



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

March 16, 1983

Mr. William J. Dircks
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Dircks:

SUBJECT: ACRS COMMENTS REGARDING POTENTIAL PIPE BREAK EFFECTS ON CONTROL ROD DRIVE HYDRAULIC LINES IN THE DRYWELLS of BWR MARK I AND II CONTAINMENTS

The subject of potential pipe break effects on BWR control rod drive hydraulic lines in the drywells of pressure suppression type containments was discussed with members of the NRC Staff on January 6, 1983 during the 273rd ACRS meeting. The Staff representatives concluded that adequate protection is provided against consequential damage of such pipe breaks. This conclusion appears to be based on generalized conservatisms in the Standard Review Plan acceptance criteria and a generic "protection against pipe break" review of BWR-6 plants with Mark III containments.

The difference between the locations of the control rod drive hydraulic line bundles in the large Mark III containments and in the extremely tight and congested Mark I and possibly Mark II containments did not seem to have been adequately considered in the Staff's analysis. At the time of the January 6 meeting, adequate knowledge of the physical arrangements in the older plants was not available.

It is difficult to believe that a hydraulic line group would survive in a workable configuration if it were subjected to the jet effects of a nearby large pipe break. The Staff stated that damage might occur to some adjacent hydraulic lines in the event of an individual rod drive housing failure which is a much less energetic accident. If a large pipe break were to occur, the damage to the control rod hydraulic line group would be practically instantaneous. A given group of lines (as well as other critical impulse lines and associated instrumentation) in the immediate vicinity of the break may suffer substantial damage involving both severance and crimping.

The time interval for depressurization of the reactor vessel is said to be long compared to the time required for normal control rod insertion. However, partially crimped lines will delay insertion and, if the insertion is dependent on reactor vessel pressure which is rapidly decreasing, some

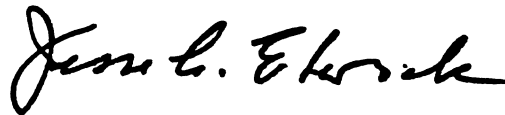
March 16, 1983

rods may never fully insert. Fully crimped discharge lines will, of course, prevent any insertion of the affected rods.

The rod groups in some if not all of the older designs are in essentially the same grouped configuration as the hydraulic lines. If enough rods are not inserted, recriticality must be considered, particularly in the context of adding fission heat to the low temperature injection water. The integral fission energy delivered to the water is added to a rather marginal storage capacity in the suppression pool.

We recommend that a survey be made of an appropriate sample of older plants to determine the actual hydraulic line configurations and rod assignments to the line groups. If an unacceptable degree of damage is physically possible due to breaks in large high energy lines, analyses should be made of the acceptability of the existing arrangements.

Sincerely,

A handwritten signature in black ink, appearing to read "Jesse C. Ebersole". The signature is written in a cursive style with a large, prominent initial "J".

Jesse C. Ebersole
Acting Chairman