

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))	July 16, 1999

DECLARATION OF DR. MARVIN RESNIKOFF

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 Utah Contention B, License Needed for Intermodal Transfer Facility. I assisted the State in the deposition of the Applicant's knowledgeable person for Contention B, John Donnell, as well as in other discovery against the Applicant.
3. I am familiar with Private Fuel Storage, L.L.C.'s ("PFS's") license submittal and updates thereto, PFS's responses to Requests for Information, as well as the applications for the storage and transportation casks PFS plans to use. I am also familiar with NRC and Department of Transportation regulations relating to the transportation and storage of spent nuclear fuel.
4. I have reviewed the Applicant's Motion for Summary Disposition of Contention B - License Needed for Intermodal Transfer Facility, including the Statement of Material Facts Not in Dispute and accompanying declarations.
5. With 365,000 total take offs and landings of commercial flights in 1998 into and out of Salt Lake City International Airport (Exhibit 5 at ¶7 to Applicant's Motion for Partial Summary Disposition for Utah Contention K, dated June 7,

1999) and 8,711 military flight per federal fiscal year 1998 into or out of the UTTR North and South Ranges (Applicant's Response to RAI 8-2, February 10, 1998) the likelihood for an air crash should be computed using the methodology of NUREG-0800. The Applicant has failed to make this analysis.

6. The SAR has little information about the ITF. Section 4.5.4.1 has one paragraph devoted to the "Intermodal Transfer Point." The paragraph has no discussion of the potential for air crashes at the ITF.
7. I assume the weather enclosure is a sheet metal structure that would provide no resistance to an air crash. The transportation casks themselves must satisfy hypothetical accident conditions under 10 CFR 71.73 involving a free drop of 30 feet onto a flat, essentially unyielding horizontal surface and a 40 inch drop onto a mild steel bar. The casks are not designed to withstand an air crash involving an F-16 jet engine weighing 3700 pounds impacting the cask at 600 mph. While a facility licensed under Part 72 must be designed to withstand credible accidents, there is not such requirement under Part 71.
8. General Matthews has informed me that rocket motors slated for destruction are transported along I-80 near the proposed ITF. In addition, rockets are transported along I-80 to the Lakeside bombing range north of I-80. Rocket motors contain 17,000 lb explosive weight, and the Trident rocket motor contains 40,000 lb net explosive weight. See Hawley Declaration, Exhibit A. There is a potential for a credible accident at the ITF due to an explosion of rockets or rocket motors. Unlike Part 72 where dangerous nearby facilities must be identified, no similar regulations appear to apply to the ITF under Part 71. Certainly the Applicant has not identified or evaluated the potential for rocket or rocket motor explosions along I-80. A transportation cask is not designed to withstand the direct strike of an Apache helicopter rocket that are designed to penetrate armored vehicles. Thus, contrary to the Applicant's statement of material facts, the spent fuel may not remain in a sealed cask at all times.
9. The NRC regulations require that the spent fuel cladding be protected during storage (§72.122(h)). A recently issued NRC Staff guidance document, ISG-12, raises questions about whether irradiated Westinghouse fuel cladding can actually withstand design basis impacts. If a Holtec cask containing Westinghouse fuel plus skid were dropped horizontally from a height of 10 inches, without the cushioning of impact limiters (which do not fully protect the sides of a transportation cask), the information provided in ISG-12 indicates

that the fuel cladding could buckle. With only a single containment barrier remaining, the canister could not be loaded into a HI-STORM overpack.

10. From an overall design and safety perspective, it makes no sense to me to transfer casks from rail cars to trailers at the ITF without certain important safety tests for leaking canisters. If it were determined at the PFS facility that a canister were leaking radioactivity, the canister would be repacked into a transportation overpack and returned to the shipper. If the tests were performed at the ITF, two transfer operations and a round trip down Skull Valley Road would be unnecessary. The Applicant should check for helium leakage and radioactivity at the ITF.
11. In addition, the transfer operation at the ITF increases the hazard to transportation workers. This appears to be the rationale why, for shipments of casks where the direct radiation on the external surface exceeds 200 mrem/hour, NRC and DOT regulations bar loading and unloading operations between the beginning and end of the transportation (10 CFR 71.47 (b)(1)(iii); 49 C.F.R. 173.441(b)(1)(iii)).

Dr. Marvin Resnikoff

Dated: July 16, 1999

* Dr. Resnikoff is unavailable today to sign this declaration. Dr. Resnikoff signed a Declaration on July 15, 1999, but editorial changes thereto, which have been approved via telephone by Dr. Resnikoff, precluded the State from filing the July 15 Declaration. The signed original of this Declaration will be filed upon Dr. Resnikoff's return.

