Adams

December 7, 2001

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

NRC STAFF'S RESPONSE TO APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF UTAH CONTENTION L, PART B

INTRODUCTION

Pursuant to 10 C.F.R. §2.749(a), the NRC Staff ("Staff") herewith responds to "Applicant's Motion for Summary Disposition of Part B of Utah Contention L" ("Motion"), filed on November 9, 2001, by Private Fuel Storage L.L.C. ("Applicant" or "PFS"). For the reasons set forth below and in the Affidavit attached hereto,[1] the Staff submits that each of the issues raised by the State of Utah ("State") in Part B of Contention Utah L have been resolved and there no longer exists a genuine dispute of material fact with respect to this matter. Accordingly, inasmuch as these issues have been resolved, the Staff submits that the Applicant is entitled to a decision in its favor on Part B of Contention Utah L, as a matter of law.

BACKGROUND

In April 1999, PFS requested an exemption from certain seismic requirements in 10 C.F.R. Part 72, in connection with its application for a license to construct and operate an independent spent fuel storage installation ("ISFSI") on the Reservation of the Skull Valley Band of Goshute Indians, to permit its use of a probabilistic seismic hazard analysis ("PSHA") with a 2,000-year

[1] Attached hereto is the "Joint Affidavit of Daniel Pomerening, John Stamatakos, Jack Guttmann, Henry Lee, and Michael Waters ("Staff Affidavit").

return period in the seismic design of the PFS Facility ("PFSF"). On November 9, 2000, the State filed a proposed modification of Contention Utah L, challenging the Applicant's seismic exemption request.[2] The State's proposed modification of Contention Utah L was ruled admissible by the Commission and was admitted for litigation by the Licensing Board, in June 2001.[3]

As delineated by the Licensing Board, Part B of Contention Utah L states as follows:

> **Utah L -- Geotechnical**
>
> * * *
>
> B. Relative to the PFS seismic analysis supporting its application and the PFS April 9, 1999 request for an exemption from the requirements of 10 C.F.R. § 72.102(f) to allow PFS to employ a probabilistic rather than a deterministic seismic hazards analysis, PFS should be required either to use a probabilistic methodology with a 10,000-year return period or comply with the existing deterministic analysis requirement of section 72.102(f), or, alternatively, use a return period significantly greater than 2000 years, in that:
>
> 1. The requested exemption fails to conform to the SECY-98-126 (June 4, 1998) rulemaking plan scheme, i.e., only 1000-year and 10,000-year return periods are specified for design earthquakes for safety-important systems, structures, and components (SSCs) -- SSC Category 1 and SSC Category 2, respectively -- and any failure of an SSC that exceeds the radiological requirements of 10 C.F.R. § 72.104(a) must be designed for SSC Category 2, without any explanation regarding PFS SSC compliance with section 72.104(a).

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[2] *See* "Request for Admission of Late-Filed Modification to Basis 2 of Contention Utah L," dated November 9, 2000. Two previous requests to modify Contention Utah L to challenge the Applicant's seismic exemption request were denied as premature. *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-99-21, 49 NRC 431 (1999); *Id.*, LBP-00-15, 51 NRC 313 (2000).

[3] *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-12, 53 NRC 459, (2001); and the Licensing Board's "Memorandum and Order (Requesting Joint Scheduling Report and Delineating Contention Utah L)," (June 15, 2001) (unpublished). *See also, Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-3, 53 NRC 84 (2001) (in which the Licensing Board found portions of Contention Utah L, Part B, to be admissible, and referred its ruling to the Commission).

2. PFS has failed to show that its facility design will provide adequate protection against exceeding the section 72.104(a) dose limits.

3. The staff's reliance on the reduced radiological hazard of stand-alone ISFSIs as compared to commercial power reactors as justification for granting the PFS exemption is based on incorrect factual and technical assumptions about the PFS facility's mean annual probability of exceeding a safe shutdown earthquake (SSE), and the relationship between the median and mean probabilities for exceeding an SSE for central and eastern United States commercial power reactors and the median and mean probabilities for exceeding an SSE for the PFS facility.

4. In supporting the grant of the exemption based on 2000-year return period, the staff relies upon the United States Department of Energy (DOE) standard, DOE-STD-1020-94, and specifically the category-3 facility SSC performance standard that has such a return period, notwithstanding the fact the staff categorically did not adopt the four-tiered DOE category scheme as part of the Part 72 rulemaking plan.

5. In supporting the grant of the exemption based on the 2000-year return period, the staff relies upon the 1998 exemption granted to DOE for the Idaho National Engineering and Environmental Laboratory (INEEL) ISFSI for the Three Mile Island, Unit 2 (TMI-2) facility fuel, which was discussed in SECY-98-071 (Apr. 8, 1998), even though that grant was based on circumstances not present with the PFS ISFSI, including (a) existing INEEL design standards for a higher risk facility at the ISFSI host site; and (b) the use of a peak design basis horizontal acceleration of 0.36 g that was higher than the 2000-year return period value of 0.30 g.

6. Because (a) design levels for new Utah building construction and highway bridges are more stringent; and (b) the PFS return period is based on the twenty-year initial licensing period rather than the proposed thirty- to forty-year operating period, the 2000-year return period for the PFS facility does not ensure an adequate level of conservatism.

On November 9, 2001, PFS filed the instant Motion. Therein, based upon its attached "Statement of Material Facts on Which No Genuine Dispute Exists" ("Statement of Material Facts"), the declarations of its experts, citations to State experts' depositions, the Staff's Safety Evaluation

Report,[4] and other evidence, PFS asserts that the bases asserted by the State in support of Part B of this contention "are incorrect or inconsequential, and do not invalidate the granting of PFS's exemption request" (Motion at 4). Accordingly, PFS concludes that there is no genuine dispute of material fact warranting a hearing, and the Board should enter summary disposition of Part B of Utah L in its favor.

As set forth below and in the Staff Affidavit attached hereto, based on a review of the Applicant's Motion, its Statement of Material Facts, and attached documentation, the Staff has concluded that each of the issues raised in Contention Utah L, Part B, has been resolved, and that there no longer exists a genuine dispute of material fact with respect to this part of Contention Utah L. Accordingly, the Staff supports the Applicant's Motion and recommends that it be granted.

