

April 5, 2000

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, LLC	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent	)	
Fuel Storage Installation)	)	

NRC STAFF'S THIRD SUPPLEMENTAL RESPONSE  
TO "THE STATE OF UTAH'S FIRST SET OF  
DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF"

INTRODUCTION

On June 10, 1999, the State of Utah filed the "State of Utah's First Set of Discovery Requests Directed to the NRC Staff" (Request), concerning the application for an Independent Spent Fuel Storage Installation (ISFSI) filed by Private Fuel Storage, L.L.C. (Applicant). In its Request, the State, among other things, filed general interrogatories pertaining to persons who provided information in response to the State's discovery requests and the identify of witnesses whom the staff of the Nuclear Regulatory Commission (Staff) expects to call at the hearing for each of the admitted Utah contentions.

On June 24, 1999, the Staff filed its initial objections and responses to that discovery request.<sup>1</sup> Thereafter, on July 13, 1999 and on August 20, 1999, the Staff supplemented its responses

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<sup>1</sup> See "NRC Staff's Initial Objections and Responses to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" (Initial Response), dated June 24, 1999.

to the State's discovery requests.<sup>2</sup> The Staff hereby further supplements its responses to the State's general interrogatories as follows.<sup>3</sup>

### OBJECTIONS

The Staff hereby reiterates and renews each of its objections to the State's discovery requests, set forth in the Staff's Initial Response of June 24, 1999, as if set forth at length herein. Notwithstanding these objections to the State's Request, and without waiving these objections or its right to interpose these or other objections in the future, the Staff hereby voluntarily provides the following supplemental responses to the State's Request.

#### **I. GENERAL DISCOVERY**

##### **A. GENERAL INTERROGATORIES**

**GENERAL INTERROGATORY NO. 1** State the name, business address, and job title of each person who was consulted and/or who supplied information for responding to interrogatories, requests for admissions and requests for the production of documents. Specifically note for which interrogatories, requests for admissions and requests for production each such person was consulted and/or supplied information.

If the information or opinions of anyone who was consulted in connection with your response to an interrogatory or request for admission differs from your written answer to the discovery request, please describe in detail the differing information or opinions, and indicate why such differing information or opinions are not your official position as expressed in your written answer to the request.

**STAFF RESPONSE.** To the extent that this interrogatory seeks information that is exempt from disclosure under 10 C.F.R. § 2.790, including without limitation pre-decisional information,

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<sup>2</sup> See (1) "NRC Staff's First Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated July 13, 1999; and (2) "NRC Staff's Second Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated August 20, 1999.

<sup>3</sup> For ease of reference, the State's interrogatories are reproduced below, followed by the supplemental response which is being provided at this time.

the Staff hereby objects thereto. Notwithstanding the above objection, with respect to Contention H (inadequate thermal design), in addition to Mr. Jack Guttman and Staff counsel, the following individuals supplied information and/or consulted with the Staff:<sup>4</sup>

Steven M. Mirsky  
Assistant Vice President  
Nuclear Licensing Safety  
Science Applications International Corporation  
20201 Century Blvd.  
Germantown, MD 20874

Further, with respect to Contention E (financial assurance), in addition to Mr. Alex McKeigney and Staff counsel, the following individuals supplied information and/or consulted with the Staff:<sup>5</sup>

Robert Wood  
Senior Level Licensee Financial Policy Advisor  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

Ira Dinitz  
Insurance/ Indemnity Analyst  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

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<sup>4</sup> In particular, these individuals were consulted with respect to discovery requests pertaining to Contention H contained in "State of Utah's Third Set of Discovery Requests Directed to the NRC Staff (Utah Contention H)," dated December 29, 1999, and "State of Utah's Fifth Set of Discovery Requests Directed to the NRC Staff (Utah Contentions E, H, and L)," dated January 31, 2000.

<sup>5</sup> In particular, these individuals were consulted with respect to discovery requests pertaining to Contention E contained in "State of Utah's Fourth Set of Discovery Requests Directed to the NRC Staff (Utah Contention E)," dated January 13, 2000, and "State of Utah's Fifth Set of Discovery Requests Directed to the NRC Staff (Utah Contentions E, H, and L)," dated January 31, 2000.

U.S. Nuclear Regulatory Commission  
Washington, D.C.

