PUBLIC SERVICE COMPANY OF COLORADO
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OSCAR R. LEE
VICE PRESIDENT

December 27, 1983
Fort St. Vrain
Unit No. 1
P-83408

Office of the Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, DC 20555

DOCKET NO. 50-267

SUBJECT: Property Damage Insurance Exemption

REFERENCES:
1) PSC letter P-83124 dated March 28, 1983
2) PSC letter P-83231 dated June 30, 1983
3) NRC letter G-83415 dated November 23, 1983

Gentlemen:

In reference (1) and (2) PSC submitted a request for exemption from the property insurance requirements of 10 CFR 50.54(W). In reference (3) the NRC requested that PSC provide additional justification in support of the PSC request.

This letter submits additional justification for your consideration in regard to PSC's request for exemption from the property insurance requirements of 10 CFR 50.54(W) in excess of $500 million.

In support of the requested exemption:

1. Concerning the probability and consequences of accidents, the Fort St. Vrain Nuclear Generating Station, a high temperature gas-cooled reactor (HTGR) is unique among licensed operating nuclear power plants in the United States. The use of an inert gas (helium) as the primary coolant and a large mass of graphite as the moderator leads to accident scenarios that are slow to

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develop and that result in relatively moderate consequences. Specifically, the following accidents are significant:

a) The permanent loss of forced circulation (LOFC) accident (DBA-1) would require the extended failure of all four helium circulators, their steam or water drives or their multiple sources of motive power, or the failure of both the main steam and reheat sections of both steam generators. This accident is evaluated in the Fort St. Vrain Final Safety Analysis Report, FSAR Section 14.10. Due to the large heat sink of the core graphite, this accident does not cause the fuel to exceed its normal operating temperature until more than 30 minutes have elapsed. The hottest region of the core heats up slowly to a peak temperature of 5400°F, occurring after 83 hours, have elapsed. At this point approximately 95% of the fuel particles in the core would suffer failed fission product retention coatings resulting in the release to the prestressed concrete reactor vessel internals (PCRV) of about 28% of the core fission product inventory. The PCRV liner, penetrations and cooling systems remain intact during this accident and the core configuration remains intact. Fission product leakage from the PCRV is conservatively assumed to be 0.2%/day into the reactor building during the accident assuming a 5 psi leakage pressure differential across a very leaky PCRV liner. The analysis shows that the PCRV liner membrane would not be damaged by this accident and therefore fission products should not leak into the reactor building. Nevertheless, all of the postulated leakage would be collected and filtered by the reactor building ventilation system before release at high velocity from roof elevation. The total duration, integrated six month doses at the low population zone boundary (16,000 meters) would be orders of magnitude less than the 10 CFR 100 limits.

b) The Maximum Hypothetical Accident, sudden depressurization (DBA-2), involves the hypothetical sudden failure of both closures in a PCRV penetration so that the primary coolant system is completely and rapidly depressurized. This accident is assumed to result in the release of the design-level fission product inventory circulating with the primary coolant plus a conservatively calculated fraction of the removable plated-out fission products. No structural damage to any reactor vessel internals would occur and the core itself would not be disturbed in this accident. Adequate primary circuit cooling would be maintained by use of the circulators on either steam or water-turbine drive with reduced coolant density. The dose rate in the reactor building reaches a peak value of 1605 r/hr at 3.6 seconds after initiation of the accident and falls to 45 r/hr after 10 minutes and 10E-7 r/hr after 2 hours. The off-site doses are all far below the limits set by 10 CFR 100. FSAR

Section 14.11 provides a detailed description of this accident and its analysis.

c) The Maximum Credible Accident is a multiple-failure accident involving the helium purification system regeneration piping that produces the maximum credible primary coolant leak rate. This accident, which is described in FSAR Section 10.8, also results in off-site doses which are orders of magnitude below the limits set by 10 CFR 100.

d) Smaller loss of coolant accidents have been evaluated, as described in FSAR Section 14.7, and all have substantially less significant environmental consequences than the Maximum Credible Accident.

2. Concerning the financial impact of plant accidents, PSC has conservatively estimated that the decontamination costs would not exceed $100 million, even for the most remote of circumstances. Allowing for additional decommissioning costs of $84,659,470 and writeoff of present plant and fuel book value of $138,899,000, PSC's maximum exposure to financial loss would not exceed $323,558,480.

   PSC currently has in effect property damage insurance coverage in the amount of $500,000,000 for Fort St. Vrain. This consists of solid, commercial coverage by ANI/MAERP and is not subject to retrospective agreements or other qualifications. This amount of insurance covers, by an ample margin, all conceivable risks associated with Fort St. Vrain.

   PSC does not consider it necessary or justifiable to carry insurance in excess of $500,000,000. Requirements to carry such excess insurance in the absence of demonstrable financial risk are arbitrary and unduly burdensome.

3. The inherent safety advantages of the HTGR design are significant and have been recognized as a basis for exemptions from other regulations aimed at water cooled reactors. For example, Fort St. Vrain has been granted exemptions from many of the TMI Action Plan Requirements (NUREG-737), such as:

   a) Shift Technical Advisors are not required to be in the Control Room within 10 minutes because postulated accident sequences develop much more slowly than in the case of an LWR, for which the 10 minute requirement was invoked.

   b) Automatic actuation of active LOCA mitigation systems is not required because a delay of one to two hours would not cause serious fuel damage.

   c) A 5-mile Emergency Planning Zone was required, in lieu of the 10-mile EPZ required for large light water reactors.

This exemption is based on the lower potential hazard associated with a relatively small HTGR.

PSC contends that the unique design and operating features and inherent safety and cleanliness of the HTGR together with the existing property damage insurance of $500,000,000 provide adequate assurance of not only the health and safety of the public but also of the financial security of the Company. The requested exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest.

We respectfully request that the Nuclear Regulatory Commission act favorably on this request.

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	)	Docket No. 50-267
Fort St. Vrain Unit No. 1	)	

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 Request for Exemption from the property insurance requirements of 10CFR50.54(w) in excess of $500 million; 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
Vice President

STATE OF Colorado)
COUNTY OF Weld)

Subscribed and sworn to before me, a Notary Public in and for the State of Colorado on this 27th day of December, 1983.

Audrey L. Kitzman
Notary Public

My commission expires 11-29-87, ~~1983.~~