DISCUSSION

A. Legal Standards Governing Motions for Summary Disposition.

Pursuant to 10 C.F.R. §2.749(a), "[a]ny party to a proceeding may move, with or without supporting affidavits, for a decision by the presiding officer in that party's favor as to all or any part of the matters involved in the proceeding. The moving party shall annex to the motion a separate, short, and concise statement of the material facts as to which the moving party contends that there is no genuine issue to be heard." In accordance with 10 C.F.R. §2.749(b), when a properly supported motion for summary disposition is made, "a party opposing the motion may not rest upon the mere allegations or denials of his answer; his answer by affidavits or as otherwise provided in this section must set forth specific facts showing that there is a genuine issue of fact." In addition, an opposing party must annex to its answer a short and concise statement of material facts as to which it contends there exists a genuine issue to be heard. 10 C.F.R. § 2.749(a). All material facts set forth in the moving party's statement will be deemed to be admitted unless controverted in the

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[4] *See* letter from Mark S. Delligatti (NRC) to John D. Parkyn (PFS), dated September 29, 2000, enclosing "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER").

opposing party's statement. *Id.*[5] Pursuant to 10 C.F.R. § 2.749(d), "[t]he presiding officer shall render the decision sought if the filings in the proceeding, depositions, answers to interrogatories, and admissions on file, together with the statements of the parties and the affidavit, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a decision as a matter of law." [6]

The Commission's summary disposition procedures have been analogized to Rule 56 of the Federal Rules of Civil Procedure. *See, e.g., Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 753-54 (1977); *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation) LBP-99-32, 50 NRC 155, 158 (1999). Indeed, the Commission, when considering motions for summary disposition filed pursuant to 10 C.F.R. § 2.749, generally applies the same standards that the Federal courts use in determining motions for summary judgment under Rule 56 of the Federal Rules. *Advanced Medical Systems,* 38 NRC at 102 (1993). Decisions arising under Rule 56 of the Federal Rules may thus serve as guidelines to the Commission's adjudicatory boards in applying 10 C.F.R. §2.749. *Perry,* 6 NRC at 754.

Under Rule 56 of the Federal Rules, the party seeking summary judgment has the burden of proving the absence of genuine issues of material fact. *Adickes v. S. H. Kress & Co.*, 398 U.S. 144, 157 (1970); *Advanced Medical Systems,* 38 NRC at 102. In addition, the record is viewed in

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[5] Pursuant to 10 C.F.R. § 2.749(c), if a party opposing the motion demonstrates in its affidavits that valid reasons exist why it cannot provide facts essential to oppose the motion, the presiding officer may deny the motion, order a continuance to permit affidavits to be obtained, or take such other action as may be appropriate.

[6] *Accord, Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units I and 2), ALAB-841, 24 NRC 64, 93 (1986). General denials and bare assertions are not sufficient to preclude summary disposition when the proponent of the motion has met its burden. *Advanced Medical Systems, Inc.* (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102 (1993). Although the opposing party does not need to demonstrate that it will succeed on the issues, it must at least demonstrate that a genuine issue of fact exists to be tried. *Id.; Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-92-8, 35 NRC 145, 154 (1992) (to avoid summary disposition, the opposing party had to present contrary evidence that was so significantly probative as to create a material issue of fact).

the light most favorable to the party opposing the motion. *Poller v. CBS, Inc.,* 368 U.S. 464, 473 (1962); *Kerr-McGee Chemical Corp.* (West Chicago Rare Earths Facility), ALAB-944, 33 NRC 81, 144 (1991). However, if the moving party makes a proper showing for summary disposition and the opposing party fails to show that there is a genuine issue of material fact, the District Court (or Licensing Board) may summarily dispose of all of the matters before it on the basis of the filings in the proceeding, the statements of the parties, and affidavits. Rule 56(e), Fed. R. Civ. P. *Accord, Advanced Medical Systems,* 38 NRC at102; 10 C.F.R. § 2.749(d).

The Licensing Board in this proceeding has previously ruled upon various motions for summary disposition filed by PFS, in accordance with these principles. In doing so, the Board succinctly summarized the standards for granting summary disposition, as follows:

> Under 10 C.F.R. § 2.749(a), (d), summary disposition may be entered with respect to any matter (or all of the matters) in a proceeding if the motion, along with any appropriate supporting material, shows that there is "no genuine issue as to any material fact and that the moving party is entitled to a decision as a matter of law." The movant bears the initial burden of making the requisite showing that there is no genuine issue as to any material fact, which it attempts to do by means of a required statement of material facts not at issue and any supporting materials (including affidavits, discovery responses, and documents) that accompany its dispositive motion. An opposing party must counter each adequately supported material fact with its own statement of material facts in dispute and supporting materials, or the movant's facts will be deemed admitted. See Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102-03 (1993).

Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), LBP-99-23, 49 NRC 485, 491 (1999) (granting summary disposition of Contention Utah C).[7]

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[7] *Accord, PFS,* LBP-01-LBP-99-31, 50 NRC 147, 152 (1999) (Security-A, Security-B and Security-C); *Id.,* LBP-99-32, 50 NRC 155, 158 (1999) (Utah G); *Id.,* LBP-99-33, 50 NRC 161, 164-65 (1999) (Utah M); *Id.,* LBP-99-34, 50 NRC 168, 173-74 (1999) (Utah B); *Id.,* LBP-99-35, 50 NRC 180, 184 (1999) (Utah K); *Id.,* LBP-99-36, 50 NRC 202, 207 (1999) (Utah R); *Id.,* LBP-99-42, 50 NRC 295, 301 (1999) (Utah H); *Id.,* LBP-00-06, 51 NRC 101, 112 (2000) (Utah E); *Id.,* LBP-01-22, 54 NRC 155, 159 (2001) (Utah V); *Id.,* LBP-01-23, 54 NRC 163, 167-68 (2001) (Utah Z); *Id.,* LBP-01-30, 54 NRC ___ (2001) (Utah DD).

Finally, it should be noted that the Commission has encouraged parties in its adjudicatory proceedings to utilize its summary disposition procedures "on issues where there is no genuine issue of material fact so that evidentiary hearing time is not unnecessarily devoted to such issues." Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452, 457 (1981).[8] Likewise, the Appeal Board has recognized that summary disposition provides "an efficacious means of avoiding unnecessary and possibly time-consuming hearings on demonstrably insubstantial issues." *Wisconsin Electric Power* Co. (Point Beach Nuclear Plant, Unit 1), ALAB-696, 16 NRC 1245, 1263 (1982); *Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit1), ALAB-590, 11 NRC 542, 550 (1980).[9]

As more fully set forth below, the Staff submits that summary disposition of Contention Utah L, Part B, is appropriate, in accordance with these established standards.

B. Applicable Regulatory Standards Governing the Applicant's Exemption Request.

Pursuant to 10 C.F.R. § 72.102(f), the following requirements are established for ISFSI applicants like PFS:

> (f) The design earthquake (DE) for use in the design of structures must be determined as follows:
>
> > (1) For sites that have been evaluated under the criteria of appendix A of 10 CFR part 100, the DE must be equivalent to the safe shutdown earthquake (SSE) for a nuclear power plant. . . .

