

STATE OF UTAH
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September 2, 1999

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Director of Public Policy & Communications

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Rulemakings and Adjudications
Rulemakings and Adjudications Staff
Office of the Secretary
U.S. Nuclear Regulatory Commission
11555 Rockville Pike, One White Flint North
Mail Stop: O16G15
Washington, D.C. 20555

Re: In the Matter of Private Fuel Storage, LLC, Docket 72-22

Dear Mr. Julian;

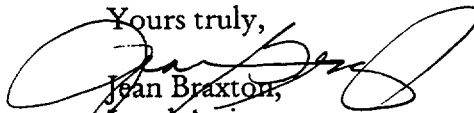
Enclosed are the following original signed documents (plus two copies of each) which were not available at the time certain pleadings were filed by the State in the above mentioned proceeding.

1. Declaration of Dr. James C. Pechmann, dated August 31, 1999, the faxed version of which was filed with the State of Utah's August 31, 1999 Supplemental Response to Applicant's Second Discovery Request (Contention L);
2. Declaration of Dr. Marvin Resnikoff, dated August 20, 1999, the faxed version of which was filed with the State of Utah's August 20, 1999 Request for Admission of Late-Filed Second Amended Utah Contention Q; and
3. Declaration of Dr. Marvin Resnikoff, dated August 9, 1999, the faxed version of which was filed with the State of Utah's August 9, 1999 Response to the Applicant's Motion for Partial Summary Disposition of Utah Contention R and Reply to the Staff's Response to the Applicant's Motion.

Please replace the faxed versions of these declarations with the enclosed original declarations.

Please contact me with any questions at (801) 366-0287. Thank you.

Yours truly,



Jean Braxton,
Legal Assistant

Enclosures: as stated
cc: PFS Docket 72-22-ISFSI Service List, without enclosures

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	Docket No. 72-22-ISFSI
)	
PRIVATE FUEL STORAGE, LLC)	ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel)	
Storage Installation))	August 31, 1999

DECLARATION OF DR. JAMES C. PECHMANN¹

I, Dr. James C. Pechmann, hereby declare under penalty of perjury and pursuant to 28 U.S.C. § 1746, that the factual statements contained in State of Utah's Supplemental Response to Applicant's Second Discovery Request (Contention L), to be filed August 31, 1999, are true and correct to the best of my knowledge, information and belief.

Dated this 31st day of August, 1999.

By: James C. Pechmann

James C. Pechmann, PhD
Research Associate Professor
of Geology and Geophysics,
University of Utah

¹ Both Dr. Pechmann and Dr. Arabasz assisted with, reviewed, and commented on a draft of the State's Supplemental Response to Discovery. Dr. Arabasz is currently traveling and unavailable to sign a Declaration. Dr. Pechmann has reviewed the final document.

UNITED STATES OF AMERICA
BEFORE THE U.S. NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

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

August 20, 1999

DECLARATION OF DR. MARVIN RESNIKOFF IN SUPPORT OF
STATE OF UTAH'S SECOND AMENDED CONTENTION Q

1, Dr. Marvin Resnikoff, declare under penalty of perjury that:

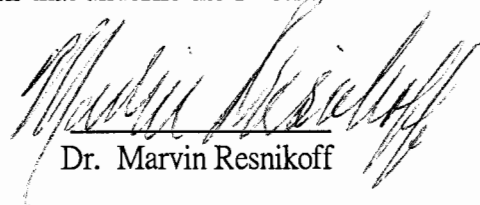
1. I am the Senior Associate at Radioactive Waste Management Associates, a private consulting firm based in New York City. On November 20, 1997 and January 16, 1998, I prepared declarations which were submitted to the Licensing Board by the State of Utah in support of its contentions regarding Private Fuel Storage, L.L.C.'s proposed Independent Spent Fuel Storage Installation. I assisted in the preparation of State of Utah's original Contention Q, which was submitted on November 23, 1997. A statement of my qualifications was attached to the November 1997 declaration. I also prepared a declaration in support of the State of Utah's Amended Contention Q (July 22, 1999), which was subsequently withdrawn.

