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FOR IMMEDIATE RELEASE
(Monday, September 26, 1994)

NOTE TO EDITORS:

The Nuclear Regulatory Commission has received two reports (attached) from its independent Advisory Committee on Reactor Safeguards. The reports, in the form of letters, comment on a proposed final version of NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants," and proposed revisions to Part 50's Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors".

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Attachments:
As stated

September 20, 1994

The Honorable Ivan Selin, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Selin:

SUBJECT: PROPOSED FINAL VERSION OF NUREG-1465, "ACCIDENT SOURCE
TERMS FOR LIGHT-WATER NUCLEAR POWER PLANTS"

During the 413th meeting of the Advisory Committee on Reactor Safeguards, September 8-10, 1994, we discussed the proposed final version of NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants." During the meeting, we had a discussion with the staff regarding how comments on the draft version of this document have been accommodated in the final version. We also had a presentation by a representative of Northeast Utilities on the safety importance of adopting proposed accident source term timing assumptions. The draft version was discussed with the Committee at the 381st meeting in January 1992, and comments were provided in our report dated January 15, 1992. We also had the benefit of the documents referenced.

NUREG-1465 defines accident source terms for use in the safety analysis of future light water reactors to replace the source term specified in Regulatory Guides 1.3 and 1.4. The proposed source terms are based on the vast amount of research sponsored over the last 15 years by the NRC and others. The proposed source terms specify the releases of eight categories of radionuclides over four time intervals after the initiation of an accident. Most of these radionuclides are expected to form aerosol particles in the containment. Only the noble gases and 5 percent of the iodine are in gaseous form. This contrasts with the source term now used which specifies an instant release consisting of 100 percent of the core inventory of the noble gases and 50 percent of the iodines (half of which are assumed to deposit on interior surfaces very rapidly) to the containment.

We believe it is important to have more realistic accident source terms available for regulatory activities. NUREG-1465 presents source terms which are a vast improvement over the source term now available. We do, however, have some comments.

A variety of calculations has been examined to develop the proposed source terms. In some cases, bounding values determined from these calculations have been adopted. In other cases, mean values have been selected, and in still others, values less than the mean have been chosen. As a result, it is difficult to ascertain the conservatism inherent in the proposed source terms. We believe it important to clarify this level of conservatism especially since the proposed source terms may be used for the analyses of both design basis and beyond design basis accidents. Appropriate levels of conservatism are quite different for these two classes of accidents.

Release fractions of some categories of radionuclides have been adjusted in the final version of NUREG-1465 from values in the draft that were derived from calculations. It appears that these adjustments have been based on expert opinions provided in comments by reviewers of the draft report. We believe these adjustments need to be better justified or not be made.

Ongoing source term research activities may yield results that would substantially alter the understanding that has been the basis of the proposed source terms. A mechanism is needed for timely updating of regulatory source terms in response to significant research findings.

The target application of the proposed source terms is to future light water reactors. Since the source terms have been derived from calculations for existing light water reactors, explicit provisions should be included in NUREG-1465 to accommodate specific features of future reactors.

We agree that licensees of existing reactors should not be required to adopt the proposed source terms. Information

provided to the Committee suggests that use of realistic timing assumptions for radionuclide releases to the containment during accidents can lead to safety improvements in existing plants. We urge that the risk implications be evaluated and consideration be given to allowing current licensees the option of using the timing assumptions in the proposed source terms without performing a complete source term reanalysis.

We emphasize the importance of realistic source terms in regulatory applications and believe that the use of realistic source terms could result in changes in reactor design and operation that reduce risk. We continue to be interested in the future application of the proposed source terms to specific regulatory areas and issues and wish to be kept informed.

Dr. Thomas S. Kress did not participate in the Committee's deliberations regarding this matter.

Sincerely,

W. J. Lindblad
Vice-Chairman, ACRS

References:

1. Memorandum dated August 5, 1994, from Themis P. Speis, RES, for John T. Larkins, ACRS, transmitting Draft Final NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants"
2. Letter dated April 29, 1994, from J. F. Opeka, Connecticut Yankee Atomic Power Company/Northeast Nuclear Energy Company, to Mr. W. T. Russell, Director, NRR, Subject: Accident Source Term Timing Assumptions
3. Report dated January 15, 1992, from David A. Ward, Chairman, Advisory Committee on Reactor Safeguards, to Ivan Selin, Chairman, NRC, Subject: Proposed 10 CFR Part 50 and Part 100 (Nonseismic) Rule Changes and Proposed Update of Source Term

September 19, 1994

The Honorable Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Selin:

SUBJECT: PROPOSED REVISIONS TO APPENDIX J TO 10 CFR PART 50,
"PRIMARY REACTOR CONTAINMENT LEAKAGE TESTING FOR
WATER-COOLED POWER REACTORS"

During the 413th meeting of the Advisory Committee on Reactor Safeguards, September 8-10, 1994, we reviewed the proposed revisions to Appendix J to 10 CFR Part 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Our Subcommittee on Containment Systems also reviewed this matter at a meeting on September 7, 1994. During this review, we had the benefit of discussions with representatives of the NRC staff, Nuclear Energy Institute (NEI), Grand Gulf Nuclear Station (Entergy Operations, Inc.), and ANS-56.8 Working Group (Containment System Leakage Testing Requirements). We also had the benefit of the documents referenced.

