MAR 17 1981

Mr. Paul Rea
1110 11th Street
Greeley, CO 80631

Dear Mr. Rea:

Your December 26, 1980 letter to Senator Gary Hart has been referred to me for reply. As you know, many of the items addressed in your letter were discussed during the January 27, 1981, ACRS subcommittee at Fort St. Vrain which you attended. We have assembled the attached Staff comments which we believe are responsive to your questions.

Thank you for your interest and if I can supply you with any additional information, please feel free to contact me.

Sincerely,

ORIGINAL SIGNED BY:

James R. Miller, Chief
Standardization & Special
Projects Branch
Division of Licensing

cc: Senator Gary Hart
ATTN: Mr. Keith Glaser

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

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Greeley, CO 80631

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ENCLOSURE 1

Comment 1: History of Gas Cooled Reactors

As a result of Fermi's experiment demonstrating a self-sustaining nuclear chain reaction, an Engineering Council was established to study the feasibility of a plutonium production pile. The use of graphite as a moderator and helium as a coolant for a nuclear reactor was first recommended in the Summer of 1942 by the Engineering Council. DuPont engineers that reviewed the pile plans also favored a helium cooled pile. After long considerations and evaluations, procurement problems arose with the helium blowers and plans started on a water-cooled pile. While the United States continued its water-cooled reactor experiments, in 1947, the British started construction of an air-cooled plutonium production reactor at Harwell; in 1950, a similar reactor was built in Windscale having a power level predictive of commercially sized power reactors. In 1952, the French built a heavy-water moderated reactor cooled with nitrogen but later substituted carbon dioxide. In 1955, the Germans joined the French and the British in a gas-cooled reactor program.

In 1956, England started construction of its first carbon dioxide cooled Magnox Class reactor at Calder Hall. A total of 13 Magnox plants were built including plants in Italy and Japan. In the same year, France started construction of an air-cooled reactor at Marcoule using a Prestressed Concrete Reactor Vessel (PCRV) concept to house the core and related components.

Today England, France, Germany, Japan and the Soviet Union have large gas-cooled reactor programs used to research various uses of advanced gas-cooled reactor concepts for process heat and electricity generation. There are 47 gas cooled, graphite moderated reactors that have been or are operating today, most of them in England, France, Germany, Italy, Japan and the Soviet Union.

One U.S. company, General Dynamics, continued its gas-cooled reactor involvement by building a small gas-cooled reactor, Peach Bottom I, for Philadelphia Electric. The design concept was started in 1958, and the reactor became operational in 1967. In 1968, a construction permit was issued to Public Service Company of Colorado to build the Fort St. Nuclear Generating Station.

Many people in the nuclear community believe the high-temperature gas-cooled reactor to be superior to the light water reactors; these people include Joseph Hendrie at the top of a very long list.

Comment 2: Goal & Purpose of the NRC

The Nuclear Regulatory Commission is under strong pressure from many organizations, viz., nuclear reactor vendors, utilities, environmental groups, the political community in Congress, and concerned citizens both pro and anti nuclear. The NRC is under even stronger pressure to provide assurance that the peaceful use of atomic energy does not result in undue risk to the health and safety of the public. This is stated in the Atomic Energy Act of 1954.

We all know what atomic energy is capable of doing, as witnessed by Hiroshima and Nagasaki on the one hand, and generation of electricity on the other. All of us in the nuclear industry have a conscience and a purpose, and that purpose steers us to act and make decisions that result in power plants that do not provide undue risk to the health and safety of the public. Pressure, regardless from whom or how strong, may only result in an understanding of and sometimes even sympathy for a given group's concerns but will not divert us from our primary goal of assuring that the peaceful use of atomic energy does not result in undue risk to the health and safety of the public.

Comment 3: Excessive Noise & Banging

A check of the plant records by the NRC resident inspector revealed that on July 2, 1979, Fort St. Vrain had been shut down. In fact, the plant was down from February to mid-July of 1979 for refueling and turbine overhaul. Moreover, according to the resident inspector, he is not aware of any incident where "plant workers ran around in confusion, with some abandoning their stations."

The incident described in your December 26, 1980 letter, with steam pipes banging violently is what always happens in all plants whether they are nuclear or conventional, during water-hammer and steam stop-valve closing. Water-hammer is a pressure rise in a pipeline caused by a sudden change in the rate of flow or stoppage of flow in the line. This can be observed in some homes by opening a faucet and then quickly closing it.