2. I am familiar with Private Fuel Storage's ("PFS's") license application and Safety Analysis Report in this proceeding, as well as the applications for the storage and transportation casks PFS plans to use. I am also familiar with NRC regulations, guidance documents, and environmental studies relating to the transportation, storage, and disposal of spent nuclear power plant fuel, and with NRC decommissioning requirements.

3. I assisted in the preparation of the State of Utah's Second Amended Contention Q. The technical facts presented in the Second Amended Contention Q are true and correct to the best of my knowledge, and the conclusions drawn from those facts are based on my best professional judgment.

4. If Second Amended Contention Q is admitted for litigation, I would testify regarding my

opinion of the inadequacy of the cask stability provided in the Holtec HI-STORM Topical Safety Analysis Report ("TSAR"), Rev.9, provided to the State by Holtec under cover letter dated July 27, 1999. Second Amended Contention Q provides a summary of the testimony I would give, based on the information that has been provided to date. I would expect to be able to expand upon and refine my testimony, after having an opportunity to review the calculations that underlie the information provided in the TSAR.



Dr. Marvin Resnikoff

July 22, 1999

Effects of Changing Variables
Table 4 in *Dynamic Impact Effects on Spent Fuel Assemblies*

	A	B	C	D	E	F	G
Rod array	17x17	17x17	17x17	17x17	17x17	17x17	17x17
Assembly weight (lb)	1450.00	1450.00	1450.00	1450.00	1450.00	1450.00	1450.00
# of rods	264.00	264.00	264.00	264.00	264.00	264.00	264.00
Fueled length (in)	144.00	144.00	144.00	144.00	144.00	144.00	144.00
# of spacers (N)	7.00	7.00	7.00	7.00	7.00	7.00	7.00
L = (fueled length/N-1)	24.00	24.00	24.00	24.00	24.00	24.00	24.00
E (psi)	1.04E+07	1.04E+07	1.04E+07	1.30E+07	1.04E+07	1.04E+07	1.04E+07
oy (psi)	8.05E+04	8.05E+04	8.05E+04	8.05E+04	4.50E+04	4.50E+04	8.05E+04
t (in)	0.02	0.02	0.02	0.02	0.02	0.02	0.05
ro (in)	0.19	0.19	0.18	0.19	0.19	0.19	0.21
ri (in)	0.16	0.16	0.16	0.16	0.16	0.16	0.16
A (in ²)	0.02	0.02	0.02	0.02	0.02	0.02	0.05
I = (1/4*3.14(ro ⁴ -ri ⁴))	3.85E-04	3.85E-04	3.09E-04	3.85E-04	3.85E-04	3.85E-04	9.37E-04
W (lb)	0.84	0.84	0.69	0.84	0.84	0.84	1.78
w (lb/in)	0.04	0.04	0.04	0.04	0.04	0.04	0.04
r (in)	0.18	0.18	0.17	0.18	0.18	0.18	0.19
pressure (lb)	2250.00	1187.80	2250.00	2250.00	2250.00	1187.80	2250.00
oa (psi)	8787.50	4639.02	10472.14	8787.50	8787.50	4639.02	4675.00
M (lb-in)	2.32	2.32	2.32	2.32	2.32	2.32	2.32
ob (psi)	1128.70	1128.70	1378.17	1128.70	1128.70	1128.70	519.50
P (lb)	68.56	68.56	55.00	85.69	68.56	68.56	166.87
ga	81.93	81.93	80.06	102.41	81.93	81.93	93.71
gy	63.54	67.21	50.81	63.54	32.08	35.76	145.96

A: Values from Westinghouse specimen (Dynamic Impact Effects... Table 4)
B: Pressure changed to a lower value (value in An Assessment of the Risk...)
C: Thickness of fuel cladding decreased due to oxidation by 17%. Column A's thickness is reduced by 17%.
D: E Modulus changed to higher value (value in An Assessment of the Risk...)
E: Yield stress lowered to half the original value
F: Yield stress lowered and pressure lowered (E and B)
G: Doubling the thickness

Note:
DIE = Dynamic Impact Effects...
AAR = An Assessment of the Risk...
AAR's E modulus was expected to be lower, as they took irradiated zircaloy into account. However, it was not, after conversion.