We are in general agreement with the proposed revisions to Appendix J and have no objection to the publication of the proposed rule for public comment. The changes proposed do not appear to have significant potential to increase public risk and, in fact, may reduce risk by decreasing the probability of accidents during shutdown. In addition, the changes will permit staff and industry resources to be redirected to more risk-significant issues.

The staff identified two issues that remain unresolved with industry. These are: (1) the proposed rule allows a maximum interval for leakage testing of Type C components (isolation valves) of 60 months, whereas industry would prefer a staggered test program leading to a maximum of 120 months; and (2) the staff proposes that certain leak testing provisions be incorporated into the technical specifications for the individual plants, whereas the industry proposes that the leak testing provisions be a commitment in the Final Safety Analysis Report (FSAR).

With regard to the leakage testing interval for Type C components, the arguments for the 120-month interval are reduction in costs, in occupational exposure, and in shutdown risks. The staff arguments for an initial 60-month limit are: (1) a conservative approach should be adopted until experience is gained, and (2) aging effects on leakage may escape timely detection if a period longer than 60 months is allowed. We accept the staff position on this issue, which includes the option for a 120-month interval after evaluating experience with the proposed rule. Our acceptance is conditional on the assumption that valve operability (as opposed to leakage) will be demonstrated appropriately by other means such as those already implemented under Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance."

We note that any shutdown risk benefit that may be gained by increasing the test interval has not been quantified. In addition, the staff has acknowledged that it has not looked for aging effects on valve leakage in older plants. We recommend that the staff examine both of these issues in order to provide additional insights relative to the appropriate maximum test

interval for Type B and C components. The shutdown risk issue could be evaluated by extension of the recently completed shutdown risk assessments for Surry and Grand Gulf nuclear plants.

With respect to the second unresolved issue, both the staff and NEI agree that the allowable leakage rate for the containment (which we view as the performance goal) should be included in the Technical Specifications (TS). The staff is still considering requirements that may be needed in the TS to ensure that program changes are reviewed by the staff. An example is the algorithm to be used for extension of Type C isolation valve leakage testing. NEI argues that it is sufficient to place these requirements in the FSAR so that changes can be made using the 10 CFR 50.59 process. Since the additional TS requirements proposed by the staff are counter to the concept of the performance-based Maintenance Rule, we recommend that the staff adopt the NEI position on this issue.

We plan to review this matter after reconciliation of the public comments.

Additional comments by ACRS Members Thomas S. Kress and Robert L. Seale and ACRS Members James C. Carroll, Ivan Catton, and William J. Lindblad are presented below.

Sincerely,

T. S. Kress
Chairman

Additional Comments by ACRS Members Thomas S. Kress and Robert L. Seale

We fully agree with the Committee that there is unlikely to be an unacceptable increase in risk as a result of this proposed change to the leakage testing interval and that this is an appropriate area to provide some regulatory relief for the industry. Nevertheless, we have two objections to the form of the proposed revisions:

1. We believe a bad precedent is set for performance-based regulations by having the relaxation (or tightening) of the regulatory oversight be on the performance measure frequency itself. It should be a general principle that these be separate.
2. We are unconvinced that an adequate technical basis has been established that two consecutive successful leakage tests

provide appropriate criteria for acceptable performance in this case. This, again, sets a bad precedent for supposedly performance-based regulations.

Additional Comment by ACRS Members James C. Carroll, Ivan Catton, and William J. Lindblad

While we believe the Appendix J revisions proposed by the staff will protect public health and safety, the further provisions that were proposed by NEI (staggered testing of classes of Type C components with a maximum testing interval of 120 months) seem to us to be proper as well. The conditions under which extended test intervals would be permitted appear to be consistent with those contemplated by the Maintenance Rule.

References:

1. Memorandum dated August 23, 1994, from Joseph A. Murphy, Office of Nuclear Regulatory Research, NRC, for John T. Larkins, Executive Director, Advisory Committee on Reactor Safeguards, Subject: Performance-Based Containment Leakage Test Rulemaking (Transmitting Draft SECY Paper for the Commissioners from James M. Taylor, EDO, undated)
2. Nuclear Energy Institute, NEI 94-01, Draft Revision C, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," August 1, 1994
3. U.S. Nuclear Regulatory Commission, NUREG-1493, Draft (Revision 2, 3/31/94), "Performance-Based Containment Leak-Test Program"
4. Electric Power Research Institute/Science Applications International Corporation, EPRI TR-104285, Final Report dated August 1994, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals"