold shutdown capabilities referred to in Section III.G.1 and throughout Appendix R relate to specific light water reactor safety systems and equipment. The negative reactivity insertion safety systems and equipment used at Fort St. Vrain to achieve and maintain "hot shutdown" and "cold shutdown" as defined in the Fort St. Vrain Technical Specifications, differ fundamentally from the shutdown systems and equipment referred to in Appendix R. Only the control rod scram systems and/or the boron carbide ball insertion systems (either the normal ball insertion system or the alternate ball insertion system) are required to achieve "hot shutdown" and "cold shutdown" as defined in the Fort St. Vrain Technical Specifications. One or both of these systems will always be free from fire damage and therefore available to provide hot and cold shutdown capabilities.
- b. While Section III.G.2 allows the use of an alternate or dedicated shutdown capability per Section III.G.3 in lieu of meeting the requirements in Section III.G.2, the alternate or dedicated shutdown capability requirements in Section III.G.3 again center around achieving a hot shutdown

condition which is not directly relevant to the Fort St. Vrain high temperature gas-cooled reactor (HTGR). The diversity of systems and equipment available at Fort St. Vrain to achieve the safe shutdown functions of concern in Appendix R is so extensive as to make it impractical and unnecessary to create a system of fire barriers between the redundant systems and equipment, or to install an array of automatic or fixed fire suppression systems throughout the multiplicity of Fort St. Vrain plant areas where the redundant Fort St. Vrain safe shutdown systems and equipment are located.

Furthermore, the required array of fire area fixed and/or automatic fire suppression systems would in all likelihood create a safety hazard if the fire suppression system(s) were ever activated at Fort St. Vrain because:

- (1) The safe shutdown systems at Fort St. Vrain may not be capable or qualified to operate in the environment created by the activated fire suppression system(s), or
- (2) The activated fire suppression system(s) may preclude access by operating personnel to the areas where safe shutdown systems and equipment may have to be operated in the event of postulated accidents involving fires.

Section III.J - Emergency Lighting

Section III.J requires "emergency lighting units with at least an 8-hour battery power supply shall be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto."

Fort St. Vrain has two 832 amp-hour station batteries, located in the 480 Volt Switchgear Room, which supply power for essential DC-powered auxiliaries and services including emergency DC lighting in the turbine and reactor buildings. Emergency DC lighting is provided in the control room, the auxiliary electrical equipment room, the 480 Volt essential Switchgear Room and the standby generator rooms to enable continuous operation in these areas. Besides these vital control areas, emergency DC lighting is provided at doorways, hallways and stairways to illuminate access and egress routes for operating personnel in the turbine and reactor buildings.

This emergency DC lighting system provides sufficient illumination for remote operation of safe shutdown equipment from the Three Room Control Complex and sufficient illumination of turbine building and reactor building access and egress routes. The station batteries have sufficient capacity to carry the DC lighting system loads for a period in excess of eight hours, or to carry all DC safe shutdown loads including the DC lighting system loads for a period in excess of four hours.

In addition, the ACM diesel generator supplies power to selected AC lighting circuits in the reactor building as well as in the turbine building. This ACM lighting provides sufficient illumination to enable manual operation of that safe shutdown equipment used in reactor shutdown/cool-down by means of the alternate cooling method. The ACM lighting in the reactor building is powered by separate cables routed in conduit. The ACM diesel generator has the capability to power this lighting, along with the other ACM loads, for periods of time well in excess of 8 hours.

Although the Fort St. Vrain emergency DC lighting design does not provide battery powered lighting in all areas needed for operation of safe shutdown equipment for all possible fire locations, the combination of emergency DC lighting and ACM lighting enables operation of the necessary safe shutdown equipment for a fire in any location.

