



State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY OFFICE OF THE EXECUTIVE DIRECTOR

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Brent C. Bradford
Deputy Director

168 North 1950 West
P.O. Box 144810
Salt Lake City, Utah 84114-4810
(801) 536-4400
(801) 536-0061 Fax
(801) 536-4414 T.D.D.
www.deq.state.ut.us Web

May 27, 1999

Scott C. Flanders
Sr. Environmental Project Manager
Licensing and Inspection Directorate
Spent Fuel Project Office
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Washington DC 20555

Dear Mr. Flanders:

Re: U.S. Nuclear Regulatory Commission, Department of the Interior, Bureau of Indian Affairs, Bureau of Land Management, Docket No. 72-22; and Department of the Interior, Bureau of Land Management, Pony Express Resource Management Plan, Environmental Impact Statement Scoping Comments and BLM Resource Management Plan Amendment Scoping Comments.

Enclosed are the written comments for the state of Utah in response to the EIS Scoping regarding the above matter.

If you have any questions, please contact me.

Best regards,

A handwritten signature in black ink, reading "Dianne R. Nielson", is written over a horizontal line.

Dianne R. Nielson, Ph.D.
Executive Director

enclosure

U. S. NUCLEAR REGULATORY COMMISSION
DEPARTMENT OF THE INTERIOR
Bureau of Indian Affairs
Bureau of Land Management
DOCKET NO. 72-22
And
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
PONY EXPRESS RESOURCE MANAGEMENT PLAN

ENVIRONMENTAL IMPACT STATEMENT
SCOPING COMMENTS
And
BLM RESOURCE MANAGEMENT PLAN AMENDMENT
SCOPING COMMENTS

SUBMITTED BY THE STATE OF UTAH
MAY 27, 1999

The following comments are provided by the State of Utah (State) in response to the March 31, 1999 Notice of Intent to Prepare Environmental Impact Statement (EIS) and Notice of Public Scoping Meeting issued by the U. S. Nuclear Regulatory Commission (NRC) and by the U.S. Department of Interior for the Bureau of Indian Affairs (BIA) and the Bureau of Land Management (BLM). These comments are also being provided in response to the BLM's separate Notice of Intent to Prepare a Plan Amendment to the Pony Express Resource Management Plan (RMP).

Because there are two agencies involved in this environmental decisionmaking process that were not involved at the time of the NRC's 1998 scoping process, it is important that these comments address matters that have already been considered by the NRC. For that reason, the EIS Scoping Comments submitted by the State of Utah on June 19, 1998 are hereby incorporated by reference. A copy of the Comments (not including the incorporated attachments) is included as Attachment A to this document.

The State's Contentions Relating to the Low Rail Spur Transportation License Amendment dated Sept. 29, 1998, developed in PFS's licensing proceeding before the NRC (NRC Docket No. 72-22) is also incorporated by reference and included as Attachment B to this document.

Comments are organized under topic headings for ease of consideration. However, issues are interrelated and commonly impact or encompass other issues under other topic headings. Issues should not be narrowly construed or evaluated, based on topic headings. If additional information or clarification is needed, please contact:

Comments from State of Utah
EIS Scoping, Docket No. 72-22
and Pony Express RMP
May 27, 1999
Page 2

Dianne R. Nielson, PhD.
Executive Director
Utah Department of Environment Quality
168 North 1950 West
Salt Lake City, UT 84116
Phone: 801-536-4402
Fax: 801-536-0061

Denise Chancellor, Esq.
Assistant Attorney General
Utah Attorney General's Office
Environment Division
160 East 300 South, 5th Floor
Salt Lake City, UT 84114-0873
Phone: 801-366-0286
Fax: 801-366-0292

A. THE PROPOSED ACTION

The NRC is considering Private Fuel Storage's (PFS's) license application for an Independent Spent Fuel Storage Installation (ISFSI) at the Skull Valley Reservation (NRC Docket No. 72-22). PFS is proposing to store up to 40,000 Metric Tons of Uranium at a storage facility on the Skull Valley Goshute Reservation. In addition, PFS has requested of BLM both a right-of-way to build a rail spur from the Union Pacific mainline paralleling I-80 south to the Reservation across BLM land and a right-of-way to use BLM land near Rowley Junction for an intermodal transfer station (ITS) to transfer the spent fuel to heavy haul trucks.

Thus, PFS is asking to transport potentially more than 80,000 Metric Tons of Uranium of high level nuclear waste on or across public lands, forty thousand metric tons to the storage area and, presumably, forty thousand metric tons from the storage area once a permanent repository is prepared. Forty thousand metric tons, the current total accumulation of the nation's commercial high-level nuclear waste, is an enormous amount. By comparison, Northern State's Power, one of the member utilities of PFS, only stores 7,000 metric tons in dry cask storage.

In addition, the proposed action includes the BIA's consideration of a proposed lease agreement between the Skull Valley Band of Goshute Indians and PFS. As a related but separate matter, the BLM is considering an amendment to its Resource Management Plan that would allow it to grant PFS's proposed right of way.

B. SCOPING IS PREMATURE

This issue is discussed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 1. Although additional information has been submitted since the time of those comments, there are still substantial gaps in the information available and necessary to complete an EIS. For example, PFS has still not provided any information about the frequency of truck or rail shipments through Skull Valley.

C. PURPOSE AND NEED FOR THE PROPOSED FACILITY

This issue is discussed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 2, and (separately by the Utah Trust Lands Administration) at 22. In addition, there are new developments in federal spent waste policy that necessitate a critical evaluation of the need for this facility must be carefully analyzed. See Part D.2 below.

D. ALTERNATIVE ACTIONS THAT MUST BE CONSIDERED IN THE EIS

An adequate EIS must consider all reasonable alternatives, including the "no action" alternative. 40 C.F.R. § 1502.14; and NRC regulations, 10 C.F.R. Part 51, Subpt A, App. A, Section 5 (incorporated through 10 C.F.R. 51.70(b)). See State's June 19, 1998 Scoping Comments, included as Attachment A, at 3 and (separately for the Utah Trust Lands Administration) at 23 for further discussion of the need for and range of alternatives that must be considered. The State also offers the following additional comments.

1. No Action Alternative

The EIS must address the no-action alternative, storing high level nuclear waste as it is currently being stored, under the control of the generator or operator, until a permanent repository is available. The license application amendment and the right of way application do not address the overall social costs or benefits that may occur from granting the right-of-way to build the rail spur and the intermodal transfer station. The no action alternative should evaluate the impacts and risks that could be avoided if the spent fuel continued to be stored at the existing reactor sites.

A no action alternative must be evaluated pursuant to the requirements of 40 C.F.R. § 1502.14(d).

2. DOE Proposed Interim Management Policy Must Be Considered as Alternative

No analysis of the environmental impacts of spent fuel storage can be complete without considering the management program preferred by the U.S. Department of Energy (DOE). Under that management program, DOE will take title to spent fuel while that fuel remains in on-site facilities associated with the reactors where the fuel was generated. On a case-by-case basis according to the preference of the utility, DOE would either undertake responsibility for managing these on-site storage facilities or would reimburse the utility for its management costs. See, e.g., March 12, 1999 testimony of Bill Richardson, Secretary of Energy, before the United

States House Subcommittee on Energy and Power of the Committee on Commerce, which is included as Attachment C.

DOE prefers this on-site storage option to a centralized DOE interim storage facility because it will postpone the costs and potential hazards of waste transport until a permanent repository site has been selected, thus avoiding any unnecessary transport in the event a site other than the proposed Yucca Mountain site is finally approved. *Id.* at 4. DOE also prefers this option because it avoids the additional costs associated with building a new, temporary DOE repository. *Id.* Both of these reasons apply to a privately-owned temporary repository as well. *Id.* See also the discussion of cost/benefit analysis below.

Federal regulations require consideration of reasonable alternatives even if they are not within the jurisdiction of the lead agency (Council on Environmental Quality (CEQ) regulations at 40 C.F.R. § 1502.14(c); and NRC regulations, 10 C.F.R. Part 51, Subpt A, App. A, Section 5 (incorporated through 10 C.F.R. 51.70(b)). It is also important to note that this is a new alternative, developed by DOE since the NRC's previous scoping process.

3. Alternatives for BLM Rights of Way

PFS has before the BLM requests for two rights of way, one for an ITS and one for the "Low Rail Spur" originating at Low, Utah. The BLM must therefore consider at least three alternatives: granting one or the other of the two proposed rights-of-way or granting both rights-of-way, or some other hybrid. Obviously, granting both rights-of-way would have significantly greater environmental impacts and other costs than granting just one. Further, since both rights-of-way serve identical functions, the benefit of granting both would be no greater than the benefit of granting just one right-of-way.

E. ANALYSIS OF PROPOSED ACTION AND ALTERNATIVES

The comparative analysis of the impacts of the proposed action and of alternatives to the proposed action is the "heart of the environmental impact statement." 40 C.F.R. § 1502.14, and 10 C.F.R. Part 51, Subpt A, App. A, Section 5. The completed EIS must present the environmental and other impacts of the proposed action and all reasonable alternatives, including the no action alternative, in a comparative form. *Id.* Other impacts that must be considered include economic and technical costs and benefits. 10 C.F.R. 51.45(c). The point of view of the State – which unequivocally opposes the proposed actions – must also be considered in this analysis. 10 C.F.R. 51.71(b).

The EIS must include a discussion of direct and indirect costs and impacts, including cumulative impacts associated with the construction and operation of the rail line. 40 C.F.R. § 1502.16, and 10 C.F.R. Part 51, Subpt A, App. A, Section 7.

Because the complete lease agreement between the Skull Valley Band of Goshutes and PFS is not available, the impacts of financial commitments governing the lease cannot be known. Without this information in the license, and absent additional financial information from the lease agreement, there is insufficient information for an adequate analysis of the costs and benefits of the proposal.

In addition, neither the license application nor the right-of-away application provide sufficient detail concerning the costs associated with constructing, operating, and closing the rail spur or the intermodal transfer station. For example, there is no performance or design specification information, such as whether the quality of the rail meets the minimum Class 2 track rating established by AAR Circular OT-55 for hazardous materials shipments, switching needs at interline connection and facilities, signaling capabilities, and travel grades. This lists only a few of the many missing details necessary for an adequate analysis of costs and benefits.

NEPA requires federal agencies to develop methods "which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making." Several of the impacts cited in Part F below are not quantifiable, e.g., many of the impacts on flora and fauna, but they must nevertheless be fairly considered in this process.

Finally, any complete EIS must also consider and compare the costs of alternatives to the proposed actions. The Department of Energy has concluded that the costs of a centralized DOE interim facility would be greater than the costs of on-site management of spent waste by \$1.5 billion. March 12, 1999 testimony of Secretary of Energy Bill Richardson, at 4. It is reasonable to assume that construction and use of an adequate private facility will cost a similar amount. The NRC, BLM, and BIA must also recognize as they conduct this analysis that monies expended by the private utilities will almost certainly have to be reimbursed by the federal government given recent case law that has given utilities the right to pursue contractual damages for DOE's failure to take title to the spent waste in January 1998. See Attachment E.

F. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES THAT MUST BE CONSIDERED IN THE EIS

An EIS must accurately describe the existing environment of the area(s) that would be affected by a proposed action, and must assess the potential impacts of the proposed action, and all

reasonable alternatives, on that environment. 40 C.F.R. §§ 1502.15 and 1502.16, and 10 C.F.R. Part 51, Subpt A, App. A, Sections 6 and 7. Although these are separate requirements, they are obviously related. For example, the EIS must consider the potential for seismic activity in the area, and must evaluate the impacts on the environment that may result from seismic activity if the proposed action is taken.

1. Cumulative Impacts Must be Considered

CEQ regulations require that an EIS consider cumulative impacts. 40 CFR 1508.25(c). "Cumulative impact" is defined in 40 CFR 1508.7 as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action. Some of the existing facilities that must be considered in this context are described in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 7 and (separately for the Utah Trust Lands Administration) at 24.

The Low Rail Corridor is being constructed solely to move spent nuclear fuel casks from the Union Pacific mainline at the junction of Interstate 80 and Low across public lands to the Skull Valley Reservation. The rail corridor has no other independent utility other than to serve the PFSs ISFSI. Thus, the Low Rail Corridor is inextricably part of the PFSs ISFSI project and as such must be evaluated under the criteria in 10 CFR 72.100(b) and 51.54(c) and CEQ regulations.

2. Indirect Impacts Must be Considered

In addition to analyzing direct impacts of the proposed actions, the EIS must analyze indirect actions. 40 C.F.R. § 1502.16, and 10 C.F.R. Part 51, Subpt A, App. A, Section 7. The proposed facility would store 40,000 metric tons of the nation's commercial spent fuel. Since approval of the proposed actions would mean that almost all the spent fuel shipments to the PFS facility would pass through Salt Lake City, the environmental impacts of transporting spent fuel through Salt Lake City and Salt Lake County must also be considered. Many of the impacts discussed in Part F are equally predictable indirect impacts of approval of the proposed actions, and must therefore be analyzed in the EIS.

3. Impacts Should Not be Assumed to be Temporary

Although the ISFSI is proposed to be temporary, there is no guarantee that it will ever be removed. See State's June 19, 1998 Scoping Comments, included as Attachment A, at 5 and

(separately for the Utah Trust Lands Administration) at 22.

3. Risk Assessments Required for Analysis

Risk assessments are critical for an accurate evaluation of this facility. See State's June 19, 1998 Scoping Comments, included as Attachment A, at 6.