Further, with respect to Contention L (geotechnical), in addition to Staff counsel, the following individuals supplied information and/or consulted with the Staff:<sup>6</sup>

John Stamatakos  
Senior Research Scientist  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road, Bldg. 189  
San Antonio, TX 78238-5166

Rui Chen  
Senior Research Engineer  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road, Bldg. 189  
San Antonio, TX 78238-5166

Asadul H. Chowdhury  
Manager  
Mining, Geotechnical, and Facility Engineering  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road, Bldg. 189  
San Antonio, TX 78238-5166

Budhi Sagar  
Technical Director  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road, Bldg. 189  
San Antonio, TX 78238-5166

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<sup>6</sup> In particular, these individuals were consulted with respect to discovery requests pertaining to Contention L contained in "State of Utah's Sixth Set of Discovery Requests Directed to the NRC Staff (Utah Contention L)," dated February 4, 2000 and "State of Utah's Fifth Set of Discovery Requests Directed to the NRC Staff (Utah Contentions E, H, and L)," dated January 31, 2000.

**GENERAL INTERROGATORY NO. 3** For each admitted Utah contention, give the name, address, profession, employer, area of professional expertise, and educational and scientific experience of each person whom NRC expects to call as a witness at the hearing. For purposes of answering this interrogatory, the educational and scientific experience of expected witnesses may be provided by a resume of the person attached to the response.

**STAFF RESPONSE.** The Staff supplements its response to this interrogatory with the addition of the following persons as prospective witnesses in this proceeding. A statement of professional qualifications is attached hereto.

**UTAH CONTENTION K (Credible Offsite Hazards)**

Kazimieras M. Campe  
Senior Reactor Engineer  
Probability Safety Assessment Branch  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

**UTAH CONTENTION E (Financial Assurance)**

Alex F. McKeigney  
Financial Analyst  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

Robert Wood  
Senior Level Licensee Financial Policy Advisor  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

**UTAH CONTENTION S (Decommissioning Funding)**

**Alex F. McKeigney**  
Financial Analyst  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

**Robert Wood**  
Senior Level Licensee Financial Policy Advisor  
Generic Issues, Environmental, Financial, and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

**UTAH CONTENTION H (Inadequate Thermal Design)**

**Jack Guttman**  
Senior Nuclear Engineer  
Spent Fuel Project Office  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C.

**GENERAL INTERROGATORY NO. 4** For each admitted Utah contention, identify the qualifications of each expert witness whom NRC expects to call at the hearing, including but not limited to a list of all publications authored by the witness within the preceding ten years and a listing of any other cases in which the witness has testified as an expert at a trial, hearing, or by deposition within the preceding four years.

**STAFF RESPONSE.**

(a) **KAZIMIERAS M. CAMPE**

**Qualifications: A statement of Dr. Campe's professional qualifications is attached hereto.**

**Publications within the preceding ten years:**

1. NUREG-1632, "Evaluation of AP600 Containment Thermal-hydraulic Performance," June, 1982 (Co-author).
2. "Recent Developments in Regulatory Use of Probabilistic Safety Assessments in the USA," Reliability '89 -- Seventh Biennial Conference on Reliability Technology, June 14-16, 1989 (Co-author).

**Testifying experience within the preceding four years: None.**

**(b) ALEX F. MCKEIGNEY**

**Qualifications: A statement of Dr. McKeigney's professional qualifications is attached hereto.**

**Publications within the last 10 years: None.**

**Testifying experience within the preceding four years: None.**

**(c) ROBERT WOOD**

**Qualifications: A statement of Mr. Wood's professional qualifications is attached hereto.**

**Publications within the last 10 years:**

1. NRC Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors:" August 1990 (co-author with Frank Cardile)
2. "Federal Regulation of Decommissioning Economics" in *The Energy Journal* (Vol. 12, 1991; International Association for Energy Economics)
3. NUREG-0327, "Owners of Nuclear Power Plants," Rev. 5 (July 1991)
4. NUREG-1577, Rev. 1, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance," March 1999

**Author of several Commission "SECY" papers and contributor to other papers.**

**Testifying experience within the last four years: None.**

(d) JACK GUTTMANN

Qualifications: A statement of Mr. Guttman's professional qualifications is attached to the "NRC Staff's Initial Objections and Responses to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated June 24, 1999.