Section III.L - Alternative and Dedicated Shutdown Capability

- a. The description of the alternate or dedicated shutdown capability in Section III.L focuses on achieving and maintaining hot standby conditions for a PWR or hot shutdown for a BWR, and achieving cold shutdown conditions within 72 hours. Again, hot and cold shutdown conditions as used in Appendix R are water reactor concepts not directly relevant to the Fort St. Vrain HTGR as discussed under Section III.G above.
- b. Section III.L further requires that during a postfire shutdown, the fission product boundary shall not be affected, i.e. there shall be no fuel clad damage, rupture of any primary coolant boundary, or rupture of the containment boundary. In essence, this requirement legislates that a fire shall not be involved in, or under any circumstances be the cause of, an accident resulting in fission product boundary integrity degradation. Regardless of the consequences to the health and safety of the public of any postulated accident scenario involving a fire, and however minimal and acceptable these fire related accident consequences may be, the NRC requires that accidents involving fires which affect fission product boundary integrity shall not occur.

This Appendix R requirement goes beyond the licensing basis for the Fort St. Vrain plant. The Fort St. Vrain plant was licensed on the basis of postulated worst case accident scenarios, often postulated to occur non-mechanistically, and then demonstrating that the public health and safety is subsequently fully protected. To require that a fire not cause an accident affecting fission product boundary integrity under any circumstances is certainly not consistent with the treatment of postulated Fort St. Vrain licensing basis accident analyses. A scenario could readily be postulated whereby a fire could result in any one of a number of accident conditions affecting fission product

boundary integrity which have been fully analyzed and whose consequences have been found by the NRC to be completely acceptable with respect to protection of the health and safety of the public.

- c. Section III.L also contains a number of requirements to the effect that safe shutdown systems or equipment, or alternative or dedicated safe shutdown systems or equipment, shall not be damaged by fire, or shall be repairable or operable within 72 hours following a fire.

As discussed under Section III.G above, the Fort St. Vrain plant has been licensed with an extensive array of normal shutdown systems and equipment, safe shutdown systems and equipment, and alternative or dedicated shutdown systems or equipment, with numerous alternatives for maintaining reactor shutdown cooling capability. Even though these systems and equipment are subject to being damaged in the event of a fire, the array of systems and equipment which would not be affected by a specific postulated fire would be available for reactor shutdown cooling, thereby assuring the protection of the public health and safety. To go beyond this public health and safety consideration and require that the redundant damaged systems and equipment be repaired within a specific time limit is inappropriate and unnecessary for the protection of the public health and safety.

Section III.O - Oil Collection System for Reactor Coolant Pump

Section III.O concerns a specific lube oil collection system used on light water reactors to support the reactor coolant pumps. The Fort St. Vrain plant has no reactor coolant pumps and has no lube oil system or lube oil collection systems associated with our primary coolant helium circulators. The primary coolant helium circulators are housed in individual penetrations within the prestressed concrete reactor vessel (PCRV) and use water lubricated bearings. Due to these specific reactor design differences, the detailed requirements of Section III.O do not have application to the Fort St. Vrain gas-cooled reactor.

Based on the above specific deficiencies in the formulation and application of the requirements of 10 CFR Part 50, Appendix R to the Fort St. Vrain gas-cooled reactor, Public Service Company of Colorado has found it necessary to identify and attempt to understand the intent of the NRC in preparing and issuing the requirements of Appendix R. The NRC appears to be requiring licensees to assure that fires will not be the cause of any postulated licensing basis accidents, and that the integrity of all reactor safety equipment and systems will remain intact or be readily restored in the event of a fire.

Such an interpretation of the requirements of Appendix R would indicate the NRC's primary fire protection concern is the ability of a licensee to quickly recover from a fire without a time consuming

outage of the plant or significant financial loss to the utility. In initially reviewing Appendix R, PSC rejected this interpretation of the NRC's intent, and instead concentrated on public health and safety consequences that could result from postulated accidents involving a fire.

PSC remains convinced that, with respect to the adequacy of fire protection provisions at the Fort St. Vrain gas-cooled reactor, the primary fire protection concern should be the health and safety of the public in the event of any accident involving a fire. In this light, PSC submitted References 3 and 4 to the NRC indicating that the Fort St. Vrain plant complied with the intent of Appendix R.

This treatment of the requirements of Appendix R was consistent with PSC's resolution of the initial 1975 NRC control room and congested cable area fire protection concerns, Reference (5), and with PSC's treatment of the fire protection requirements of Appendix A to BTP APCS 9.5-1, References (6) and (7). PSC has expended over \$2 million in installing enhanced fire protection provisions since 1975 in response to NRC fire protection concerns and regulations.