4. Transportation Impacts

Transportation impacts were discussed at length in previous Scoping comments submitted by the State. See State's June 19, 1998 Scoping Comments, included as Attachment A, at 8 and (separately for the Utah Trust Lands Administration) at 24. The EIS must address the cumulative transportation impacts to the proposed storage facility, similar to the cumulative transportation impacts considered for Clark County, Nevada in NUREG-1437. The EIS must evaluate the design and operational details of the proposed rail line. The EIS must spell out the State of Utah permits and requirements. The EIS must investigate the probability and consequences of sabotage to a fully-loaded transportation cask, particularly in an urban location like Salt Lake City. Finally, the EIS must address the economic impact of transportation accidents.

State Approval

Under Item 9 in the BLM application, PFS states that no State government approval is required. The PFS application is incorrect. PFS needs to obtain permission from Utah Department of Transportation (UDOT) and Utah Department of Environmental Quality regarding a number of design, construction, and operational requirements of their transportation proposal and approvals where vehicles exceed size and weight restrictions.

Intermodal Transfer Station (ITS)

PFS requested a right-of-way to build an ITS on BLM land 1.8 miles west of Rowley Junction. The new proposed ITS would still be located next to the Union Pacific mainline and in close proximity to Interstate 80, the industrial salt plant, and Timpie Springs Wildlife Management Area. Concerns identified during the initial scoping comments also apply to this new site.

Skull Valley Road

The proposed use of 24 miles of a public road (Skull Valley Road) for such movements appears to be rather unrealistic, given the operational burdens that would be placed on the road by 100 to 200 (per Section 1.4 of the SAR) annual round trip heavy haul movements (200 to 400 total one-way movements through Utah including return trips by empty casks). This could amount to more than one heavy haul movement per day. The movements would likely involve daily

disruptions of local traffic for significant periods of time (probably hours, given travel at the slow rate of speed usually associated with the weight and nature of the load), and excessive wear and tear on the road (given the greater than 200-ton weight of the loaded packages). Use of the road by oversize/overweight loads may require upgrading the road, which would require UDOT approval. Widening the road would require additional right-of-way, which would be the company's responsibility. The EIS should evaluate these operational considerations.

With regard to anticipated weight loads and clearance limits, the EIS should provide the specification of the existing "22 to 24-foot wide asphalt highway" (Environmental Report Section 2.1.2) beginning at Timpie and continuing south to the PFS access road. What are the weight tolerances for the anticipated 225-ton loaded heavy haul truck? What specifications has the road been built to? Will the road need to be rebuilt to carry the anticipated loads? Also Figures 2.1-2 (2 figures) are "silent" on the elevation, grade, and performance specifications of the PFS access road. The related discussions in Section 3.2.1.4 of the Environmental Report, although providing more information on the Skull Valley Road improvements, is silent on the improved road and performance specifications. Also it appears from the discussion that it is not yet certain whether improvements will be within existing road right-of-ways. If not, acquisition of right-of-ways may pose significant challenges.

Road crossings

UDOT approval is required for all public road crossings by a rail line.

The PFS 26-mile long north-south railroad along Skull Valley will impede recreational users and ranchers from their established ability to cross Skull Valley going east or west. While the Environmental Report (ER) mentions that the proposed rail line will cross several roads, it is unclear whether plans include constructed rail crossings for all roads, including dirt roads and trails. Moreover, the presence of the railroad disrupts recreational activities such as off-road vehicle use and hunting and it will also disrupt ranching activities. ER Rev. 1 at 4.4-8. Once again, the ER fails to quantify the costs or evaluate the cumulative impacts associated with the railroad -- this time as they relate to recreational users and ranchers.

Trailer Design

The design of the trailer, including carrying load of the axles, must similarly be approved by Utah DOT. Wheel loading, wheel spacing, time of movement, speed, escorts, gross weight, and other issues must also be addressed by heavy haulers in meeting State/local governmental requirements relevant to heavy haul movements. These problems are reflected in the cost of a move, since they impact on both the choice of equipment, as well as the actual operations. The EIS should address these issues.

Rail Line and Highway Design and Operation

The discussion of the rail alternative (described in Section 3.2.1.5) is deficient in that it provides no performance or design specification information, such as whether the quality of the rail meets the minimum Class 2 track rating established by AAR Circular OT-55 for hazardous materials shipments, switching needs at interline connection and facilities, signaling capabilities, and travel grades. UDOT has specific authority on approval of rail line as well as roadway design.

In addition, the EIS should address the rail line and highway weight limits and highway heavy haul requirements associated with the heavy rail casks. These include the bridges, trestles, switching, and secondary lines (rail), as well as the State bridges and arterial roads in the vicinity of the proposed site, and the feeder lines (rail) throughout the Salt Lake City, Ogden, and Provo interchanges.

The EIS should address the physical clearance limits (height, weight) of the package. The License Application is silent on whether the proposed spent fuel shipments will meet the "special train guidelines" established by Union Pacific for hazardous materials (or heavy loads) shipments (e.g., would the combined center of gravity [rail car and load] exceed the AAR interchange rules, thus warranting special train consideration, such as speed limits and train delays). Although the License Application (SAR Section 4.5.4.2) describes the proposed use of a six axle rail car carrying a 142-ton loaded rail cask, not all rail line segments can accommodate these weight loads (greater than 400,000 lbs.), nor the six axle flat car dimensional clearances.

Operational considerations. With increasing consolidation and abandonments of rail lines due to mergers, there have been increasing densities of traffic on the remaining lines. Key east-west and north-south interchanges have been experiencing severe traffic delays and congestion. This in turn directly affects the throughput of proposed spent fuel rail shipments. It also increases the statistical probability and severity of potential accidents (traffic density has been growing; traffic composition has been getting heavier; train lengths and speed on congested line segments have been increasing). For example, Union Pacific estimates significantly increased traffic densities on its east-west mainlines (200 trains/day by 2010), with increasing mainline speeds (60 mph for bulk shipments; 70 mph for heavy-haul intermodal shipments). This may lead to conflicts in dispatch as high speed, high density, high volume traffic competes for traffic space with low speed, relatively low volume, spent fuel traffic on the same corridors, generating bottlenecks at interchange points such as Ogden and Salt Lake City. The poor experience of Union Pacific in meeting (and mitigating) congestive bottlenecks suggests the need to significantly improve line haul capacity and supporting infrastructure in the corridor and destination travel lines, and institution of expensive operational improvements (such as in-transit rail welding and "maintenance on the fly"). These costs have generally been included directly through

contributions to transport infrastructure from shippers or have been included in higher rates. The License Application is silent on the proposed project's contribution to reducing such potential bottlenecks in the Salt Lake City metropolitan area, but this should be considered in the EIS. Historically, most heavy haul movements of commercial spent fuel have been either on the site of a commercial nuclear power plant, or off-site a relatively short distance to a nearby rail or barge facility. On-site heavy haul movements of spent fuel at licensed nuclear power plant facilities have generally not had to address the heavy-haul constraints recited above, including those associated with transporter design. Wheel spacing and load distribution requirements for a single-purpose, on-site and/or near-site road can be quite different from those for public highways and roads.

For off-site movements of spent fuel, as a general rule, the longer the heavy-hauling distance, the more difficult it is to implement such movements on a routine basis. Most heavy-haul movements of spent fuel have been over relatively short distances. Movements of up to 10 miles have been arranged without major issues arising, but beyond that, the impediments seem to mount exponentially. Given the associated logistical problems, some heavy haulers have stated categorically that hundreds or even dozens of repetitive movements of large spent fuel casks (the current proposal anticipates hundreds per year) over public roads would simply not be tolerated by most public highway officials.

5. Impacts from Sabotage and Accidents

Attention to the vulnerability of the shipping cask to intentional sabotage is merited and should be considered in the EIS. Recent experience with domestic terrorism mandates attention to this matter. The standard argument against considering such an analysis is 1) that better sabotage targets are possible, and 2) the likelihood of a sabotage event is unknown. In our opinion, nuclear targets are highly visible and have a very high publicity value. The NRC needs to address this issue and the impacts should be considered in the EIS. Prior NRC/DOE analyses of the impacts of explosive charges on spent fuel shipping casks are deficient and flawed, leaving open the question of just how serious an attack on a spent fuel shipment could be. NUREG-0170 does not address this issue, nor have any subsequent NRC or DOE analyses been instructive as to magnitude or probability. The shipping routes for many of the shipments to the proposed site will pass through many environmentally sensitive and urban areas, and especially when rail shipments are involved, many of which pass directly through highly populated areas.

Since the early 1980s, the NRC has relied on an outdated and poorly interpreted set of experiments carried out by Sandia and Battelle Columbus Laboratories. In one of the Sandia experiments, a GE IF-200 truck cask containing one unirradiated fuel assembly was attacked

with a M3A1, a military "shaped charge". Although the results "demonstrated that casks could indeed be breached by military explosives and that a considerable fraction of spent fuel could be released by such an attack,"¹ the NRC concluded that since only 2/1,000,000 of the total fuel weight was released in inhalable form, the "average radiological consequences of a release in a heavily populated urban area such as New York City would be no early fatalities and less than one (0.4) latent cancer fatality."² Halstead and Ballard recommend a 1% release because that is the percentage of unirradiated fuel released in the Sandia sabotage tests.³ We maintain that a design basis accident should not be the release of 2×10^{-5} of the cesium inventory, but 1%, based on the sabotage tests.

The EIS should consider the following sabotage scenarios:

The reference weapon should be portable anti-tank missiles for their ability to permeate the strong cask materials, their range and availability. Either the TOW-2 or MILAN anti-tank weapon could be considered.

A 10-year-cooled, medium burn-up, Westinghouse PWR assembly should be the reference spent fuel. "A NAC-TSC rail cask loaded with 26 assemblies of the reference fuel would represent a total radioactivity of about 5.5 million curies...a terrorist incident resulting in a one-percent release would have radiological consequences far greater than those assumed in the outdated DOE and NRC consequence assessments."⁴

The new assessment must employ "credible worst case assumptions about the timing and location of a potential attack, and weather conditions during and after the attack which are important for determining the fate of any releases."⁵

The following two scenarios, at a minimum should be considered: "an attack in which the cask is captured, penetrated by one or more explosive devices, and releases a significant amount (at least one percent) of its radioactive contents; and an attack in which the cask is perforated by one or more armor-piercing rockets or missiles and releases a significant amount (at least one

¹ Halstead, Robert J, and James David Ballard, "Nuclear Waste Transportation Security and Safety Issues; The Risk of Terrorism and Sabotage Against Repository Shipments," prepared for the Nevada Agency for Nuclear Projects, Carson City, Nevada, October, 1997, p.25.

² *Ibid.*, p. 26.

³ Sandoval, RP *et al*, An Assessment of the Safety of Spent Fuel Transportation in Urban Environs, SAND82-2365, prepared for DOE by Sandia Labs, June 1983.

⁴ *Ibid.*, p.xvii.

⁵ *Ibid.*, p. xv.

percent) of its radioactive contents."⁶

To bound the transportation impacts of the proposed storage facility, the EIS should estimate occupational and public exposures and economic costs under likely transportation scenarios.

Accident consequences, both generically and in the specific case of Salt Lake City, are understated by RADTRAN; the program needs to be critically examined.

The following RADTRAN issues need to be critically examined:

Accident severity fraction Under RADTRAN, the most severe accidents lead to a release of radioactivity. These severe accidents are also the least probable. In order to weight the likelihood of accidents by severity, RADTRAN employs accident severity fractions. These were developed from a very thin accident database, about 30 years old. Since many accident parameters have changed over the past 30 years, this database needs to be updated. For example, RADTRAN makes a large number of unrealistic assumptions about how long fuel could burn, the temperature of a fire, and how rapidly a fire department could extinguish a fire.

Locations of severe accidents The location of severe accidents needs to be more critically examined. Using "engineering judgment," the Commission assumed in NUREG-0170 (1977) that more severe accidents occurred in rural areas. Our review of 40 severe rail and highway accidents shows that more severe accidents occur in urban and suburban areas⁷ The table details 40 severe accidents we considered and their locations. This error understates accident consequences by a factor of 10.

Unrealistic accident scenarios RADTRAN assumes a host of unrealistic scenarios on how a radiological accident would play out. RADTRAN makes assumptions about how long a person may remain at an accident scene, how rapidly an area may be evacuated, whether the food supply may be interdicted and the time required to decontaminate an area. RADTRAN does not assume a long-term direct gamma dose, assuming the area would be evacuated and decontaminated.

Rail accident rates must be studied The newer model casks, holding 24 PWR or 68 BWR fuel assemblies, weigh more than 125 tons and require special rail cars. The Maxson-type flatbed, with two three-axle trolleys, have a higher accident rate, about double the standard rail-car accident rate. This accident rate for rail cars must be incorporated into the RADTRAN analysis.

All radionuclides not included In the calculations conducted by RADTRAN, radionuclides important to a thyroid dose, iodine-129 and chlorine-36, are generally not been included. Cobalt-

⁶ *Ibid.*, p. xiv.

⁷ Resnikoff, M, "Unresolved Safety Issues," paper presented at conference, Nuclear Waste Transportation and the Role of the Public, Las Vegas, Nevada, February 1, 1995.

60 crud, usually accounting for the greatest direct gamma dose, must also be included in the RADTRAN calculations.

Sabotage not evaluated The likelihood and consequences of a sabotage event have also not been evaluated. Anti-tank weapons, such as the TOW-2 and MILAN weapons, could easily penetrate a cask.⁸ These devices can penetrate one meter of steel, and therefore could easily penetrate 9 to 10 inches of a transportation cask. Studies undertaken by the NRC⁹ in 1981 demonstrates that at least 1% of the cask radioactive inventory could be released in an accident. This is far higher than the one part in 100,000 for particulates assumed by RADTRAN. The NRC should evaluate the consequences of a 1% release in a major city like Salt Lake City. The NRC could start this hard look by examining the consequences of a sabotage event in a city like Salt Lake City. If the consequences are high, the NRC should then proceed to estimate or bound the probability of a sabotage event.