Publications within the last 10 years:

1. "Risk Informed In-service Inspection Program," in *Nuclear Engineering and Design*, November 28, 1997.
2. "Technical Elements of Risk-Informed Inservice Inspection Programs for Piping," NUREG-1661, January 1999 (Co-author).
3. "An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping," for Trial Use, Regulatory Guide 1.178, September 1998 (Co-author).
4. "Standard Review Plan for Trial Use for the Review of Risk-Informed Inservice Inspection of Piping," NUREG-0800, Chapter 3.9.8, September 1998 (Co-author).
5. "Decrease in Feedwater Temperature, Increase in Feedwater Flow, Increase in Steam Flow and Inadvertent Opening of a Steam Generator Relief or Safety Valve," NUREG-0800, Chapters 15.1.1 - 15.1.4, July 1981 (Co-author).
6. "Steam System Piping Failures Inside and Outside of Containment (PWR), NUREG-0800, Chapter 15.1.5, July 1981 (Co-author).
7. "Loss of Normal Feedwater Flow," NUREG-0800, Chapter 15.2.7, July 1981 (Co-author).
8. "Loss -of-Coolant Accidents Resulting from Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary," NUREG-0800, Chapter 15.6.5, July 1981 (Co-author).

Testifying experience within the last 4 years: None.

GENERAL INTERROGATORY NO. 5 For each admitted Utah contention, describe the subject matter on which each of the witnesses is expected to testify at the hearing, describe the facts and opinions to which each witness is expected to testify, including a summary of the grounds for each opinion, and identify the documents (including all pertinent pages or parts thereof), data or other information which each

witness has reviewed and considered, or is expected to consider or to rely on for his or her testimony.

**STAFF RESPONSE**

The subject matter and views of the Staff's witnesses are set forth in the "NRC Staff's Statement of Its Position Concerning Group I-II Contentions," dated December 15, 1999, as supplemented by the Staff's responses to the Applicant's motions for summary disposition of contention Utah H and contention Utah E/Confederated Tribes F, dated June 25, 1999 and December 22, 1999, respectively.

Regarding completed portions of the Staff's review pertaining to Utah Contention K/Confederated Tribes B, the subject matter and views of the Staff's witness are set forth in the "NRC Staff's Statement of Its Position Concerning Group I Contentions," dated June 15, 1999, as supplemented by the Staff's responses to the Applicant's motion for summary disposition of Utah Contention K/Confederated Tribes B, dated July 22, 1999. The Staff will further supplement its response when the Staff states its position regarding the remainder of Utah Contention K.

**B. GENERAL DOCUMENT REQUESTS**

**REQUEST NO. 2**

All documents in your possession, custody or control relevant to each Utah admitted contention.

**STAFF RESPONSE**

The Staff is providing herewith a document, which it has identified that relates to Utah Contention R. In addition, the Staff has attached a list of those documents, also pertaining to Utah Contention R, that the Staff asserts are privileged or otherwise exempt from disclosure.

Respectfully submitted,

*Catherine L. Marco*

Catherine L. Marco  
Counsel for NRC Staff

Dated at Rockville, Maryland  
this 5th day of April 2000

**Alex F. McKeigney**  
**Financial Analyst**  
**Division of Regulatory Improvement Programs**  
**Office of Nuclear Reactor Regulation**  
**U.S. Nuclear Regulatory Commission**

**B.A. in Sociology and Economics, The University of Mississippi, 1965**  
**M.A., Ph.D. in Sociology, The University of North Carolina, 1967 and 1969**  
**MBA, Harvard Business School, 1978**

Dr. McKeigney has significant experience in evaluating a wide variety of NRC applicants. He has worked with the NRC since April 1997 as a Financial Analyst and has conducted numerous safety reviews involving financial qualifications. He has participated in special studies and assignments, such as co-authoring a Commission Paper on monitoring foreign ownership and control of reactor licensees and serving as one of the principal reviewers of the AmerGen purchase of TMI-1.

Dr. McKeigney has many years of experience in strategic and financial planning positions with electric utilities that operate nuclear power reactors. He has evaluated the relative feasibility and profitability of alternative corporate strategies and financing plans, compared options for project financing, and has conducted numerous other quantitative analyses and reviews for electric utilities.

Dr. McKeigney has taught and developed courses in social science at the undergraduate level and in strategic planning at the graduate level. He also has worked in state-level economic development research, which included labor force analysis and financial analysis utilizing state-level econometric models.