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[8] In 1998, the Commission reviewed and endorsed this policy statement, but indicated that "Boards should forego the use of motions for summary disposition except upon a written finding that such a motion will likely substantially reduce the number of issues to be decided, or otherwise expedite the proceeding." *Statement of Policy on Conduct of Adjudicatory Proceedings*, CLI-98-12, 48 NRC 18, 20-21 (1998). The Staff submits that summary disposition of Utah Contention L, Part B, will reduce the multiplicity of issues that require hearings and will serve to expedite the proceeding.

[9] It is well settled that an agency may ordinarily dispense with an evidentiary hearing where no genuine issue of material fact exists. *Veg-Mix, Inc.* v. *U.S. Dep't of Agriculture*, 832 F.2d 601, 607-08 (D.C. Cir. 1987).

Further, in accordance with Appendix A of 10 C.F.R. Part 100, ISFSI applicants west of the Rocky Mountain Front (like PFS) are currently required to utilize a deterministic methodology in establishing the design basis for their facilities[10] -- unlike nuclear power plants, which are now permitted to use a probabilistic approach under 10 C.F.R. § 100.23. While the Commission has initiated rulemaking efforts to revise the Part 72 requirements to allow ISFSI applicants to use a probabilistic methodology -- as reflected in SECY-98-126 and, more recently, in SECY-01-0178 -- the use of such a probabilistic approach has not yet been incorporated into the Commission's regulations governing ISFSI applications.

Pursuant to 10 C.F.R. § 72.7, an ISFSI applicant may request an exemption from any of the requirements in Part 72. The Commission may grant such a request, upon finding that the requested exemption "is authorized by law and will not endanger life or property or the common defense and security and [is] otherwise in the public interest."[11]

As set forth in considerable detail in the Staff's SER of September 29, 2001, the Staff has evaluated the Applicant's seismic exemption request and determined that it should be granted. See SER, § 2.1.6. Thus, the Staff is satisfied that the exemption request satisfies the standard governing the issuance of exemptions, as set forth in 10 C.F.R. § 72.7. Further, as discussed below, the Staff has reviewed the issues raised by the State in Contention Utah L, Part B, and in the Applicant's motion for summary disposition thereof. Based upon its review of these matters, the Staff is satisfied that no genuine dispute of material fact remains to be litigated with respect to those issues.

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[10] *See also*, 10 C.F.R. § 72.102(b) ("West of the Rocky Mountain Front (west of approximately 104 deg. west longitude), and in other areas of known potential seismic activity, seismicity will be evaluated by the techniques of appendix A of part 100 of this chapter. . . .").

[11] As stated by the Commission upon admitting Part B of Contention Utah L for litigation, an applicant seeking an exemption from the regulations is required "only to justify the seismic hazard analysis and design standards it proposes to use. *See* 10 C.F.R. § 72.7." *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-12, 53 NRC 459, 471 (2001).

C. No Genuine Dispute of Material Fact Remains With Respect to the Issues Stated in Contention Utah B.

In its motion for summary disposition, PFS asserts that the issues stated in Part B of Contention Utah L have been resolved, for the following reasons:

(1) no dispute exists concerning the appropriateness of PFS's use of a probabilistic seismic hazards analysis methodology for its seismic design -- and the State's witness, Dr. Arabasz, has agreed that use of such methods for the PFSF is appropriate (Motion at 5-6);

(2) the use of a 2,000 year return period earthquake is sufficiently protective of the public health and safety, considering the higher standard of protection established for nuclear power plants, the standard established in the U.S. Department of Energy's ("DOE") STD-1020-94 for performance category three (PC-3) facilities, and the existence of risk reduction factors in the PFSF facility design (*id.* at 6-9);

(3) the fact that the exemption request does not comport with the two-tiered Rulemaking Plan in SECY-98-126 is of no consequence, in that the Rulemaking Plan was non-binding and, in any event, has been superseded by the modified approach using a single-tier, 2,000-year return period, as set forth in the modified Rulemaking Plan in SECY-01-178 (*id.* at 9);[12]

[12] The Commission has approved the Staff's modified Rulemaking Plan approach, subject to the Staff's solicitation of comments "on a range of probability of exceedance levels from 5.0E-04 through 1.0E-04," and its performance of "further analysis to support a specific proposal." *See* Staff Requirements Memorandum of November 19, 2001, attached to Letter from Sherwin E. Turk, Esq. to Denise Chancellor, Esq., dated November 20, 2001.

(4) the fact that the exemption request was not based upon the radiological dose approach proposed in SECY-98-126[13] is of no consequence, as stated in item (c) above (*id.* at 10-11);[14]

(5) the State has failed to show that the Staff's comparison of the radiological hazards posed by ISFSIs and nuclear power plants was incorrect (*id.* at 12-13);

(6) the State has failed to show that the Staff's reference to and reliance upon DOE STD-1020 was inappropriate (*id.* at 13-14);

(7) the State has failed to show that the Staff's reference to and reliance upon the exemption granted to DOE's Idaho National Engineering and Environmental Laboratory ("INEEL") for the Three Mile Island Unit 2 ("TMI-2") fuel debris ISFSI was inappropriate (*id.* at 14-15);[15]

(8) the use of a PSHA with a 2,000-year return period ensures an adequate level of conservatism (*id.* at 15-16); and

(9) various aspects of the PFSF design "result[ ] in safety structures capable of withstanding even the severe seismic events postulated by the State (*id.* at 16-18).

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[13] Under that approach, a 10,000-year return period would be utilized for systems, structures and components ("SSCs") whose failure would result in dose consequences that exceed the normal (non-accident) dose limits in 10 C.F.R. § 72.104(a); otherwise, a 1,000-year return period earthquake would be utilized in the design.

[14] The Staff agrees with the Applicant's observation that the State, in its discovery responses, attempted to raise untimely design issues in Contention Utah L, Part B -- which it also raised in Contention Utah QQ, as the State's witnesses acknowledged. *See* Motion at 11-12; Ostadan Dep. Tr. 55-65, Bartlett Dep. Tr. 66-70. Significantly, Part B of Contention Utah L raises a question as to whether PFS's request for an exemption from the deterministic seismic requirements in Part 72, allowing it to use a PSHA with a 2,000-year return period in establishing its design basis, is sufficiently conservative and should be granted. It does <u>not</u> raise a question as to whether the Applicant's resulting design is adequate.