Economic costs of accidents The economic impact of transportation accidents must be included in the EIS. The dollar figures fall directly out of the RADTRAN results. Realistic dollar figures for Salt Lake City must be incorporated, including the loss of income local businesses and the State due to an evacuation of the city. The long-term financial implications must also be evaluated. The further cost to the railroad of tying up the rail lines while restoration of the accident scene and decontamination takes place, must also be considered. The lost revenues alone are estimated by the American Association of Railroads at \$1 million an hour. The cost to decontaminate a major urban area such as Salt Lake City must also be evaluated, including decontamination of streets and buildings.

6. Impacts from Fire

The Environmental Report and the right-of-way application fail to give adequate consideration to the potential for fire hazards and the impediment to response to wild fires associated with constructing and operating the Applicant's proposed rail line. PFS's proposed movement of casks by locomotive in the Low rail line corridor presents a new wildfire ignition source.

Construction, operation and activities associated with the rail line will introduce a new incidence fire source into an area that already has a high incidence for wildfires. Moreover, PFS's proposed rail line will create an impediment to fighting wild fires. Typically in this area responders use four-wheel drive vehicles and drive cross country to fight wild land fires. Hand crews may also

⁸ Halstead, RJ and JD Ballard, "Nuclear Waste Transportation Security and Safety Issues; The Risk of Terrorism and Sabotage Against Repository Shipments," prepared for the Nevada Agency for Nuclear Projects, October, 1997.

⁹ Schmidt, EW et al, *Shipping Cask Sabotage Source Term Investigation*, Battelle Columbus Laboratories, NUREG/CR-2472, December 1981.

be used but generally, heavy equipment is not used because of the damage it may cause to the fragile ecosystem. The four-wheel drive vehicles carry a water tank containing 200-300 gallons of water. The vehicles will have difficulty directly crossing the rail line. The presence of hazardous material such as spent nuclear fuel may further endanger responders as well as impede their fire fighting activities around such hazardous material because firefighters will be reluctant to pursue a wildfire in the vicinity of a train load of spent nuclear fuel casks.

7. Impacts on Flora and Fauna

There is the potential that endangered, threatened and candidate endangered species may be found in the Low Corridor, *e.g.*, Ute Ladies-Tresses, Least Chub, Spotted Frog, Peregrine Falcon, Bald Eagle and Mountain Plover. ER Rev. 1, Table 2.3-2. These species, other sensitive species, and their food base may be impacted by construction activities, noise levels and operation of the railroad.

The EIS must not only address impacts to endangered and threatened species, but candidate, sensitive, and high value species. Threatened species include bald eagles which are known to frequent Skull Valley and peregrine falcons which nest at Timpie Springs Wildlife Management Area, near the proposed intermodal transfer station. Furthermore, the RMP proposed to fully cooperate with the reintroduction of peregrine falcon into the Timpie Springs area and indicated that "surface disturbing activities on public lands adjacent to these areas would not be permitted to disturb birds or destroy important habitat."¹⁰

State listed sensitive bird species and other "high-interest" bird species in the area include the bobolink, burrowing owl, Caspian tern, common yellow throat, ferruginous hawk, long-billed curlew, short-eared owl, and Swainson's hawk. Moreover, the RMP indicates it will protect candidate species such as the ferruginous hawk and Swainson's hawk during critical nesting periods.¹¹

Furthermore, the EIS must address impacts from the proposed intermodal transfer facility and impacts from the transportation of high level nuclear waste to the storage site on the BLM Timpie Springs Wildlife Management Area and the Horseshoe Springs wetland areas. The State has great concern regarding damage to these wetlands, their associated species, and the Great

¹⁰Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County. Salt Lake District, Bureau of Land Management, U.S. Department of Interior. January 1990. At 37.

¹¹Id. at 36.

Salt Lake, into which these wetlands flow. Any resultant damage to the Great Salt Lake ecosystem could lead to the deaths of countless thousands of migratory birds.

In addition, the RMP designates Horseshoe Springs as an Area of Critical Environmental Concern and prescribes that transportation and utility corridors avoid the Horseshoe Springs area.¹² Skull Valley Road traverses through the Horseshoe Springs area. Although Skull Valley Road is an existing transportation and utility corridor, activities such as the intermodal transfer station, that would significantly increase the use of Skull Valley Road and substantially impact Horseshoe Springs should not be allowed.

The RMP designated specific lands as important wildlife habitat which must be managed in a manner that protects, improves and maintains the habitat. Some wildlife species will be permanently driven out of the area either because of destruction of habitat or from noise and other activities associated with construction, operation, and maintenance of the railroad. Noise levels from construction and operation of the railroad may also disrupt mating and breeding activities. The proposed rail spur will traverse the Cedar Mountains Wildlife Habitat Area and near the Horseshoe Springs Wildlife Habitat Area.¹³ Furthermore, the proposed rail spur area is the habitat for one of the only two wild horse herds in the Pony Express Resource Management Plan area. The railroad may act as an artificial barrier to the traditional range of some wildlife. For example, the railroad will probably cut off winter feeding range for wild horses and it may disrupt other established wildlife migration patterns for mule deer and pronghorn antelope.

The rail spur should not be allowed to disturb these areas that have already been designated as important wildlife habitat. At a minimum, BLM must ensure that the rail spur and transportation of high level nuclear waste is consistent with each of the specific Habitat Management Plans or the Pony Express RMP, Wildlife and Fisheries Program Decision must be amended.

In the event the right-of-ways are granted, construction and operation of the rail spur and the intermodal transfer facility should not occur within the wildlife sensitive seasonal periods identified in the current RMP¹⁴.

Clearing and grubbing activities prior to railroad construction will destroy as much as 776 acres of acres of vegetation. ER Rev. 1 at 4.4-3. This vegetation provides habitat for a variety of

¹²Id. at 51, 52.

¹³Id. at 34.

¹⁴Id. at 37.

wildlife species. Id. PFS claims it will be able to revegetate a significant amount (621 acres) of vegetation destroyed during construction, with a permanent loss of 155 acres of vegetation. Id. The area of habitat destruction is located in a sensitive, slow growing, xeric environment. Such areas, notoriously sensitive to environmental impacts, are difficult to restore. The ER is inadequate because it fails to demonstrate how the PFS plans to carry out revegetation of 621 acres in such an sensitive and slow growing environment. Any discussion of revegetation efforts must also show where and how the PFS will obtain access to needed water.

This matter was also addressed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 28.

8. Visual Impact on Proposed Wilderness Area

As has been raised by the Southern Utah Wilderness Alliance, no account has been taken of the visual impact the railroad will have on the nearby BLM Cedar Mountains Wilderness Study Area (WSA) or other locations in Skull Valley. The Cedar Mountains WSA is located parallel to and to the west of the PFS rail line. In some places, the WSA boundary is less than two miles from the railroad. Moreover, PFS has not quantified the costs associated with noise levels from construction activities and operation of the railroad on wilderness and recreational areas. The railroad will be visible from the WSA and other recreation areas in Skull Valley and noise from the operation of the rail line will be heard, thus destroying the solitary values associates with wilderness areas.

9. Groundwater and Surface Water Impacts

The EIS must address the nature and character of the watercourses present at the proposed intermodal transfer point and along the proposed rail spur route. A stream alteration permit must be obtained for any alteration of natural streams.

The EIS must also address the flood potential and method for managing any floods from the greater watershed along the proposed rail route and the intermodal transfer station. In the event a flood control impoundment is necessary, it may require plan approval by the State Engineer.

The EIS must address any water needs for the intermodal transfer facility and operation of the rail spur. The water needs assessment must also include water requirements for fighting wild fires created by the operation of the rail spur or industrial fires at the intermodal transfer station. Once the water needs are determined, the water rights and method for obtaining those rights must be disclosed. The EIS must identify points of diversion, interference with, or impairment of

existing water rights, and how will those water rights be made whole.

This matter was also addressed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 26-28, and 33.

10. Institutional Trust Land Impacts

The State submitted comments on the impact of NRC's proposed approval in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 20. The State also submits the following additional comments.

Background

Through the Utah Enabling Act of 1894, Congress granted approximately 1/9th of the lands in Utah to the State for the support of public education ("trust lands"). The United States Supreme Court has referred to this Enabling Act land grant as a "solemn compact" between the United States and the State of Utah. The grant has also been held to constitute a perpetual trust to which standard trust principles apply, and thereby imposing fiduciary duties upon the State of Utah.

However, of significant importance is that this "solemn compact" imposes reciprocal duties upon the United States, as grantor of the trust. Consequently, the United States is bound to act "for the support of common schools" that were the beneficiaries of this trust.

Railroad Spur

It is critical that the Nuclear Regulatory Commission ("NRC"), the Bureau of Land Management ("BLM"), and the Bureau of Indian Affairs ("BIA") take into account the purpose of trust lands in the drafting of an environmental impact statement ("EIS") for, and ultimately in its consideration of whether to approve, the construction and operation of an independent spent fuel storage installation ("ISFSI") by Private Fuel Storage, L.L.C. ("PFS") on the Skull Valley Goshute Indian Reservation in Tooele County, Utah (the "Proposal"). The problem of addressing the handling of high level radioactive waste is fraught with uncertainties as a result of the complexity of technical issues, its novelty, its extraordinary time horizon, and the extreme difficulty in predicting with any confidence the numerous unknowns associated with high level radioactive waste. This has resulted in the American people being deeply apprehensive of high level radioactive waste.

The effect of the public's apprehension on the market value and revenue generating potential of trust lands surrounding the proposed transportation routes, including the railroad spur, are especially concerning to the Trust Lands Administration. It has been documented that property

values of lands near proposals involving high level radioactive waste have been diminished as a result of this apprehension. See City of Santa Fe v. Komis, 845 P.2d 753 (NM 1992) (plaintiff entitled to compensation for the loss of market value of its property as a result of the Waste Isolation Pilot Project, even if the loss is based on fears not founded on objective standards).

The proposed railroad spur has the potential of dramatically impacting trust lands, as the Trust Lands Administration administers approximately 31,500 acres of fee surface and mineral, and 25,000 acres of fee mineral near the proposed railroad spur. Without a doubt, the market value and revenue generating potential of these trust lands will be adversely affected if NRC accepts the amendment to PFS's application to allow for the proposed railroad spur.

Pursuant to the applicable rules and regulations implementing the National Environmental Policy Act ("NEPA") and NRC regulations, the EIS must evaluate both direct and indirect effects that are "caused by" the Proposal. Under 40 C.F.R. § 1508.8 and 10 C.F.R. § 51, Subpt. A, App. A, this evaluation requires an analysis of the present and future economic effects of the Proposal on surrounding trust lands. Furthermore, this economic analysis must account for all diminution in value to trust lands, including any impact to trust lands "caused by" the public's attitude towards the Proposal and its involvement with the handling, transportation and storage of high level radioactive waste.

Furthermore, NRC regulation 10 C.F.R. § 51, Subpt. A, App. A, provides that the EIS must identify possible conflicts between the Proposal and its alternatives and the objectives of federal and state policies. The fiduciary duties imposed upon the Trust Lands Administration constitute the basis for its policies outlining the management of trust lands. In upholding its fiduciary duties the Trust Lands Administration must manage the trust lands in the most prudent and profitable manner possible, and not for any purpose inconsistent with the best interest of the trust beneficiaries. Accordingly, the Trust Lands Administration must maximize the economic gain from trust land uses consistent with long-term support of the trust beneficiaries.

As previously indicated, the "solemn compact" creating trust lands imposes reciprocal duties upon the United States as grantor of the trust. Accordingly, the United States is bound to act "for the support of common schools" that were the beneficiaries of this trust. To the extent the Proposal hinders the ability of the Trust Lands Administration to effectively manage trust lands, or diminishes the market value or revenue generating potential of trust land, the Proposal is in conflict with the objectives of both the State and federal policies for trust lands. Accordingly, the EIS must identify and fully discuss the presence of this conflict.

11. Geologic Hazards

Potential for significant geological hazards should be analyzed to determine their nature and extent as they are crucial to the safe and responsible siting of a rail line carrying spent nuclear fuel rods. To date, these issues have not been satisfactorily addressed by Private Fuel Storage.

This matter was addressed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 26. In addition, the State provides the following comments.

Earthquake hazards

New data collected by Private Fuel Storage and provided to the State of Utah indicates that the railway may be subject to fault rupture of the surface during large earthquakes and subject to stronger ground shaking than expected. Either surface rupture or strong ground shaking could be sufficient to cause derailment of a train carrying nuclear materials.

The railway would cross at least two branches of the 'East' and 'West' capable faults, recently identified by PFS's consultants while investigating hazards at the proposed storage site. PFS's consultant's also identified at least 2 dozen other young faults under or adjacent to the storage site, the size and extent of which are as yet undetermined. The Utah Geological Survey is currently evaluating the PFS data and it appears that there are more faults present than those recognized by PFS's consultants.

The railway would cross the western extension of the Pass Canyon fault, labeled the 'Pass Canyon structure' by PFS. This geologic feature needs to be evaluated to determine if it is a capable fault.

Just south of Interstate highway 80, the proposed railway parallels segments of the Cedar Mountain fault. The size, extent, location, and nature of this fault is poorly known. We do not at present know how much of a hazard the Cedar Mountain fault presents to the railway.