**PROFESSIONAL CHRONOLOGY: Financial Analyst, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, 1997-present; Senior Lead Planner-Operations, Entergy Services, Inc., 1993-1995; Director-Strategic Planning, Mississippi Power and Light Company, 1983-1992; Director-Strategic Planning, Middle South Services, Inc., 1980-1982; Vice President-Consulting, Social Systems, Inc., 1979; Financial Analyst, Carolina Power and Light Company, 1978-1979; Manager-Manpower Development and Analysis, Mississippi Research & Development Center, 1972-1976; Assistant Professor, Southern Methodist University, 1969-1971.**

**PROFESSIONAL QUALIFICATIONS  
ROBERT S. WOOD**

**Senior Level Licensee Financial Policy Advisor  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission**

Robert Wood has served as Senior Level Licensee Financial Policy Advisor in the Office of Nuclear Reactor Regulation from 1997 to the present. He has responsibility for the development and implementation of NRC policies on and programs for nuclear property and liability insurance, financial assurance for decommissioning nuclear power facilities, financial qualifications of NRC licensees, electric utility deregulation, license transfers, and other financial and economic issues with a potential impact on the safe operation and decommissioning of NRC-licensed nuclear facilities. He provides technical guidance and oversight in his areas of expertise to financial analysts in the Generic Issues, Environmental, Financial, and Rulemaking Branch of the Division of Regulatory Improvement Programs.

Mr. Wood received a B.A. degree in economics from Drew University in 1968 and an M.P.A. degree from the Ohio State University in 1971. He also successfully completed course work and qualifying exams for a Ph.D. in economics at the Ohio State University.

Mr. Wood began his professional career as a Management Intern in 1971 with the former U.S. Atomic Energy Commission. After serving as Systems Analyst and Program Analyst, Mr. Wood became Assistant to the Chief, Antitrust and Indemnity Group in 1976. Since then, he has held several positions with responsibility for the NRC's programs and policies in financial qualifications, decommissioning funding assurance, antitrust, insurance, and economic analysis. He served as Section Chief, Policy development and Financial Evaluation Section in the Inspection and Licensing Policy Branch, Office of Nuclear Reactor Regulation, from July 1992 to April 1994. From 1994 to 1997, he served as a Senior Financial Analyst. He has presented testimony on financial qualifications issues before the Atomic Safety and Licensing Board and on decommissioning funding assurance before several State Public Utility Commissions as an NRC expert.

**Kazimieras M. Campe**  
**Statement of Professional Qualifications**

**Kazimieras M. Campe**  
**Senior Reactor Engineer**  
**Probabilistic Safety Assessment Branch**  
**Division of Systems Safety and Analysis**  
**Office of Nuclear Reactor Regulation**

**B.S., Mechanical Engineering, University of Connecticut**  
**M.S., Mechanical Engineering, University of Connecticut**  
**Ph.D., Nuclear Engineering, Purdue University**  
**Post-Graduate Courses and Training**  
    **Rensselaer Polytechnic Institute**  
        **Mathematics**  
    **Massachusetts Institute of Technology**  
        **Nuclear Power Plant Operations**  
    **Babcock & Wilcox**  
        **Nuclear Power Plant Operations**  
    **U. S. Nuclear Regulatory Commission**  
        **System Reliability and Safety Analysis**  
        **BWR Fundamentals**  
        **PWR Fundamentals**  
        **Fault Tree Analysis**  
        **Radiological Accident Assessment**  
        **Fundamentals of Inspection**  
        **Supervision and Management**

**U. S. Nuclear Regulatory Commission (formerly U. S. Atomic Energy Commission), 1972 - Present**

Currently technical staff member of the Probabilistic Safety Assessment Branch. Responsible for performing safety assessments of nuclear power plant facilities. Safety evaluations include thermal hydraulic analyses of containment response to design basis accidents involving loss of coolant events. In addition, performs safety reviews of risks posed to nuclear facilities by external man-made hazards. These include assessment of risks associated with aircraft activity as well as other modes of transportation (e.g., railroads, highways, navigable waterways, and pipelines).

Prior to his present position, Dr. Campe was assigned to the Analytic Support Group, which provided analytic services to the technical branches within the Division of Systems Safety and Analysis. As a technical staff member of this group, he primarily performed thermal hydraulic analyses of nuclear power plant transients and design basis accidents using advanced nuclear analysis codes. Part of his duties within the group involved code development and maintenance activities. In addition, he provided analytic support in other areas, such as spent fuel pool thermal analysis code work.

Before joining the Analytic Support Group, Dr. Campe was employed as Section Chief in the Risk Applications Branch. His responsibilities within the branch were to supervise and participate in the administrative and technical activities of the Reliability Applications Section. This involved the

planning, coordinating, and directing risk evaluations with respect to the design and operation of nuclear power plants. Specifically, using a diverse background of systems engineering and risk assessment, Dr. Campe supervised the development and application of systems reliability and plant risk analysis for the purpose of identifying significant contributors to risk. As Section Chief, he also performed technical evaluations and provided expert consultation in the area of man-made hazards.

Prior to the Risk Applications Branch, Dr. Campe held the positions of Section Leader in the Plant Systems Branch and the Site Analysis Branch. His principal responsibilities were the technical and administrative supervision of licensing actions relating to plant systems design and operation, external hazards, and site suitability determinations.

