

ACRS-3007

PDR 10/3/96

Certified by William Lindblad
7/9/96

Issued: 6/14/96

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
EXTREME EXTERNAL PHENOMENA SUBCOMMITTEE
MEETING MINUTES
APRIL 3, 1996
ROCKVILLE, MARYLAND

INTRODUCTION

The Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on Extreme External Phenomena held a meeting on April 3, 1996, in Room T-2 B3, 11545 Rockville Pike, Rockville, Maryland, with representatives of the U.S. Nuclear Regulatory Commission (NRC). The purpose of this meeting was to review the proposed final revisions to 10 CFR Parts 50 and 100, new Appendix S to Part 50, and associated Regulatory Guides and Standard Review Plan (SRP) sections. The entire meeting was open to the public. Mr. Amarjit Singh was the Cognizant ACRS staff engineer for this meeting. The meeting was convened at 8:30 a.m. and adjourned at 3:30 p.m.

ATTENDEES:

ACRS Members

Mr. W. Lindblad, Chairman
Dr. D. Miller, Member
Dr. T. Kress, Member

Dr. D. Powers, Member
Dr. M. Fontana, Member
Dr. R. Seale, Member

Nuclear Energy Institute

Mr. R. Anderson

Westinghouse Electric

Mr. J. Grover

Principal NRC Speakers and Consultants

Mr. L. Soffer, Office of Nuclear Regulatory Research (RES)
Dr. A. Murphy, RES
Dr. N. Chokshi, RES
Mr. R. Kenneally, RES
Mr. T. King, RES
Mr. C. Ader, RES
Mr. B. Zalzman, Office of Nuclear Reactor Regulation (NRR)
Mr. R. Emch, NRR
Mr. J. Kudrick, NRR
Mr. M. Snodderly, NRR

No written comments or requests for time to make oral statements were received from members of the public. Approximately five members of the public attended the meeting. A list of those who registered is available in the ACRS Office.

DESIGNATED ORIGINAL

Certified By

EMB

9610070167 960614
PDR ACRS
3007

PDR

O&M-7 ACRS
O&M-6 Meeting
R501
0/1

April 3, 1996

OPENING REMARKS BY THE SUBCOMMITTEE CHAIRMAN

Mr. William Lindblad, Chairman of the Extreme External Phenomena Subcommittee, convened the meeting at 8:30 a.m. and stated that the purpose of the meeting was to discuss the proposed final revisions to 10 CFR Parts 50 and 100 and associated Regulatory Guides and SRP sections. He also stated that the Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

DISCUSSION OF ITEMS

Introduction, Chronology, and Overview of Current Rule (Seismic)

-Mr. Leonard Soffer, OEDO, formerly with RES

Mr. Leonard Soffer presented a brief chronology and overview of the current rule. He stated that 10 CFR Part 100, one of the oldest of the Commission's regulations, was issued in 1962. Appendix A to Part 100 was issued in November 1973. ACRS was briefed on the first proposed revision to Appendix A in February 1992. The proposed rule was published in October 1992 for public comment. Due to the substantive nature of changes, the proposed rule was withdrawn in March 1994 in its entirety; the revised proposed rule was reissued in October 1994. The proposed revised final rule has two subparts. Subpart A consists of the existing regulations, which remain for the current operating plants. Subpart B is applicable to the future plants.

Seismic and Geologic Siting Criteria

-Dr. Andrew Murphy, RES

Dr. Andrew Murphy, RES, presented the background and the technical aspects of the proposed revisions to the seismic and geologic siting criteria for nuclear power plants. He stated that the current regulations are too detailed, inflexible, and lack clarity leading to conflicting interpretations and do not reflect recent advances in seismology and geology. The principal purpose of the revision is to provide stability in license reviews for future plants. He stated that one of the staff's proposed actions is to decouple siting criteria from plant design. He described areas where substantive changes had been made in the regulatory requirements or guidance, especially in the definition of the operating-basis earthquake (OBE).