We believe that a large earthquake on the nearby Stansbury Fault could trigger significant earthquakes on the shallow buried faults in the valley. Scientific studies have found that nearly two-thirds of all the historical earthquakes that ruptured the surface in the Basin and Range province (between Salt Lake City and Reno) occurred on faults that had no evidence of surface rupturing in the last 10,000 years.

Fault zones similar to that underlying the storage site exist in many areas of the world, including parts of the Wasatch Fault. In similar zones of multiple faults, history demonstrates that surface

fault rupture can occur on any of the fault strands or in rare cases may cause a new fault branch to be propagated and rupture the surface in a new location.

Therefore, we strongly encourage the EIS to consider the impacts of greater ground shaking than expected, and the possibility of a surface rupturing earthquake that might occur anywhere, at any time along the railway.

Expansive and collapsible soils

The railway crosses the piedmont slope on the eastern edge of the Cedar Mountains. The slope is underlain by Lake Bonneville and alluvial-fan deposits. These deposits may contain expansive and collapsible soils which may subject the rail bed to instability because of volumetric change.

Debris flows and floods

The alluvial fans were formed as sediment and debris were deposited by streams flowing from mountain canyons. Debris flows, debris floods, and stream floods emanate from canyon mouths and flow down the fans during periods of intense rainfall or rapid snowmelt. These processes are expected to continue and pose a hazard to the operation of a rail spur in their path.

12. Impacts on Mineral Resources

Mineral potential exists in southern Skull Valley for several types of ore deposits: skarn/porphyry copper deposits, vein/replacement lead-zinc-silver deposits, and disseminated gold-silver deposits. Potential exists on both BLM land and Skull Valley Reservation land. The better potential is on the west side of the valley near the proposed railway corridor.

Exploration for deposits buried beneath shallow valley fill has become increasingly important in recent years and has resulted in a number of sizable discoveries in Nevada, Arizona, and internationally.

Skarn/porphyry copper and disseminated gold-silver deposits are typically mined by open pit methods. Most open pits require relatively large areas for both the pits and waste dumps, often several square miles or more. Surface facilities such as railroads, warehouses, and transmission lines could encroach on the area required for development of the deposit and create access or development problems. If a deposit is found, building of the railway or other surface facilities over or near the deposit could negatively impact the mineral development of the resource. The EIS needs to consider the potential economic loss to the State and to the Skull Valley Band.

13. Impacts on Archeological Resources

Archeological artifacts have been encountered along the proposed railway, and more are likely to be found. The U.S. Bureau of Land Management studied artifacts from one Early/Mid-Fremont time period site near the railway, estimated to be from around 600-870 AD (Utah Archeology, vol.7, No.1, p.51-68). Additional archeological artifacts, of this age and more recent, are expected in the vicinity of the railway. A thorough inventory needs to be made of archeological resources that might be affected by the railway.

The ER states that the rail line will cross the Hastings Trail and Donner-Reed Trail. ER Rev. 1 at 2.9-3. Thus, two significant historical resources may be lost where the rail line crosses these two pioneer trails. The ER does not quantify or otherwise evaluate this loss as a cost of obtaining a license to store spent nuclear fuel on the Skull Valley reservation. Such an evaluation is required under NEPA.

14. Impacts on Emergency Management

Public safety and emergency response were discussed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 15. In addition, the Utah Department of Public Safety, Division of Comprehensive Emergency Management has submitted a letter directly to the Nuclear Regulatory Commission, voicing their scoping comments and concerns. A copy of that letter, dated May 4, 1999, is included as Attachment D and made a part of these comments from the State of Utah.

15. Socio-Economic Impacts

This matter was addressed in the State's June 19, 1998 Scoping Comments, included as Attachment A, at 30, 34 (Applicant's Financial and Corporate Structure), and 35 (Environmental Justice).

During the 1999 Session, the Utah Legislature and the Governor enacted law which revokes the statutory and common law grants of limited liability for any entity that arranges for or engages in the transportation, transfer or storage of high level nuclear waste in Utah. UCA 19-3-318et seq. Each officer, director and equity holder of Private Fuel Storage (PFS) and its parent organizations are now held individually, strictly, and jointly and severally liable for obligations incurred in Utah regarding PFS' actions and operations. The EIS should include consideration of this liability condition as part of the evaluation.

16. The effects of the proposal on the Utah Test and Training Range must be considered

The proposal to store high level nuclear waste in Skull Valley, and either method to get it there - rail/truck or rail spur - both constitute a threat to the vitality and mission of the Utah Test and Training Range, operated out of Hill Air Force Base. Hill Air Force Base is a major economic engine for the economy of the state of Utah. The Test Range is a key component of the vitality of the Base, and its ability to remain open in times of reductions in military force. The Test Range offers outstanding and unique opportunities for low level topographic flying, low-level helicopter training, and one of the only places where unmanned missiles can be flown. It is flown at all times of the year, in all types of weather, in order to train the pilots for all types of combat conditions. The need for this type of facility will only increase as the new generation of planes, missiles and helicopters is developed. Skull Valley is both within the restricted flight zone Military Operating Area, and an ingress route to the MOA. Ingress routes are limited both by nearby civilian commercial flight requirements, and the need for realistic tactical operational training of the military pilots.

The proposal threatens the operations of the Test Range in two ways. First, the threat of the accidental release of live ordnance or crash of aircraft with or without ordnance, the chance of which happening can never be realistically placed at zero. Secondly, the perception that the military may not be sensitive to this deadly material below their operations may cause restrictions on flight operations which reduce or eliminate the effectiveness of the training. These types of restrictions have happened at other flight ranges around the country for reasons related to recreational or other public uses. While the military may have accommodated those restrictions elsewhere, the reason for those restrictions was not concern about a material that has the potential to cause a catastrophic disaster in a large metropolitan area. The NRC and BLM cannot ignore or minimize the effects that movement and storage of high level, deadly, nuclear waste in the Skull Valley may have on the current and future uses of the Utah Test and Training Range and therefore on the viability of Hill Air Force Base.

G. ADDITIONAL COMMENTS ON BLM'S PROPOSAL TO AMEND THE RMP

In addition to the above comments on Docket No. 72-22 and the Pony Express RMP, when amending the Pony Express RMP, BLM is required to conform its planning process to the NEPA EIS planning process. 43 C.F.R. § 1610.2(a). For example, it is required to conform its planning process to the NEPA EIS planning process. 43 C.F.R. § 1610.2(a). For example, it is required to completely develop and consider all alternatives, including a no action alternative. In developing and considering such alternatives, consideration of each alternative's impact on local economies and uses of adjacent or nearby non-federal lands is required. Such consideration must include a

detailed estimate of the economic effects of implementing each alternative. See 43 C.F.R. §§ 1610.4-5 and 1610.4-6. In addition, 43 C.F.R. § 1610.4-7 provides that a preferred alternative shall be developed based upon an evaluation of the alternatives and the estimation of their effects, including their economic effects.

Because the analysis that must be done by BLM to comply with these requirements is very similar to the analysis that must be done for the EIS, the State's Scoping Comments, including all attachments, are also pertinent to this analysis and are hereby incorporated by reference.

1. Impacts on the Utah Trust Lands Administration

BLM regulation 43 C.F.R. § 1601.1-8 provides that any amendment to an RMP shall consider the impact on uses of adjacent or nearby non-federal lands. Accordingly, any plan amendment to the Pony Express RMP must take into account the impact of PFS's proposed railroad spur (the "ROW") on adjacent and nearby Utah Trust Lands.

In applying 43 C.F.R. §§ 1610.4-5 and 1610.4-6, the BLM must consider and include a detailed estimate of the economic effects of implementing each alternative. Accordingly, every alternative considered by BLM, including the proposed plan amendment for the railroad spur right-of-way, must estimate its economic impact upon the economic potential of trust lands.

In applying 43 C.F.R. § 1610.4-7, BLM should consider not only the adverse economic impacts the ROW will have on nearby trust lands, but also consider the fact that, pursuant to the BLM/State of Utah Memorandum of Understanding FOCUS LIST, the Trust Lands Administration has nominated BLM lands surrounding Timpie, Utah, for exchange of existing trust lands inholdings (see Attachment E, letter dated April 14, 1999). Currently, a significant amount of trust lands are contained within areas BLM has designated for protection (e.g., Desert Tortoise Habitat Conservation Plan). Certainly, BLM's priority, from both a practical standpoint and as grantor of the trust, should be focused on exchanging the trust lands inholding out of these protected areas rather than issuing the ROW to PFS.

As indicated in this agency's earlier scoping comment, notwithstanding the fact that no high level radioactive waste is generated as a result of the operation of nuclear power plants within the State of Utah, the school children of Utah should not be forced to suffer an economic loss as a result of the storage of high level radioactive waste pursuant to the Proposal. It is the hope of the Trust Lands Administration that NRC, BLM, and BIA fully consider the purpose of trust lands and the issues submitted above in the drafting of the EIS. And if the EIS determines that the Proposal will hinder the ability of the Trust Lands Administration to effectively manage trust

lands or adversely impact the economic value or revenue generating potential of trust lands, the United States, through NRC, BLM, and BIA, should honor its duty as grantor of the trust and either compensate the Trust Lands Administration fully or deny the licensing of the Proposal.

2. Improper Use of Federal Land

The RMP states "public land will not be made available for inappropriate uses such as storage or use of hazardous materials (munition, fuel, chemicals, etc.) and live artillery firing." this is an appropriate requirement that should not be changed by amending the RMP. The right-of-way requests to build and operate the rail spur and the intermodal transfer facility to transfer high level nuclear waste on BLM lands are inconsistent with this requirement and should therefore be rejected.

3. The Pony Express Resource Management Plan needs overall review

The Pony Express Resource Management Plan was adopted in 1988 - eleven years ago. Many changes are proposed for the area, especially the Skull Valley portion. A coordinated resource management plan is underway, studies of vegetation are being conducted, the I-80 corridor is a target of developmental interest, land values might increase in the area. The EIS review of the rail line cannot be limited to only a rail spur, but must consider all of these issues in a coordinated plan. Any proposed amendments to the RMP should be written as a coordinated amendment for all issues in the Skull Valley area.

4. The effects of the proposal on the Utah Test and Training Range must be considered

The proposal to store high level nuclear waste in Skull Valley, and either method to get it there - rail/truck or rail spur - both constitute a threat to the vitality and mission of the Utah Test and Training Range, operated out of Hill Air Force Base. Hill Air Force Base is a major economic engine for the economy of the state of Utah. The Test Range is a key component of the vitality of the Base, and its ability to remain open in times of reductions in military force. The Test Range offers outstanding and unique opportunities for low level topographic flying, low-level helicopter training, and one of the only places where unmanned missiles can be flown. It is flown at all times of the year, in all types of weather, in order to train the pilots for all types of combat conditions. The need for this type of facility will only increase as the new generation of planes, missiles and helicopters is developed. Skull Valley is both within the restricted flight zone Military Operating Area, and an ingress route to the MOA. Ingress routes are limited both by nearby civilian commercial flight requirements, and the need for realistic tactical operational training of the military pilots.

The proposal threatens the operations of the Test Range in two ways. First, the threat of the accidental release of live ordnance or crash of aircraft with or without ordnance, the chance of which happening can never be realistically placed at zero. Secondly, the perception that the military may not be sensitive to this deadly material below their operations may cause restrictions on flight operations which reduce or eliminate the effectiveness of the training. These types of restrictions have happened at other flight ranges around the country for reasons related to recreational or other public uses. While the military may have accommodated those restrictions elsewhere, the reason for those restrictions was not concern about a material that has the potential to cause a catastrophic disaster in a large metropolitan area. The BLM cannot ignore or minimize the effects that movement and storage of high level, deadly, nuclear waste in the Skull Valley may have on the current and future uses of the Utah Test and Training Range and therefore on the viability of Hill Air Force Base. These considerations must be made as part of the review of both proposed rights-of-way, as the considerations are directly related to the existence of both rights-of-way.

5. Coordination and Consistency Requirements

Under 43 C.F.R. 1610.3-1 (applicable through 43 C.F.R. 1610.5-5), the BLM is required to coordinate its proposed actions with the State, in part to determine whether the proposed actions are consistent with State purposes, plans, policies, and programs. In this case, the proposed action is fundamentally inconsistent with State purposes, plans, policies, and programs. See Part G.1, above. See also, e.g., House Concurrent Resolution 6, passed during the 1998 General Session of the Utah Legislature.

Comments from State of Utah
EIS Scoping, Docket No. 72-22
and Pony Express RMP
May 27, 1999
Page 26

ATTACHMENT A

EIS Scoping Comments submitted by the State of Utah
on June 19, 1998

ATTACHMENT B

The State's Contention HH, developed in PFS's licensing proceeding
before the NRC (NRC Docket No. 72-22)

ATTACHMENT C

March 12, 1999 Testimony of Bill Richardson, Secretary of Energy,
before the United States House Subcommittee on Energy and Power
of the Committee on Commerce

ATTACHMENT D

May 4, 1999 letter from the Utah Department of Public Safety, Division of
Comprehensive Emergency Management to the Nuclear Regulatory Commission,
which includes scoping comments and other concerns.

