

Dr. George E. Apostolakis, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

September 17, 2001

SUBJECT: SECY-01-0100, "POLICY ISSUES RELATED TO SAFEGUARDS, INSURANCE,
AND EMERGENCY PREPAREDNESS REGULATIONS AT DECOMMISSIONING
NUCLEAR POWER PLANTS STORING FUEL IN SPENT FUEL POOLS"

Dear Chairman Apostolakis:

Thank you for your letter to the Commission of July 24, 2001, on the views of the Advisory Committee on Reactor Safeguards (ACRS) regarding SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools." The following is the staff's response to your comments, conclusions, and recommendations.

ACRS Comments on Policy Issues:

- Policy Issue 1: Application of Operating Nuclear Power Plant Safety Goals to Decommissioning Plants

The staff agrees with the ACRS conclusion that the Safety Goals for operating nuclear power plants be applied to decommissioning plants while spent fuel is being stored in the spent fuel pool.

- Policy Issue 2: Should the Commission develop an approach using probabilistic risk assessment for quantifying the likelihood of sabotage that would permit greater risk-informed regulatory decision making in the area of safeguards?

The staff partially agrees with the ACRS recommendation on this policy issue. Specifically, the July 24, 2001, letter states "Given the current state of the art with respect to a safeguards PRA, we agree with the staff's recommended Option 3." The ACRS goes on to recommend that the Office of Research prepare a strategy for developing and utilizing a safeguards PRA that includes the frequency of various levels of threat for both decommissioning and operating plants similar to Option 2 presented in SECY-01-0100.

As the staff stated in SECY-01-0100, developing a feasibility study for quantifying the initiating event frequency of radiological sabotage and the associated nature or level of the threat to operating or decommissioning nuclear power plants would be difficult and costly and would put the NRC in the lead ahead of other agencies that have a higher level of responsibility and expertise on this subject. The staff would need the support of these agencies to provide a comprehensive assessment of what is possible given the

current state of the art. It is not clear that other agencies would be willing to divert resources to assist the NRC in this effort. For these reasons, the staff did not recommend the development of a risk-informed approach for quantifying the likelihood of sabotage in SECY-01-0100.

- Policy Issue 3: How should the Commission define the safeguards protection goal to be applied to spent fuel pools at decommissioning plants?

It is the staff's understanding that the ACRS does not object to the use of a performance-based, deterministic approach to decommissioning nuclear power plant safeguards as presented in SECY-01-0101.

- Policy Issue 4: What level of insurance is appropriate for licensees of decommissioning plants given the low likelihood of a large onsite and offsite radiological release from a zirconium fire accident involving the spent fuel stored in the spent fuel pool?

The staff and the ACRS agree that offsite insurance coverage can be substantially reduced shortly after a facility permanently shuts down. The ACRS accepted the staff's assessment that the primary offsite insurance level be reduced to \$100 million and that decommissioning licensees be released from participation in the secondary retrospective rating pool. However, in its letter of July 24, 2001, the ACRS indicates that it would not agree with further incremental reductions of the insurance levels as a function of decay time until the large uncertainties associated with radiological sabotage can be resolved. In addition, the ACRS recommends that the conditional probability of a zirconium fire as a function of decay time should be characterized before further incremental reductions in insurance levels are considered. The staff notes that SECY-01-0100 does not recommend further reductions of offsite insurance at decommissioning plants beyond the initial reduction shortly after a plant permanently shuts down.

- Policy Issue 5: What level of offsite emergency preparedness (EP) is appropriate for decommissioning plants given the low likelihood of a radiological release large enough to exceed protective action guides offsite?

The ACRS letter of July 24, 2001, states that "...defense-in-depth should be applied in areas where the risks and associated uncertainties could be large. We think these attributes well describe the risk associated with decommissioning plants and this appears to be a place to maintain an appropriate level of EP as defense-in-depth." While the ACRS states that it agrees with relaxing offsite EP when sufficient warning time exists to respond to a postulated zirconium fire event on an ad hoc basis, the July 24, 2001, ACRS letter implies that some level of offsite EP be maintained at decommissioning plants until there is a more definitive technical assessment for determining the warning time as a function of decay time.

The staff has proposed to maintain a level of offsite EP consistent with the Commission's defense-in-depth philosophy while utilizing risk insights and spent fuel heatup times from NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants." The staff believes that full operating reactor offsite EP requirements are not the appropriate level of offsite EP for a decommissioning nuclear power plant after some initial period of spent fuel decay. The staff proposed that eventually the level of offsite EP could be reduced to a level similar to that required for a monitored retrieval fuel storage installation. The timing and specifics of the reduction would be determined in the rulemaking process in close collaboration with the Federal Emergency Management Agency and would be based on expert judgment of the need or benefit of specific offsite EP requirements relative to the physics of the zirconium fire. The staff proposes to conservatively apply the heatup time estimates in NUREG-1738.

- Existing Exemptions:

The staff and ACRS are in agreement that there is not an immediate undue risk to the health and safety of the public associated with postulated spent fuel pool accidents at currently decommissioning facilities given the long time periods available to support implementation of protective and mitigative measures and the presumed low likelihood of sabotage events.

- Staff and Industry Differences:

The ACRS believes that the differences between the staff and industry in the findings of NUREG-1738 with regards to ruthenium release fractions, probability of cask drop events causing rapid draining of a spent fuel pool, and the need for a formal peer review of the document would not impact the policy decisions made on SECY-01-0100. The staff agrees with this assessment.

- Other:

The ACRS recommends that the staff initiate a study to determine the conditional probability of a zirconium fire as a function of decay time. The staff agrees that currently, NUREG-1738 does not quantify the difference in the frequency of a zirconium fire event as a function of spent fuel decay. As pointed out by the ACRS in its letter, this study could contribute to developing a safeguards risk assessment and possibly result in additional benefits for reducing regulatory burdens in the insurance and EP areas. However, the staff does not consider this effort necessary to move forward with decommissioning regulatory improvements in the areas of safeguards, insurance, and EP which, in the staff's opinion, can proceed upon Commission direction on the policy options presented in SECY-01-0100.

Dr. Apostolakis

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Please feel free to contact me or Cynthia Carpenter of the NRR Generic Issues, Environmental, Financial, and Rulemaking Branch at (301) 415-1282 for any further information concerning this letter.

Sincerely,

/RA/

William D. Travers
Executive Director
for Operations

cc: Chairman Meserve
Commissioner Dicus
Commissioner McGaffigan
Commissioner Merrifield
SECY

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Dr. Apostolakis

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