

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 20, 1996

MEMORANDUM TO:

James M. Taylor Executive Director for Operations

FROM:

Edward L. Jordan, Chairman Committee to Review Generic Requirements

SUBJECT:

EXPEDITED CRGR REVIEW OF THE PROPOSED FINAL REVISIONS TO 10 CFR 100, "REACTOR SITE CRITERIA"

The Committee to Review Generic Requirements (CRGR) met on May 9 and May 17, 1996 to review, at the request of the Director, RES, the final rulemaking package associated with the revised Reactor Site Criteria. The proposed final rulemaking involves revisions to 10 CFR 50 and 10 CFR 100 with respect to site suitability and nuclear power plant seismic design. The review package consisted of a number of documents associated with the rule change itself, as well as the accompanying regulatory guides and Standard Review Plan modifications.

The CRGR first reviewed its jurisdiction. The Committee agreed that inasmuch as the guidance package was forward-fit only, the term "backfit" does not apply. In this sense, the package is not subject to the terms and conditions of 10 CFR 50.109. The Committee also agreed that the material was within the scope of the CRGR charter. We did express the view that the staff should verify that current plants which might apply for license renewal and license amendments would not be subject to the new (Subpart B) requirements as embodied in the package. The staff affirms that the operating plants when applying for license renewal and license amendments will not be subjected to this rule change.

The Committee considered the technical aspects, which may be divided into two broad areas: seismic and non-seismic. In general, the Committee supported the changes in the seismic area, and made several comments in this area. The details of the CRGR comments in this area will be presented in the meeting minutes, and the staff has agreed to our suggestions. Thus, we endorse this portion of the rule.

In the non-seismic area, the Committee primarily focused on the policy and guidance relating site acceptability to radiological dose limitations and population distribution. Specifically, the Committee noted that the present dose calculation which is used for reactor siting, and has been used for almost 35 years, has the following characteristics and assumptions:

A major accident is hypothesized such that the potential hazards would not be exceeded by any other accident generally considered credible.

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- The containment leaks at its demonstrable leak rate, i.e., does not suffer gross failure.
- Some credit may be given for fission product removal systems.
- There is an exclusion area such that an individual located at any point on its boundary for two hours immediately following the onset of the fission product release would not receive a total radiation dose in excess of 25 rem or a total thyroid dose in excess of 300 rem.
- There is a low population zone (LPZ) such that an individual located at any point on its outer boundary exposed to the radioactive cloud during the entire period of passage (taken to be 30 days) would not exceed the same dose limits.

The proposed final rule as reviewed by the CRGR contained' most of the features of the original Part 100 as promulgated by the AEC in 1962. The portion of this rule which deals with release of fission products into containment does account for research insights, and is much more realistic than the present rule and guidance. However, some other important insights gained from severe accident research are not taken into account in this rule, for example:

- In many cases studied, the risk-dominating accidents do not involve the containment at all (e.g., interfacing LOCA and steam generator tube rupture which bypass the containment). Furthermore, for some sequences there is the possibility of consequent early containment failure or late failure. The analytical and experimental research insights include early containment failure likelihoods due to pressure loads from direct containment heating or melt-through, and late containment failure from thermal-hydraulic loadings and hydrogen combustion.
- Modern probabilistic risk analysis, which couples accident sequences, core response, fission product release, and containment response, proceeds in an orderly way to account for public risk. The proposed rule omits some of this orderly process.

Relationship to 50.47, Appendix E:

Although the dose calculation accounts for the likely variations in wind direction, it is not credible that an individual would remain at the outer boundary of the LPZ for 30 successive days² and, in general, the role of emergency planning and response in terms of dose saving to individuals at the outer boundary of the EAB or LPZ is not acknowledged. While this may be

¹Although relocated from 10 CFR Part 100 to Part 50.

²In fact, page 10 of the proposed Federal Register Notice, in effect, conceded that the concept of a 30-day exposure is somewhat unlikely.

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acceptable for purposes of siting, it would be instructive for the statement of considerations to note that such emergency response would no doubt result in lower doses in practice.

De-coupling of Siting to Design (non-seismic):

Concerning the question of calculating EAB and LPZ boundary doses during the "first" vs the "worst" two-hour period, the CRGR observed that there are artificial assumptions involved in both approaches. Examples discussed were: (a) the selection of a two-hour period instead of one-hour or three-hour period; (b) choice of the two-hour exposure period itself (say, from six hours through eight hours following onset of fission product release, rather than cumulative exposure over the entire eight-hour period; and (c) the assumption that a hypothetical individual would remain in the cloud path and not evacuate. The Committee also noted that ground shine was not taken into account as a dose contributor. Inasmuch as both approaches are based on similar and somewhat arbitrary assumptions, the CRGR did not take a position in favor of either. The Committee noted, however, that the use of the "worst" two hours could in some cases affect the ESF design requirements (i.e., containment sprays) and, therefore, would couple siting to design.

The CRGR believes that siting should be de-coupled from design. We understand that a recommendation will be made to the Commission late this year regarding a possible follow-up to Phase II (Part 100) rulemaking effort. The Committee supports a follow-up to Phase II rulemaking as a vehicle for further addressing this objective.

Comments about the CRGR Review Process:

The CRGR reviewed the original proposed rule on this subject in March, 1992 during Meeting No. 217. Subject to various comments, the Committee endorsed the proposed rule for publication. The proposed rule was published in October 1992. At the May 9, 1996 briefing, the staff informed the Committee that due to a number of factors, including some adverse comments on the package, the proposed rule had been withdrawn and a second proposed rule was issued for comment in 1994. A schedule was adopted by the staff which called for a Commission briefing on June 3, 1996. However, the CRGR review package (well over 500 pages) was not sent to the CRGR until Monday, May 6, 1996. The staff wanted a disposition in time to support the EDO briefing on May 23rd. The CRGR scheduled a briefing session on May 9th and a review session on May 17th. This was the first opportunity that the Committee had to comment on the form and content of the revised (non-seismic) site criteria, which significantly deviated from the first proposed rule (1992 version.) The Committee is concerned that the schedule did not provide proper allowance for the time needed for CRGR review.

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Conclusions and Bases:

Although some important insights of probabilistic risk analyses, and some aspects of severe accident research, are not reflected in the new rule, the Committee concluded that:

The seismic portion of the rule represents a major improvement.

- The proposed rule in the non-seismic area is an improvement, albeit modest, to the present rule and guidance.
- The public comment process did not result in major disagreement.
- It is not likely that significant further improvement could be achieved in a reasonable period of time.

Based on the above factors, the Committee does not object to the issuance of this rule.

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