ATTACHMENT E

April 14, 1999 letter from the Utah Trust Lands Administration to BLM

U. S. NUCLEAR REGULATORY COMMISSION
DOCKET NO. 72-22
PRIVATE FUEL STORAGE LLC
PROPOSAL TO STORE HIGH LEVEL NUCLEAR WASTE ON THE
SKULL VALLEY RESERVATION

ENVIRONMENTAL IMPACT STATEMENT
SCOPING COMMENTS
SUBMITTED BY THE STATE OF UTAH
JUNE 19, 1998

The following comments are provided by the State of Utah (State) in response to the U.S. Nuclear Regulatory Commission (NRC) Docket No. 72-22, Private Fuel Storage LLC (PFS), Independent Spent Fuel Storage Installation (ISFSI), Skull Valley Reservation, Notice of Intent to Prepare an Environmental Impact Statement (EIS) and conduct a scoping process in accordance with the National Environmental Policy Act (NEPA). Comments are organized under topic headings for ease of consideration. However, issues are interrelated, and commonly impact or encompass other issues under other topic headings. Issues should not be narrowly construed or evaluated, based on topic headings. If additional information or clarification is needed, please contact:

Dianne R. Nielson, Ph.D.
Executive Director
Utah Department of Environmental Quality
168 North 1950 West
Salt Lake City, UT 84116
Phone: 801-536-4402
Fax: 801-536-0061

Denise Chancellor, Esq.
Assistant Attorney General
Utah Attorney General's Office
Environmental Division
160 East 300 South, 5th Floor
Salt Lake City, UT 84114-0873
Phone: 801-366-0286
Fax: 801-366-0292

EIS SCOPING IS PREMATURE

As defined by the NRC,¹ the purpose of the EIS scoping is to, in part:

- Define the scope of the proposed action which is to be the subject of the EIS,

¹ U. S. Nuclear Regulatory Commission, April 24, 1998, Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process, Docket No. 72-22.

- Determine the scope of the EIS and identify the significant issues to be analyzed in depth, and
- Identify and eliminate from detailed study issues which are peripheral or are not significant.

However, because of substantial and significant omissions and inadequacies in the license application of PFS, the information necessary for defining the scope of the EIS, much less conducting evaluations for the EIS under NEPA, is not available. Some of those omissions and inadequacies in the application are apparent from the recent Request for Additional Information (RAI) relating to the Safety Evaluation Report that the NRC Staff addressed to the Applicant. The Applicant responded to some of the requests in May 1998, however, the Applicant will not respond to significant portions of the RAI until September and December, 1998. Some of these responses, especially with respect to seismicity, directly impact the scope of the EIS. Furthermore, the NRC Staff is yet to send the Applicant an RAI relating to the deficiencies in the Applicant's Environmental Report.

The Staff's RAIs and the Applicant's responses thereto are integral to the scope of the EIS. If scoping proceeds and public comment on the scoping is concluded on June 19, 1998, there will be information relevant to the licensing of the facility, and therefore preparation of the EIS, which will not be available for consideration in the EIS scoping or preparation.

NRC should consider:

- Is the license application complete, such that additional information will not need to be analyzed or evaluated at a later time as part of the EIS process?
- If more information will be provided later, how will it be included in the EIS scoping and evaluation?
- How will new data and information be made available to the public, and how will the public be provided an opportunity to submit additional comments and scoping questions during the EIS process?

If NRC cannot define a process which provides for scoping, analysis, and evaluation of all issues associated with a complete and technically adequate license application, then it should delay the EIS scoping and analysis until such time as the license application is complete and technically adequate and an environmental impact evaluation can be made as required under NEPA.

PURPOSE AND NEED FOR THE PROPOSED FACILITY

As part of the EIS, the NRC must determine if there is a need for the proposed facility. The Environmental Report isolates the need for the facility to a particular group -- operators of

nuclear power reactors -- and does not discuss any overall social costs or benefits that may be derived from this facility. The EIS must analyze the need for this facility in terms of overall societal costs and benefits. Furthermore, the NRC must look to federal statutes and policies when evaluating the need for this facility.

Under 10 CFR § 51.71(d) "draft environmental impact statements should also include consideration of the economic, technical, and other benefits and costs of the proposed action and alternatives and indicate what other interests and considerations of Federal policy, including factors not related to environmental quality if applicable, are relevant to the consideration of environmental effects of the proposed action identified pursuant to paragraph (a) of this section." Furthermore, NRC must comply with federal statutes and policies contained therein in drafting its EIS. In particular, the EIS must consider whether the need for a centralized national private ISFSI is a violation of the intent and the policies contained in the Nuclear Waste Policy Act, 42 USC §§ 10,101 to 10,270 (NWSA). Under the NWSA, the State in which a federally-owned interim disposal facility is located is guaranteed involvement in "all stages of planning, development, modification, expansion, operation, and closure of storage capacity at a site or facility within such State for the interim storage of spent fuel from civilian nuclear power reactors." 42 USC § 10,155(d)(2). The Governor and the State Legislature are involved in the site selection investigation. 42 USC § 10,155(d)(1). Cooperative agreements between the Department of Energy (DOE) and the State are available for State funding and involvement. 42 USC § 10,155(d)(3). Furthermore, equipment, funds and training are available to states along the transportation corridor routes as well as to the State in which the site is located.

The EIS must evaluate the environmental consequences that flow from PFS's proposal, which has none of the State participation and involvement contemplated by NWSA. In fact, the EIS must evaluate whether PFS's proposal is a deliberate effort to avoid the requirements of the NWSA.

The need for the facility and the "No Action" alternative are coextensive of each other. The No-Action alternative is discussed in the following section, Range of Alternatives.

RANGE OF ALTERNATIVES FOR CONSIDERATION IN EIS

NEPA requires federal agencies to consider whether they can carry out the proposed federal action in a less environmentally damaging manner and whether alternatives exist that make the action unnecessary. A discussion of the range of alternatives is considered the "heart" of an EIS. 40 CFR § 1502.14. The purpose of a discussion of alternatives is to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." *Id.* Yet, the Applicant presents only one option: a centralized national storage facility on the Skull

Valley Reservation.

The discussion of alternative sites in the Applicant's Environmental Report (ER) is woefully deficient. The Environmental Report lists 38 potential sites. However, there appears no reason, other than a willing host, to substantiate why the Skull Valley Reservation was the only siting alternative discussed in any detail. ER § 8.1. The EIS must rigorously explore and objectively evaluate all the 38 potential sites listed in the ER. The fact that the 38 sites are listed in the Applicant's ER demonstrates that these sites are all reasonable alternatives to a site on the Skull Valley Reservation.

As part of the EIS scoping, the NRC should also determine if the socio-economic nature of the alternative sites suggests that the site identification process was prejudiced, in violation of the requirements of policy and law governing Environmental Justice.² See Environmental Justice discussion below.

One option that the EIS is compelled to explore is the "No Action" alternative, which is the flip side of the need for the facility. A careful evaluation of the "No Action" alternative is an absolute priority in this case. Existing nuclear power plant sites already have more than sufficient capacity to continue to store spent fuel rods.³ Before the NRC contemplates licensing the proposed PFS facility, it must carefully evaluate the unique risks and costs posed by transporting thousands of tons of high level nuclear waste across the country to a new, centralized facility, as compared to the risks and costs of maintaining the status quo, i.e., leaving the spent fuel at the sites of the nuclear power plants where it is generated and currently stored, pending the opening of a permanent, deep geologic repository.

The "No-Action" alternative should evaluate the impacts and risks that could be avoided if spent fuel were stored at existing nuclear power plant sites until a permanent repository becomes available. The PFS proposal doubles the number of times that fuel must be transferred from storage casks to shipping casks and from shipping casks to storage casks. It also increases the distance that the spent fuel must be shipped, and increases the time that spent fuel will be moving across the country, subject to accidents or sabotage. This consideration is particularly significant for two reasons:

- Some transportation corridors, including the I-80 - Union Pacific Railroad transportation corridor east-west through Tooele and Salt Lake Counties, are not designated

² Federal Executive Order No. 12898, February 11, 1994.

³ GAO Report to Congressional Requesters, September 1991, Nuclear Waste--Operation of Monitored Retrievable Storage Facility is Unlikely by 1998, GAO/RCED-91-194, p. 4.

transportation corridors for other shipments of high level nuclear waste; but for the pending proposal, these areas would not be subject to the risks of transportation of high level nuclear waste;

- This is particularly true for the shipments of high level nuclear waste from PFS member corporation Southern California Edison; if Yucca Mountain were the licensed permanent storage facility, there is no cost effective transportation route which would dictate transportation of high level nuclear waste from southern California, through northern Utah, and then back southwest to southern Nevada.

In fact, the Nuclear Waste Policy Act requires the federal government, when selecting interim storage sites, to "minimize the transportation of spent nuclear fuel." 42 USC § 10,155(a)(3). As part of the EIS, if the NRC determines that the proposed facility results in excess transportation of spent fuel rods, the EIS must recommend that the proposed ISFSI alternative is flawed and unacceptable under NEPA.

Another option the EIS must explore is how the proposed ISFSI fits into the overall federal scheme for disposing of high level nuclear waste. Recent proposed legislation to site a Monitored Retrievable Storage (MRS) facility is indicative that this alternative is within the range of reasonable alternatives the EIS must consider. Thus, the environmental effects, including transportation risks of Applicant's private centralized national storage facility must be evaluated against those same risks associated with an MRS. The effect that the Applicant's proposal will have on a comprehensive scheme to deal with the disposal of high level nuclear waste must also be addressed in the EIS.

Another reasonable proposal the EIS must explore is the development of private regional ISFSIs where the transportation distances and volume of fuel would be substantially less than those associated with the PFS proposal.

The EIS should also examine the alternative of providing a hot cell where damaged fuel can be retrieved, thereby avoiding the risks incurred in shipping the fuel back across the country to the originating nuclear power plant. The avoided risks that should be considered include the risk of accidents (which is enhanced by the loss of cladding effectiveness), and the risk of sabotage.

GUARANTEE THAT FACILITY WILL BE "TEMPORARY"

The "temporary" designation of this proposed facility is also within the purview of this EIS. The facility is being proposed and evaluated as a temporary storage facility. However, there is no way to ensure that spent fuel rods will ever be removed after they are shipped to the facility.

- There is no permanent repository, and Yucca Mountain remains under study. There is no

- permanent, deep geologic storage facility for the high level nuclear waste commercial spent fuel rods.
- Furthermore, the license application clearly states that one of the objectives for licensing this temporary facility is to enable fuel rods to be shipped off-site so the nuclear power plant can be decommissioned. Once all the fuel is transported from the power plant and the possession-only license (POL) is relinquished, fuel rods could not be returned to the power plant.
 - Because the PFS facility is proposed to be designated a "start clean, stay clean" facility, if there is an accident or problem during transportation or storage and a cask leaks, there is no hot cell, which would be needed to repair or repackage the rods or cask. If the cask were leaking, regulatory requirements and opposition from transportation corridor states would likely make it impossible to remove the material from the proposed "temporary" PFS facility.

The NEPA process requires an evaluation of the facility as proposed for operation, a *temporary* facility. If the facility cannot be demonstrated to be temporary, then the facility would operate beyond the scope of the license and beyond the scope of the EIS, irrespective of NRC Waste Confidence Decision.

QUANTITATIVE AND QUALITATIVE RISK ASSESSMENTS

Risk assessments, both quantitative and qualitative, are critical for the initial and ongoing evaluation of a facility for licensing, environmental impact analysis, and operations. The nuclear industry has conducted extensive work in these areas as part of the licensing of nuclear power plants. The techniques and information have evolved significantly, and regulatory agencies as well as the public and the industry have come to rely more heavily on these assessments, not only for initial evaluations of risk, but for quality, compliant, safe operations.

The Utah Department of Environmental Quality (DEQ) used both quantitative and qualitative (health/ecological) risk assessments as required components of the permit for the Tooele Chemical Agent Destruction Facility (TOCDF) at Deseret Chemical Depot in Tooele County. The health/ecological risk assessment is used to identify potential reasonable worst case contaminants, pathways, and impacts on public health and the environment. The original assessment is updated as needed to reflect changes in operations. DEQ works closely with the U.S. Environmental Protection Agency (EPA) in selecting and revising the model and procedures. The quantitative risk assessment identifies all human or mechanical errors, the impacts of errors, accident scenarios, and the statistical probability for each step in a process or function. Then risks, including injuries and fatalities, of each individual step, combined risks of the process, and the overall activity are determined.

Quantitative and qualitative (health/ecological) risk assessments have not been provided as part of the existing information in the PFS license application. Nor is there any indication when such risk assessments would be completed. This is information which is essential, not only to the evaluation of the construction and operation of the storage facility, transportation operations, transfer station, and related operations and facilities, but also to the impacts of such operations on public health and the environment.

When an ISFSI is licensed in conjunction with and located at an existing nuclear power plant, some portion of the impacts are potentially already included in existing health/ecological and quantitative risk assessments. However, where an ISFSI is constructed away from a nuclear power plant, the entire site- and operation-specific risk assessments must be designed and conducted. This has not been provided in the license application for the PFS proposed facilities and operations, and until it has been done, and a sufficient opportunity for public review is provided, it is impossible to evaluate the cumulative impacts of facility and transportation options on the public and the environment. And without such evaluation, the EIS is incomplete and unacceptable.

CUMULATIVE IMPACT ANALYSIS

The EIS must consider the cumulative impact of the proposed storage site and the numerous other facilities and activities in the West Desert. This area is already the storage site for 42 percent of the U. S. stockpile of chemical weapons. The malfunction and crash of a Cruise Missile on the adjacent Dugway Proving Grounds, as well as crashes of F-16s on maneuvers over the adjacent Utah Test and Training Range are well-documented. Within a 30 mile radius of the proposed site, there are two hazardous waste incinerators, one hazardous waste land disposal site, one NORM/Mixed waste/11(e)2 waste disposal facility, the single largest Toxic Release Inventory (TRI) air pollution source in the United States (Magnesium Corporation of America, Rowley, Utah facility), and operations for stockpile and destruction of conventional munitions. Dugway Proving Grounds is also the designated landing site for NASA's Stardust spacecraft and the MUSES-C Asteroid Mission, a Japanese mission with NASA participation.