Before accepting the position of Section leader, Dr. Campe was employed as Senior Site Analyst, Site Analyst, and Nuclear Engineer. He was responsible for performing licensing reviews, principally in the areas of man-made external hazards associated with toxic, flammable, or explosive substances, as well as missile impacts. In addition, he performed reviews of tornado and turbine missile risks, and control room habitability systems with respect to design basis accidents.

His activities in generic studies included technical contract management, computer code development, drafting of Regulatory Guides, and participating in Fission Product Release and Foreign Reactor Safety Research Groups. Specifically, he has prepared most of the technical input for Regulatory Guide 1.115 on turbine missiles. He has also prepared the following sections of the Standard Review Plan, NUREG-0800 (formerly NUREG-75/087): Standard Review Plan § 3.5.1.3, "Turbine Missiles"; Standard Review Plan § 2.2.1-2.2.2, "Identification of Potential Hazards in Site Vicinity"; Standard Review Plan § 2.2.3, "Evaluation of Potential Accidents"; Standard Review Plan § 3.5.1.5, "Site Proximity Missiles (Except Aircraft)"; and Standard Review Plan § 3.5.1.6, "Aircraft Hazards."

Hittman Associates, Inc., Columbia, MD, 1966 - 1972

As Section Chief for radiation analysis and special projects, Dr. Campe was responsible for radiation analysis of systems which either use or interface with radioisotopes.

In this capacity, he has performed numerous parametric studies on the radiation shielding characteristics of conceptual polonium, promethium, and plutonium fueled heat sources, and was responsible for detailed analysis of the radiation fields and the radiation shielding requirements of radioisotope thermoelectric generators for spacecraft. He also performed radiation analyses for implanted medical devices.

Dr. Campe also was active in reactor physics analysis, performing calculations and developing advanced computer codes for analyzing water moderated reactor lattices.

Pratt and Whitney, CANEL, Middletown, CT, 1960 - 1962 (plus summer of 1963)

As Analytical Engineer, Dr. Campe worked in the Analytic Physics Group on problems associated with the design of a nuclear propulsion reactor for an aircraft. This involved extensive reactor physics analyses of a liquid metal fast fission spectrum reactor.

**NRC STAFF DOCUMENTS WITHHELD UNDER A CLAIM OF  
PRIVILEGE<sup>1</sup> CONCERNING CONTENTION UTAH R (ONSITE FIRE FIGHTING)<sup>2</sup>**

<u>Date</u>	<u>Author</u>	<u>Recipients</u>	<u>Subject</u>
undated	P. Lain (NRC)	--	Handwritten comments on SAR chapter 4 -- PD
undated	M. Delligatti (NRC)	P. Lain	Requests comments for SER rewrite -- PD
undated	P. Lain	--	Comments on draft of PFS SER -- PD
undated	P. Lain	--	Handwritten notes on "Applicant's Motion for Partial Summary Disposition of Utah Contention R" -- PD
undated	P. Lain	--	Handwritten notes regarding SER Chapter 6 -- PD
2/29/00	A. Ghosh (CNWRA)	M. Bailey (NRC), M. Delligatti, P. Lain	Questions for discussion with PFS on fire-related issues -- PD
2/28/00	M. Bailey	P. Lain	Questions regarding fire-related open items -- PD
2/24/00	M. Bailey	P. Lain	Comments on fire-related open items -- PD
2/23/00	M. Bailey	P. Lain, M. Delligatti	Comments on use of National Fire Protection Association standard -- PD
2/23/00	A. Ghosh	M. Bailey, M. Delligatti, A. Chowdhury (CNWRA)	Comments on use of National Fire Protection Association standard -- PD
2/22/00	A. Ghosh	M. Bailey, A. Chowdhury, M. Delligatti	Proposed questions for PFS re: fire ratings of canister transfer building --PD
12/13/99	P. Lain	A. Ghosh, M. Delligatti, et. al	Proposed questions on fire-related open items -- PD
12/10/99	M. Delligatti	A. Ghosh, P. Lain	Proposed questions on fire-related open items -- PD

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<sup>1</sup> The following abbreviations are used herein: AC-attorney client privileg; PD-predecisional deliberative process; AWP-attorney work product

<sup>2</sup> Organizations are abbreviated herein as follows: NRC Staff - "NRC," Private Fuel Storage, L.L.C. - "PFS," Center for Nuclear Waste Regulatory Analyses - "CNWRA"

