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Tel. 301/415-8200

FOR IMMEDIATE RELEASE
(Wednesday, December 21, 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:

1) the potential for loss of spent fuel pool cooling following a loss-of-coolant accident at the Susquehanna Steam Electric Station in Pennsylvania; and

2) revisions to NRC's Part 71 regulation, "Packaging and Transportation of Radioactive Material."

In addition, the ACRS sent a letter report to the NRC's Executive Director for Operations that comments on the agency's technical training program.

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Attachments:
As stated

December 19, 1994

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

Dear Chairman Selin:

SUBJECT: LOSS OF SPENT FUEL POOL COOLING FOLLOWING A LOSS-OF-COOLANT ACCIDENT AT THE SUSQUEHANNA STEAM ELECTRIC STATION

During the 416th meeting of the Advisory Committee on Reactor Safeguards, December 8-10, 1994, we discussed the NRC staff Draft Safety Evaluation Report (DSER) dealing with the potential for loss of spent fuel pool cooling following a loss-of-coolant accident (LOCA) at the Pennsylvania Power and Light (PP&L) Company's Susquehanna Steam Electric Station Units 1 and 2. During the meeting, we had the benefit of discussions with representatives of the NRC staff, PP&L, and the individuals who brought this matter to the attention of the NRC on November 27, 1992, through a 10 CFR Part 21 notification. We also had the benefit of the documents referenced. We considered this matter previously during our May 5-7, 1994 meeting.

The 10 CFR Part 21 notification described the individuals' concerns with: (1) the ability of Susquehanna to provide adequate cooling of the spent fuel storage pool following various design-basis LOCAs; (2) the potential causes and consequences of failure to cool the spent fuel storage pool; and (3) numerous regulatory issues regarding potential design deficiencies.

The primary concern raised by the two individuals was a postulated failure to cool the spent fuel storage pool following a design-basis LOCA or a LOCA with a loss of offsite power (LOOP). They posited that a design-basis LOCA would result in the failure of the nonsafety-related spent fuel pool cooling system. They further posited that a design-basis LOCA results in the development of a TID 14844-like radiological source term inside the reactor building that would prevent operators from entering the building and restoring cooling to the spent fuel pool. The individuals further postulated that, upon boiling in the pool, vapor would be transported throughout the reactor building by the ventilation systems and would eventually cause the failure of safety-related systems needed to mitigate the LOCA. The ultimate consequences of these boiling scenarios include severe core damage, failure of the stored spent fuel, and loss of primary and secondary containment.

The DSER, which stands separate from the staff's regulatory compliance evaluation, includes a review of certain specific aspects of the Susquehanna facility design and a deterministic examination of some of the physical phenomena involved. The evaluation also includes a probabilistic analysis of postulated event sequences involving loss of the spent fuel storage pool cooling.

In our review of this matter, we were looking for answers to three questions:

1. Is Susquehanna now operating without undue risk to the health and safety of the public?
2. Was Susquehanna operating in an unsafe condition prior to modifications and procedural changes that have been made?
3. Are there generic implications of undue risk at other operating plants?

Additionally, we have an interest in whether or not the postulated pool boiling sequences should have been part of the design-basis accident and, thus, part of the licensing basis for Susquehanna. Our interest here stems from our concerns about coherence in the regulatory process and about ill-advised actions that can create burdens on licensees without providing a corresponding increase in safety.

Clearly, the appropriate approach to answering the first question is to conduct a limited probabilistic risk assessment (PRA) for the plant as now configured, focusing on the LOCA sequences that can lead to spent fuel pool boiling. The staff has done this and found that the core-damage frequency (CDF) is less than $1 \times 10^{-6}/\text{yr}$. This clearly indicates that the plant is not at undue risk from these particular sequences.

The appropriate approach to answering the second question is to repeat the limited PRA but with the plant in the as-found configuration before any modifications. The staff has conducted this study and found that the risk was similarly low, with a CDF of $4 \times 10^{-6}/\text{yr}$.

Our opinion on this issue rests on how well we think these PRAs were done and whether or not the results are credible. Since we did not review these PRAs in any detail, we are unable at this time to make a judgment as to their quality. Because the safety case rests primarily on the validity of the results of these PRAs, we recommend that the PRAs and their associated uncertainty analyses be given a thorough review. The reviewers should pay particular attention to the treatment given the environmental effects brought

about by LOCAs, including interfacing system LOCAs. This area of PRA could use additional research by NRC.

We cannot judge the generic implications. The low risk for the "as-found" configuration (before modifications), indicated by the PRA result, indicates to us that spent fuel pool boiling is not likely to be of concern as a risk-contributor at other plants. Nevertheless, we think it appropriate that NRC issue a generic notification to all licensees describing this particular issue and requesting a review of plant vulnerability to spent fuel pool boiling. This could be an adjunct to the Individual Plant Examination (IPE) process.

With respect to the licensing-basis issue, we have the following opinion. If the PRA result indicating very low risk is correct, then it would be inappropriate at this time to consider augmenting the Susquehanna licensing basis with the postulated pool-boiling sequences.

Sincerely,

T. S. Kress, Chairman
ACRS

References:

1. Letter dated October 24, 1994, from Gary M. Holahan, Office of Nuclear Reactor Regulation, NRC, to J. T. Larkins, Executive Director, ACRS, Subject: 409th ACRS Meeting Followup Matters and transmitting Draft Safety Evaluation Report
2. Letter dated May 16, 1994, from D. Lochbaum and D. Prevatte, Members of Public, to J. T. Larkins, Executive Director, ACRS, Subject: Susquehanna Steam Electric Station Units 1 and 2 Loss of Spent Fuel Pool Cooling Licensing Basis

December 19, 1994

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

Dear Chairman Selin:

SUBJECT: REVISIONS TO 10 CFR PART 71, PACKAGING AND TRANSPORTATION
OF RADIOACTIVE MATERIAL

During the 416th meeting of the Advisory Committee on Reactor Safeguards, December 8-10, 1994, we discussed the subject proposed final rule with representatives of the NRC staff and the Nuclear Energy Institute. We also had the benefit of the document referenced.