These existing activities and operations must be considered in the EIS. The NRC has a responsibility under NEPA to know, to evaluate, and to mitigate the cumulative impacts of those activities, or to disapprove the proposed storage facility. Utah and the Skull Valley Reservation are not safe places to store radioactive waste fuel rods.

COST-BENEFIT ANALYSIS

A statutory requirement under NEPA is that all agencies of the federal government develop methods "which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking." NEPA § 102(2)(B), 42 USC § 4332(2)(B). In addition, NRC regulations require a draft environmental impact statement "include consideration of the economic, technical and other benefits and costs of the proposed action and alternatives...." 10 CFR § 51.70(d). In Utah Contention CC, the State described the Applicant's inadequate balancing of costs and benefits in the Environmental Report. Contention CC, One-Sided Cost-Benefit Analysis, at 178-79, is incorporated by reference into these comments. Because the complete lease agreement between the Skull Valley Band of Goshutes and PFS is not available, the impacts of financial commitments governing the lease, which impact the total cost-benefit analysis, are also not available. Without this information in the license, and absent additional financial information from the lease agreement, there is insufficient information for a cost-benefit evaluation. The NRC secure that information and must objectively discuss, quantify and weigh the adverse socioeconomic and environmental consequences that flow from the Applicant's activities associated with the proposed ISFSI.

Decentralized at-reactor storage costs and benefits must be compared to PFS centralized storage and federal centralized storage at Yucca Mountain. For decentralized storage, the economic costs should include licensing a decentralized ISFSI, ISFSI construction, casks and staff (unless the federal government assumes the burden) until fuel is transported and the POL is relinquished. Under the PFS proposal, the economic costs should include the casks, staff, transportation, Rowley Junction facility costs, licensing and decommissioning the facility. Under federal interim storage, all transportation and storage costs would be paid out of the Federal Waste Management Fund. While the proposed ISFSI is only being considered for a twenty year license, a more reasonable projection is 60 years or more (if temporary).

The financial impacts on ratepayers of the member utilities of PFS should also be considered in the evaluation. Rate payers have already paid for the disposal of spent nuclear fuel by the federal government. By committing funds from public utilities to fund a second storage facility, the ratepayers are paying twice. This is particularly troublesome when existing capacity for temporary storage already exists at current nuclear power generating facility. See discussion under Range of Alternative for Consideration in EIS, above.

TRANSPORTATION IMPACTS

Before preparing the Draft EIS, the NRC staff must obtain more information from PFS regarding

the nature of the proposed action as it relates to transportation of the spent fuel. As PFS has acknowledged, its study of transportation alternatives is "ongoing." Letter from Jay E. Silberg, Counsel to Applicant, to Licensing Board Panel (June 8, 1998). Because PFS's study has not concluded, PFS's license application still lacks crucial information that is necessary for the evaluation of the proper scope of the EIS. For instance, PFS's application has not identified the originating locations of the spent fuel, the means and routes by which it will be shipped, or the manner in which it will be transferred to shipping vehicles. In addition, as PFS has acknowledged, it has not yet settled on the means for transporting the spent fuel from the main railroad line to the Private Fuel Storage facility. *Id.* Thus, to a significant degree, the "proposed action" which must be evaluated in the Draft EIS remains undefined. Therefore, it is not possible to fully evaluate the necessary scope of the EIS. *See, e.g., Sierra Club v. Watkins*, 808 F. Supp. 852 (D.C.D.C. 1991), in which an environmental assessment was remanded for failure to adequately identify and evaluate alternatives to the Port of Hampton Roads for receipt of fuel rod shipments. Here, it would be impossible to identify the scope of alternative shipping routes that should be considered, because there is no specific proposal with which to compare alternatives. Once the Applicant has made a more definite proposal, the NRC Staff should provide an additional opportunity for comments on the scope of the EIS. To the extent that it is possible to comment on the scope of the EIS based on information provided to date, the State does so below.

The EIS must address the impacts of all actions that are foreseeable as a result of the licensing of the activities proposed by PFS in its license application. Both impacts of normal operations and non-normal operations such as accidents and sabotage must be considered. The activities whose impacts must be evaluated include preparation of spent fuel for transportation to the ISFSI, actual transportation of spent fuel to the proposed ISFSI by rail and/or truck, transfer from rail to truck at the currently proposed Rowley Junction intermodal transfer site, transportation from Rowley Junction to the PFS facility by heavy-haul truck, and transfer from transportation casks to storage casks. The EIS must also consider transfer-related and transportation-related impacts incurred if and when spent fuel must be returned to the originating nuclear power plant site or another site if it is found to be improperly packaged or defective, and the impacts of transferring and transporting spent fuel to a final repository at the conclusion of the storage period at the PFS facility.

The EIS should take into account the following considerations relating to spent fuel transfer and transportation:

- *Transportation corridor impacts.* Major transportation corridors in the West are critical not only to the states and communities they connect, but to the economic viability of local, national, and international businesses and governments. Interstate 80 and the Union Pacific Railroad through Salt Lake and Tooele Counties comprise a critical east-west transportation corridor. This is the corridor PFS will use, whether it transports

nuclear fuel rods by truck or rail. Any accident resulting in the release of radioactive material would be devastating to public safety. But even an accident which blocks east-west transportation for hours or days could have significant impacts on commerce, business, and the public. There is no nearby, equivalent transportation corridor. When the Great Salt Lake threatened to flood this transportation corridor, the State of Utah spent more than \$50 million dollars on pumps to lower the Great Salt Lake and protect this critical transportation corridor. The EIS should evaluate whether and how the owners/operators of the proposed facility will provide the financial and procedural guarantees necessary to assure an equivalent level of protection based on impacts from their facility and transportation operations.

- *Impacts of normal transportation.* The EIS should consider all environmental impacts associated with normal transportation of spent fuel, including occupational radiation exposures and exposures to the public along highways and rail lines. In evaluating radiation exposures, the NRC should utilize the RADTRAN computer code, which is significantly more accurate and generally shows much higher radiological doses to the general public than methods used in the past by the NRC. See State of Utah's Contentions on the Construction and Operating License Application by PFS, LLC for an ISFSI, dated November 23, 1997 (hereinafter "State's Contentions") at 159-60. RADTRAN is consistently used by the Department of Energy in its environmental analyses of radioactive waste transportation, and there is no reason it cannot be used by the NRC.
- *Impacts of accidents.* The EIS should identify and evaluate the impacts of the range of foreseeable accidents that could occur during fuel transfer, transportation and storage. Accidents evaluated should include, but not be limited to, cask drop, collision during transportation, collapse of or fall from railroad trestle (including impacts of burial in sediment and water intrusion into cask), and major fires. See State's Contentions at 146-59. The EIS should also evaluate the risks of flooding of transportation corridors by the Great Salt Lake. In addition, the EIS should evaluate the likelihood of fuel cladding degradation due to pre-shipment dry cask storage, and its effects on the risk of accidental radiation releases. See State's Contentions at 157-58. Previous NRC environmental studies, which assume pre-shipment storage in spent fuel pools, are inadequate to address this phenomenon.
- *Impacts of sabotage.* The EIS should thoroughly evaluate the risks and impacts of sabotage during transportation and storage of spent fuel. Since the time when WASH-1238 was prepared, the threat of sabotage has become more real and the technology more sophisticated. The bombings at the World Trade Center and the Murrah Federal Building in Oklahoma City have vividly demonstrated the credibility of sabotage as a

very real threat. *See* State's Contentions at 152-54. The NRC's previous environmental studies are inadequate to address the increased sophistication and availability of weapons for sabotage purposes. Nor do currently available NRC studies address the particular circumstances of the proposed PFS facility and transportation scheme (to the extent they are known) which render them especially vulnerable to sabotage, such as the shipment of large quantities of fuel at low speeds on rail lines that are easily accessible to saboteurs, the increased vulnerability of transportation casks to sabotage during long layovers in rail yards, and the close proximity of Rowley Junction to I-80.

- *Impacts caused by human error and maximum credible accidents.* The EIS should consider the risk of accidental radiation exposure caused by human error in the design and construction of casks. *See* State's Contentions at 154-55. The EIS should also identify and evaluate a bounding accident, taking into account the maximum hazards and demographic conditions of the environment.
- *Characteristics of fuel.* The EIS should take into account the characteristics of the fuel shipments, such as the burn-up level of the fuel, and the weight of fuel shipments. For the reasons stated in Utah Contention V, *see* State's Contentions at 146-49, it is inappropriate to rely on Table S-4 of 10 C.F.R. Part 51 to evaluate these factors.
- *Rail and highway conditions.* PFS projects shipment of spent fuel at a large volume and frequency -- 100-200 rail shipments per year, with 4,000 casks to be shipped altogether. SAR at 1.4-2, License Application at 3-1. This amounts to approximately 8-17 rail shipments per month. Some fuel may also be shipped by truck. The EIS should take into account the contribution to the risks and impacts of spent fuel transportation caused by current and anticipated conditions on interstate highways and rail corridors. For instance, traffic congestion and highway speeds on interstate highways have significantly increased since the 1970s, when WASH-1238 was prepared. The use of railroad lines for freight traffic has also greatly increased in recent years, causing delays and bottlenecks in shipping. *See, e.g.,* New York Times: Weary Hands at the Throttle (April 26, 1998), attached hereto as Exhibit A. Such congestion increases the potential for accidental collisions, and also increases the potential for sabotage against unprotected railroad cars that are either moving very slowly or sitting on railroad sidings for extended periods of time. The EIS should also examine the potential bottlenecking effect of focusing a large number of spent fuel shipments, originating all over the United States, on a single geographic area.
- *Impacts of extended storage at Rowley Junction.* The large volume and frequency of proposed rail shipments by PFS creates the significant potential for backup of trains and casks at Rowley Junction. In addition, Union Pacific Railroad has a stated policy of

shipping spent fuel in dedicated trains at 35 miles per hour. Thus, it can be reasonably anticipated that five or more casks will arrive at Rowley Junction at the same time. Furthermore, the amount of time required to move a cask out of Rowley Junction is contingent on many factors: there is only one crane to unload casks at Rowley Junction; the cask must be transported 24 miles by a slow moving heavy haul truck from Rowley Junction to the ISFSI; once at the ISFSI the cask must be inspected and removed from the truck and shipping container to a transfer container then to a storage container-- an operation that could take anywhere from 11 to 22 hours. See SAR Table 5.1-2. Potentially only one cask per day could be moved out of Rowley Junction. Consequently, if casks have to be stored at Rowley Junction, both the radiation doses to workers and the public and the risk of accidents will increase. These impacts are not anticipated in previous NRC environmental analyses, and must be considered in the EIS for the PFS facility.

- *Demographic characteristics of transportation corridors.* In assessing normal and accident-related radiation exposures and risks, the NRC should evaluate the demographics of transportation corridors proposed for use by PFS. The State is concerned, for example, that large quantities of spent fuel will pass through Salt Lake City, a major population center. WASH-1238 is inadequate for purposes of assessing the impacts of spent fuel transportation on large population centers such as Salt Lake City.
- *Shipment to PFS from nuclear power plants not serviced by rail lines.* The EIS should evaluate the environmental impacts of shipping spent fuel to the proposed ISFSI from nuclear power plants not serviced by any rail lines. Although PFS states that all fuel will be shipped to the ISFSI by rail, some of the plants it serves have no rail access. Those with sufficient crane capability may transfer the casks to heavy haul trucks, and from thence to rail cars. However, there are some plants, such as Indian Point, which do not have sufficient crane capability to handle heavy shipping casks. The impacts of these transfers have not been assessed by PFS, nor have they been assessed in previous NRC environmental impact statements.
- *Accident costs.* The EIS should address the costs of accidents, which are likely to be significant. See State's Contentions at 155-56. Cost analyses should take into account the vital role played by rail lines and interstate highway 80 in the economic health and well-being of the State of Utah and the entire region.

The EIS should also address the issue of who will pay the cleanup costs, as well as the level of assurance that the costs will be paid. If cleanup costs cannot be paid promptly by responsible parties, the economic and health costs to the public are likely to increase.