Based on the recently performed NRC audit of PSC's compliance with the requirements of Appendix R, and the additional information provided by the NRC's auditors on how the NRC intended to apply Appendix R fire protection requirements, PSC has again reviewed the fire protection provisions at Fort St. Vrain. PSC hereby reaffirms its earlier conclusions that the fire protection provisions at Fort St. Vrain are adequate to protect the health and safety of the public in the event that postulated accidents involving fires (including fires postulated in the formulation of the requirements of Appendix R) were to occur at Fort St. Vrain. This reaffirmation is based on the application of worst case accident scenarios involving fires, and concluding that the remaining portions of the Fort St. Vrain safe shutdown cooling systems, and/or the Fort St. Vrain alternate cooling method systems and equipment, would be adequate to protect the health and safety of the public within NRC accident exposure limits.

EXEMPTION REQUEST

To avoid any further misunderstandings regarding the application of the fire protection requirements of 10 CFR Part 50, Appendix R to the Fort St. Vrain high temperature gas-cooled reactor, it is now apparent that an exemption from the detailed requirements of 10 CFR Part 50, Appendix R, Section III.G, Section III.J, Section III.L, and Section III.O will be required. Therefore, pursuant to 10 CFR Part 50.12(a), Public Service Company of Colorado hereby applies for an exemption from the requirements of the following regulations on the basis of the information cited:

- a. Based on the information previously submitted in Reference (5), (6) and (7), and evaluated and accepted by the NRC staff in References (1) and (2), and the conclusion of

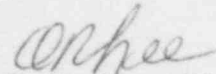
Section III.G included herein, the Public Service Company of Colorado hereby requests an exemption from the detailed requirements of 10 CFR Part 50, Appendix R, Section III.G.

- b. Based on the discussion of Section III.J included herein, the Public Service Company of Colorado hereby requests exemption from the detailed requirements of 10 CFR Part 50, Appendix R, Section III.J.
- c. Furthermore, the NRC is requested to exempt the Fort St. Vrain plant from the detailed requirements of 10 CFR Part 50, Appendix R, Section III.L based on the information previously submitted in References (5), (6) and (7), and evaluated and accepted by the NRC staff in References (1) and (2), and the discussion of Section III.L included herein.
- d. Finally, based on the discussion of Section III.O included herein, the Public Service Company of Colorado hereby requests that the NRC concur that 10 CFR Part 50, Appendix R, Section III.O is not applicable to the Fort St. Vrain high temperature gas-cooled reactor, and that Fort St. Vrain is exempt from the requirements in Section III.O of Appendix R.

PSC has reviewed the defense-in-depth fire protection provisions at the Fort St. Vrain plant with the NRC on numerous occasions in the past, as should be apparent from the referenced correspondence, as well as other correspondence and NRC-PSC meetings on fire protection noted by the referenced correspondence. Again, Public Service Company of Colorado is convinced that the fire protection provisions at Fort St. Vrain are adequate to protect the health and safety of the public in the event that postulated accidents involving fires were to occur at Fort St. Vrain. PSC stands ready to review the fire protection provisions at Fort St. Vrain with the NRC again, or to resubmit information on the fire protection provisions at Fort St. Vrain to the NRC for further review if required.

Your early consideration of this exemption request would be appreciated.

Very truly yours,



O. R. Lee, Vice President
Electric Production

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter

Public Service Company of Colorado
Fort St. Vrain Unit No. 1

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) Docket No. 50-267
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AFFIDAVIT

O. R. Lee, being duly sworn, hereby deposes and says that he is Vice President of Public Service Company of Colorado; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached 10 CFR 50, Appendix R, Exemption Request; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

O. R. Lee
O. R. Lee
Vice President

STATE OF *Colorado*)
COUNTY OF *Denver*)

Subscribed and sworn to before me, a Notary Public on
this *2nd* day of *March*, 1984.

Ira LeBlanc
Notary Public
4026 E. 113th Place
Thornton, CO 80233

My commission expires *August 19, 1987*, 1984.