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MEMORANDUM FOR: Milton S. Plesset, Chairman
Advisory Committee on Reactor Safeguards

FROM: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

THRU: William J. Dircks
Acting Executive Director for Operations (Signed) William J. Dircks

SUBJECT: THE FACTORING OF QUANTITATIVE ESTIMATES INTO SEISMIC SAFETY EVALUATION

Regarding your memorandum of June 10, 1980 on the above subject, the staff is beginning development of a probabilistic rationale for estimating risk due to earthquakes. It is clear that we will not be able to convert all of the uncertainties associated with acceleration, frequency, ground displacement, liquefaction and building and equipment response into a single, uncontroversed, decision methodology. However, it is hoped that we can eventually do a reasonable job of improving the bases and understandability of prudent and technically sound decisions in these areas.

We are making limited use of probabilistic methods in conjunction with the more traditional empirical-deterministic methodologies. For example, in the GETR review probabilistic estimates were used to supplement classical geological methodologies and judgments with respect to fault evaluations. In the Sequoyah review probabilistic estimates were used to help assess the relative significance of differences in ground motion levels determined from different non-probabilistic methodologies. In the Systematic Evaluation Program a probabilistic study aimed at establishing seismic hazard at older nuclear power plants is being used along with non-probabilistic methodologies in defining suggested ground motion levels for plant reevaluations. The study incorporates the diverse opinions of highly qualified seismologists and wide ranging sensitivity studies. The first two volumes will appear within two months as NUREG/CR-1582.

It is anticipated that we should be able to brief the Subcommittee on Extreme External Phenomena on our progress in this area sometime near the end of September. At the same time, we will brief the Subcommittee on our recommended position regarding plants that do not have seismically qualified auxiliary feed-water systems, or some other seismically qualified method of residual heat removal, which was the subject of another June 10 ACRS letter.

[Signature]
Original by
H. R. Denton
7/10 Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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RJD-166

SEE ATTACHED YELLOW FOR ADDITIONAL CONCURRENCES

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DATE	7/8/80	7/10/80	7/1/80	7/11/80	7/15/80	7/16/80

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 Acting Executive Director for Operations

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Harold R. Denton, Director
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	ACKNOWLEDGMENT		DATE OF DOCUMENT
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Req to be advised what basis the Staff is developing in re to factoring of quantitative estimates into the seismic safety evaluation			
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

June 10, 1980

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

SUBJECT: THE FACTORING OF QUANTITATIVE ESTIMATES INTO SEISMIC SAFETY
EVALUATION

Dear Mr. Dircks:

In recent reviews of the seismic safety of reactors, including LACBWR and GETR, the Regulatory Staff and/or the Applicant have included probabilistic estimates of the safe shutdown earthquake, permanent fault displacement, liquefaction, etc. The Committee wishes to encourage such efforts. However, in connection with the development of such quantitative estimates, the ACRS believes it is appropriate to develop a rationale for including them in the decision making process in some consistent way.

The matter was discussed with members of the Regulatory Staff at the Subcommittee meeting on Extreme External Phenomena held on June 4, 1980.

The ACRS would appreciate learning what basis the Staff is developing in regard to this matter.

Sincerely,

A handwritten signature in cursive script that reads "Milton S. Plesset".

Milton S. Plesset
Chairman

8008010/20