- *Radiological releases.* The EIS should re-evaluate previous assumptions and calculations regarding radiological releases during an accident. Recent analyses suggest that during a severe accident, a greater fraction of cesium-137 may be released than estimated in WASH-1238. See State's Contentions at 158. Moreover, the cesium-137 inventory of the TransStor cask is a factor of 3.4 greater than assumed in WASH-1238. This new information must be evaluated in the EIS.
- *Transportation Distances.* The EIS must consider the great distances over which spent fuel will be shipped to the PFS facility. WASH-1238 is based on a transportation distance of approximately 1,000 miles. WASH-1238 at 38. But as PFS acknowledges, the distance may be more than twice that amount. ER at 4.7-3. Most spent fuel is located at reactors in the Eastern United States, which implies transportation distances much greater than 1,000 miles. For example, the one way mileage from Boston, Massachusetts to Salt Lake City is 2388 miles. PFS cites NUREG-1437 for the proposition that this increase is inconsequential. However, in light of all the deficiencies in WASH-1238, this is not a valid assertion. Doses must be recalculated for the entire shipping distance from plants to the ISFSI, and from the ISFSI to the repository, for all 19 plants served by the proposed ISFSI. See State's Contentions at 160-61.
- *Cumulative Transportation Impacts.* The State of Utah has a number of facilities for the storage and/or processing of radiological and hazardous materials, including both civilian and military material. The EIS should examine the cumulative impacts of shipping various kinds of dangerous materials through the State, including cumulative risks of normal and accidental exposure to toxic materials, and risks of accidental collisions. The EIS should also evaluate the interaction of spent fuel transportation to and from the PFS facility on other activities in the area. For instance, State Route 196, a two-lane blacktop road that runs north-south from I-80 at Rowley Junction to Dugway Proving Ground, is the route defined by PFS for transportation of spent fuel rods by heavy haul truck. The EIS must evaluate other uses and priorities for this route, including the fact that it is the primary surface transportation route for Dugway Proving Grounds, and is one of three emergency evacuation routes for the nearby chemical weapons incinerator at Desert Chemical Depot. It is also the sole access for the community of Iosepa, Utah, the adjacent ranching community, and residents of Skull Valley Reservation. There is also a need to evaluate the impacts of upgrading or widening the road, if that is the transportation corridor for transportation of spent fuel rods or as a result of increased traffic and use of the state route.
- *Risks of transporting damaged fuel from PFS facility to originating plant.* Contrary to the requirements of 10 C.F.R. § 72.122(l), PFS's application does not clearly establish measures for assuring the retrievability of spent fuel. If fuel is found to be damaged, PFS

proposes to return it to the originating nuclear power plant or to some other facility where it can be repackaged. The EIS should evaluate the impacts of transporting spent fuel whose cladding is known to be damaged, and therefore less capable of performing its safety function. Moreover, the EIS should evaluate the environmental impacts that would result if the spent fuel could not be transported to the originating plant because the plant had closed, and no other nuclear licensee would accept the fuel for repackaging.

- *Unique impact on transportation corridor.* The I-80 - Union Pacific Railroad transportation corridor east-west through Tooele and Salt Lake Counties is not a designated transportation corridor for other shipments of high level nuclear waste. Therefore, this proposed facility and the transportation corridor impacts which are uniquely associated with the proposed facility pose an otherwise non-existent set of risks to the local community, users of the transportation corridor, and the environment along the corridor. The significant and unique risks must be evaluated as part of the EIS. Impacts to be considered include:
 - What are the impacts of using non-dedicated trains to transport high level nuclear waste fuel rods, not only through Utah, but across the United States?
 - What are the impacts of shipment along a corridor which is not and will not likely be proposed for shipment of waste to the proposed deep geologic repository at Yucca Mountain, Nevada?
 - What are the additional impacts of transporting high level nuclear waste fuel rods from Southern California Edison's nuclear power plants, realizing that these wastes would not otherwise travel through Utah on their way to deep geologic storage at the proposed site at Yucca Mountain, Nevada?
 - What are the impacts of not providing funding for emergency response along the transportation corridor throughout the United States?
 - How will transportation by truck or rail be scheduled to avoid delays and conflicts with normal commerce and as well as emergency transportation?
 - How will conflicting transportation on State Route 196 be mitigated, recognizing that based on information in the license application, there will be up to 200 shipments per year, and turn around time for unloading each cask once it arrives at the ISFSI will take anywhere from 11 to 22 hours per cask? See SAR Table 5.1-2.
- *Other impact considerations.* As part of the scope of this EIS, the full and complete impacts to all transportation corridors must be evaluated.
 - What are the types of accidents which are possible because of the transportation of high level nuclear waste fuel rods?

- What impacts are caused by such accidents?
- How will impacts of transportation accidents involving high level nuclear waste be mitigated?
- Who will bear responsibility for financial and other losses resulting from such accidents?
- How will that financial responsibility and payment be assured?
- What are the cumulative possibilities for high level nuclear waste accidents and other accidents associated with existing and currently known activities?
- What transportation modes will be used by PFS, when will these be identified, and how will these alternatives be evaluated?

PUBLIC SAFETY AND EMERGENCY RESPONSE

The lack of emergency planning exhibited in the license application and the need for such planning are critical issues. But, emergency planning is a fall-back, fail-safe measure, not the primary means for assuring the safety of the public. In the context of the NRC safety regulations, the NRC must first conclude that the spent fuel can be safely transported in compliance with all relevant regulations. In the context of NEPA, emergency planning is not a substitute for an adequate EIS that evaluates all of the risks and costs posed by the proposed spent fuel transportation, objectively weighs whether the planned transportation constitutes the most cost-beneficial alternative, and then applies appropriate mitigation measures.

A critical aspect of the EIS scoping process is the definition of emergencies, both those that could result from the operation of the proposed storage of high level nuclear waste fuel rods and emergencies which could impact the ISFSI operations. Cumulative impacts of these emergencies should also be developed and evaluated. This evaluation should include a quantitative risk assessment as well as a detailed evaluation of the regulations, procedures, and equipments and personnel necessary to mitigate the impacts of the individual and cumulative problems. The following represents a partial list of the types of problems, accidents, and emergencies which need to be evaluated and mitigated in order to ensure protection of public health and the environment under the scope of the EIS. For example:

- How will the impacts and risks of range or wildfires be evaluated and mitigated?
- How will the risk of snow build-up around storage casks on-site be evaluated and mitigated?
- How will excessive heat and cold and resulting damage during summertime and wintertime storage be evaluated and mitigated?
- What is the necessary response time and capability for righting an overturned cask?
- What would be the impacts of being unable to repackage a cask which is damaged or leaking, during transportation and storage?

The EIS should also indicate what permits, licenses, regulation, and procedures, at a minimum, would be required to ensure that these impacts can be mitigated.

The State Science Advisor acts as coordinator for all state executive agencies for transportation related issues for high level and transuranic radioactive waste. The State Science Advisor has expressed serious and extensive concerns regarding the PFS proposal and its deliberate and inexcusable omission of any consideration of a comprehensive and detailed transportation or emergency response plan.

In recognition of the multitude and seriousness of concerns relating to the transportation of radioactive materials, Congress enacted the Nuclear Waste Policy Act of 1982 as amended in 1987 to provide for the safe, efficient and cost effective transportation of radioactive materials with specific provisions for spent nuclear fuel, naming the Department of Energy's Office of Civilian Radioactive Waste Management as the agency responsible for all shipments of high-level nuclear waste and commercial spent fuel to federal facilities. It is the position of the State of Utah that this proposal between PFS and the Skull Valley Band of Goshutes is an intentional and calculated attempt to circumvent the provisions of that Act which Congress deemed necessary to ensure the safety and environmental protection of nuclear waste shipping campaigns.

In preparation for shipments of high level radioactive waste transportation campaigns, the DOE began development of the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico to serve as a pilot and demonstration program for handling, transporting and storing radioactive waste. Through the WIPP and other DOE related campaigns, the State of Utah has worked cooperatively and productively to design, plan, and implement a comprehensive and detailed transportation program and emergency response capability with critical and necessary input from all stakeholders involved. As a result of the successful cooperation of all parties, DOE will begin shipping materials to the WIPP facility this month with the full assurance of all corridor states that appropriate measures are in place. This effort has required many years of planning, written memoranda of understanding and agreement and development of a relationship of cooperation and trust. The State believes this has been a valuable pilot program and should serve as a model for PFS for the planning, implementation and operation of a high-level nuclear waste storage facility within the State's borders.

Private Fuel Storage proposes to undertake the design, building, transportation to and operation of a facility, the order of magnitude and the potential lethality of which is unprecedented in this country. With no experience, nor concern for the impacted stakeholders, PFS has demonstrated an egregious arrogance and lack of respect for not only the State of Utah but for every corridor state, local community and Native American jurisdiction through which the transportation of

these materials must pass.

It is the State's position that a comprehensive, detailed and cooperatively developed transportation plan to the proposed nuclear waste storage facility be provided to all potential corridor states and tribes. Further, it is the State's position that all provisions of the Nuclear Waste Policy Act be met by the proposers of this facility, including but not limited to financial and technical assistance, training, equipment and mutually agreed upon development for:

- Route selection ;
- Alternative route analysis;
- Route risk analysis;
- Route inspection (highway and rail) contingency routing plans;
- Transportation infrastructure improvements;
- Shipment notification;
- Shipment tracking;
- Shipment escorting;
- Provision of public information on routing and shipments;
- Preparation and enforcement of transportation operations protocols;
- Carrier and shipper compliance reviews;
- Assessment of state and local capabilities regarding safe routine transport and emergency response;
- Enhancement and maintenance of emergency response and recovery capabilities;
- Awareness training for first-on-the-scene and first responder personnel;
- Specialized training for emergency management and recovery personnel;
- Public information training for route community liaison personnel;
- Training for hospital personnel and other medical personnel;
- Waste acceptance scheduling(start date and annual rate);
- Safe and adequate contingency measures for handling and returning damaged fuel casks;
- Cask loading;
- Cask full scale testing;
- Accident notification;
- Safe parking designation and procedures; and
- Provision of equipment for emergency response, inspection, first response personnel.

A separate, comprehensive transportation and handling plan must be developed to address all aspects of the additional rail spur required or intermodal transfer of the high level waste at Rowley Junction, including but not limited to infrastructure improvements, handling equipment and protocols, security and sabotage safeguards, inspection of shipping casks, vehicles and carriers and state oversight and regulation.

It is further the State's position that responsibility for transportation-related damages from accidents involving spent fuel moving to and from this private facility will be solely and completely borne by Private Fuel Storage.

The Utah Division of Comprehensive Emergency Management (CEM) serves to save lives, reduce injuries, and protect property and the environment from the effects of natural and man-caused disasters. This is achieved through a statutory, comprehensive effort to prepare for, respond to, recover from, and mitigate the effects of disasters and emergencies created by a wide variety of hazards. CEM cares for people.

The best way to mitigate against a hazard is to reduce the risks associated with it to as low a level as possible. For example, while the State cannot remove the many earthquake faults that lie under our populated areas, it can establish and enforce appropriate building codes, increase public awareness and understanding of the earthquake threat, and take many related, proactive mitigation measures as individuals, families, and communities to plan and prepare for a major quake that is known to be overdue here.

The State can also continue efforts such as the intensive, cooperative process among local, state and federal agencies to eliminate the huge stockpile of chemical weapons currently being destroyed at the Tooele Chemical Weapons Disposal Facility at Deseret Chemical Depot. When these weapons are gone forever from the State, so will be the risks associated with them. The Chemical Stockpile Emergency Preparedness Program (CSEPP), coordinated by CEM in Utah, represents a great effort on the part of many different levels of government to protect the public during the destruction process. The State's CSEPP successes have been well documented, and have come about only through many years of concentrated work by dedicated professionals who recognize that effective communication and coordination are essential to protect the residents of our State. In fact, Utah CSEPP has established a standard of care that directly or indirectly applies to the emergency management of other technological hazards, and perhaps many natural hazards as well.

On the other hand, CEM's experience with the ISFSI proposed by PFS on the Skull Valley Reservation has proven to be quite a departure from the Utah CSEPP standard of care. Never once has PFS, nor any other representative of this effort, contacted CEM regarding its plans to store high level nuclear waste in Utah. Never once has any reply been offered to the many CEM comments and observations about the gross deficiencies in PFS's Emergency Plan, as outlined in the State of Utah 2.206 Petition (June 27, 1997), and the more recent State of Utah's Contentions. PFS's failure to communicate and coordinate with the State agency whose statutory responsibility for emergency management has been well established for many years is particularly remarkable since the intent of the consortium is to introduce an arguably significant hazard into the State's environment. Simply put, PFS's purpose is quite the opposite of hazard

mitigation; for Utah, it is *hazard promulgation*.

The State is aware that PFS has contacted Tooele County Emergency Management (one of the State's CSEPP partners), and we know, too, that Tooele County Emergency Management has replied to PFS with a list of concerns they share with CEM. However, the ISFSI is not uniquely a Skull Valley Goshute Indian business opportunity, nor an internal Tooele County problem that can be solved within the confines of Tooele County's boundaries. This is a vexing State issue that will affect hundreds of thousands of the State's residents along the expected transportation corridors to the proposed waste site. It is an issue for which appropriate, comprehensive emergency planning, such as in CSEPP, must take place.

In August of 1997, with an eye to emergency management-related issues, three CEM senior staff conducted a careful review and analysis of the PFS license application and related materials, including the Emergency Plan for the proposed PFS facility. More than ninety critical observations and questions regarding the PSF Emergency Plan alone were compiled at that time. These issues appear to remain largely unresolved to this day.

For example, regarding the PFS Emergency Plan, CEM commented: "Transportation planning here is confined to the site itself, and the area surrounding it within Tooele County. The plan does not consider intrastate transportation and interstate transportation planning requirements. This is not satisfactory considering the heavily populated regional transportation corridors along which these dangerous cargos may move. For example, Salt Lake County is likely to be affected, but does not receive any planning consideration (See SAR 1-4-1, and 10 CFR 72.108)."

Other serious questions follow on these observations. What exactly are the identified transportation routes from the nuclear reactors to the ISFSI site? What specific Utah communities will be affected, can they deal with a nuclear waste-related emergency, and what remedial or enhanced emergency management measures will be required? What unique security-related circumstances along the identified routes must be considered -- what factors that could make the shipments vulnerable to sabotage or accident? What is the overall hazard vulnerability of the transfer site at the routes' end? These, and many other concerns must receive appropriate emergency planning consideration.

The State has learned through the precedent of many years' successful participation in the Chemical Stockpile Emergency Preparedness Program that forthright communication, coordination, and effective planning by all jurisdictions and entities are essential to the attainment of public safety. Further, CEM believes that the State's residents, and those who serve them, have a right to accept or reject being subjected to unwarranted, unwanted risks over which they may exercise some control. In the absence of the communication, coordination, and effective planning elements that characterize a successful emergency management effort, the

ISFSI proposed for Skull Valley is viewed as especially unwelcome by Utah CEM. Therefore in the interest of public safety, CEM requests that the NRC reject the PFS proposal.

