UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

Hanauer

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November 8, 1979

TO: M. Plesset

FROM: A. Bates

SUBJECT: ACRS FLUID DYNAMICS SUBCOMMITTEE MEETING, SEPTEMBER 13-14, 1979

I have prepared the attached proposed meeting summary for your review. Copies are being distributed to the other ACRS members and Subcommittee consultants for their information and comment. Corrections and additions will be included in the minutes of the meeting.

Attachment: as stated

cc: ACRS Members
ACRS Technical Staff
I. Catton
T. Wu
L. S. Yao
S. Bush
F. Zaloudek
Z. Zudans
R. Baer
C. Anderson
C. Grimes
S. Hanauer

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November 8, 1979

PROPOSED SUMMARY OF THE SEPTEMBER 13-14, 1979 FLUID DYNAMICS SUBCOMMITTEE MEETING

Purpose:

The purpose of the meeting was to review the present status and future schedule for NRC and Utility action in resolving the issues related to the acceptance criteria for Mark I and Mark II Containment designs.

Attendees:

ACRS members in attendance included: M. Plesset, W. Mathis and J. C. Mark. Consultants present included: S. Bush, I. Catton, T. Wu, L.S. Yao, F. Zsloudek, and Z. Zudans.

Meeting Highlights, Agreements and Requests

1. Mr. C. Anderson, NRC Staff, reviewed the Status of the Mark II Containment review. This included alternate loads for some structures in the lead plant program, the need for downcomer supports in LaSalle and Zimmer, the status of the Long Term Program, and the preliminary results of some foreign Mark II tests.

2. Subsequent to the issuance of NUREG-0487 Mark II Acceptance Criteria, the vent clearing loads on the wetwell basemat and walls have been revised; pool swell velocities and heights have been revised; and the asymmetric pool boundary load was revised.

3. The loads on submerged structures from LOCAs and SRV discharges were reviewed briefly. Following the issuance of NUREG-0487, the Mark II Owners proposed some alternative methods of specifying the loads. The NRC has issued supplementary criteria which allow for the use of some of the alternatives.

4. Revision of Load Case 5 for the SRV discharges based upon T-quencher loads were agreed to by the NRC.

5. The Mark II Owners Group reported on ongoing efforts and tests on condensation oscillation loads and multivent discharge loads. Reports on these programs will be submitted to the NRC in 1980 for the Long Term Program. Improved chug loads are being developed by GE. Quencher tests on SRV discharges have been run at in CAORSO Reactor with indications that loads are much reduced over the ramshead loads.

6. Mr. Ross, Philadelphia Power and Light Company, reported on their work with GKM to provide information on loads for the Susquehanna plant. This program was started due to concerns about the time available to get the information from other programs.

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7. Burns and Roe, Inc., reported on their work to develop an improved chug load definition for the WPPSS #2 plant.

8. The NRC reported on the preliminary results of tests conducted in Japan and Germany on Mark II type test facilities. The results of these tests are proprietary and the Mark II Owners and GE do not have the data. The NRC Staff has not had sufficient time or understanding of the tests to comment on them in detail.

9. Mr. R. Kohrs, GE, reviewed the Mark I loads associated with pool swell. A number of methods are available to reduce the upward and downward loads on the containment during pool swell. These include shortening the downcomers and maintaining a higher pressure in the drywell. Impact loads on the vent header can be reduced with a deflector. The pool swell load definition is based upon 1/4 scale - 2D GE tests, 1/12 scale - 2D GE tests, and 1/12 scale - 3D EPRI tests. Data is also available from LLL 1/5 scale 2D/3D tests. GE believes the test data shows that the 2D test results are conservative with respect to the 3D tests. The NRC disagrees and has added a 21.5% margin.

10. Mr. Bilanin, GE, reviewed the basis for the condensation oscillation and chugging loads for the Mark I Long Term program. The primary data available is from the FSTF (Full Scale Test Facility) at Norco. These tests indicated that additional load mitigation is not needed - that low stresses were observed in FSTF. The ACRS consultants indicated that they would like to see additional information on the peak loads observed, rather than the average peak load.

11. Mr. Mulford reviewed the loads associated with the SRV discharges to the torus. Tests included Monticello Ramshead tests, Monticello T-quencher tests and quarter scale tests at NUS. Results indicate significant reduction in loads (50-75%) with the use of the T-quencher on the SRV discharge lines.

12. As a result of the GE - Mark I Owners testing program, a Load Definition Report (LDR) was prepared. The LDR will be used by the individual utilities to develop loads in their facilities under the Plant Unique Analyses which will be performed.

13. M. C. Grimes reviewed the NRC Staff's Acceptance Criteria for the Mark I load definitions and the bases for the acceptance criteria. The Staff has imposed additional conservatisms in a number of areas, beyond the loads proposed by the Mark I Owners Group. These include the pool upward force on the torus following vent clearing and loads on the vent header deflectors. The Staff will also require some additional tests in FSTF for condensation oscillation loads.

14. Mr. Kohrs presented a summary of comments on the NRC Staff's acceptance criteria for the Mark I Owners Group. They believe that the criteria on the up loads on the torus are excessive, as well as the criteria for the vent header deflectors. The Mark I Owners also do not believe that additional tests in FSTF are necessary. The Mark I Owners also believe that the SRV load from individual quenchers should be combined by SRSS methods rather than by absolute summation.

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