



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

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VICE PRESIDENT
JAN 15 1973

January 11, 1973

Docket Nos. 50-282
50-306

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Mr. A. V. Dienhart
Vice President - Engineering
Northern States Power Company
414 Nicollet Avenue
Minneapolis, Minnesota 55401

Dear Mr. Dienhart:

In our meeting of January 4, 1973, you requested clarification of the guidelines and criteria enclosed with our December 12, 1972 letter regarding a postulated break in a pipe carrying a high-energy fluid in the Prairie Island Nuclear Generating Plant, Units 1 and 2.

The enclosed clarifications are a result of the staff's review of the questions discussed in the January 4, 1973 meeting, and should be used in the preparation of design modifications of your facility to accommodate the postulated pipe break. The major clarifications are that supplemental guidelines are provided regarding (a) the location of postulated breaks in addition to locations specified in Request No. 9.29.7 and (b) protection of safety-significant systems from adverse environments in addition to that specified in 9.29.11(a).

We understand from the meeting of January 4, 1973 that you plan to provide an amendment to the application describing your proposed modifications by February 1, 1973. Please inform us within 7 days after receipt of this letter if your plans for filing the amendment have changed.

Sincerely,


A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing

Enclosure:
As stated

Mr. A. V. Dienhart

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cc:
Mr. Gerald Chamoff, Esquire
Shaw, Pittman, Potts, Trowbridge & Madden
910 17th Street, NW
Washington, D. C.

ENCLOSURE

NSP requested interpretation of the AEC guidelines attached to the December 12, 1972 letter to them requesting consideration of the postulated accident. The questions raised by NSP and the staff's response is summarized below. Request numbers refer to the AEC guidelines.

Request No. 9.29.6(a)

Question: Should the pipe design pressure and temperature conditions specified be used only to identify those pipes that would require pipe whip protection or should they be used to identify pipes carrying a high energy fluid that if ruptured would require protection to meet any of the criteria, including pipe whip criteria?

Answer: The pipe design pressure and temperature conditions should be used to identify high energy fluid pipes for use with any of the criteria. For example, the charging line is not considered to be a high energy line for these criteria, because service temperature is less than 200°F.

Request No. 29.6(d)

Question: Does Note 1 for this paragraph mean that the steam flow limiter may be considered to reduce the force acting on the section of pipe containing the limiter? For example, does the force equal $1.2 \times \text{fluid pressure} \times \text{nozzle throat area}$?

Answer: Note 1 does mean that the steam flow limiter may be considered; however, the magnitude of the coefficient in the force equation is subject to analysis.

Request No. 9.29.7 b (2)

Question: Should the coefficient of the algebraic expressions in this paragraph be 0.8, as in the Prairie Island criteria, or 0.9 as in the Monticello criteria?

Answer: 0.8 is correct.

Request No. 9.29.7 b (3)

- Question: The criteria for selecting postulated pipe breaks at intermediate locations requires that a minimum of two locations be selected on a reasonable basis as necessary to provide protection. Can these two locations be selected based only on calculated stress levels for that pipe run or should they also be selected based on the consequences of a pipe rupture at any location along the pipe run?

For example, in the straight run of pipe near equipment required for a safe shutdown, must pipe whip supports or a barrier be provided only at two high stressed locations, or must protection be provided for a break at any location along the length if the consequences of such a break would be the loss of capability for a safe shutdown?

Answer: The staff will answer this question within 2 weeks.

Note: Subsequent to the meeting, the staff answered this question as follows:

"Design basis break locations should be selected in accordance with the pipe whip protection criteria of Request No. 9.29.7; however, where pipes carrying high energy fluid are routed in the vicinity of structures and systems necessary for safe shutdown of the nuclear plant, supplemental protection of those structures and systems shall be provided to cope with the environmental effects (including the effects of jet impingement) of a single postulated open crack at the most adverse location(s) with regard to those essential structures and systems. The length of the crack being chosen not to exceed the critical crack size. The critical size is taken to be one half the pipe diameter in length and one half the wall thickness in width."

Request No. 9.29.11

Question: Part (a) of this criterion appears to cover the complete break size spectrum of postulated pipe ruptures. What is the intent of part (b) that states rupture of a pipe carrying high energy fluid should not result in loss of ability to cope with accidents due to ruptures of other pipes too small to cause a reactor accident but large enough to cause electrical failure?

Answer: Part (a) does cover the complete pipe size spectrum with minor modifications; insert "required" before redundancy and substitute "that event" for "the steam line break accident." Part (b) can be deleted.

Note: Subsequent to the meeting the staff reconsidered this question, and concluded that rather than delete Part (b) of the criterion, it should be replaced by the following:

"(b) Environmentally induced failures caused by a leak or rupture of the pipe which would not of itself result in protective action but does disable protection functions. In this regard, a loss of redundancy is permitted but a loss of function is not permitted. For such situations plant shutdown is required."

Request No. 9.29.13

Question: Does this criterion apply only to a "steam line or feedwater line" break and does this include the rupture of the heating steam line?

Answer: It was intended that this criterion should apply to any pipe carrying a high energy fluid. Delete "steam line or feedwater line" in the first sentence and add "of a pipe carrying high energy fluid" at the end of the sentence.