March 13, 1980

SEE PADI.018

- TO: Dave Okrent Chet Siess
- FROM: Paul Shewmon

SUBJECT: PIPING BEHAVIOR DURING EARTHQUAKES

REF: MENO: E. Rodabaugh to E. Igne, dated February 27, 1980 Comments on Plant Arrangements Subcommittee Meeting of February 21, 1980 (Attached)

Questions of the adequacy of reactor seismic design at the SSE is of concern to all of us. It's led to the big research program NRC has at LLL. It apparently will come up in consideration of the risk of operating the Zion and Indian Point reactors because Dave feels there is a significant chances of the SSE occurring during the life of the plant. This concerns him because he isn't sure the plant would successfully cope with an earthquake at or above the SSE. I'm much more sanquine because I feel there is a large uncredited safety margin in the ductility and work hardening capability of the piping. I have much less feeling for the rest of the plant.

The reference memo is by a very capable consultant in this area. I found it quite interesting and commend it to you, if you didn't see it.

I haven't yet gotten to the meeting of the overview committee of the seismic program but hope the program will answer questions raised by Rodabaugh:

- (pg. 4) "In my opinion, an NRC task to evaluate what has happened to piping during earthquakes would be more useful to ACRS perspective of the subject than any ongoing NRC program on seismic evaluations."
- 2) (pg. 4) "What happens to piping when it is subjected to severe dynamic loads from any source? "... the particular data I am interested in was perhaps developed by the U.S. Navy ...." "I would suggest, if it has not already been attempted, that ACRS request NRC staff to see if such data might be available. Possibly such data might also be relevant to what happens to pressure vessels, pumps, valves, instruments, etc.

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Dave Okrent Chet Siess

In closing, let me add one more question. Our central concern is the prob-ability of the ESF of a reactor to survive an earthquake at or above the SSE. Is NRC doing anything leading to answers on this? Professor Cornel at MIT had a contract on it but I've never seen any written report and have the impression he never wrote a final report.

I'll try to make your next meeting, but in case I don't, I'd appreciate your bringing up these questions.

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cc: ACRS Members E. Igne, ACRS R. Budnitz, RES R. Savio, ACRS

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