	AAR	DIE
E modulus	1.30E+07	1.04E+07 psi
Pressure	1187.80	2250.00 psi

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	Docket No. 72-22-ISFSI
)	
PRIVATE FUEL STORAGE, LLC)	ASLBP No. 97-732-02-ISFSI
Independent Spent Fuel)	
Storage Installation))	August 9, 1999

**DECLARATION OF DR. MARVIN RESNIKOFF IN SUPPORT OF
THE STATE'S RESPONSE TO APPLICANT'S MOTION FOR
PARTIAL SUMMARY DISPOSITION OF UTAH CONTENTION R**

Under penalty of perjury, I, Dr. Marvin Resnikoff, declare as follows:

1. I am the Senior Associate of Radioactive Waste Management Associates, a private consulting firm based in New York City. I have researched radioactive waste issues for the past 25 years and have extensive experience and training in the field of nuclear waste management, storage, and disposal. A copy of my resume is attached.
2. I am the State of Utah's expert witness on various contentions in this proceeding. As a nuclear engineer, I am assisting the State in the review and analysis of the Holtec and TranStor casks that will be used at the proposed Private Fuel Storage, L.L.C.'s ("PFS's") facility.
3. I am familiar with the PFS license submittal and updates thereto and PFS's responses to the Staff's Requests for Information. I am also familiar with the submittals to the NRC for a certificate of compliance for the storage, transportation and transfer casks that are intended to be used at the PFS facility, as well as the NRC regulations relating to radiation safety and the transportation and storage of spent nuclear fuel.
4. I have reviewed the Applicant's Motion for Summary Disposition of Contention R - Emergency Planning, the attachments thereto, and the Staff's Response to the Motion.

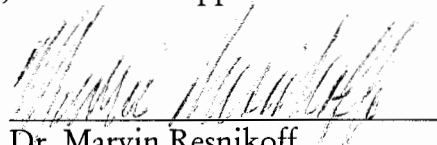
5. The Applicant says it has analyzed credible fires that may occur inside the Canister Transfer Building from a 50 gallon spill of diesel fuel from the cask transporter and a 300 gallon spill from the heavy haul truck and fires that may occur outside the building from an unknown quantify of diesel fuel spilled from the locomotive and from wildfires. It is my opinion that the Applicant has not conducted a proper analysis of the fires it believes are credible and has also not taken into account the effects of fires from those sources it analyzed as well as from other sources.
6. The PFS Safety Analysis Report ("PFS-SAR") provides overall diagrams without any detail to ascertain that the building design will prevent the escape of diesel fuel spilled inside the Canister Building from the cask load/unload bay or from the main bay outside a transfer cell to other areas of the building. Accordingly, the Applicant must conduct an broader analysis of a 300 gallon fuel spill than simply restricting the analysis to the load/unload bays. In my opinion such an analysis must include the effects of a 300 gallon fuel fire on the transfer casks.
7. The HI-STORM Topical Safety Analysis Report ("TSAR") has only considered a fire analysis involving a 50 gallon spill. HI-STORM TSAR § 11.2.4.2.2. The short-term accident design temperatures for the HI-TRAC cask varies from 300°F for the neutron absorber material (Holtite-A) at the top of the HI-TRAC cask to 600-700°F for other materials such as the lead liner and outer water jacket. HI-STORM TSAR, Docket No. 72-1014, Table 2.2.3. The maximum temperature of the fuel cladding under steady-state conditions is 902°F while the fuel cladding for a 50 gallon fire is 942°F. *Id.* at 4.5-11 (Rev. 8); *see also id.* at Table 4.5.2. It is important to note, however, that the maximum fuel cladding temperature has not been calculated for a 300 gallon fire or a 6,000 gallon fire. It is my opinion that such a fire would cause gross cladding defects. The Holtec TSAR has no such analysis; neither does the Applicant's summary disposition motion.
8. Because the inertial mass of the TranStor transfer cask and the age of the fuel it is designed to carry are similar to those of the HI-TRAC transfer cask, the short-term accident design temperatures for the two casks are likely to be similar as well. However, British Nuclear Fuels Ltd., manufacturers of TranStor cask systems, does not analyze short-term accident design temperatures for a fire accident involving 50 gallons of diesel fuel. SAR for the TranStor Storage Cask System, SNC-96-72 SAR, Rev. C, November 1998, Docket No. 72-1023. The Srinivasan Declaration attached to the Applicant's motion only discusses the