Resume of Marvin Resnikoff, Ph.D.

Dr. Marvin Resnikoff is Senior Associate at Radioactive Waste Management Associates and is an international consultant on radioactive waste management issues. He is Principal Manager at Associates and is Project Director for risk assessment studies on radioactive waste facilities and transportation of radioactive materials. Dr. Resnikoff has concentrated exclusively on radioactive waste issues since 1974. He has conducted studies on the remediation and closure of the leaking Maxey Flats, Kentucky radioactive landfill for Maxey Flats Concerned Citizens, Inc. under a grant from the Environmental Protection Agency, the Wayne and Maywood, New Jersey thorium Superfund sites and on proposed low-level radioactive waste facilities at Martinsville (Illinois), Boyd County (Nebraska), Wake County (North Carolina), Ward Valley (California) and Hudspeth County (Texas). He has conducted studies on transportation accident risks and probabilities for the State of Nevada and dose reconstruction studies of oil pipe cleaners in Mississippi and Louisiana, residents of Canon City, Colorado near a former uranium mill, residents of West Chicago, Illinois near a former thorium processing plant, and residents and former workers at a thorium processing facility in Maywood, New Jersey. In West Chicago he calculated exposures and risks due to thorium contamination and served as an expert witness for plaintiffs A Muzzey, S Bryan, D Schroeder and assisted counsel for plaintiffs KL West and KA West. He is presently serving as an expert witness for a separate group of plaintiffs in West Chicago, including R Dassion. He also evaluated radiation exposures and risks in worker compensation cases involving G Boeni and M Talitsch, former workers at Maywood Chemical Works thorium processing plant.

Under a contract with the State of Utah, Dr. Resnikoff is a technical consultant to DEQ on the proposed dry cask storage facility for high-level waste at Skull Valley, Utah and proposed storage/transportation casks. He is assisting the State on licensing proceedings before the Nuclear Regulatory Commission. In addition, at hearings before state commissions and in federal court, he has investigated proposed dry storage facilities at the Point Beach (WI), Prairie Island (MN) and Palisades (MI) reactors.

In Canada, he has conducted studies on behalf of the Coalition of Environmental Groups and Northwatch for hearings before the Ontario Environmental Assessment Board on issues involving radioactive waste in the nuclear fuel cycle and Elliot Lake tailings and the Interchurch Uranium Coalition in Environmental Impact Statement hearings before a Federal panel regarding the environmental impact of uranium mining in Northern Saskatchewan. He has also worked on behalf of the Morningside Heights Consortium regarding radium-contaminated soil in Malvern and on behalf of Northwatch regarding decommissioning the Elliot Lake tailings area before a FEARO panel. More recently he completed a study for Concerned Citizens of Manitoba regarding transportation of irradiated fuel to a Canadian high-level waste repository.

He was formerly Research Director of the Radioactive Waste Campaign, a public interest organization conducting research and public education on the radioactive waste issue. His duties with the Campaign included directing the research program on low-level commercial and military waste and irradiated nuclear fuel transportation, writing articles, fact sheets and reports, formulating policy and networking with numerous environmental and public interest organizations and the media. He is author of the Campaign's book on "low-level" waste, *Living Without Landfills*, and co-author of the Campaign's book, *Deadly Defense, A Citizen Guide to Military Landfills*.

Between 1981 and 1983, Dr. Resnikoff was a Project Director at the Council on Economic Priorities, a New York-based non-profit research organization, where he authored the

390-page study, *The Next Nuclear Gamble, Transportation and Storage of Nuclear Waste*. The CEP study details the hazard of transporting irradiated nuclear fuel and outlines safer options.

In February 1976, assisted by four engineering students at State University of New York at Buffalo, Dr. Resnikoff authored a paper that changed the direction of power reactor decommissioning in the United States. His paper showed that power reactors could not be entombed for long enough periods to allow the radioactivity to decay to safe enough levels for unrestricted release. The presence of long-lived radionuclides meant that large volumes of dismantled reactors would still have to go to low-level waste disposal facilities. He has assisted public interest groups NECNP and CAN on the decommissioning of the Yankee-Rowe reactor.

