



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

ACRSR-1700

PDR

June 17, 1997

The Honorable Shirley Ann Jackson
Chairman
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

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Dear Chairman Jackson:

SUBJECT: PROPOSED STAFF POSITION REGARDING INCLUSION OF A
CONTAINMENT SPRAY SYSTEM IN THE AP600 DESIGN

During the 442nd meeting of the Advisory Committee on Reactor Safeguards, June 11-14, 1997, we met with representatives of the NRC staff and the Westinghouse Electric Corporation to discuss the proposed staff position that the AP600 design should include a containment spray system or equivalent for accident management following a severe accident. We also had the benefit of the documents referenced.

The staff position is that the addition of a nonsafety-related containment spray system in the AP600 design would achieve an appropriate balance between prevention and mitigation of severe accidents. The staff stated that such a system would compensate for the uncertainties associated with natural removal mechanisms for aerosols during severe accidents and provide for accident mitigation and operator intervention capability as part of a long-term accident management strategy. The staff believes that a containment spray system or equivalent is consistent with the AP600 passive design philosophy and the Commission's defense-in-depth philosophy.

The Westinghouse position is that the AP600 design meets existing regulatory prevention and mitigation criteria, including the Safety Goals. This may well be the case; however, we have not yet completed our review. Westinghouse also contends that a requirement for additional systems is neither justified nor warranted. The information presented to us by Westinghouse did not address the relevant uncertainties associated with the AP600 probabilistic risk assessment.

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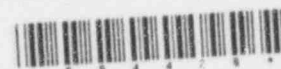
Ideally, the determination of the need for a containment spray system should be based on a judgment as to the levels of

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uncertainties associated with aerosol depletion and overall risk, as well as on the value of additional accident management capability. The first question of interest is, what are the nature and extent of the uncertainties of concern. If all uncertainties were quantifiable, it would be fairly straightforward to determine whether sufficient defense-in-depth is built into the system by assessing the risk status with respect to the subsidiary Safety Goals (core damage frequency and large, early release frequency). At present, however, a large component of uncertainties remain unquantified. The identification of these uncertainties and the qualitative judgments regarding their impact on regulatory decisions would make the debate more specific and would enhance communication among the stakeholders.

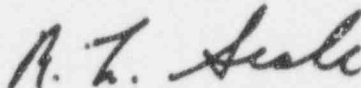
In judging the usefulness of a containment spray system in compensating for these uncertainties, both positive and negative impacts of this system should be evaluated in a quantitative and qualitative way. A judgment based on such an evaluation would help make the decision more acceptable to stakeholders because the basis for the decision would be explicit and transparent. Furthermore, such an evaluation process would be a good first step towards the integration of risk and traditional concepts such as defense-in-depth.

Although we prefer to have the information from the evaluation outlined above, based on our current state of knowledge, we support the staff's contention that the addition of a severe accident mitigation system is appropriate. The addition of a spray system to the AP600 containment would significantly increase its effectiveness in fission product control and provide the ability to intervene and control the course of an accident. We believe, however, that the spray design concept suggested by the staff is marginally adequate.

The debate associated with this issue and the difficulty of making a decision highlight our belief that the NRC needs to develop a new policy statement that would provide more guidance on the extent and nature of defense-in-depth expected by the Commission.

Dr. Dana A. Powers did not participate in the Committee's deliberations regarding this matter.

Sincerely,



R. L. Seale
Chairman

References:

1. ACRS letter dated June 15, 1995, from T. S. Kress, Chairman, ACRS, to James M. Taylor, Executive Director for Operations, NRC, Subject: Proposed Commission Paper on Staff Positions on Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design.
2. ACRS report dated August 15, 1996, from T. S. Kress, Chairman, ACRS, to Shirley Ann Jackson, Chairman, NRC, Subject: SECY-96-128, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design."
3. Memorandum dated November 12, 1996, from James M. Taylor, Executive Director for Operations, NRC, to the NRC Commissioners, Subject: Clarification of Staff Position in SECY-96-128, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standard Pressurized Reactor Design."
4. Memorandum dated January 15, 1997, from John C. Hoyle, Secretary, NRC, to Hugh L. Thompson, Jr., Acting Executive Director for Operations, NRC, and Karen D. Cyr, General Counsel, NRC, Subject: Staff Requirements - SECY-96-128 - Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design.
5. Memorandum dated February 19, 1997, for the Commissioners, from Hugh L. Thompson, Jr., Acting Executive Director for Operations, NRC, Subject: SECY-97-044, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design."
6. Memorandum dated March 18, 1997, from L. Joseph Callan, Executive Director for Operations, NRC, to Chairman Jackson, Subject: Use of Non-Safety-Related Equipment to Address Safety Concerns on Nuclear Power Plants.
7. Letter dated March 13, 1997, from Brian A. McIntyre, Westinghouse Electric Corporation, to John Hoyle, Secretary, NRC, Subject: Westinghouse Comments on SECY-97-044, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standard Pressurized Reactor Design."
8. Memorandum dated May 16, 1997, from L. Joseph Callan, Executive Director for Operations, NRC, to the NRC Commissioners, Subject: Westinghouse Comments on SECY-97-044, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standard Pressurized Reactor Design."