12/10/99	M. Delligatti	A. Ghosh, P. Lain	Proposed questions regarding fire-related open items -- PD
12/9/99	P. Lain	R. Sullivan, S. Turk (NRC) C. Emeigh (NRC), D. Martin (NRC)	Input for PFS SER -- PD, AC
11/15/99	M. Bailey	P. Lain, A. Chowdhury, M. Delligatti A. Ghosh	Comments on PFS SER -- PD
11/02/99	P. Lain	A. Ghosh	Comments on PFS SER --PD
10/26/99	P. Lain	M. Bailey, M. Delligatti, D. Martin	Comments on PFS SER re: fire protection evaluation -- PD
8/31/99	P. Lain	M. Delligatti, R. Sullivan	Comments regarding question for PFS -- PD
8/31/99	R. Sullivan	M. Delligatti, P. Lain	Comments on draft SER for EP plan -- PD
3/20/99	P. Lain	M. Delligatti, R. Sullivan, S. Turk	Comments on issues in Contention R - PD, AC
8/18/99	P. Lain		Handwritten notes on contention issues, facts in dispute, proposed RAIs -- PD
8/16/99	S. Turk	P. Lain, R. Sullivan	Requesting comments re: "State's Response to motion for summary disposition on Contention R" --AC, PD
8/16/99	P. Lain	M. Delligatti, R. Sullivan, S. Turk	Comments regarding contention issues -- AC
8/16/99	R. Sullivan	M. Delligatti, S. Turk	Comments regarding contention issues -- AC
8/16/99	S. Turk	C. Marco, M. Bailey, P. Lain	Comments regarding contention issues -- AC, AWP
8/16/99	S. Turk	P. Lain, R. Sullivan	Requests comments regarding contention R -- AC, PD
8/16/99	M. Delligatti	S. Turk	Comments regarding contention R -- AC, PD

06/29/99	S. Turk	R. Sullivan, P. Lain	Requests comments on Applicant's motion -- AC
06/30/99	R. Sullivan	S. Turk	Comments regarding contention R -- AC
06/30/99	S. Turk	R. Sullivan, M Delligatti	Requests comments regarding contention R -- AC
6/10/99	L. Deere (CNWRA)	--	Comments on NRC Staff Position Concerning Utah Contention R -- AC, PD

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

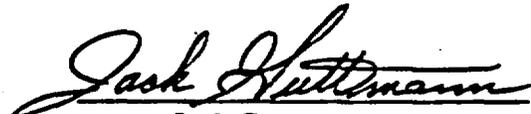
In the Matter of )  
 )  
PRIVATE FUEL STORAGE, LLC ) Docket No. 72-22-ISFSI  
 )  
(Independent Spent )  
Fuel Storage Installation) )

SUPPLEMENTAL AFFIDAVIT OF JACK GUTTMANN

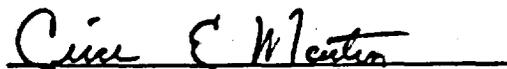
I, Jack Guttman, having first been duly sworn, do hereby state as follows:

1. My name is Jack Guttman. I am employed as a Senior Nuclear Engineer, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C.

2. I have reviewed the foregoing "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" and verify that the responses to General Interrogatory Nos. 1, 3, 4, and 5, with respect to Utah Contention H, are true and correct to the best of my information and belief.

  
Jack Guttman

Subscribed and sworn to before me this  
5 day of April, 2000.

  
Notary public



My commission expires: March 1, 2003

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
PRIVATE FUEL STORAGE, LLC ) Docket No. 72-22-ISFSI  
 )  
(Independent Spent )  
Fuel Storage Installation) )

SUPPLEMENTAL AFFIDAVIT OF ALEX F. MCKEIGNEY

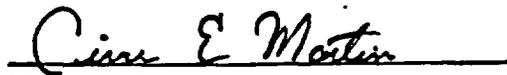
I, Alex F. McKeigney, having first been duly sworn, do hereby state as follows:

1. My name is Alex F. McKeigney. I am employed as a Financial Analyst in the Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C.

2. I have reviewed the foregoing "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" and verify that the response to General Interrogatory 1, with respect to Utah Contention E, and the responses to General Interrogatories 3, 4, and 5, with respect to Utah Contentions E and S, are true and correct to the best of my information and belief.

  
\_\_\_\_\_  
Alex F. McKeigney

Subscribed and sworn to before me this  
5 day of April, 2000.