[15] The Staff does not agree with the Applicant's view that certain statements contained in SECY-98-171 "show[ ] that the Staff intended that the exemption it was granting for INEEL would be relied upon as precedent for other exemption applications" (Motion at 14). Rather, the Staff believes that the cited language indicates no more than it states explicitly -- *i.e.*, that the Staff expected to receive exemption requests similar to the INEEL exemption request, if that exemption was granted.

The Staff has carefully reviewed the Applicant's Motion and its Statement of Material Facts, as set forth in the "Joint Affidavit of John Stamatakos, Daniel Pomerening, Jack Guttmann, Henry Lee, and Michael Waters" attached hereto. On the basis of its review, the Staff has determined that it agrees with the Applicant's Statement of Material Facts in all material respects[16] -- although the Staff takes no position with respect to certain of the Applicant's assertions, and believes that other assertions should be modified to some extent, none of which affects that Staff's conclusion that there does not exist a genuine dispute with respect to any material fact. *See* Staff Affidavit, at ¶¶ 5-7. For these reasons, as more fully set forth in the attached Affidavit, the Staff submits that there does not exist any genuine issue of material fact with respect to Part B Contention Utah L, and that summary disposition on Part B of Contention Utah L is appropriate.

CONCLUSION

For the reasons set forth above and in the attached "Joint Affidavit of John Stamatakos, Daniel Pomerening, Jack Guttmann, Henry Lee, and Michael Waters," the Staff submits that the Applicant is entitled to a decision in its favor as a matter of law on Part B of Contention Utah L.

Respectfully submitted,

Sherwin E. Turk
Counsel for NRC Staff

Dated at Rockville, Maryland
this 7th day of December 2001

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[16] In the attached Affidavit, the Staff does not address a limited number of the assertions made in the Applicant's Statement of Material Facts. In this regard, the Staff notes its belief that those assertions -- largely consisting of statements addressing specific design issues or asserting that the PFS facility design can withstand forces that are "significantly" greater than or "far" exceed the 2,000-year design basis earthquake -- exceed the scope of Contention Utah L, Part B, and/or are not necessary to a proper resolution of this contention. Accordingly, in the attached Affidavit, the Staff either takes no position with respect to those matters, or concurs with the Applicant's views in general without addressing specific assertions which the Staff believes are not material to a decision on Part B of Contention Utah L.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S RESPONSE TO APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF UTAH CONTENTION L, PART B," in the above captioned proceeding have been served on the following through deposit in the NRC's internal mail system, with copies by electronic mail, as indicated by an asterisk, or by deposit in the U.S. Postal Service, as indicated by double asterisk, with copies by electronic mail this 7th day of December, 2001:

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Sherwin E. Turk
Counsel for NRC Staff

December 7, 2001

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

JOINT AFFIDAVIT OF
JOHN STAMATAKOS, DANIEL POMERENING,
JACK GUTTMANN, HENRY LEE, AND MICHAEL WATERS

John Stamatakos ("JS"), Daniel Pomerening ("DP"), Jack Guttmann ("JG"), Henry Lee ("HL"), and Michael Waters ("MW"), having first been duly sworn, do hereby state as follows:

1(a). (JS) I am employed as a Senior Research Scientist at the Center for Nuclear Waste Regulatory Analyses (CNWRA), which is 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. A statement of my professional qualifications is attached hereto.

1(b). (DP) I am employed as a Principal Engineer at the Mechanical and Materials Engineering 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. A statement of my professional qualifications is attached hereto.

1(c). (JG) I am employed as Chief, Technical Review Section B, in the Spent Fuel Project Office (SFPO), Office of Nuclear Material Safety and Safeguards (NMSS), U.S. Nuclear Regulatory Commission (NRC), in Washington, D.C. A statement of my professional qualifications is attached hereto.

1(d). (HL) I am employed as a Senior Structural Engineer in the Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, in Washington, D.C. A statement of my professional qualifications is attached hereto.

1(e). (MW) I am employed as a Project Engineer in the Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, in Washington, D.C. A statement of my professional qualifications is attached hereto.

2. This Affidavit is prepared in response to the "Applicant's Motion for Summary Disposition of Part B of Utah Contention L" ("Motion"), filed on November 9, 2001, by Private Fuel Storage L.L.C. ("Applicant" or "PFS"), and the "Statement of Material Facts on Which No Genuine Dispute Exists" ("Statement of Material Facts") attached thereto.

3(a). (JS) As part of my official responsibilities, I reviewed the adequacy of the Applicant's probabilistic seismic hazard analysis ("PSHA") for the PFS Facility, with a 2,000 year return period. I further assisted in preparing the Staff's related safety evaluation of these matters, presented in section 2.1.6 of the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, and am currently assisting the Staff in its preparation of a Supplement to the SER. Also as part of my official responsibilities, I have reviewed the Applicant's Motion, Statement of Material Facts, and the attachments thereto, in which PFS seeks summary disposition of Part B of Utah Contention L. In particular, I reviewed Statements of Fact Nos. 1-28, 30, 35, 39, and 57, set forth in the Applicant's Statement of Material Facts.

3(b). (DP) As part of my official responsibilities, I reviewed the adequacy of the Applicant's facility design, based upon a design earthquake derived from the Applicant's PSHA with a 2,000 year return period. I further assisted in preparing the Staff's related safety evaluation of these matters, presented in the NRC Staff's SER, issued on September 29, 2000, and am currently

assisting the Staff in its preparation of a Supplement to the SER. Also as part of my official responsibilities, I have reviewed the Applicant's Motion, Statement of Material Facts, and the attachments thereto, in which PFS seeks summary disposition of Part B of Utah Contention L. In particular, I reviewed Statements of Fact Nos. 29, 31-34, 36-38, 42, 50-52, and 54-56, set forth in the Applicant's Statement of Material Facts.

3(c). (JG) As part of my official responsibilities, I reviewed, *inter alia,* the thermal design of the HI-STORM cask proposed for use at the site of the PFS Facility, and the potential for cask tipover at the PFSF site in the event of a seismic event. I further assisted in preparing the Staff's safety evaluation of these matters, presented in the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, and am currently assisting the Staff in its preparation of a Supplement to the SER. Also as part of my official responsibilities, I have reviewed the Applicant's Motion, Statement of Material Facts, and the attachments thereto, in which PFS seeks summary disposition of Part B of Utah Contention L. In particular, I reviewed Statements of Fact Nos. 41 and 49, set forth in the Applicant's Statement of Material Facts.

3(d). (HL) As part of my official responsibilities, I reviewed the structural design of the HI-STORM cask proposed for use at the site of the PFS Facility. I further assisted in preparing the Staff's safety evaluation of these matters, presented in the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, and am currently assisting the Staff in its preparation of a Supplement to the SER. Also as part of my official responsibilities, I have reviewed the Applicant's Motion, Statement of Material Facts, and the attachments thereto, in which PFS seeks summary disposition of Part B of Utah Contention L. In particular, I reviewed Statements of Fact Nos. 40, 42-44 and 53, set forth in the Applicant's Statement of Material Facts.

