



Omaha Public Power District

1623 HARVEY • OMAHA, NEBRASKA 68102 • TELEPHONE 536-4000 AREA CODE 402

June 29, 1979

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert W. Reid, Chief
Operating Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: Docket No. 50-285

Gentlemen:

In accordance with Section 3.2.1 of the Fort Calhoun Station fire protection Safety Evaluation Report (SER), issued by the Commission on August 23, 1978, the Omaha Public Power District herewith submits five (5) copies of a qualitative report addressing the effects on safety related equipment of rupture of the fire water piping to be installed at the Fort Calhoun Station. This report (attached) includes: (1) a description of the assumptions to be used to quantitatively evaluate the effects on safety related systems of fire water piping rupture and (2) design considerations to be employed to mitigate the consequences of fire water piping rupture.

A quantitative analysis addressing specific fire water piping will be submitted to the Commission in November, 1979, when design of the piping referenced in Section 3.1.5 of the SER is completed. The quantitative analysis depends upon the actual physical location of the piping systems in the Fort Calhoun Station auxiliary building. The Commission is respectfully requested to provide timely review of the attached qualitative data in order that the preparation of the quantitative analysis may proceed according to schedule.

Sincerely,

T. E. Short
Assistant General Manager

TES/KJM/BJH:jmm

Attach.

cc: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, N. W.
Washington, D. C. 20036

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ATTACHMENT

Qualitative Report Effects of Fire Water Pipe Rupture on Safety Related Equipment at the Fort Calhoun Unit 1 Nuclear Power Station

- I. The new auxiliary building fire hose system for Fort Calhoun Unit 1 will operate at ambient temperature and at a pressure of 125 psig and is, therefore, classified as moderate energy piping in Branch Technical Position MEB 3-1.

Piping cracks shall be postulated in the Fort Calhoun Unit 1 auxiliary building fire hose moderate energy fluid system, which during normal plant conditions, will be either in operation or maintained pressurized (above atmospheric pressure) under conditions where both of the following are met:

maximum operating temperature is 200 F or less, and
maximum operating pressure is 275 psig or less

Fluid flow from a crack shall be based on a circular opening of area equal to that of a rectangle one-half pipe diameter in length and one-half pipe wall thickness in width. The flow from the crack shall be assumed to result in an environment that wets all unprotected components within the compartment, with consequent flooding in the compartment and communicating compartments. Flooding effects will be determined on the basis of a conservatively estimated time period required to effect corrective action.

- II. Through-wall leakage cracks will be postulated for the Fort Calhoun Unit 1 auxiliary building fire hose moderate energy piping system in accordance with the following criteria:
 1. Cracks will be postulated at locations that are isolated or physically remote from essential systems and components.
 2. Cracks will not be postulated in pipes of nominal pipe size of 1 in. and less.
 3. Cracks will be postulated to occur individually, at locations that result in the maximum effects from fluid spraying and flooding. Only environmental effects that develop from these cracks shall be considered.

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II. (Continued)

Cracks shall be postulated in the fire lines and only environmental effects (flooding, spray, etc.) shall be considered for protection of safety-related components. The flow from a crack is assumed to result in an environment that wets all unprotected components within the compartment, with consequent flooding in the compartment and communicating compartment.

III. The following steps shall be taken during piping design and installation to protect against the effects of pipe cracks:

1. Essential* instruments and components shall be sealed or otherwise capable of operating in a wet environment.
2. Adequate drains, flood barriers, or bulkheads shall be provided to prevent flooding of essential equipment.
3. Essential* instruments and components shall be elevated to minimize the potential for flood damage, as appropriate.
4. The fire protection piping will be located remote from safety-related equipment to the greatest extent possible.
5. Where the piping must be located adjacent to safety-related equipment, the piping and its supports will be seismically designed.
6. Adequate spray shields will be provided where necessary to prevent entrance of spray into existing safety-related electrical panels.
7. Piping will be routed so as to take maximum advantage of existing structure, conduits and cable trays to break-up and disperse spray.

*Equipment necessary to safely shut down the plant and maintain it in a safe shutdown condition.

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References

1. NRC Standard Review Plan, Section 3.6.1, March 1975, entitled "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment", containing Branch Technical Position APCSB 3-1.
2. NRC Standard Review Plan, Section 3.6.2, March 1975, entitled "Determination of Break Locations and Dynamic Effects Associated With the Postulated Rupture of Piping", containing Branch Technical Position MEB 3-1.
3. Letter from A. Giambusso, Deputy Director for Reactor Projects, to NUSCO President, December 1972, requiring consideration of piping system break outside the containment.

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