TranStor storage cask and appears to rely on the Holtec 50 gallon fuel spill analysis rather than relying on any independent analysis. See Srinivasan Declaration ¶ 6. The Srinivasan Declaration contains no reference to the TranStor transportation cask or the transfer cask.

9. The Applicant admits that a credible event from a fire inside the Canister Transfer Building is the loss of electrical power. Johns Dec. at ¶ 10. Therefore, a fire would likely cause electrical wiring in the Canister Building building to burn and need to be replaced. The Johns Declaration goes so far as to say that loss of electrical power while canister transfer operations were in progress would not cause a release of radioactivity. Johns Dec. at ¶ 10. The PFS SAR recognizes that interruption of transfer operations due to external power outage would require crane operators to "take measures as necessary to assure adequate distance and/or additional shielding between themselves and the transfer casks to minimize doses...." PFS SAR at 8.1-5 (Rev. 0). There is no analysis, however, either in the PFS SAR or the Applicant's motion, of the effects to electrical repair workers from having to repair or replace any burned wiring inside the canister transfer bay. In my opinion utility workers would be at risk of high occupational exposures of radiation. Furthermore, the Applicant has not identified how or when it could resume canister transfer operations if fire causes burned out electrical wiring supplying the Canister Transfer Building during those operations.
10. The Applicant says it has analyzed the effects of a fire caused by fuel spilled from a locomotive located outside the Canister Transfer Building. Johns Dec. ¶ 13. This analysis is meaningless because there is no reference whatsoever to the quantity of fuel involved in the spill. Such facts as the total fuel capacity of the locomotive and the quantity of fuel spilled must be divulged by the Applicant before an analysis can begin. The Applicant's effort to compare a fire from some unknown quantity of fuel spilled from a locomotive to fire from a 50 gallon spill that may engulf a storage cask has no scientific validity.
11. The fuel capacity of a locomotive at PFS is a significant material fact in analyzing a fire involving diesel fuel from a locomotive. For example, the GE AC6000CW locomotive has a fuel capacity of 6,000 gallons of diesel fuel. See Exhibit 1 attached to this Declaration.
12. Casks loaded on railcars will enter and exit the Canister Transfer building on railroad tracks. There is no indication how those railcars will enter and exit the building if, as PFS claims, some undisclosed administrative procedures will

preclude a locomotive from entering the building. According to the PFS discovery documents I have reviewed, the total weight of a rail car, plus tie-down and cask will exceed 211 tons. The length of the load/unload area is 198 feet. PFS SAR Fig. 4.1-1. *See also* Johns Dec. at ¶ 9. There is nothing in the PFS submittals to NRC to suggest there is any way, other than by a locomotive, to move the casks into and out of the Canister Transfer Building. Therefore, the logical assumption is that the railcars will be moved by the locomotive. Given the significant quantity of fuel that a locomotive may carry, it is an important safety concern to analyze a fire caused by a spill of fuel from a locomotive inside the Canister Transfer Building. Certainly the Holtec TSAR has not analyzed the effects of fire on the transfer cask from a fire involving such a large quantity of diesel fuel.

13. A loaded heavy haul truck and a loaded rail car may fit into the cask load/unload area at the same time. PFS SAR Fig. 4.7-1 (sheet 1). There is nothing in the PFS submittals to NRC that states that a heavy haul truck and a locomotive moving a railcar will not be inside the Canister Transfer Building at the same time. Therefore, it is credible for a fire to occur involving fuel from both the heavy haul truck and the locomotive. The Holtec SAR has not analyzed the effects from such a fire; nor has the Applicant.


Dr. Marvin Resnikoff

Dated: August 9, 1999