  
\_\_\_\_\_  
Notary public



My commission expires: March 1 2003

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

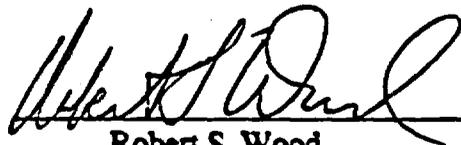
In the Matter of )  
 )  
PRIVATE FUEL STORAGE, LLC ) Docket No. 72-22-ISFSI  
 )  
(Independent Spent )  
Fuel Storage Installation) )

AFFIDAVIT OF ROBERT S. WOOD

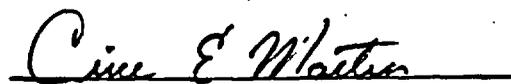
I, Robert S. Wood, having first been duly sworn, do hereby state as follows:

1. My name is Robert S. Wood. I am employed as a Senior Level Licensee Financial Policy Advisor, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C.

2. I have reviewed the foregoing "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" and verify that the response to General Interrogatory No. 1, with respect to Utah Contention E, and the responses to General Interrogatories No. 3, 4, and 5, with respect to Utah Contentions E and S, are true and correct to the best of my information and belief.

  
Robert S. Wood

Subscribed and sworn to before me this  
5 day of April, 2000.

  
Notary public



My commission expires: March 1, 2003

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
PRIVATE FUEL STORAGE, LLC ) Docket No. 72-22-ISFSI  
 )  
(Independent Spent )  
Fuel Storage Installation) )

AFFIDAVIT OF KAZIMIERAS M. CAMPE

I, Kazimieras M. Campe, having first been duly sworn, do hereby state as follows:

1. My name is Kazimieras M. Campe. I am employed as a Senior Reactor Engineer in the Probabilistic Safety Assessment Branch, Division of Systems Safety and Analysis, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C.

2. I have reviewed the foregoing "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" and verify that the responses to General Interrogatories No. 3, 4, and 5, with respect to Utah Contention K, are true and correct to the best of my information and belief.

  
Kazimieras M. Campe

Subscribed and sworn to before me this  
5<sup>th</sup> day of April, 2000.

  
Notary public



My commission expires: March 1, 2003

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, LLC	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent	)	
Fuel Storage Installation)	)	

SUPPLEMENTAL AFFIDAVIT OF JOHN STAMATAKOS

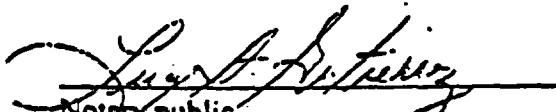
I, John Stamatakos, having first been duly sworn, do hereby state as follows:

1. My name is John Stamatakos. I am employed as a Senior Research Scientist at the Center for Nuclear Waste Regulatory Analysis (CNWRA), which is a division of the Southwest Research Institute (SwRI), in San Antonio, Texas. I am providing this affidavit under a technical assistance contract between the NRC Staff and SwRI.

2. I have reviewed the foregoing "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff'" and verify that the response to General Interrogatory No. 1, with respect to Utah Contention L, is true and correct to the best of my information and belief.

  
John Stamatakos

Subscribed and sworn to before me this  
5<sup>th</sup> day of April, 2000.

  
Notary public.

My commission expires: August 24, 2001



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Sandians Jeff Bobbe (front) and Mike Arviso wire the exterior of the shipping containers for the fire test. The nuclear-material shipping casks were placed inside these standard containers.

**News Release**

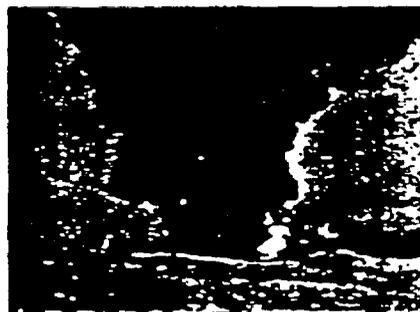
## Fire Tests Help Ensure Safety of Nuclear-material Shipping Casks

ALBUQUERQUE, N.M. – Nuclear-material shipping casks transported inside standard steel shipping containers can survive large fires and still protect their contents and prevent radioactive material releases, according to preliminary results from recent fire endurance tests.

Conducted near Mobile, Alabama, by Sandia National Laboratories for the U.S. Department of Energy's National Transportation Program, the tests exposed nuclear-material casks inside International Standards Organization (ISO) shipping containers to a fire fueled by 4,000 gallons of JP-8 jet fuel. The containers tested measure 20 feet long, eight feet tall, and eight feet wide, and weigh about 5,000 pounds empty. (Other standard ISO containers are up to 50 feet long.) The multi-purpose containers are used to ship cargo by sea, rail, and road.

