



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

ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO OPERATOR'S ROLE IN MITIGATING A HIGH ENERGY LINE BREAK
PUBLIC SERVICE COMPANY OF COLORADO
FORT ST. VRAIN NUCLEAR GENERATING STATION
DOCKET NO. 50-267

1.0 INTRODUCTION AND BACKGROUND

On February 22, 1986, the staff met with the licensee to discuss the qualification of equipment at Fort St. Vrain under the provisions of 10 CFR 50.49, the equipment qualification rule. One subject discussed at this meeting was the potential role of the operators following a high energy line break (HELB). The staff was concerned about the ability of the operators to carry out their role, given the potentially harsh conditions that could exist in the plant following the HELB.

By letter dated April 6, 1986, the staff formally requested certain information concerning technical aspects of this problem. The licensee responded in letters dated June 26, 1986, and January 15 and March 31, 1987. Further review of the licensee's responses caused the staff to ask additional questions on June 24, 1988, concerning human factors aspects of the operator's role. The licensee responded to these questions by letter dated December 9, 1988.

The staff requested review of the licensee's first set of responses by its contractor, Idaho National Engineering Laboratory (INEL). INEL's review is found in the technical evaluation report (TER) provided as Enclosure 2 to our letter.

2.0 EVALUATION

2.1 Technical Response

The licensee was initially asked to describe the response of the operators to the HELB and to provide an evaluation of the operator's ability to make that response. The licensee noted that under normal circumstances environmentally qualified remote equipment (valves) or valves with remote hand wheels would be used as part of the shutdown process. Only if there was a single failure of the qualified valves would the operator potentially have to enter a harsh environment.

The initial conclusion of the staff was that this could be accomplished in the environment following the HELB, where the temperatures were expected to be less than 140 degrees F about 30 minutes after the HELB is isolated.

This is described in detail in the INEL TER. However, before concluding the situation was acceptable, the staff requested more information from the licensee on the human factors aspects of this problem.

2.2 Human Factors Response

The staff's human factors concerns covered four major areas. These are:

- Ability to identify and manipulate manual valves.
- Ability to correctly read instrumentation.
- Ability to protect the operators and operator communication.
- Post-HELB temperature, humidity, noise, and lighting conditions.

These are discussed in the following sections.

The licensee has provided a listing of the valves that would have to be manipulated. The licensee has stated that the valves are identified with tags and the operators are familiar with their location from procedures, training, and plant walkdowns. The licensee has reviewed the ability of the operators to manipulate the valves and concluded that this can be accomplished. The staff has also performed a partial walkdown of the system and noted that the valves are easily identified. Therefore, the staff concludes that the operators will be able to identify and correctly manipulate the valves for plant shutdown following an HELB.

The instruments that have to be read during the shutdown sequence are located either in the plant or in the control room for quick installation when they are needed. The licensee has provided information on the instruments that indicates they have sufficient accuracy to enable the operators to monitor the plant cooldown process. The staff has seen the installation of this equipment during a plant walkdown and verified its accessibility and availability for use. Therefore, the staff concludes the instrumentation is adequate for the intended purpose.

The licensee has reviewed the ambient conditions under which the operators would have to perform the required tasks. The licensee has found that the temperature, humidity, and lighting conditions are adequate for the operators to perform their tasks. Specifically, the temperatures in the plant would be less than 145 degrees F within 45 minutes following the isolation of the HELB. In addition, air packs and flashlights are available for the operators to use. Given these conditions, the use of protective clothing does not appear to be necessary. The operators will be able to communicate with radios, or use the plant Gaitronics system as a backup. Therefore, the staff concludes ambient conditions for performing the operators tasks are acceptable.

3.0 CONCLUSIONS

In view of the above, the staff concludes that its concerns about the ability of the operators to respond to an HELB have been adequately

addressed by the licensee. Since the operators in most cases will not have to enter a harsh environment, the measures proposed by the licensee are adequate. The staff also concludes that the technical and human factors aspects of how the operators will respond to an HELB are acceptable.

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