3(e). (MW) As part of my official responsibilities, I reviewed, *inter alia,* the shielding design and radiological consequences of accidents involving the HI-STORM cask proposed for use at the site of the PFS Facility. I further assisted in preparing the Staff's related safety evaluation of these matters, in the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, and am currently assisting the Staff in its preparation of a Supplement to the SER. Also as part of my official responsibilities, I have reviewed the Applicant's Motion, Statement of Material Facts, and the attachments thereto, in which PFS seeks summary disposition of Part B of Utah Contention L. In particular, I reviewed Statements of Fact Nos. 45-49, set forth in the Applicant's Statement of Material Facts.

4. On the basis of our review of the Applicant's SAR and the information it has submitted to the NRC, we are satisfied that the Statement of Material Facts attached to the Applicant's Motion is correct, except to the extent that (a) we believe certain statements of fact should clarified or corrected as set forth in Paragraph 5 below,[1] and (b) no position is taken herein with respect to certain Statements of Fact as set forth in Paragraph 6 below.

5. In our view, the following Material Fact Statements should be modified, to read as follows:

> 7. (JS) In 1997, the Commission amended Parts 50 and 100 of its regulations to provide for the use of the PSHA methodology for the seismic design of new nuclear power plants. ~~100 C.F.R. §~~ *See* 10 C.F.R. §§ 50.34(a) and 100.23(d)(1).
>
> 12. (JS) Two factors, among others, that are relevant to determining the likelihood of seismic failure of a facility or structure due to an earthquake event. These are (1) the seismic design basis earthquake ("DBE") for the facility or structure and (2) the conservatisms embodied in the codes and standards applicable to its seismic design. Cornell Dec. ¶¶ 18-19; see also Arabasz Dep. at 41-42, 81-84, 115-117.

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[1] In the following discussion, proposed changes to the Applicant's Statement of Material Facts are indicated by underlining (insertions) or underlining and strikeout (deletions).

13. (JS) The average mean annual probability of exceedance ("MAPE") corresponding to the Safe Shutdown Earthquake ("SSE") for the seismic design basis for nuclear power plants located in the Eastern and Central part of the United States has been calculated to be $1x10^{-4}$, or a return period earthquake of approximately 10,000 years. Cornell Dec. ¶ 38, Arabasz Dep. at 61-62, 70.

14. (JS) The average MAPE ~~mean SSE~~ for the seismic design basis for nuclear power plants located in the Western United States has been calculated to be $2x10^{-4}$, or a return period earthquake of approximately 5,000 years. Cornell Dec. Exhibit 3; Arabasz Dep. at 69-71.

15. (JS) Accordingly, using an average ~~mean SSE~~ MAPE of $1x10^{-4}$ approximately represents the seismic design basis for nuclear power plants in the Eastern, Central and Western regions of the United States. Arabasz Dep. at 70-71; Cornell Dec. ¶ 38.

19. (JS) The State's argument for the use of a median estimate in lieu of the mean estimate for the design of nuclear power plants, and similarly for ISFSIs, ~~would~~ could lead to inconsistent mean SSE probabilities across the country for such facilities because the ratio of the mean to the median is not constant across all regions of the country. Cornell Dec. ¶ 38; see also Arabasz Dep. at 60-63.

24. (JS) Under DOE-1020, PC3 structures systems and components have a seismic performance goal or failure probability of $1x10^{-4}$. If the PFSF was a DOE facility to which DOE-1020 directly applied, this would be the applicable ~~This is a rationale and appropriate~~ performance goal for the PFSF. Cornell Dec. ¶¶ 21-22, 26-27; Arabasz Dep. at 80-81.

25. (JS) Under DOE-1020, the ~~The~~ difference between the mean annual probability of exceedance of the DBE and the performance goal is obtained by conservatisms incorporated into the applicable design procedures and criteria. Cornell Dec. ¶¶ 19, 22.

26. (JS) The conservatisms in DOE-1020 embodied in the risk reduction factor R_R for PC3 structures systems and components is 5. Together with the mean annual probability of exceedance of the DBE in DOE 1020-94 for category PC3 of $5x10^{-4}$, this R_R meets the performance objectives for PC3 structures, systems and components of $1x10^{-4}$. Cornell Dec. ¶¶ 21-22.

29. (DP) The design guidelines provided by NRC Standard Review Plans ("SRPs") contain numerous conservatisms that result in factors of safety greater than the design basis for NRC-licensed facilities. In a comparable manner, risk reduction factors ~~as large~~

~~as, or larger than, those~~ are provided for PC4 facilities under DOE-1020. Cornell Dec. ¶ 25 and Attachment A.

31. (DP) Important to safety structures systems and components at the PFSF are designed in accordance with the NRC SRPs and other nuclear industry standards that provide ~~comparable~~ conservatisms beyond the values reflected in the PFSF design basis. Cornell Dec. ¶¶ 13, 26; Joint Declaration of Krishna P. Singh, Alan I. Soler, and Everett L. Redmond, II. ("Holtec Dec.") (November 9, 2001) ¶¶ 11-13, 21; Declaration of Bruce E. Ebbeson ("Ebbeson Dec.") (November 9, 2001) ¶¶ 12-16.

32. (DP) Designing the PFSF important to safety structures, systems and components ("SSCs") using the NRC SRPs means that the PFSF important to safety structures, systems and components have seismic failure probabilities ~~5 to 20 or more times~~ lower than the 2,000 mean return period DBE, ~~i.e., seismic failure mean return periods of 10,000 to 40,000 years or more.~~ Cornell Dec. ¶¶ 25-26 and Attachment A.

35. (JS) ~~Both in absolute terms and by~~ By comparison to nuclear power plant standards, the proposed PFSF seismic design basis of a 2,000 MRP DBE and SRP design procedures and criteria provide an appropriate and consistent level of protection to the Public health and safety. Cornell Dec. ¶ 30.

36. (DP) The design procedures and acceptance criteria for the International Building Code 2,000 are ~~significantly~~ less conservative than those in the NRC's SRPs. Cornell Dec. ¶ 47.

37. (DP) PFSF important-to-safety structures, systems and components will have a mean annual probability of failure ~~approximately 2.5 or more~~ lower than "essential structures" designed to IBC-2,000 standards. Cornell Dec. ¶¶ 46-47.