A steam stop valve is a large, heavy valve, usually larger than 24" in diameter, that is used to stop steam flow in a turbine. When this valve closes, its weight plus the force of 2500 psi of steam behind it causes tremendous noise. In some cases, the turbine building reverberates with the noise, but again this occurs at all plants.

Comment 4: Fort St. Vrain Rise to Power

The action of the Public Utilities Commission (PUC), does not "encourage PSCo to take the final gamble, to push the reactor the limit so as to avoid losing its considerable investment".

The order by the PUC stipulated that after the next refueling, on an annual basis, FSV has to achieve a capacity factor of at least 50 percent. This is based on 200 MWe and corresponds to 70 percent power. The refueling scheduled maintenance time and NRC imposed outages are not included in the capacity factor. In 1978 and 1980, FSV achieved capacity factors in excess of 43%. Taking into account the modifications that are scheduled to be implemented, the 50% capacity factor can be achieved even without going to the rated power level of 842 MWt, 100 percent power.

Another item that deserves clarification is the continued use of the phrase "push the reactor to the limit". When reactors are licensed, the maximum design limit is stipulated by the design and all accident analyses, transients and normal operation are based on this design limit. The NRC reviews all pertinent analyses and determines if, in fact, operation of the plant at that design limit does not result in undue risk to the health and safety of the public. Fort St. Vrain has been reviewed by the NRC and found to be acceptable for operation up to 100 percent power (842 MWt or 330 MWe). The following is a history of the various "holds" that were placed on the plant operation:

The Public Service Company of Colorado was issued a construction permit on September 17, 1968 and submitted the Final Safety Analysis Report as Amendment No. 14 to its application for a construction permit and operating license for the Fort St. Vrain Nuclear Generating Station on November 4, 1969. A Safety Evaluation Report (SER) dated January 20, 1972, concluded that FSV can be operated, as proposed, at power levels up to 842 MWt without endangering the health and safety of the public.

After issuing the 1972 SER, several deficiencies were found which, in later years, limited the power level at which FSV could be operated. These were: (1) 1974-2 percent hold due to cracked Pelton wheel, (2) 1976-40 percent hold due to cable separation discrepancies, (3) 1977 0 percent hold due to analytical discrepancies.

We have reviewed the material submitted by PSCo in support of full power operation and presented our findings on the accident reanalysis portion of the 70 percent hold in Amendment No. 22. The remaining items are discussed in the Safety Evaluation Report supporting Amendment No. 23, which was issued on March 16, 1981. Amendment No. 23 will permit rise-to-power ascension testing and fluctuation testing up to full power. Following testing, steady-state power will be limited to 70% until the NRC has reviewed the results of the full power test program and approves full power steady-state operation.

ENCLOSURE 2

POOR ORIGINAL

Public Service Company of Colorado

February 23, 1981
Fort St. Vrain
Unit No. 1
P-81062

Mr. George Kuzmycz 28198
U. S. Nuclear Regulatory Commission
Division Project Management
Special Projects
Washington, D. C. 20555

Docket No. 50-267

SUBJECT: Response to Professor Rea's Letter December 26, 1980

Dear Mr. Kuzmycz:

In response to Professor Rea's letter the following information is offered keyed to the paragraph numbers of the subject letter. Since the letter is written more along the line of making statements rather than asking questions the following is an attempt to address the issues of the statements made:

1. Fort St. Vrain has had some operational problems. It is a first-of-a-kind plant built under the provisions of the Power Reactor Demonstration program, and not unlike the development of water reactor technology in its beginning the gas cooled technology requires development. The first-of-a-kind equipment at Fort St. Vrain has resulted in some problems along with conventional equipment which has been applied in services for which there is no operating or design history. Although it may appear that the operational problems experienced to date have some implication on safety it should be noted that with the design conservatism, redundant components, etc., the plant and the plant control systems have always responded in a conservative manner with reference to the health and safety of the public.

With reference to chronology of General Atomic (GA) ownership we are not aware of any bankruptcy being involved. GA was a part of the General Dynamics organization in the early design stages of Fort St. Vrain. Gulf Oil along with many other oil companies interested in becoming total energy companies bought into General Atomic which then became Gulf General Atomic. The inference that Gulf Oil purchased the plant is totally false. The plant was purchased by Public Service Company of Colorado by contract agreements in 1965, and has always been Public Service Company's plant regardless of the change in