Dr. Murphy discussed the significant revisions made to geological siting criteria in Appendix A (10 CFR 100.23), specifically the removal of the definition of the OBE from Part 100 and the guidance provided for the uncertainty analysis. Dr. Murphy stated that the

April 3, 1996

role of probabilistic analysis is to ensure that all of the uncertainties have been included in the assessment of the seismic hazard and the role of the deterministic analysis is to ensure that the resultant design provides protection against the most likely worst case that should be considered in the design of the plant. He concluded by providing the regulatory guidance assembled for the earth science portion the earthquake engineering in Regulatory Guide 1.165, "Guidance for Determining the Safe Shutdown Earthquake for Nuclear Power Plant."

Use of Probabilistic Seismic Hazard Analysis

-Dr. Nilesh Chokshi, RES

Dr. Nilesh Chokshi, RES, presented the details of the probabilistic hazard analysis and the steps involved to determine the controlling earthquake from semi-probabilistic analysis. He discussed briefly the comparisons that were which was made from the nine sites to determine the design basis ground motion. Dr. Chokshi stated that in the proposed final rule, the uncertainties can be addressed through a probabilistic analysis. He also stated that the proposed new Appendix S to 10 CFR Part 50 is applicable to Part 52 applicants and will not apply to existing plants. The staff has provided for guidance, associated regulatory guides and Standard Review Plan sections with the proposed final rule.

Non Seismic

-Mr. Leonard Soffer, OEDO

Mr. Soffer, briefly discussed the proposed final rule and stated that it retains the use of source term and dose calculations to determine the distance to the exclusion area boundary (EAB) and the size of the outer radius of the low population zone (LPZ). The proposed final rule requires that any individual, located at any point on the exclusion area boundary for any two-hour period following the postulated release of the fission products, not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE). Similarly, an individual located at the outer boundary of the LPZ, who is exposed to the radioactive cloud resulting from the release of the postulated fission products (during the entire period of its passage), not receive a dose in excess of 25 rem TEDE. The source term dose criteria are to be relocated to 10 CFR Part 50.34. With regard to population density, the proposed final rule states that reactor sites should be located away from very densely populated centers and that areas of low population density are, generally, preferred. However, in determining the acceptability of a particular site located away from a very densely populated center but not in an area of low density, consideration will be given to safety, environmental, economic, or other factors, which may result in the site being found acceptable. The guidance for preferred population density is

provided in Revision 2 of Regulatory Guide 4.7, "General Site Suitability Criteria".

Mr. Soffer also stated that the reason for revising 10 CFR Part 100 was to facilitate the considerations that went into Part 52 regarding the licensing of standardized designs without a site or certified sites without a set design. Mr. Soffer stated that the elements of the revised final rule, the source term and dose criteria are being relocated to 10 CFR Part 50.34. The dose criteria have been changed from 25 rem whole body and 300 rem thyroid to 25 rem TEDE. The dose to an individual at the EAB is not to exceed 25 TEDE for any two-hour period following the fission product release.

Mr. Soffer stated that the RES staff has a differing opinion regarding the time period during which the dose to an individual at the EAB is to be evaluated. RES recommends that the final rule be modified from "any two-hour period after release of fission products" (referred to as the "worst two hours") to a "period of two hours commencing with fuel failure plus the time period from accident initiation until fuel failure begins" (referred to as the "first two hours").

Mr. Zalzman discussed NRR's view regarding the use of first two hours and the worst two hours. NRR believes that regarding:

- ° Proposed licensing framework would provide a relaxation of ESF performance requirements commensurate with updated source term and radiological insights
- ° Regulatory requirements for determining in-containment radioactive material during the two-hour dose evaluation period should be consistent and should contain provisions for addressing designs substantially different from those analyzed in NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants"
- ° Analysis should be easy to perform and reproducible with confidence
- ° Technical bases and analytical methods should be defensible

For these reasons, the NRR staff recommends that the proposed final rule should be issued with the worst two-hour period for the dose evaluation.

April 3, 1996

SUBCOMMITTEE RECOMMENDATIONS

The subcommittee recommended that representatives of the staff brief the full Committee on the above-discussed issues.

The meeting was adjourned at 3:30 p.m. on April 3, 1996.

.....

NOTE: Additional details of this meeting can be obtained from a transcript of this meeting available in the NRC Public Document Room, 2120 L Street, N.W., Washington, D.C. 20006, (202) 634-3274, or can be purchased from Neal R. Gross & Co., Inc., Court reporters and Transcribers, 1323 Rhode Island Avenue, N.W., Washington, D.C. 20005, (202) 234-4433.