

Dockets

SEP 28 1973

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DOCKET NOS.: 50-329 AND 50-330

APPLICANT: CONSUMERS POWER COMPANY

FACILITY: MIDLAND PLANT, UNITS 1 AND 2

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

SUMMARY OF MEETING ON HIGH ENERGY PIPELINES

The Regulatory staff held a meeting in Bethesda, Maryland on September 11, 1973 with Consumers Power Company, Bechtel Corporation (Ann Arbor) and Babcock & Wilcox representatives. An attendance list is enclosed.

The meeting was held at the request of the applicant in order that it benefit from the experience of the staff and receive guidance in formulating its design criteria for high energy pipelines.

The applicant's letter of February 26, 1973 established the agenda for the meeting. That letter was the applicant's initial response to our "General Information Required for Consideration of the Effects of a Piping System Break Outside Containment" forwarded to the applicant on December 15, 1972. There was also discussion of the January 10, 1973 errata sheet for the general information required and discussion of our high energy pipeline criteria issued July 12, 1973. The applicant was urged to implement the July 12, 1973 criteria to the extent practicable in the design of the plant.

In discussing the systems that must remain functional so that the reactor can be shut down and maintained in a safe cold shutdown condition, it was made clear that cold shutdown was not merely the temperature that would allow operation of the decay heat removal system (280°F) but was a lower temperature such as 100°F.

The following points were made with regard to design considerations for these systems and the evaluation of postulated pipe ruptures:

1. Only a single pipe break is considered at any one time.
2. Plant conditions prior to rupture are normal steady state or hot standby. However, stresses should be considered for the full cycle of startup, steady state, and shutdown conditions. Seismic stresses will be included for determining postulated break locations and designing pipe restraints.

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3. No accident is assumed to occur concurrently with the pipe failure outside the containment.
4. Credit may be taken for equipment to mitigate the effects of a postulated break even though that equipment has not been designed to Category I Seismic Design requirements.
5. A break between the containment and the first isolation valve need not be postulated, provided that adequate design measures have been taken to prevent excessive stresses in this area resulting from a downstream break, e.g., extra thick pipe walls and downstream pipe restraints.
6. Loss of off-site power is assumed after accidents causing plant trip.
7. Capability must be maintained to eventually establish and maintain a cold shutdown of the reactor.
8. A single failure of an active component is assumed in the analysis of the accident and subsequent cooldown to the cold shutdown condition.
9. Design basis pipe breaks will be considered in all piping systems wherein either of the following conditions exists: (1) the maximum operating temperature exceeds 200°F, or (2) the maximum operating pressure exceeds 275 psig. (This will include the steam lines for the turbine driver auxiliary feedwater pumps.) The applicant will employ our July 12, 1973 criteria for determining the locations of postulated breaks.
10. Design analytical tools will include those in the Bechtel Topical Report BN-TOP-2, "Design for Pipe Break Effects". The applicant stated that contrary to its February 26, 1973 letter, it will not use the COPRA code, but will use a multi-compartment code for calculating the effects of steam flooding and compartment pressurization.
11. The applicant stated in its letter of February 26, 1973, that "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 staff added that such essential equipment should also be tested for such environmental conditions.

- 12. In its letter of February 26, 1973, the applicant stated, "Effects considered must include pipe whip, jet impingement, water flooding, steam flooding and structural integrity of compartments", and "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".

The staff explained that these missiles are secondary missiles and not pipe fragments.

- 13. The applicant was given a copy of "Document (B), Structural Design Criteria for Evaluating the Effects of High Energy Pipe Breaks on Category I Structures Outside the Containment", and it was discussed briefly.

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.

The applicant plans to submit an amendment to its PSAR before the end of 1973 that will specify the criteria it will employ. The criteria will be a combination of our December 15, 1972 criteria and our July 12, 1973 criteria as discussed in this meeting. The amendment will also include the applicant's analysis of the effects of rupture of high energy piping.

Original Signed

S. D. MacKay, Project Manager
Pressurized Water Reactors Branch 4
Directorate of Licensing

Enclosure:
List of Attendess

- DISTRIBUTION:
- Docket File (2) TR ADs
 - AEC PDR TR BCs
 - Local PDR RP ADs
 - RP Rdg File RP BCs
 - L Rdg File SMacKay
 - PWR-4 Rdg File FMiraglia
 - RCDeYoung EGoulbourne
 - JHendrie DKartalia, OGC
 - RO (3) ACRS (16)
 - RWKlecker DCFisher
 - ASchwencer JPKnight
 - ISihweil RRMaccary PCHearn

OFFICE ▶	x7548/L:PWR-4				
SURNAME ▶	<i>SDM</i> SMacKay:cjr				
DATE ▶	9/28/73				

MEETING ON HIGH ENERGY LINES
CONSUMERS POWER - MIDLAND PLANT
SEPTEMBER 11, 1973

LIST OF ATTENDEES

Atomic Energy Commission

S. D. MacKay
D. C. Fischer
J. P. Knight
R. R. Maccary
I. Sihweil
P. C. Hearn

Babcock & Wilcox

R. R. Steinke
G. W. Delaney
N. S. Embrey
D. K. Frerichs
W. E. Wilson
C. E. Mahaney
A. McBride

Bechtel

J. R. Koupal
E. M. Hughes
P. C. Thompson
S. Cartwright
R. Baker

Consumers Power Company

M. P. Hanson