

May 24, 1976

ACRS  
ACRS Technical Staff

MEETING ON MIDLAND 1&2 PROPOSED HIGH ENERGY LINE BREAK ANALYSIS

On May 21 Consumers Power Company met with the NRC Staff in Bethesda to discuss proposed High Energy Line Break Analysis (HELBA) for the Midland Units. The Agenda for the meeting (attached) appeared of sufficient interest to ACRS that, with Mr. Libarkin's concurrence, I attended.

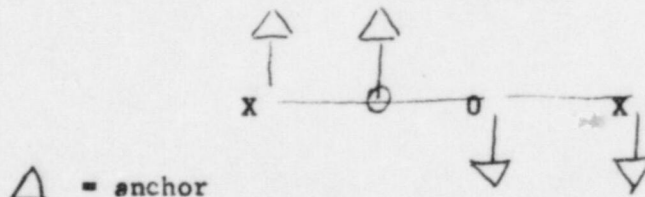
The meeting had been requested by Consumers Power Company (CPCo.), not to negotiate around requirements but to get an interpretation of requirements from the Staff in view of newer Standard Review Plans (SRP) since the Midland application was filed. Bechtel had indicated that \$30 - 50 million was at stake cost-wise, and schedule-wise. They were approaching the critical pouring of concrete and needed answers to finish the work.

Representatives of CPCo., Bechtel, and B&W were present. The Staff was represented by the LPM, Larry Crocker, and the Mechanical Engineering and Auxiliary Power Conversion Branches.

The Roman numerals below refer to the corresponding agenda items:

- I. The CPCo. HELBA system consists of analyzing all piping within a set of anchors as one system. Each system may have several branch runs but it reacts as a system. All stresses calculated are low compared to Regulatory Guide 1.46 (.8 yield). Intermediate points are picked for analysis on the basis of highest stress, but none exceed the .8 criterion.

A system may have four anchor points or terminal ends; breaks are postulated there. The following example was used:



△ = anchor

Break at each of anchors and anywhere stress exceeds .8 (No where)

X - assume break at elbows

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Regulatory Guide 1.46 may require break at terminal O, but this Tee does not act as a restraining point since there is no anchor there.

The NRC Staff indicated they would have no problem with not postulating a break at this point provided a detailed stress analysis is done at this point to show that no stress limits are exceeded.

The same concept applies to all HELBA

II. It was agreed that longitudinal slot breaks at terminal end points need not be assumed (except for seamed piping). CPCo. pointed out that this is inconsistent with commitments made in their Amendment 25. Nevertheless, Mechanical Engineering Branch (MEB) representatives found this acceptable for Class 2 and 3 piping.

III. It was agreed that longitudinal slot breaks need not be postulated to occur at intermediate locations. Only circumferential breaks are assumed since the .8 criterion is not approached.

It was noted that guard pipes may be a problem. They must be subject to in-service inspection (ISI).

IV. The referenced letter required a discussion of the effects of critical cracks in high energy systems. A "critical crack" is defined as one half the pipe diameter in length and half the wall-thickness in width. Full area breaks are calculated only where both 200°F and 275 psig are exceeded. The Staff asked if a critical crack can effect a piece of safety equipment. CPCo. pointed out the piping was so lowly stressed that there was no reason to consider it. The Staff concurred that longitudinal cracks need not be considered for high energy piping. For moderate energy, critical cracks should be considered; however, any adverse situation will probably be taken care of by the postulated break in high energy lines.

It was agreed that item 3 in the Schwencer letter (a copy of which was not available) was taken care of. The Applicant will consider H.E. cracks of short duration.

V. The agreement that Moderate Energy (M.E.) Analysis was not required, seemed clearer in the Bechtel meeting notes of the September 11, 1973, meeting, than in those prepared by NRC. The Staff indicated cracks in M.E. systems must be examined to insure that redundant safety systems are not impaired. The Staff would be satisfied if lines close to safety systems are identified and only those analyzed. If a M.E. line is close to a limiting H.E. line, the M.E. line need not be analyzed.

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CPCo. indicated the M.E. Analysis might not make the FSAR.

CPCo. will plan to do M.E. line analysis but will reserve the option to bring in problems for further discussion.

If a conflict arises between the SRP and Amendment 25, CPCo. will use the SRP.

CPCo. stated that the requirements were clarified and that the meeting had served its purpose.

/s/

Ragnwald Muller  
Senior Staff Assistant

Attachment

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PROPOSED HIGH ENERGY LINE BREAK ANALYSIS

MEETING AGENDA

I. Interpretation of piping runs, branch runs, and terminal end points

We propose that piping runs and branch runs for piping inside and outside containment be treated as a total piping system between fixed points (anchors) since the stress analysis performed considers it as such. We perform thermal, dead weight, and seismic stress analyses for the total system including branch lines (within anchors). The analysis considers all of the stress intensification factors and flexibility factors as applicable to various piping components. Thus, we propose that breaks be postulated within the system as follows:

1. Terminal end points (anchors)  
(Branch connections to main piping are not considered as terminal ends.)
2. At all points which exceed the stress criteria of R.G. 1.46  
(As a minimum, two (2) intermediate breaks will be selected for each piping system, [main and branch lines within anchors])

II. Longitudinal slot breaks at terminal end points

We propose that longitudinal slot breaks not be postulated to occur at terminal end points for piping without longitudinal welds. This proposal is in accordance with Section 3b(2)(a) of the Branch Technical Position MEB 3-1 and should be a reasonable assumption for Midland Units 1 and 2 both inside and outside of containment.

III. Longitudinal slot breaks at intermediate locations

We propose that longitudinal slot breaks not be postulated to occur at intermediate locations where the Regulatory Guide 1.46 criterion for a minimum number of break locations must be satisfied. This proposal is in accordance with section 3b(2)(b) of the Branch Technical Position MEB 3-1 and should be a reasonable assumption for Midland Units 1 and 2 both inside and outside containment.

IV. Discussion of item 3 of A. J. Schwencer (NRC) to S. Howell (CPCo) letter of October 18, 1974, pertaining to Amendment 25 to the Midland PSAR.

V. Moderate Energy Analysis

Based on agreements reached in the meeting with the NRC on September 11, 1973, it is our understanding that moderate energy analysis is not required for Midland.