The primary purpose of the tests was to determine whether the nuclear-material casks that are routinely shipped inside the ISO containers could withstand a major fire on a ship's open deck, says Sandia's technical project leader Joe Koski. The tests were also designed to quantify typical container fire conditions and compare them to conditions that typically exist during land-based shipping accidents.

The tests involved nine shipping containers and were conducted at the Coast Guard's Fire and Safety Detachment on Little Sand Island in the middle of the bay south of Mobile. The facility is used by the Coast Guard and other government-funded groups for marine fire and safety tests.



A Coast Guard employee videotapes the July 30 fire test near the Coast Guard's Mobile, Ala., Fire and Safety Test Detachment. The Sandia test subjected nuclear-material shipping casks – placed inside these standard steel shipping containers – to a JP-8 jet fuel fire. Preliminary results indicate that the casks can survive these extremely hot fires (about 2,200 degrees F.) and still protect their contents and prevent radioactive material releases. (Sandia photo by Diana Helgeson)



**Sandians prepare to wire and instrument the nuclear-material shipping casks before the July 30 fire test. From left are Mike Arviso, Joe Koski, and Jeff Bobbe.**

Several types and sizes of radioactive-material packages were inside one of the shipping containers during the tests, but no nuclear materials were involved. Other containers were packed only with steel pipe calorimeters simulating casks, and still others contained combustible materials such as wood pallets, cardboard, and paper.

The fire was set on July 30 with the jet fuel burning for about one hour, although combustible paper, cardboard, and wood in some containers continued to smolder more than a day. JP-8 fuel burns at temperatures up to 2,200 degrees F. Flames reached more than 30 feet high at times.

After the fire, the unloaded radioactive materials packages were examined and appeared to be in good condition. The packages are being returned to Albuquerque for further inspection and analysis.

"Although we need to study the test data in detail," says Koski, "we are encouraged by the preliminary results and believe the casks in combination with the containers will do exactly what they are designed to do - protect their contents and prevent the release of potentially hazardous radiation if they are ever involved in an accident of this type."

Spent nuclear fuel and other nuclear materials are typically moved internationally aboard cargo ships, in casks placed inside the standard shipping containers. Casks must meet standards set by the Code of Federal Regulations (10CFR71) in the U.S. or International Atomic Energy Agency (IAEA) Safety Series 6 for international shipments.

"To the best of our knowledge, nuclear-material shipping casks have never been involved anywhere in the world in a severe fire accident like we simulated," Koski says. But he adds that ISO standard shipping containers are used extensively, so knowledge of the protection they offer is valuable to analysts trying to understand the safety issues surrounding such shipments.

Sandia's tests were designed to answer questions about the actual temperatures and heat transfer phenomena in and among the containers in a configuration typical of on-deck stowage where oxygen is available to contribute to the intensity of a fire, says Koski.

Sandia used a suite of scientific instruments including calorimeters, thermocouples, and data-recording devices that it built or configured specifically for these tests.

Koski and several others in Sandia's Transportation Systems Development Department, including Ray Dukart, Jeff Bobbe, Mike Arviso, and manager Glenn Hohnstreiter, had major roles in the tests. The tests contribute to a cooperative research program sponsored by the IAEA and funded by the U.S. Department of Energy. Final results will be published as soon as possible and provided to agencies and companies around the world that are concerned with nuclear materials shipping safety.

"These results will not be an end in themselves," says Koski. "Using what we learn, we plan to develop well-calibrated computer models that can predict the behavior of nuclear-material shipping casks when exposed to various types of fire scenarios. Accurate computer models could save lots of money and time when approval is being sought for shipping potentially hazardous materials."

Sandia National Laboratories is a multiprogram Department of Energy laboratory, operated by a subsidiary of Lockheed Martin Corporation. With about 7,500 employees and facilities in Albuquerque, N.M., and Livermore, Calif., Sandia has major R&D responsibilities in national security, energy, environmental technologies, and economic competitiveness.

Color photographs available

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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CERTIFICATE OF SERVICE

I hereby certify that an electronic copy of "NRC STAFF'S THIRD SUPPLEMENTAL RESPONSE TO "THE STATE OF UTAH'S FIRST SET OF DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF"" in the above captioned matter, has been transmitted to the Office of the Secretary (SECY) for entry into the NRC's ADAMS system, for subsequent distribution to the internal recipients listed below. I also certify that signed paper copies have been served on the following through deposit in the NRC's internal mail system, with copies by electronic mail, as indicated by an asterick, or by deposit in U.S. Postal Service as indicated by double asterick, with copies by electronic mail as indicated this 5<sup>th</sup> day of April, 2000:

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