39. (JS) Under a probabilistic seismic hazard assessment approach, the ~~The~~ proper focus in making facility safety decisions is on annual probabilities or frequencies of occurrence. Cornell Dec. ¶ 49; see also Arabasz Dep. at 51-52.

40. (HL) The HI-STORM Storage casks and multi-purpose canisters will be constructed in accordance with applicable ASME III Codes and designed to withstand non-seismic (*i.e.*, impact) loads which significantly exceed the loads that would be induced by a design earthquake. ~~have significant built-in conservatisms and design margins that assure their ability to perform beyond design requirements and to resist very large earthquake induced forces.~~ Holtec Dec. ¶¶ 11-13.

43. (HL) The concrete of the HI-STORM storage casks will not crack as a result of ~~under~~ accelerations produced by the 2,000 year design basis earthquake for the PFSF. Holtec Dec. ¶ 24.

44. (HL) The concrete of the HI-STORM storage casks will not crack as a result of ~~under~~ accelerations produced by a 10,000 year beyond design basis event at the PFSF. Holtec Dec. ¶ 24.

46. (MW) The dose rate at the PFSF site boundary will remain essentially unchanged (*i.e.*, it will not increase significantly) and will remain below NRC accident dose limits regardless of whether one assumes that a single cask, any number of casks, or all the casks tipover. Holtec. Dec. ¶¶ 25-32.

48. (MW) Taking one of the many conservatisms into account (*i.e.*, the burnup and cooling time assumptions) reduces the calculated dose rate of 5.85 mrem per year by more than 50%. Holtec Dec. ¶ 31.

50. (DP) The important-to-safety structures, systems and components of the CTB ~~posses for~~ possess greater seismic loading capacities than the seismic loads imposed by the 2,000 year mean return period earthquake. Ebbeson Dec. ¶¶ 16-26.

51. (DP) Directly quantifiable margins in the capacity of the CTB roof to withstand accelerations well in excess of those produced by the 2,000 year return period earthquake include the following:

> a. The maximum calculated bending moment of a typical girder (*i.e.*, girder G1) is only 71% of the code allowable stresses.
>
> b. The ultimate bending moment capacity of one element in the roof (girder G1) ~~the roof~~ is more than 50% greater than the bending moment capacity based on code allowable stresses.
>
> * * *

Ebbeson Dec. ¶ 23.

54. (DP) The ultimate capacity of the seismic support struts are ~~45%~~ greater than the seismic loads imposed by the 2,000 year return period earthquake. Ebbeson Dec. ¶ 26.

55. (DP) In addition to the ~~directly quantifiable or~~ conservatisms in Material Fact Statements 50-53 above, other significant non-quantifiable conservatisms are also present with respect to

important-to-safety CTB structures systems and components. Ebbeson Dec. ¶¶ 12-15, 21.

56. (DP) The combination of quantifiable and non-quantifiable margins establish that CTB important to safety SSCs can withstand an earthquake with a return period ~~significantly~~ greater than the 2,000 year DBE. Ebbeson Dec. ¶ 27.

6. No position is taken herein with respect to Statements of material Fact Nos. 34, 51 (parts c and d), 52, and 53.

7. Notwithstanding the modifications set forth in Paragraph 5 above, and the items set forth in Paragraph 6 above as to which no position is taken, we agree with the Applicant's view that the concerns raised by the State of Utah in Part B of Contention Utah L have been addressed satisfactorily by the Applicant, and no genuine dispute of material fact exists with respect to these matters.

8. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

John Stamatakos

Sworn to before me this
7th day of December 2001

Notary Public

RUBEN JUAREZ
Notary Public, State of Texas
My Commission Expires Nov. 29, 2005

My commission expires: 11-29-2005

8. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

Daniel J. Pomerening

Sworn to before me this
7th day of December 2001

Notary Public

RUBEN JUAREZ
Notary Public, State of Texas
My Commission Expires Nov. 29, 2005

My commission expires: 11-29-2005

8. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

Jack Guttmann

Sworn to before me this
7th day of December 2001

Notary Public

ELVA BOWDEN BERRY
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires December 1, 2003

My commission expires: _____

8. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

Henry Lee

Sworn to before me this
7th day of December 2001

Notary Public

ELVA BOWDEN BERRY
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires December 1, 2003

My commission expires:

8. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

Michael Waters

Sworn to before me this
7th day of December 2001

Notary Public

ELVA BOWDEN BERRY
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires December 1, 2003

My commission expires: My Commission Expires December 1, 2003

DANIEL J. POMERENING
Principal Engineer
Mechanical and Materials Engineering Division

B.S. in Aerospace Engineering, Georgia Institute of Technology, 1975
M.E. in Civil Engineering, Structural Engineering and Structural Mechanics
University of California, Berkeley, 1977

Mr. Pomerening is experienced in design, analysis, and testing of structural systems in the fields of Naval Architecture, Aerospace and Civil Engineering. While working for the Naval Ship Research and Development Center, Mr. Pomerening participated in the design, construction, instrumentation, testing, and data reduction of a variety of models tested in wind tunnels. As a research assistant at the University of California, Berkeley, Mr. Pomerening was involved with the testing of building structures on a large scale seismic simulator. His Master's project produced a feasibility study on a boundary layer wind tunnel to study the dynamic effects of the wind on structures immersed in the atmospheric boundary layer.

Since joining Southwest Research Institute, Mr. Pomerening has been involved in the study of structural response of systems under dynamic loading with specific emphasis on transient and shock loading. Investigations of the structural integrity under seismic motion have included the response of floating platforms, industrial plants, electrical racks, valves and other components. Mr. Pomerening has performed seismic qualification programs for components using both analytical and experimental procedures. Work in this area has also included a Nuclear Regulatory Commission (NRC) program designed to evaluate methodology of equipment seismic qualification for nuclear plants. This has included development of procedures for use of hand held analyzers for determination of the in-situ modes of systems. Mr. Pomerening has supported programs in the Center for Nuclear Waste Regulatory Analysis (CNWRA). These have included reviews of safety analysis reports with specific emphasis on identification of design criteria and assessment of the structural integrity of structures, systems and components to with respect to the NRC Standard Review Plans.

Studies of aerospace structures have included structural models of light aircraft for determination of structural-borne noise, the T-37B aircraft wing to determine local crack growth rates, and the dynamic response of a number of missile systems during transportation and flight. Mr. Pomerening has performed several preliminary hazards analysis of electrical systems and reliability studies of space station mechanical systems. Other activities have included ground vibration and flight flutter testing as part of the T-37B structural life extension program, and slosh and crash testing of light aircraft wings.

His work in Naval Architecture has been associated with LNG transport ships, the use of reinforced concrete in the marine environment, the study of ship-based missile systems, blast response of submarines and radomes and dynamic response and fatigue assessments of submersibles.

