



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO PRIMARY PROPERTY DAMAGE INSURANCE EXEMPTION

PUBLIC SERVICE COMPANY OF COLORADO

FORT ST. VRAIN NUCLEAR GENERATING STATION

DOCKET NO. 50-267

1.0 INTRODUCTION

By letter dated August 8, 1990, Public Service Company of Colorado (PSC, the licensee), operator of the Fort St. Vrain Nuclear Generating Station (FSV), requested an exemption from the property/accident recovery insurance requirements of 10 CFR 50.54(w). Section 50.54(w) requires, in part, that each electric utility licensee take reasonable steps to obtain onsite property damage/accident recovery insurance with a minimum coverage limit for each reactor station site of either \$1.06 billion or whatever amount of insurance is generally available from private sources, whichever is less.

PSC's request for this exemption was made pursuant to the provisions of 10 CFR 50.12, which, in part, states that the Commission may, upon application, grant exemptions from the requirements of the regulations of this part, which are:

"(1) Authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security.

(2) The Commission will not consider granting an exemption unless special circumstances are present. Special circumstances are present whenever - ... (ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; or (iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated..."

2.0 DISCUSSION

The property/accident recovery insurance requirements of 10 CFR 50.54(w) are intended to provide an assured source of funds to pay for stabilizing and decontaminating a power reactor suffering an accident. The amount of insurance required is \$1.06 billion, which was based on an analysis developed by Pacific Northwest Laboratory (PNL). The PNL analysis was published as NUREG/CR-2601, "Technology, Safety and Costs of Decommissioning Reference Light Water Reactors Following Postulated Accidents." This study evaluated three accidents of different severity that could occur while a facility was operating at full

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power. For the worst-case accident from which the insurance coverage limits were derived, the study assumed a major loss-of-coolant accident in which emergency core cooling is delayed, resulting in 100 percent fuel cladding failure and significant fuel melting and core damage. The postulated consequences included severe radioactive contamination of the containment structure, moderate radioactive contamination of supporting buildings, and major physical damage to structures and equipment. The study determined that it would cost \$404.5 million for a large pressurized water reactor (PWR) and \$420.9 million for a large boiling water reactor (BWR) operating at full power at the time of the accident. In addition to these basic cleanup costs, adjustments were made for base operations and maintenance, design differences in comparison to Three Mile Island 2 (TMI-2), cost escalation during cleanup, additional reactor building cleanup, and net stabilization cost. From these basic costs plus adjustments, the \$1.06 billion insurance requirement was derived.

Pursuant to 10 CFR 50.12, under special circumstances the Commission may grant exemptions from its regulations in 10 CFR Part 50 provided that the exemption is authorized by law, does not result in an undue risk to the public health and safety and is consistent with the common defense and security. PSC's request for exemption is based on special circumstances relating to the status of FSV and the cost of the required insurance.

With respect to the status of FSV, PSC states that FSV was permanently shut down on August 8, 1989. On May 1, 1990, the NRC issued a Confirmatory Order on Shutdown of FSV that stated, "The licensee is prohibited from taking the FSV reactor to criticality and the facility shall not be operated at any power level."

Following a 100-day cooldown period, defueling to the Fuel Storage Wells (FSWs) commenced on November 27, 1989. The FSV reactor core, which is comprised of 1482 fuel elements, is approximately one-third defueled to the FSWs. The reactor vessel is depressurized to less than 5 psig and operating systems have been reduced to only those necessary to support the plant in its shutdown and defueled status. In the reactor core, decay heat generation and remaining radioactivity have been significantly reduced. Analyses indicate that in the event of a complete loss of forced circulation, the core will not reach 760 degrees F° for over 10 days, at which time forced circulation should be restored to prevent components from exceeding normal operating temperatures. The 10 days would allow more than sufficient time to restore cooling and forced circulation to the core. PSC further states that the core is incapable of being taken critical through credible means, because physical and administrative controls have been implemented to ensure that no more than 3 of 37 control rod drive assemblies are capable of being energized at any one time.

PSC has performed an accident analysis that takes into account the maximum credible accident that could occur given FSV's current status. PSC estimates that this accident would involve the dropping of a spent fuel shipping cask within the reactor building during defueling operations. PSC concludes that a worst-case accident at FSV would release less than five percent of the radio-

activity that would be released in a NUREG/CR-2601 Scenario 1 accident¹, which was the least severe of the three accidents studied by PNL. Comparing the cleanup costs of such a release to the cleanup costs for a Scenario 1 accident, PSC has determined that it needs \$169 million in insurance coverage.

With respect to the cost of the required insurance of \$1.06 billion, PSC pays an average annual premium of \$1.23 million. PSC estimates that \$250,000 would be the annual premium for the coverage level of \$169 million that PSC is requesting. This would represent a savings of nearly \$1 million annually.

