

September 11, 2000

MEMORANDUM TO: Ashok C. Thadani, Director
Office of Nuclear Regulatory Research

FROM: Samuel J. Collins, Director /RA/
Office of Nuclear Reactor Regulation

SUBJECT: USER NEED REQUEST FOR TECHNICAL STUDY OF SPENT FUEL
POOL ACCIDENT RISK AT DECOMMISSIONING PLANTS

This user need request supplements two previous memorandums from Gary M. Holahan to John W. Craig, dated August 18, 1999, and from Gary Holahan to Thomas King, dated March 26, 1999, (see attached) and requests RES continued support in performing a technical study on spent fuel pool accident risk at decommissioning plants. Specifically, the August 18 memorandum requests independent review of the seismic portion of the staff's proposed draft technical study of spent fuel pool accidents at decommissioning plants and the March 26 memorandum requests evaluation of offsite radiological consequences of beyond design basis spent fuel pool accidents.

Background

To improve its regulatory guidance related to the decommissioning of permanently shutdown power reactor facilities (SECY-99-168), the NRC determined that it will risk inform its process of granting exemptions for decommissioning facilities in areas such as emergency planning and insurance. The NRR staff formed a technical working group (TWG) to evaluate and report on spent fuel accident risk at decommissioning plants using deterministic and probabilistic assessments. On August 18, 1999, and March 26, 1999, the NRR staff issued two memoranda requesting technical assistance from RES and its consultants to perform an independent review of the seismic portion of the TWG report and provide calculations for offsite radiological consequences.

The staff subsequently published the draft technical study on spent fuel pool accident risk at decommissioning plants on February 15, 2000, and briefed the Advisory Committee on Reactor Safeguards (ACRS) on this subject during the week of April 5-7, 2000. In its letter to the Chairman dated April 13, 2000, the ACRS raised concerns about the conservative treatment of seismic issues as they related to risk-informed decisionmaking regarding spent fuel pool fires. The NRR and RES staff subsequently held several meetings on this subject.

CONTACT: Diane Jackson, SPLB/DSSA/NRR
301-415-8548

JH

Your assistance is requested to perform the following tasks:

1. Quantitatively and qualitatively evaluate the conservatism in seismic assumptions as they relate to spent fuel pool fires.
2. Evaluate uncertainty in the treatment of seismic issues.
3. Provide the mostly likely SFP failure modes and locations for boiling water and pressurized water reactor pools; the expected level of collateral damage given a seismic event necessary to fail the SFP (e.g., damage to notification and communication systems, buildings, roads, bridges, and other items needed for emergency response).
4. Perform review and provide comments on the final report on the technical study of SFP accident risk at decommissioning plants.
5. Provide related technical and consultant expertise level support to ACRS full committee and subcommittee meetings, and public meetings.
6. Provide additional consequence calculations for 30 days, 90 days, and 1, 2, 5, and 10 years after shutdown to show the reduction in the consequences of a SFP fire as a function of time after shutdown. Details for the calculations are provided in a memorandum from Richard Barrett to John Flack, dated August 25, 2000.

Inputs on Items 1 and 2 have been completed in support of a meeting with the Nuclear Energy Institute that was held on August 23, 2000, and our effort to respond to the Commission shortly thereafter. Item 3, to be provided by September 20, and Item 4, to be completed by October 2, are in support of the Commission due date of October 31, 2000, for the final report. Item 5 is to be carried out on an as needed basis, but not to extend past December 29, 2000. We understand the calculations for Item 6 have been completed and are in the formalization process.

NRR has ranked this user need against the four outcome goals; maintaining safety, enhancing public confidence, reducing unnecessary regulatory burden, and increasing effectiveness and efficiency of our activities. This user need received a total score of 10 out of a possible 12, and has been assigned a high priority (high priority is 9 through 12, medium priority is 7 or 8, and low priority is 4 through 6). My staff has used this priority value, in relation to the existing set of NRR user needs, in their discussions with members of your staff to determine whether your office can support our scheduler requirements for this user need. These discussions indicate that the scope and schedule of this user need can be accomplished within the current RES budget.

We appreciate your support to date in providing the requested evaluations, as well as your support to NRR during meetings with the regulated industry.

Attachment: As stated

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Attachment: As stated DISTRIBUTION ON NEXT PAGE

* See previous concurrences

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DATE	8/14/00*	8/14/00*	8/10/00*	8/14/00*	8/16/00*
OFFICE	D:DE	ADPT:NRR	D:NRR		
NAME	JStrosnider	BSheron	SCollins		
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August 18, 1999

MEMORANDUM TO: John W. Craig, Director
Division of Engineering Technology
Office of Nuclear Regulatory Research

FROM: Gary M. Holahan, Director /s/ T. Collins for:
Division of System Safety and Analysis
Office of Nuclear Reactor Regulation

SUBJECT: REQUEST FOR REVIEW OF DRAFT TECHNICAL STUDY OF SPENT
FUEL POOL ACCIDENTS FOR DECOMMISSIONING PLANTS
(TAC NO. MA5099)

The Office of Nuclear Reactor Regulation (NRR) is in the process of developing a risk-informed technical basis to establish a predictable approach for requesting and granting exemptions to licenses and to increase the efficiency and effectiveness of decommissioning regulations. We formed a technical working group (TWG) to perform a study of spent fuel pool accidents. A draft version of the study was provided in the report, "Draft Technical Study of Spent Fuel Pool Accidents for Decommissioning Plants." A public workshop was held on July 15 and 16, 1999, to discuss issues related to the report. With regard to the consideration of beyond design basis events, your staff and consultants provided very effective technical support and this led to the consensus that a seismic check list can be used to screen out plants from further review of seismic vulnerability.