Dr. Resnikoff is an international expert in nuclear waste management, and has testified often before State Legislatures and the U.S. Congress. He has extensively investigated the safety of the West Valley, New York and Barnwell, South Carolina nuclear fuel reprocessing facilities. His paper on reprocessing economics (*Environment*, July/August, 1975) was the first to show the marginal economics of recycling plutonium. He completed a more detailed study on the same subject for the Environmental Protection Agency, "Cost/Benefits of U/Pu Recycle," in 1983. His paper on decommissioning nuclear reactors (*Environment*, December, 1976) was the first to show that reactors would remain radioactive for hundreds of thousands of years.

Dr. Resnikoff has prepared reports on incineration of radioactive materials, transportation of irradiated fuel and plutonium, reprocessing, and management of low-level radioactive waste. He has served as an expert witness in state and federal court cases and agency proceedings. He has served as a consultant to the State of Kansas on low-level waste management, to the Town of Wayne, New Jersey, in reviewing the cleanup of a local thorium waste dump, to WARD on disposal of radium wastes in Vernon, New Jersey, to the Southwest Research and Information Center and New Mexico Attorney General on shipments of plutonium-contaminated waste to the WIPP facility in New Mexico and the State of Utah on nuclear fuel transport. He has served as a consultant to the New York Attorney General on air shipments of plutonium through New York's Kennedy Airport, and transport of irradiated fuel through New York City, and to the Illinois Attorney General on the expansion of the spent fuel pools at the Morris Operation and the Zion reactor, to the Idaho Attorney General on the transportation of irradiated submarine fuel to the INEL facility in Idaho and to the Alaska Attorney General on shipments of plutonium through Alaska. He was an invited speaker at the 1976 Canadian meeting of the American Nuclear Society to discuss the risk of transporting plutonium by air. As part of an international team of experts for the State of Lower Saxony, the Gorleben International Review, he reviewed the plans of the nuclear industry to locate a reprocessing and waste disposal operation at Gorleben, West Germany. He presented evidence at the Sizewell B Inquiry on behalf of the Town and Country Planning Association (England) on transporting nuclear fuel through London. In July and August 1989, he was an invited guest of Japanese public interest groups, Fishermen's Cooperatives and the Japanese Congress Against A- and H- Bombs (Gensuikin).

Between 1974 and 1981, he was a lecturer at Rachel Carson College, an undergraduate environmental studies division of the State University of New York at Buffalo, where he taught energy and environmental courses. The years 1975-1977 he also worked for the New York Public Interest Group (NYPIRG).

In 1973, Dr. Resnikoff was a Fulbright lecturer in particle physics at the Universidad de Chile in Santiago, Chile. From 1967 to 1973, he was an Assistant Professor of Physics at the State University of New York at Buffalo. He has written numerous papers in particle physics, under grants from the National Science Foundation. He is a 1965 graduate of the University of Michigan with a Doctor of Philosophy in Theoretical Physics, specializing in group theory and

particle physics.

Dr. Marvin Resnikoff

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EXPERIENCE:

- April 1989 - present **Senior Associate**, Radioactive Waste Management Associates, management of consulting firm focused on radioactive waste issues, evaluation of nuclear transportation and military and commercial radioactive waste disposal facilities.
- 1978 - 1981; 1983 - April 1989 **Research Director**, Radioactive Waste Campaign, directed research program for Campaign, including research for all fact sheets and the two books, *Living Without Landfills*, and *Deadly Defense*. The fact sheets dealt with low-level radioactive waste landfills, incineration of radioactive waste, transportation of high-level waste and decommissioning of nuclear reactors. Responsible for fund-raising, budget preparation and project management.
- 1981 - 1983 **Project Director**, Council on Economic Priorities, directed project which produced the report *The Next Nuclear Gamble*, on transportation and storage of high-level waste.
- 1974 - 1981 **Instructor**, Rachel Carson College, State University of New York at Buffalo, taught classes on energy and the environment, and conducted research into the economics of recycling of plutonium from irradiated fuel under a grant from the Environmental Protection Agency.
- 1975 - 1976 **Project Coordinator**, SUNY at Buffalo, New York Public Interest Research Group, assisted students on research projects, including project on waste from decommissioning nuclear reactor.
- 1973 **Fulbright Fellowship** at the Universidad de Chile, conducting research in elementary particle physics.
- 1967 - 1972 **Assistant Professor of Physics**, SUNY at Buffalo, conducted research in elementary particle physics and taught range of graduate and undergraduate physics courses.
- 1965 - 1967 **Research Associate**, Department of Physics, University of Maryland, conducted research into elementary particle physics.

EDUCATION



University of Michigan
Ann Arbor, Michigan

PhD in Physics, June 1965
M.S. in Physics, Jan 1962
B.A. in Physics/Math, June 1959