Under Mr. Pomerening's management, a number of programs have been performed to qualify equipment installed on air, sea, and land-based vehicles. The programs have included test tailoring in accordance with the most recent standards. Mr. Pomerening has also managed a number of programs which tested packaging systems used in the shipment of nuclear materials for compliance with 10 CFR, Part 72 requirements.

Professional Chronology:

Student Engineering Trainee, Naval Ship Research and Development Center, 1970-75; Research Assistant, University of California, Berkeley, 1976-77; Southwest Research Institute, 1977 to Present in the positions of Research Engineer, 1977-83, Senior Research Engineer, Department of Mechanical and Fluids Engineering, 1983-96; and Principal Engineer, 1999 to Present.

Memberships:

American Society of Civil Engineering, ASTM, American Concrete Institute

JOHN STAMATAKOS

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EDUCATION:

B.A., Geology, Franklin and Marshall College, Lancaster, Pennsylvania, 1981

M.S., Geology, Lehigh University, Bethlehem, Pennsylvania, 1988

Ph.D., Geology, Lehigh University, Bethlehem, Pennsylvania, 1990

GENERAL QUALIFICATIONS:

Dr. Stamatakos is a structural geologist and geophysicist with international research experience in regional and global tectonics. Dr. Stamatakos has conducted research on a range of topics including paleomagnetism, neotectonics, kinematics of fault block rotations in strike-slip, normal, and thrust fault systems, effects of internal strain on the magnetic properties of deformed rocks, evolution of curvature in arcuate mountain belts, and age and sequence of deformation in folded and faulted mountain belts. This research has focused on the northern and central Appalachians in the eastern United States and Canada, the Hercynian mountains in Germany and northern Spain, the Rocky Mountains and Basin and Range in the western United States, and the northern Cordilleran Mountains in Alaska. Other strengths include numerical modeling of deformation, magnetostratigraphy, rock magnetism, and exploration geophysics.

As a Research Scientist in the Center for Nuclear Waste Regulatory Analyses, Dr. Stamatakos is a Principal Investigator for structural deformation and seismicity, including tectonics and neotectonics research. Tectonics research at CNWRA currently includes compiling a tectonics Geographic Information System (GIS) database, field analyses of the structural and tectonic elements of the Basin and Range province in southwestern United States, evaluation of seismic and faulting hazards at nuclear facilities, and the development of tectonic models for the region surrounding the proposed high-level nuclear waste repository at Yucca Mountain, Nevada. These investigations, sponsored by the U.S. Nuclear Regulatory Commission, currently support development of the tectonic framework for evaluation of risk of earthquakes and volcanic activity, and the effects of structures and tectonic processes on groundwater flow in the region surrounding Yucca Mountain.

Prior to coming to CNWRA, Dr. Stamatakos held positions as a visiting faculty at the University of Michigan and as a postdoctoral fellow at the Eidgenössische Technische Hochschule (ETH) in Zurich, Switzerland. At the University of Michigan, Dr. Stamatakos taught courses in field mapping, structural geology, geophysics, and tectonics.

Dr. Stamatakos has written or collaborated on nearly 50 papers and reports on structural geology, tectonics, and geophysics. He has made presentations at international conferences in the U.S., Canada, and Europe and has won an outstanding paper award from the American Geophysical Union.

Dr. Stamatakos is associate editor of the Geological Society of America Bulletin, former GP Editor for EOS of the American Geophysical Union, and is a regular reviewer of papers for the Journal of Geophysical Research, Earth and Planetary Science Letters, Journal of Geophysics, Journal of Structural Geology, Physics of the Earth and Planetary Sciences, Tectonophysics, Journal of Geology, Geophysical Journal International, Geological Society of America Bulletin, and Geophysical Research Letters as well as grant proposals for the National Science Foundation.

Acquired NSF and similar institutional grant support for research. Taught geology and geophysics at both undergraduate and graduate levels, including two summer field camp sessions. Co-developed and taught advanced field course for petroleum-industry geologists. Supervised undergraduate, master, and Ph.D. research, including service as external committee member on several masters theses and a Ph.D. dissertation.

Memberships: Geological Society of America, American Geophysical Union, Sigma Xi.

PROFESSIONAL EXPERIENCE

1996-2001: Senior Research Scientist, Center for Nuclear Waste Regulatory Analyses, Southwest Research Institute, San Antonio, Texas.

1995-1996: Research Scientist, Center for Nuclear Waste Regulatory Analyses, Southwest Research Institute, San Antonio, Texas.

1995-2001: Adjunct Research Scientist, Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan

1999-2001: Adjunct Professor, Incarnate Word University, Palo Alto College, University of Texas at San Antonio, all in San Antonio, Texas.

1992-1994: Visiting Assistant Professor, Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan.

1990-1992: Research Associate: Eidgenössische Technische Hochschule (ETH), Institut für Geophysik, Zürich, Switzerland.

1984-1990: Research and Teaching Assistant, Lehigh University, 1984–1990.

1981-1983: Petroleum Geologist, Analex Geosciences, 1981–1983.

RESEARCH INTERESTS:

Global and regional tectonics through the study of earthquake seismology, paleomagnetism, structural geology, neotectonics, magnetostratigraphy, potential-field geophysics (gravity and magnetics), fission-track thermochronology, and numerical modeling.

PUBLICATIONS

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Jack Guttmann

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Education:

B.S. in Mechanical Engineering, Michigan Technological University, 1973

M.S. Nuclear Engineering, University of Michigan, 1974

Professional Experience:

Mr. Guttmann has experience in nuclear engineering related to thermal-hydraulic and mechanical engineering analysis. Mr. Guttmann worked at the Idaho National Engineering Laboratory as a contractor to the NRC in the area of thermal-hydraulic computer code validation and analysis. He performed analyses that quantified the conservatism between the accident analysis requirements for licensing nuclear power plants (10 C.F.R. Part 50, Appendix K), validated the computer code RELAP for regulatory application by the NRC, and performed independent confirmatory transient and accident analyses of operating reactor events and safety issues defined by the NRC.

While working at the NRC, Mr. Guttmann was responsible for reviewing and approving the computer codes used by the nuclear industry for transient and accident analysis. He was the Office of Nuclear Reactor Regulation (NRR) representative on the Advanced Code Review Committee, the Loss of Fluid Test Facility, and the Semiscale Test Facility. Mr. Guttmann performed independent analyses of plant operating events, including regulatory responses to the TMI event. He was a member of the BWR Bulletins and Orders Task Force that reviewed the ramifications of the TMI-2 events for boiling water reactors. He reviewed and approved emergency operator procedures for PWR designs and performed quality assurance inspections. Mr. Guttmann developed standard review plans for analyzing reactor transient and accident events, developed regulatory guidance and NUREG documents for implementing Risk-Informed In-Service Testing of Piping, and was on the task force for developing Risk-Informed regulatory guidance documents.