The staff stated that the proposed revisions are being made for two reasons:

- to make U.S. transportation regulations compatible with the 1985 edition of the International Atomic Energy Agency (IAEA) regulations, and
- to promulgate new criteria for air shipment of plutonium as required by statute.

The following are the proposed revisions for the U.S. regulations:

- requiring additional hypothetical accident test criteria for certain types of packages,
- increasing the number of radionuclides with A_1 and A_2 quantities that determine shipping container requirements,
- changing the A_1 and A_2 quantities for some radionuclides,
- simplifying the fissile material transport classes,
- revising requirements for shipment of "low specific activity" (LSA) material, and
- including the criteria for packages used to transport plutonium.

The Committee supports the concept of making the U.S. regulations on packaging and transport of radioactive materials compatible with IAEA regulations if this can be done without undue compromise of safety. In the past, the ACRS has extensively reviewed the safety

aspects of the existing regulations. Our present review has not been in-depth because it is apparent that the proposed revisions have minor safety significance.

Our concerns are not with the revisions themselves but with the associated regulatory process that strikes us as being somewhat atavistic for the following reasons:

- the proposed revisions are solely developed deterministically and do not have a clear technical risk basis,
- a probabilistic risk analysis is lacking,
- a regulatory analysis for the departures from the IAEA regulations appears to be incomplete, and
- apparently, there have been no interactions with industry since 1989.

The IAEA regulation for LSA and surface-contaminated-object material calls for a limit on the exposure level at a particular distance from the unshielded material. The staff is concerned that large quantities of resin beads shipped in LSA containers could change geometry and lose self-shielding during an accident. As a result, personnel exposure could be greater than originally analyzed. Therefore, the staff proposes to depart from the IAEA regulations by placing a limit on the quantity of activity that can be shipped in LSA packages. We believe this departure would fail a cost/benefit screen as well as a screen on substantial increase in safety. We believe that a well-founded regulatory analysis that properly considers the probability and level of the greater exposure, and the practical limits on the mass of material in a shipment would indicate that the safety benefit would not justify the burdens created.

We recommend that the proposed revisions to 10 CFR Part 71, with the exception of the plutonium air shipment provisions, be reevaluated with the objective of making them equivalent to the IAEA regulations. We also recommend that a risk analysis be performed for the purposes of understanding the risk profile and quantifying the safety margins. If departures from IAEA regulations are found to be necessary based on risk considerations, dialogue should be renewed with those in the industry likely to be

Mr. James M. Taylor

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affected. We encourage a closer and continuing interaction with licensees in the consideration of these issues.

Sincerely,

T. S. Kress, Chairman
ACRS

Reference:

Draft SECY, undated, from James M. Taylor, Executive Director for Operations, NRC, to the Commissioners, Subject: Final Rule on Revision of NRC Transportation Regulations (received November 8, 1994)

Mr. James M. Taylor

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December 15, 1994

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

Dear Mr. Taylor:

SUBJECT: NRC TECHNICAL TRAINING PROGRAM

During the 416th meeting of the Advisory Committee on Reactor Safeguards, December 8-10, 1994, we discussed the NRC technical training program. Our Subcommittee on NRC Technical Training discussed this matter with representatives of the NRC staff during a meeting on December 7, 1994. In addition, two of our members toured the Technical Training Center (TTC) in Chattanooga, Tennessee on October 4, 1994. We also had the benefit of the documents referenced.

The TTC provides technical training in response to the needs identified by NRC program offices. Such training is limited to technical subjects and includes reactor technology, radiation protection, fuel cycle, safeguards, engineering support, and probabilistic risk assessment (PRA). Five full-scope simulators are maintained at TTC for training reactor inspectors, operator examiners, and others.

In discussions with Office for Analysis and Evaluation of Operational Data (AEOD) management and TTC representatives, we sensed a strong commitment to the evaluation and strengthening of existing programs, and a responsiveness to the emerging needs of the NRC in the areas of PRA and digital instrumentation and control systems.

Notwithstanding the broad nature of the existing inspector training program, we suggest that consideration be given to training related to water chemistry, health physics aspects of source terms, and the needs of inspectors monitoring licensee implementation of the Maintenance Rule (10 CFR 50.65). Additionally, the entire technical staff may benefit from training emphasis given to those aspects of reliability and uncertainty that are pertinent to the regulatory use of PRA and to performance-based regulation.

We plan to hold further discussions with the staff regarding training curricula in the areas of PRA and digital instrumentation and control systems. We plan to examine the staff's identification of learning objectives and its assessment of achieving individual course goals.

Mr. James M. Taylor

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Sincerely,

T. S. Kress, Chairman
ACRS

References:

1. U. S. Nuclear Regulatory Commission, Office for Analysis and Evaluation of Operational Data, "Technical Training Center Syllabus of Courses," 1994-1995
2. U. S. Nuclear Regulatory Commission, Office for analysis and Evaluation of Operational Data, "Technical Training Center Annual Report for Fiscal Year 1994"
3. Memorandum dated September 15, 1994, for All Employees from Kenneth A. Raglin, Technical Training Division, Office for Analysis and Evaluation of Operational Data, transmitting Technical Training Division Course Schedule for FY 1995