The next phase of our effort in this area includes providing the stakeholders and other technical organizations with a technically sound set of attributes for the seismic check list. The concept of this check list was discussed in the staff's draft technical study, but it needs further refinement and practicality review. The assistance of your staff and consultants in the Engineering Research Applications Branch is requested to perform an independent review of the seismic part of the TWG's draft study and the input from the Nuclear Energy Institute (NEI) on the seismic check list. This need for technical assistance from your staff was discussed with you recently. A copy of the report and details regarding the requested review are attached. The NEI input on the seismic check list will be forwarded upon receipt. Please provide your recommendations in response to this request by November 19, 1999.

Attachments: As stated

CONTACT: Diane Jackson, SPLB/DSSA/NRR
301-415-8548

August 18, 1999

MEMORANDUM TO: John W. Craig, Director
Division of Engineering Technology
Office of Nuclear Regulatory Research

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301-415-8548

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OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEMS SAFETY AND ANALYSIS
PLANT SYSTEMS BRANCH
DRAFT TECHNICAL STUDY OF SPENT FUEL POOL ACCIDENTS
FOR DECOMMISSIONING PLANTS

BACKGROUND

The Nuclear Regulatory Commission (NRC) is currently updating and developing its regulatory guidance to address issues related to the decommissioning of permanently shutdown power reactor facilities. The NRC has determined it will risk inform its process of granting exemptions for decommissioning facilities in the areas such as emergency procedures and insurance. The Office of Nuclear Reactor Regulation (NRR) formed a technical working group (TWG) to evaluate spent fuel pool accidents at decommissioning plants using deterministic and probabilistic assessments. We made a draft version of the technical study available to the industry and the public, and held several public meetings to solicit comments and provide information to the industry and the public as to how we are proceeding in the process to develop a risk informed approach. In order to further increase public confidence, and ensure the draft technical study is a more effective document, we conducted a public workshop on July 15 and 16, 1999. The purpose of the workshop was to interface with the industry and public to identify risk perspectives, design characteristics, procedures, capabilities, or other aspects of decommissioning plants that may refine the scenarios and analyses in the draft technical study. With regard to the consideration of beyond design basis events, your staff and consultants in the Engineering Research Applications Branch provided very effective technical support at the workshop and this led to the consensus that a seismic check list can be used to screen out plants from further review of seismic vulnerability.

We seek the assistance of your staff and consultants in the Engineering Research Applications Branch to perform an independent review of the seismic part of the TWG's draft study and the input from the Nuclear Energy Institute (NEI) on the seismic check list.

OBJECTIVE

The specific objective of this request is to obtain the technical expertise necessary to assist NRR in assessing and updating the seismic part of the draft technical study, providing sound technical recommendations for the seismic check list and the seismic check list input provided by the NEI.

WORK REQUESTED AND SCHEDULE

The assistance of your staff is requested to perform the following tasks related to reviewing the draft technical study of spent fuel pool accidents for decommissioning plants:

1. Evaluate the seismic part of the TWG's draft study and the input from NEI on the seismic check list for technical soundness and scope.

2. Provide recommendations on practical measures to mitigate the effects of seismic vulnerability that could be adopted by decommissioning plants as a defense-in-depth action.

We request that this work be performed by November 19, 1999, to support our overall project schedule.

March 26, 1999

MEMORANDUM TO: Thomas L. King, Director
Division of System Technology
Office of Nuclear Regulatory Research
/original signed by T. Collins for/
FROM: Gary M. Holahan, Director
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

SUBJECT: TECHNICAL SUPPORT FOR SPENT FUEL POOL
ZIRCONIUM FIRE CONSEQUENCE ANALYSIS

On March 16, 1999 staff from DSSA met with staff from DST/AEB to discuss the progression and consequences of a zirconium fire in a spent fuel pool. DSSA is specifically interested in the offsite doses that result from a zirconium fire in a spent fuel pool. The information is needed to support proposed rulemaking for relaxing emergency planning and insurance requirements for permanently shutdown reactors.

DSSA is therefore requesting that your staff perform offsite dose calculations assuming that a zirconium fire progresses to fuel melting. The base case should be for a time of one year after shutdown and use the same fission product inventory and release fractions as the calculations performed in NUREG/CR-4982 Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82. A small to moderate number of sensitivity calculations may also be needed. The time frame for completion of these calculations is approximately two months.

Any questions on this matter may be addressed to Diane Jackson or Joseph Staudenmeier.

CONTACT: Joseph Staudenmeier, NRR/DSSA/SRXB
415-2869

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