3.0 EVALUATION

3.1 The Exemption Is Authorized by Law

PSC maintains that the exemption is fully authorized by law and cites similar exemptions issued for Humboldt Bay, Yankee Atomic, Big Rock Point, LaCrosse, and Shoreham.

The staff concurs with PSC's contention that the requested exemption is authorized by law.

3.2 The Exemption Would Present No Undue Risk to the Public Health and Safety

PSC asserts that their requested exemption would present no undue risk to the public health and safety because (1) PSC has shut down FSV and the NRC has issued a Confirmatory Order prohibiting PSC from operating the plant; (2) Physical and administrative controls ensure that no more than 3 of the 37 control rod drive assemblies are capable of being energized at any one time and, therefore, the probability that criticality would or could ever be achieved is remote; and (3) during and following defueling of FSV, PSC will maintain the plant in a safe condition with adequate safeguards, so as to limit the consequences of any remaining credible accident to within those analyzed.

The staff agrees with PSC's conclusions and notes that the consequences of PSC's postulated worst-case accident -- the dropping of a spent fuel shipping cask during defueling operations -- would be the release of less than 5 percent of the radioactivity postulated in NUREG/CR-2601 to be released in a Scenario 1 accident. The maximum exposure at the proposed 100-meter Emergency Planning Zone (EPZ) boundary is projected to be 0.19 mrem (two-hour exposure, whole body gamma) for the worst-case accident.

3.3 The Exemption Would Be Consistent With the Common Defense and Security

PSC believes and the NRC staff concurs that the requested exemption is consistent with the common defense and security and no proposed action would adversely

¹ A scenario 1 accident was defined as a small loss-of-coolant accident in which the emergency core cooling system functions to cool the core and to limit the release of radioactivity. Some fuel cladding rupture is postulated, but no fuel melting. Consequences include moderate contamination of the containment structure but no significant physical damage to buildings and equipment.

impact those considerations. PSC has proposed no changes to the FSV physical security or fire protection programs which could compromise the safeguarding of the remaining spent fuel.

3.4 Application of the Requirement for the Full \$1.06 Billion of Insurance Coverage is not Necessary to Achieve the Underlying Purpose of the Rule

PSC interprets the purpose of the property/accident recovery insurance rule to be a means of ensuring that sufficient funds will be available to stabilize and decontaminate a facility in the event of an accident. The requirement for \$1.06 billion was established to cover accidents at large light water reactors operating at full power. Because FSV is permanently shut down, the reactor is in partially defueled condition, and physical and administrative measures have been implemented to prevent FSV from achieving criticality, the possibility of a major credible accident with potential for significant property damage no longer exists. PSC's accident analysis is based on 330 days of fuel cooldown vs an actual cooldown of over 500 days since FSV was permanently shutdown. The staff has determined that pursuant to 10 CFR 50.12(a)(2)(ii), PSC's proposed insurance limit of \$169 million is sufficient to cover stabilization and decontamination expenses for any credible accident and thus meets the underlying purpose of the rule.

3.5 Compliance Would Result in Undue Hardship or Other Costs ... That Are Significantly in Excess of those Incurred by Others Similarly Situated

PSC contends that compliance with the full coverage requirements of 10 CFR 50.54(w) would require it to spend nearly \$1 million more annually in insurance premiums than if PSC's requested level were approved. Requiring PSC to carry \$1.06 billion in insurance coverage would be inconsistent with exemptions granted by NRC to other licensees with plants similar in status and condition to FSV. (See Section 3.1). PSC notes that, in granting an exemption to Pacific Gas and Electric Company for its Humboldt Bay plant, the NRC stated, ... "this financial burden, if placed on the licensee and its customers, would not be warranted by the marginal additional benefit that would be obtained." (Exemption, November 3, 1982).

The staff concurs with PSC's contentions and concludes that pursuant to 10 CFR 50.12(a)(2)(iii) undue hardship would result if the proposed exemption was not granted.

4. CONCLUSION

Currently FSV has been permanently shut down for over one year and is in the process of defueling. Based on an analysis of a worst-case accident for FSV in this condition, PSC had determined, and the staff concurs, that \$169 million in insurance would be sufficient to cover any any credible accident stabilization and cleanup costs at FSV.

Therefore, the staff concludes that the special circumstances of both 10 CFR 50.12(a)(2)(ii) and (iii) exist. The staff further concludes that granting an exemption is authorized by law, would present no undue risk to the public health and safety, and is consistent with the common defense and security. Thus, the staff finds that PSC's request for an exemption from certain requirements of 10 CFR 50.34(w)(1) by reducing onsite property damage insurance from \$1.06 billion to \$169 million should be granted.

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Dated: January 18, 1991