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To: George Hubbard
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Subject: Sheron memo

Below

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MEMORANDUM TO: Brian W. Sheron, Associate Director
for Project Licensing and Technical Analysis
Office of Nuclear Reactor Regulation

FROM: John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Gary M. Holahan, Director
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY AND STATUS OF ONGOING STAFF EFFORTS TO
DEVELOP A RISK-INFORMED TECHNICAL BASIS FOR IMPROVING
REACTOR DECOMMISSIONING REGULATIONS

On March 17, 1999, we met with the Commission and discussed the current status of reactor decommissioning regulations and necessary licensing actions required for decommissioning facilities. We informed the Commission that revisions to the regulations were necessary in a number of areas to streamline the decommissioning process and eliminate unnecessary regulatory burden. The Commissioners and representatives from the nuclear industry urged us to take a risk-informed approach to developing the technical bases for these new rules.

In response to the Commission's direction during the March 17, 1999, meeting and the subsequent Staff Requirements Memorandum of June 23, 1999, we prepared SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants," (June 30, 1999). In SECY-99-168, we provided the details of our planned two-part approach to developing risk-informed regulations for reactor decommissioning. The first part consists of an integrated rulemaking effort which begins by developing a risk-informed technical basis for reducing emergency preparedness, insurance, and safeguards requirements at appropriate times after permanent shutdown of a reactor. The technical basis would then be used to begin a near-term rulemaking effort that would combine these rule changes into a single, integrated rulemaking package. We also proposed a longer term decommissioning regulatory improvement initiative in which we would perform a comprehensive review of all NRC regulations to identify those regulations applicable to decommissioning as well as those regulations that need to be changed to properly reflect the differences between operating and decommissioning nuclear power plants. While implementing this second effort, we also intend to clarify NRC power reactor decommissioning regulations. The proposed approach is to relocate them to a dedicated part within Title 10 of the Code of Federal Regulations. Details and status of our activities to accomplish these two objectives are provided in the sections below.

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Developing a Risk-Informed Technical Basis for an Integrated Rulemaking

In June 1999, the technical working group completed its 3-month preliminary effort to provide a technical basis for future exemption requests and rulemaking for decommissioning plants in the areas of emergency preparedness, safeguards, and insurance. During the effort, we held four separate public meetings to solicit input and comments from the public and the nuclear industry. Because of the unprecedented nature of much of our work and the short schedule for performing the study, we planned to complete an independent review and receive external input on the quality of our report before we publish it for public review and comment. However, at the request of the Nuclear Energy Institute (NEI), we agreed to an atypical approach where we publicly released the preliminary work as a draft report. We concluded that due to the significant outside interest, that the public, particularly the nuclear industry, might be able to provide additional information on operating practices, equipment, and data to enhance our product.

In July 1999, we held a 2-day workshop to receive feedback from the public. Comments were given in many areas, including heavy loads, human reliability, safeguards, and the thermal hydraulic analysis. These comments will be addressed by our current effort to finalize the report. As planned, we are now conducting an independent review of the draft and performing additional technical work in certain areas. The additional activities utilize resources from the technical working group, other NRC offices, and independent contractors.

In addition to information received at the workshop and public meetings, we received further information and written comments from NEI on July 30, August 18, August 26, and August 30, 1999. NEI raised issues in many areas including heavy loads, seismic events, and human reliability. In the area of heavy loads, we have improved our modeling techniques given the lack of probabilistic data available for heavy load drops. Using improved statistical techniques over those used previously in the draft report, we now estimate the frequency of heavy load drops leading to a loss of inventory in a decommissioning spent fuel pool to be lower than indicated in our draft report. With regard to seismic events, without plant-specific knowledge of the seismic capacities of the spent fuel pools, we have determined that use of a "checklist" and plant walkdown should be adequate to find potential seismic vulnerabilities at decommissioning units. We previously developed a checklist, and we are also reviewing a checklist proposed by NEI.

In the area of human reliability analysis, we have requested the opinion of several world-renowned human reliability experts to attempt to extend the state-of-the-art in human error rate prediction for events taking place over multiple days. NEI requested to be involved in any activities in this area. However, legal guidance from the Office of the General Counsel advised that direct NEI participation was not considered appropriate. As an alternative, when we provided our human reliability position to the outside experts, it was also placed in the public document room and mailed to interested members of the public, including NEI, to provide the maximum opportunity for the public to provide comments and participate in the process.

Although NEI and the nuclear industry have not performed a spent fuel pool risk assessment, NEI has submitted detailed comments on our analysis. We have provided NEI's comments to our contractor for evaluation as part of the ongoing independent technical review. NEI has pressed for a risk-based, rather than a risk-informed, decisionmaking process. This

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concept runs counter to the Commission's policy statement on risk-informed regulation and the staff's guidance in RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Our final recommendations on spent fuel pool accidents will be based on both risk and deterministic information, and will consider margin of safety and defense in depth. We do not intend to make regulatory determinations solely on the basis of risk values.

We are in the final phases of our project. In our final assessment efforts, we will evaluate the submittals by NEI and other information included in comments from the public. Based on our original working group plan and in response to public comments, we are working on or will include the following items in our final report:

- additional technical work in areas of probabilistic risk, human reliability, and thermal hydraulic analysis;
- additional discussion on safeguards, design-basis accidents, and seismic events;
- consequences of a zirconium fire;
- improved description of our assessment, including discussion of the inadequacies of past analyses for spent fuel pool risk, and
- recommendations as needed to address defense-in-depth and margin of safety.

We are committed to complete the independent review and the necessary technical work by the end of November 1999. We will then assess the information and revise our report to be able to issue our draft-for-comment on January 7, 2000. January and February will be a public comment period. We will review all comments and revise the report as necessary by March 31, 2000. After additional NRC management review, the report will be available to the public in early April 2000. By May 31, 2000, we will complete a rulemaking plan containing the schedule and resource estimates for the integrated rulemaking.

Decommissioning Regulatory Improvement Initiative

In addition to the risk-informed integrated rulemaking effort, the decommissioning regulatory improvement initiative composes the longer term portion of our two-part effort. In June 1999, we completed our initial review of all 10 CFR Part 50 regulations to determine (1) which regulations needed changes in scope to ensure proper applicability to decommissioning plants, and (2) which regulations needed substantive changes to properly apply to decommissioning. We identified about 42 regulations where scope changes were possibly needed and about 40 areas where substantive changes to regulations may be required to properly address decommissioning power reactors. We have contracted with Brookhaven National Laboratory to begin an independent review of NRC regulations to ensure that all potential areas needing changes are identified.

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Among the regulations identified as needing modifications, the following topics have been given priority:

- (1) emergency planning, insurance, security, operator staffing/training, and the backfit rule have been selected for inclusion in the near-term effort to produce an integrated, risk-informed rulemaking package described in the previous section, and
- (2) technical specifications, reporting requirements, 10 CFR 50.59 plant modifications, defueled safety analysis report contents, partial site release requirements, maintenance rule, fitness-for-duty, and quality assurance requirements have each been assigned to a topical area expert for evaluation and development of proposed new requirements for decommissioning facilities.

In addition, the outline and structure of a possible new part in Title 10 of the Code of Federal Regulations had been drafted as a placeholder for the new regulations being constructed. We intend to complete both a detailed rulemaking plan for the new part in Title 10 and an advance notice of proposed rulemaking within a year of receiving authorization from the Commission to proceed. Since the staff is already working on many of the rulemaking topics, we expect to make rapid progress with these regulations after the rulemaking plan is approved.