With respect to policy development, Mr. Guttmann served as a technical assistant to Commissioner Forrest J. Remick. He advised Commissioner Remick on policy development of advanced nuclear power plants, operating reactor issues, research needs, and represented the Commission as an observer on INPO inspections.

Mr. Guttmann is currently performing thermal and containment evaluations of spent nuclear fuel transportation and storage casks. His work includes the evaluation of normal, off-normal and accident dose analyses, and the adequacy of the thermal design of spent nuclear fuel casks.

PROFESSIONAL CHRONOLOGY:

Jr. Engineer, Detroit Edison Co., Enrico Fermi Atomic Power Plant-I, 1972-73; Research Engineer, Idaho National Engineering Laboratory, 1975-1976; Nuclear Engineer, Office of Nuclear Reactor Regulation, NRC, 1976-1985; Technical Coordinator, Office of the Secretary, NRC, 1985-1990; Technical Assistant, Office of the Commission, NRC, 1990-1994; Sr. Reliability and Risk Assessment Engineer, Office of Nuclear Regulatory Research, NRC, 1994-1999; Sr. Nuclear Engineer, Office of Nuclear Material Safety and Safeguards, NRC, 1999-present.

Henry W. Lee

Senior Structural Engineer

Spent Fuel Project Office

Office of Nuclear Materials Safety and Safeguards (NMSS)

U.S. Nuclear Regulatory Commission

Education:

B.S. in Hydraulics Engineering, Cheng Kung University, 1963

M.S. in Civil Engineering, University of Missouri at Rolla, 1966

Ph.D. in Civil Engineering, University of Maryland at College Park, 1970

PROFESSIONAL EXPERIENCE:

Dr. Lee has more than thirty years of experience in Structural Engineering. He is a registered professional engineer and he is skilled in structural analysis, computer modeling, and finite element analysis.

Dr. Lee is currently performing structural evaluations for the licensing of spent nuclear fuel transportation and storage casks. His work includes the evaluation of the structural integrity of casks under the combined loadings of normal, off-normal, postulated design basis accident and extreme natural phenomena events, which include cask stability analysis under design basis seismic events. He has provided input for the preparation of NUREG-1567, Standard Review Plan for Spent Fuel Dry Storage Facilities; NUREG-1536, Standard Review Plan for Dry Cask Storage Systems; NUREG-1617, Standard Review Plan for Transportation Packages for Spent Nuclear Fuel. He has reviewed both the HI-STAR 100 Cask Storage application and the HI-STAR 100 Transportation Package application. He has also prepared many Safety Evaluation Reports for licensing actions involving the storage and transportation of spent nuclear fuel.

PROFESSIONAL CHRONOLOGY:

Bridge Design Engineer, State of Illinois, 1966-1967; Research Assistant, University of Maryland, 1967-1970; Senior Structural Engineer, Ewell, Bombhardt Associates Inc., 1970-1972; Assistant Professor, South Dakota State University, 1972-1973; Research Engineer, Gilbert Associates Inc., 1973-1978; Structural Engineer, Structural Engineering Branch, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, 1978-1980; Structural Engineer, Transportation Certification Branch, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 1980-1989; Senior Structural Engineer, Transportation Certification Branch, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 1989-1995; Senior Structural Engineer, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, 1995-Present.

Michael D. Waters

EDUCATION:

M.S. Nuclear Engineering Sciences, University of Florida, 1995

B.S. Nuclear Engineering, University of Florida, 1993

PROFESSIONAL EXPERIENCE:

U.S. NUCLEAR REGULATORY COMMISSION

May 1996 to Present Project Engineer, NMSS, Spent Fuel Project Office (SFPO)

Project Manager (PM): Schedule, coordinate, and prepare licenses, amendments, and approval certificates for several spent fuel storage installations, spent fuel storage and transportation cask designs, and transportation package designs. Coordinate multi-disciplined technical review teams to make regulatory findings on the adequacy of proposed designs. Develop NRC policy on assigned technical and licensing issues.

Technical Reviewer: Reviewed the adequacy of several spent fuel storage cask, storage facility, and transportation package designs primarily in the major technical disciplines of shielding, criticality, containment, radiological protection, and operating and maintenance procedures. Performed detailed technical reviews and conducted independent confirmatory analyses with state-of-the-art methods to determine compliance of proposed designs with 10 federal safety requirements in 10 CFR Parts 20, 71, and/or 72. Prepared written safety evaluations reports, federal rulemakings, and environmental assessments for assigned projects.

Major NRC Casework and Publications:

SFPO Project Manager (backup) for the Private Fuel Storage Facility (PFSF) license application review. Review team member for the PFSF environmental impact review.

SFPO Project Manager for the Fort St. Vrain independent spent fuel storage installation (ISFSI), Three Mile Island Unit 2 ISFSI, SPEC-300 transportation package, and MOX fresh fuel package.

Primary shielding and radiological safety reviewer of the HI-STAR 100 transportation cask design (Part 71), HI-STAR 100 storage cask design (Part 72), and HI-STORM 100 storage cask design (Part 72). Primary shielding, radiological safety, criticality, and/or containment reviewer of multiple other storage and transportation cask designs (Part 71 and 72).

Co-author of NUREG-1571, *"Information Handbook on Independent Spent Fuel Storage Installations,"* December 1996. Primary author of *"Reconsideration of Dose Assessments for Future Independent Spent Fuel Storage Installation Multi-Row Cask Arrays,"* Sixth International Conference on Nuclear Engineering.

UNIVERSITY OF FLORIDA

Jan 1993 - April 1996 Research Assistant/Graduate Student, Department of Nuclear Engineering Sciences

Responsibilities: Developed computer codes to analyze and evaluate the characteristics of industrial fuel designs and performed cost-benefit analyses to determine optimum fuel designs. Investigated the University's hazardous mixed waste problem, interviewed research laboratory personnel, identified root causes of waste generation, and determined inexpensive methods to mitigate waste.

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

May 1993 - August 1993 Professional Intern, Oak Ridge National Laboratory

May 1992 - August 1992

Responsibilities: Performed various studies with the RELAP-5 thermal hydraulic code and commercial plotting software. Developed experiments and standard procedures, as part of a program to confirm criticality design features of the reactor spent fuel storage racks.

NRC AWARDS

NRC Special Act Award - August 5, 2001

NRC Performance Award - July 18, 2000

NRC Performance Award - March 18, 1999