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FOR IMMEDIATE RELEASE  
(Thursday, September 21, 1995)

NOTE TO EDITORS:

The Nuclear Regulatory Commission has received the attached report, in the form of a letter, from its independent Advisory Committee on Reactor Safeguards. The report comments on the development of improved techniques for more accurately detecting and assessing steam generator tube defects.

In addition, the NRC's Executive Director for Operations has received three ACRS letter reports. They provide comments on:

- 1) A Nuclear Energy Institute petition that proposes to amend the NRC's fire protection rule;
- 2) Health effects valuation in NRC regulatory activities;
- 3) Proposed resolution of generic issue 24, "Automatic Emergency Core Cooling System Switchover to Recirculation."

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Attachments:  
As stated

September 15, 1995

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

Dear Chairman Jackson:

SUBJECT: DEVELOPMENT OF IMPROVED NONDESTRUCTIVE EXAMINATION  
(NDE) TECHNIQUES

During the 424th meeting of the Advisory Committee on Reactor Safeguards, September 7-8, 1995, we heard presentations from representatives of the Electric Power Research Institute (EPRI), the EPRI Technical Advisory Group on NDE, Zetec, Babcock & Wilcox Nuclear Technologies, ABB-Combustion Engineering, and Westinghouse Electric Corporation regarding activities to improve NDE techniques for more accurately detecting and assessing steam generator tube defects. The status of staff activities on the development of a new steam generator rule and a supporting research program was also discussed. We had the benefit of the documents referenced.

In the June 16, 1995 Staff Requirements Memorandum, the Commission asked the ACRS to assist the staff in encouraging the industry to develop improved NDE techniques for steam generator tube inspections. The industry presentations at our meeting indicated that substantial progress is being made on the development of techniques that will provide significantly improved capabilities for detecting and sizing circumferential flaws. Not surprisingly, industry efforts are focused on a rapid resolution of the circumferential cracking problem using evolutionary improvements in eddy current technology. In addition, development is proceeding on innovative techniques such as ultrasonic guided (Lamb) waves, in situ fluorescent dye-penetrant inspections, in situ tube burst pressure testing, and combined ultrasonic and eddy current probes. Improved methods of signal processing and display are being developed to aid interpretation of NDE results. We believe modern, real time, signal processing technologies could provide great improvements in signal interpretation, defect detection, and defect sizing.

The staff and industry both recognize that the current regulatory approach to steam generator inspections discourages the development and adoption of improved NDE techniques. In the current framework, an increased detection capability leads to more plugging or repairs without necessarily improving safety. We believe that adoption of a new steam generator rule with realistic requirements for demonstrating tube integrity could provide the industry with a strong economic incentive to develop more effective NDE techniques. Careful thought must be given to

the requirements for adequate "performance demonstrations" of the NDE techniques essential for implementing a new rule. The steam generator mockup being developed by Westinghouse Electric Corporation under the Office of Nuclear Regulatory Research sponsorship may provide a useful independent regulatory check on the adequacy of NDE inspection techniques.

Dr. William J. Shack did not participate in the Committee's deliberations regarding this matter.

Sincerely,  
/s/

T. S. Kress  
Chairman, ACRS

References:

1. Staff Requirements Memorandum dated June 16, 1995, from Andrew L. Bates, Acting Secretary of the Commission, Subject: Meeting with ACRS, June 8, 1995
2. NRC Information Notice 94-88, "Inservice Inspection Deficiencies Result in Severely Degraded Steam Generator Tubes," dated December 23, 1994
3. NRC Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes," dated April 28, 1995

September 15, 1995

Mr. James M. Taylor  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: THE NUCLEAR ENERGY INSTITUTE PETITION FOR RULEMAKING TO  
AMEND 10 CFR 50.48, "FIRE PROTECTION"

During the 424th meeting of the Advisory Committee on Reactor Safeguards, September 7-8, 1995, we completed our discussion regarding the subject rulemaking petition. Our Auxiliary and Secondary Systems Subcommittee met on June 7, 1995, to begin the review of this matter. During these meetings, we had the benefit of discussions with representatives of the staff, the Nuclear Energy Institute (NEI), and the Electric Power Research Institute (EPRI). We also had the benefit of the documents referenced.

The NEI petition for rulemaking proposes to amend 10 CFR 50.48, "Fire Protection," by adding an Appendix S, which is described as a "performance-based" alternative to the existing prescriptive Appendix R. NEI believes that the recommended addition to 10 CFR 50.48 will be "safety neutral" and that considerable cost savings will result.

We support risk-based regulations. It is not clear, however, how performance-based regulations should be developed from risk consideration. It is our perception that such regulations should include the following elements:

- Clearly stated objectives with demonstrable performance requirements, expressed either in deterministic or probabilistic terms.
- Flexibility in the methods that the licensee is permitted to use to meet the performance goals or criteria. These methods should be supported by operational experience and experimental results.
- The regulatory body must have a valid means to establish that the performance criteria have been met.

Unfortunately, the proposed rule in the NEI petition is deficient in all these elements.

The objective of the proposed rule is to assure "that the safety functions required to safely shut a plant down and maintain it in a safe condition are maintained during and following a fire." It

is further stated that fire modeling, as well as PRAs, may be used to identify the pertinent performance criteria. The proposed rule, however, avoids setting probabilistic requirements and uses non-quantitative language. Thus, there are references to "credible" fires and "credible" scenarios, as well as to "adequate" time for completing safety functions. These concepts need to be defined in quantitative, probabilistic terms. For example, we would expect a quantitative performance requirement for the probability that fire will compromise safe shutdown equipment and lead to core damage.

