Regulatory Cy.

Consumers Power Company

Stephen H. Howell
Vice President

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

February 26, 1973

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U.S. ATOMIC ENERGY COMMISSION

MIDLAND PLANT
Pipe Failures Outside of the Containment
Docket Nos. 50-329 and 50-330

Mr. A. Giambusso, Deputy Director
for Reactor Projects
Directorate of Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Giambusso:

Your lette ber 15, 1972 requested a safety analysis of postula pe failures outside of the containment structure. Our letter of December 28, 1972 stated that we would respond to your request in two steps. As indicated in our letter of December 28, 1972, we are hereby submitting a discussion of the methods we intend to employ to ensure conformance with your guidelines relative to the postulated locations and effects of ruptures of high energy fluid line breaks outside the reactor building.

The effects of such breaks will be minimized at least to the extent that the reactor can be shut down and brought to and maintained in a safe cold shutdown condition. Systems which must remain functional to obtain this cold shutdown condition after rupture of a high energy fluid line include:

Reactor Coolant System

Portions of the Makeup and Purification System used for High Pressure Safety Injection

Decay Heat Removal System

Auxiliary Feedwater System

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Atmospheric Steam Dump System

Portions of the Component Cooling Water System

Portions of the Service Water System

Emergency AC Power Distribution System

Emergency 125 V DC Power Distribution System

Portions of the Engineered Safeguards Actuation System

Reactor Protective System

Control Room (including its habitability systems)

Certain ventilation systems, control instruments, actuation equipment, electrical cable, wire, and raceway circuits associated with the above listed systems are also considered essential.

It will be noted that almost all of these systems are located, at least in part, outside the reactor building.

In order to ensure operability of the above systems, plant layout and structures are being designed and the designs reviewed within the constraints of the following criteria:

1. Only a single pipe break is considered.

2. Plant conditions prior to rupture are normal steady state or hot standby.

3. No accident is assumed to occur concurrently with the pipe failure outside the containment.

4. Loss of off-site power is assumed after accidents causing plant trip.

5. Capability must be maintained to eventually establish and maintain a cold shutdown of the reactor.

6. A single failure of an active component is assumed in the analysis of the accident and subsequent cooldown to the cold shutdown condition.

7. Failure in any piping systems whose service temperature exceeds 200°F and also whose design pressure exceeds 275 psig will be considered.

8. Effects considered must include pipe whip, jet impingement, water flooding, steam flooding and structural integrity of compartments.

Design analytical tools used will include Bechtel's topical report BN-TOP-2, "Design for Pipe Break Effects", and the Bechtel code COPRA (for the effects of steam flooding and compartment pressurization). The topical report BN-TOP-2 was transmitted separately to you by Mr. R. D. Allen of Bechtel Corporation in September 1972. If it is found that adverse environmental conditions cannot be prevented in certain areas of a building, any essential equipment within these areas will be designed for the worst environmental conditions calculated.

The basic design approach on the Midland Plant will be to locate essential equipment away from areas containing high energy fluid lines. When the basic approach is not feasible, pipe restraints and structural barriers will also be employed to mitigate the consequences of piping failure. As noted above, essential equipment will also be designed for the worst environmental conditions in the area in which it is located. Redundant equipment within the same essential system will also be located so as to preclude a failure of one "train" from causing a failure in the other. Finally, walls adjacent to high energy fluid lines will be designed to withstand pipe whip, jet forces, and missiles emanating from a failure of the line, if the walls are required to protect required equipment.

As indicated in our December 28, 1972 submittal, we will amend the Midland PSAR to include detailed analyses commensurate with your guidelines "General Information Required for Consideration of Effects of a Piping System Break Outside Containment". The amendment will be submitted by November 1, 1973. By that time our design will have reached a stage where meaningful analyses are possible.

Yours very truly,

WEK/jmb

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Consumers Power Company Jackson, Michigan 49201 Stephen H. Howell	2-26-73	3-1-73	X			

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Mr. Giambusso	1 signed			SENT AEC PDR X SENT LOCAL PDR X

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DESCRIPTION:
Ltr re our 12-15-72 ltr....furnishing info re postulated pipe failures outside of the containment structure.....

ENCLOSURES:

Do Not Remove
ACKNOWLEDGED

PLANT NAMES: Midland Units 1 & 2

FOR ACTION/INFORMATION 3-1-73 AB

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