Some of the issues that the proposed rule raises could be naturally resolved in a PRA context. Examples are the inadvertent actuation of automatic suppression systems and the relevance of the current requirements regarding the concurrent occurrence of a fire and loss of offsite power. In addition, the proposed rule does not address the issue of transient fuels. PRAs have shown that, in some cases, transient fuels are required to produce fires of severity sufficient to damage redundant safety systems. Such transient fuels have been found in controlled areas in the past. Not only are transient fuels not addressed, the proposed rule suggests that some administrative controls dictated by Appendix R may be eliminated. We would prefer to see an evaluation of such issues in the context of a fire PRA.

We are concerned that neither the NRC nor NEI has any plans for conducting fire tests for refining the probabilistic analysis of time-to-suppression. We also have concerns about weakening the requirement for automatic fire detection systems, the lack of a methodology for treating the potentially damaging effects of smoke, the use of a limited fire initiation database, and the neglect of consideration of fire during shutdown. We will address these concerns should the rulemaking process advance.

Even though we support the use of PRA in the development of a performance-based rule, we note that, given the uncertainties in the state of the art, fire PRAs cannot be the sole basis for regulatory requirements. Developing the right mix of criteria based on PRA and criteria based on good engineering practice is a challenge and a necessary requirement for a well-written rule.

We believe it will take some time and resources to develop and institute performance-based fire regulation. We also believe doing so is an important step in the agency's move in this direction.

Additional comments by ACRS Members George Apostolakis, James C. Carroll, and Ivan Catton are presented below.

Sincerely,  
/s/

T. S. Kress, Chairman, ACRS

Additional Comments by ACRS Members George Apostolakis, James C. Carroll, and Ivan Catton

We support the Committee letter but have further comments for your consideration. The use of performance-based rules for fire protection is frustrated by conventional attitudes. The desire of regulators to have simple rules and tests for administrative convenience contrasts with the need of plant operators to have flexibility to arrive at optimal solutions. Unfortunately, the prescriptive characteristics embodied in regulations are accepted without proof, while any engineering solution supporting a performance requirement is subjected to a disproportionately higher standard of proof.

References:

1. Letter dated February 2, 1995, from W. Rasin, Nuclear Energy Institute, to John C. Hoyle, Acting Secretary, NRC, Subject: Petition for Rulemaking to Amend 10 CFR 50.48
2. SECY-94-090 dated March 31, 1994, from James M. Taylor, Executive Director for Operations, NRC, to the Commissioners, Subject: Institutionalization of Continuing Program for Regulatory Improvement
3. SECY-95-034 dated February 13, 1995, from James M. Taylor, Executive Director for Operations, NRC, to the Commissioners, Subject: Status of Recommendations Resulting from the Reassessment of the NRC Fire Protection Program
4. Memorandum dated December 30, 1994, from James M. Taylor, Executive Director for Operations, NRC, to the Commissioners, Subject: Eighth Quarterly Report on the Status of the Thermo-Lag Action Plan

September 13, 1995

Mr. James M. Taylor  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: HEALTH EFFECTS VALUATION

In your September 1, 1995 response to our letter of July 20, 1995, on the referenced subject, you stated that the staff continues to recommend retention of an undiscounted \$1000 per person-rem but may also include a discounted \$2000 per person-rem as a sensitivity parameter. The justification stated for this recommendation by the staff is that use of the discounted \$2000 per person-rem "would misleadingly suggest a level of precision which does not exist," and "would impose additional complications and staff burden, with no improved regulatory decisions."

We continue to recommend the use of a discounted \$2000 per person-rem for the following reasons:

- (1) Discounting is the technically correct approach for making cost comparisons. An undiscounted single-value surrogate is fundamentally incorrect, and its use can be very misleading. The NRC should not continue to use methods known to be incorrect in its regulatory activities.
- (2) The \$2000 value embodies an Office of Management and Budget recommended "value of a statistical life." Thus, it is very likely to be adopted by all other U.S. Government agencies in performing mandated cost/benefit analyses for their regulatory activities. There is considerable merit in promoting consistency in methodology across Government agencies.
- (3) The \$2000 value does not imply a different level of precision than does the \$1000 value.

We believe the change to \$2000 per person-rem is technically correct and adds to coherency in regulations. We look forward to discussing this matter with the staff in the immediate future.

Sincerely,  
/s/

T. S. Kress  
Chairman, ACRS

References:

1. Letter dated September 1, 1995, from James M. Taylor, Executive Director for Operations, NRC, to Thomas S. Kress, Chairman, Advisory Committee on Reactor Safeguards, Subject: Health Effects Valuation
2. Letter dated July 20, 1995, from T. S. Kress, Chairman, Advisory Committee on Reactor Safeguards, to James M. Taylor, Executive Director for Operations, NRC, Subject: Health Effects Valuation



September 12, 1995

Mr. James M. Taylor  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: PROPOSED RESOLUTION OF GENERIC ISSUE 24, "AUTOMATIC  
ECCS SWITCHOVER TO RECIRCULATION"

During the 423rd meeting of the Advisory Committee on Reactor Safeguards, July 13-14, 1995, we discussed the proposed resolution of Generic Issue 24. During this meeting, we had the benefit of discussions with representatives of the NRC staff. We also had the benefit of the document referenced. We concur with the resolution proposed by the staff.

Sincerely,

/s/

T. S. Kress  
Chairman, ACRS

Reference:

Memorandum dated May 8, 1995, from C. Serpan, RES, to J. Larkins, ACRS, Subject: Proposed Resolution of Generic Issue 24, "Automatic ECCS Switchover to Recirculation"

cc: J. Hoyle, SECY  
J. Blaha, OEDO  
L. Soffer, OEDO  
D. Morrison, RES  
L. Shao, RES  
C. Serpan, RES  
J. Cortez, RES  
A. Thadani, NRR