SCHOOL AND INSTITUTIONAL TRUST LANDS AND FUNDS

Through the Utah Enabling Act of 1894, Congress granted to the State approximately 1/9th of the lands in Utah for the support of public education (trust lands). The United States Supreme Court has referred to this Enabling Act land grant as a "solemn compact" between the United States and the State of Utah. Andrus v. Utah, 446 U.S. 500, 507 (1980). The grant has also been held to constitute a perpetual trust to which standard trust principles apply.

Trust principles impose fiduciary duties upon the State of Utah, including the duty to manage the trust lands in the most prudent and profitable manner possible, and not for any purpose inconsistent with the best interest of the trust beneficiaries. In Utah, the trust lands are managed by the School and Institutional Trust Lands Administration (Trust Lands Administration), which acts as a trustee for the State's public schools, the major trust beneficiary. Accordingly, the Trust Lands Administration must maximize the commercial gain from trust land uses consistent with long-term support of the trust beneficiaries. Pursuant to this fiduciary duty, the Trust Lands Administration is authorized, among other things, to sell or exchange trust lands, develop mineral resources contained upon or within trust lands, issue grazing permits, special use leases, easements and permit rights-of-entry across trust lands, and designate parcels of trust lands as development property.

Furthermore, imposed upon the Trust Lands Administration is the duty of undivided loyalty to, and a strict requirement to administer the trust corpus for the exclusive benefit of, the trust beneficiaries, which do not include governmental institutions or agencies or the public at large. This "solemn compact" imposes reciprocal duties upon the United States, as grantor of the trust. Consequently, the United States is bound to act "for the support of common schools" that were the beneficiaries of this trust.

It is critical that the NRC take into account the purpose of trust lands in the drafting of an EIS for, and ultimately in its consideration of whether to approve, the construction and operation of an ISFSI by PFS on the Skull Valley Reservation in Tooele County, Utah (the Proposal). The problem of addressing the handling of high level radioactive waste (HLW) is fraught with uncertainties as a result of the complexity of technical issues, its novelty, its extraordinary time horizon, and the extreme difficulty in predicting with any confidence the numerous unknowns associated with HLW. This has resulted in the American people being deeply apprehensive of HLW.

In fact, studies show that the possibility of exposure to radiation evokes considerably more dread than other hazards that may be more dangerous, and that the public has little confidence or trust in the federal agencies regulating HLW, especially concerning the agencies' estimates regarding the health dangers posed by HLW. Consequently, the public fear of the risks of accidents during the packaging, transportation, and storage of HLW is high.

This public perception and attitude towards HLW results in the diminution of the property value of lands surrounding activities involving HLW. Regardless of whether public perception regarding HLW is justified or is simply irrational, the fact is that the public's feelings shape their behavior and attitude regarding HLW, and consequently, the value of lands associated with or surrounding the packaging, transportation, and storage of HLW is adversely impacted. The case of City of Santa Fe v. Komis, 845 P.2d 753 (NM 1992), which dealt with an inverse condemnation action involving the construction of a highway to transport radioactive waste to the Waste Isolation Pilot Project in New Mexico, is illustrative of this point.

The court in Komis held that the plaintiff was entitled to compensation for the loss of market value of its property even if the loss is based on fears not founded on objective standards. The court stated, "if loss of value can be proven, it should be compensable regardless of its source. Thus, if people will not purchase property because they fear living or working on or near a WIPP route, or if a buyer can be found, but only at a reduced price, a loss of value exists." Komis, 845 P.2d at 756-57.

The public fear discussed in the Komis case is by no means isolated to the WIPP project, but stems from the public's general perception of radioactive wastes, and therefore, is present with any proposal involving radioactive wastes. Consequently, the effect of the public's behavior and attitude on the market value and revenue generating potential of trust lands surrounding PFS's proposed ISFSI, intermodal transfer point (ITP), and transportation routes especially concerns the Trust Lands Administration.

The Proposal has the potential of dramatically impacting trust lands, as the Trust Lands Administration administers approximately 42,780 acres of fee surface and mineral, 35,311 acres of fee mineral, and 4,850 acres of fee surface within Skull Valley and the area surrounding Rowley Junction. The market value and revenue generating potential of these trust lands will probably be adversely affected if NRC approves the Proposal.

Pursuant to the applicable rules and regulations implementing the NEPA and NRC statutes, the EIS must evaluate both direct and indirect effects that are "caused by" the Proposal. Under 40 C.F.R. § 1508.8 and 10 C.F.R. § 51, Subpt. A, App. A, this evaluation requires an analysis of the present and future economic effects of the Proposal on surrounding trust lands. Furthermore, this economic analysis must account for all diminution in value to trust lands, including any impact to

trust lands "caused by" the public's attitude towards the Proposal and its involvement with the handling, transportation and storage of HLW.

If the EIS determines that the economic value and revenue generating potential of trust lands will be adversely impacted or that the Trust Lands Administration will be hindered in its ability to effectively manage trust land, the United States, acting through NRC, must honor its duty as grantor of the trust and either compensate the Trust Lands Administration or deny licensing of the Proposal.

In addition, the Trust Lands Administration submits the following comments to be utilized in the development of the EIS for the Proposal:

1. *Purpose and Need* - Pursuant to NEPA, the EIS must analyze the purpose and need for the Proposal. This analysis must assess existing on-site storage capacities of the generators of HLW and the ability of HLW generators to construct additional storage capacity on-site. Moreover, this analysis must account for the possible storage capabilities of the Yucca Mountain site as a repository for HLW in the future. If this analysis determines that existing on-site storage is sufficient, construction of additional storage is feasible, or that the Yucca Mountain site will be available as a repository for HLW in the future, then the EIS should indicate that no valid need exists for the Proposal. Accordingly, NRC should deny the PFS's license application for the Proposal as no need exists and its costs will outweigh its benefits.
2. *Decommissioning* - Under 10 C.F.R. § 72.42, the Proposal can only be licensed for a maximum of forty (40) years, which reflects a twenty (20) year license term with an additional (20) year renewal term. Since the Proposal contemplates a temporary storage facility for HLW, decommissioning of the Proposal facilities must occur. However, as raised in the State's Contentions, questions exist whether decommissioning can occur. As the Contentions indicate, PFS fails to provide sufficient data about the design of its storage casks to assure compatibility with Department of Energy (DOE) repository specifications. Furthermore, the proposed facilities are not capable of repackaging spent fuel. Consequently, a question exists whether the HLW can be removed from the proposed facilities, thereby facilitating decommissioning of the proposed facilities as required under NRC regulations.

NEPA requires that all reasonable consequences of the Proposal be considered and addressed. Since questions exist regarding the compatibility of the storage casks with DOE specifications and the Proposal fails to provide for repacking of spent fuel, it is reasonable to consider that decommissioning of the proposed facilities could be delayed or will not occur. Accordingly, the EIS must analyze all impacts on trust lands,

including economic impacts, associated with either the delay or the failure to decommission the proposed facilities.

3. *Alternatives* - The EIS must include all reasonable alternatives to the Proposal. The importance of identifying and analyzing all reasonable alternatives is illustrated under NRC's own regulation, 10 C.F.R. § 51, Subpt. A, App. A, which states the alternative section "is the heart of the [EIS]." Pursuant to 40 C.F.R. § 1502.14, NRC must "rigorously explore and objectively evaluate all reasonable alternatives...[and] devote substantial treatment to each alternative...so that reviewers may evaluate their comparative merits." Reasonable alternatives to the Proposal include:

- a) *"No Action" alternative* - Under 40 C.F.R. § 1502.14(d), the EIS must include the analysis of the no action alternative.
- b) *On-site storage* - The EIS must analyze the option of storing HLW at the place of generation. Accordingly, an assessment must occur to determine the existing on-site capacity or the feasibility of constructing additional on-site storage capacity at the facilities generating the HLW. Such an assessment will allow NRC to better analyze whether a legitimate need exists for the Proposal or whether on-site storage is feasible at the place of generation.

Storage at the place of generation ("on-site storage") is the most logical approach in the management of HLW. On-site storage reduces the public's exposure to HLW, and consequently, the health risk posed by HLW is reduced. Furthermore, on-site storage presents a more manageable and controlled environment should an accident occur - the site is secure from the public; employees of generators of HLW are trained in evacuation procedures; trained personnel and specialized equipment are present thereby reducing risk of exposure and facilitating prevention or containment of contamination; the site has undergone extensive scientific studies and been deemed suitable for activities involving radioactive material.

Public exposure and the health risk presented by HLW is extremely high with storage of HLW at a place other than the place of generation ("off-site storage"). Off-site storage requires the utilization of railroads and public highways for the transportation of HLW. Consequently, a less manageable and totally uncontrolled environment exists should an accident occur - no secure site exists, as the public is present; the public is not educated nor trained in protecting themselves from the dangers of radioactive material; trained personnel and specialized equipment are not present; thus, risk of exposure and likelihood of contamination are greatly compounded; railroads and public highways often border waterways, thus facilitating rapid and widespread dispersion of radioactive materials and

increasing the area of contamination.

- c) *Alternative site location* - The EIS must analyze the option of alternative site locations. Such alternative site locations must encompass all possible site locations, whether presently feasible or feasible in the future, including utilization of the Yucca Mountain site as a storage facility for HLW.
4. *Transportation* - The EIS must analyze the proposed equipment, the frequency, and the routes to be utilized in the transportation of HLW from the place of generation to the proposed ISFSI site. This analysis must fully examine:
- a) *Direct and Indirect Impacts* - The EIS must analyze the direct and indirect impacts of the transportation of HLW to the proposed ISFSI site, including the economic impact to trust lands adjacent to transportation routes. In addition, the EIS must assess the economic impact to the approximately 15,890 acres of fee surface and mineral and approximately 4,140 acres of fee mineral administered by the Trust Lands Administration around Rowley Junction - the proposed ITP site.
 - b) *Safety Issues* - The EIS must fully examine the safety of all the equipment to be utilized in the transportation of the HLW, including canisters, trucks, railroad cars, loading and unloading equipment, etc.
 - c) *Accident Rates* - The EIS must determine the accident rates associated with each type of equipment to be utilized in the transportation of HLW, the probability of each type of accident event, and its impact upon each proposed transportation route. In assessing the impact, the EIS must assess any economic impact that may occur as a result of the closure of each proposed transportation route to facilitate the containment and cleanup of any contamination.
5. *Cumulative Impacts* - The EIS must determine and analyze the cumulative impacts, including economic impacts, to trust lands should NRC approve the Proposal. In this evaluation, the EIS must take into account the Proposal's effect on trust lands in conjunction with the Dugway Proving Ground, the Hill Air Force Base Bombing and Gunnery Range, the Wendover Bombing and Gunnery Range, the Army's Chemical Weapon's Incinerator, the Laidlaw APTUS hazardous waste incinerator, and the Envirocare low level and mixed waste landfill.
6. *Affected Environment & Environmental Consequences* - Pursuant to the requirements of NEPA and NRC regulations, the EIS must succinctly describe the environment of the area(s) to be affected by, and assess the environmental consequences of, the Proposal and

its alternatives. In particular, the EIS must address:

- a) *Seismology* - The Trust Lands Administration is concerned that Skull Valley has a potential for seismic activity, and may thereby expose trust lands surrounding the Proposal to the threat of contamination from HLW should the Proposal be approved. Accordingly, the EIS must fully examine the geologic stability of the region surrounding the proposed ISFSI site. This examination must assess surface and subsurface faulting, ground motion (including liquefaction), and soil stability.
- b) *Hydrology* - Contamination of trust lands via hydrological systems is a serious concern to the Trust Lands Administration. The EIS must analyze the Proposal's potential to contaminate surface and groundwater systems. Accordingly, the EIS must identify all surface and groundwater systems, contamination sources of the Proposal, and the impact of contamination to trust lands down gradient.

Furthermore, the EIS must require the installation of monitoring wells around the proposed ISFSI and ITP facilities to safeguard against contamination of surface and groundwater systems. Baseline data must be compiled to be utilized in conjunction with the monitoring wells to effectively monitor for the presence of contaminants from the Proposal. Moreover, monitoring wells will assist in identifying the direction and migration rate of any contamination should it occur, and thereby, facilitate a more efficient and effective cleanup.

7. *Mitigation* - NEPA and NRC regulations require the EIS to identify mitigation measures for the Proposal. Therefore, the EIS must include measures and assurances that the contamination of any trust lands as a result of the Proposal will be rectified. Furthermore, the EIS must include a means to compensate for any loss of economic value of trust lands or the imposition of any additional costs associated with the management of trust lands as a result of the approval of the Proposal.
8. *Conflicts* - Pursuant to 10 C.F.R. § 51, Subpt. A, App. A, the EIS must identify possible conflicts between the Proposal and its alternatives and the objectives of federal and State policies. The fiduciary duties imposed upon the Trust Lands Administration constitute the basis for its policies outlining the management of trust lands. As previously indicated, in upholding its fiduciary duties the Trust Lands Administration must manage the trust lands in the most prudent and profitable manner possible, and not for any purpose inconsistent with the best interest of the trust beneficiaries. Accordingly, the Trust Lands Administration must maximize the commercial gain from trust land uses consistent with long-term support of the trust beneficiaries.

The "solemn compact" creating trust lands imposes reciprocal duties upon the United States as grantor of the trust. Consequently, the United States is bound to act "for the support of common schools" that are the beneficiaries of this trust. To the extent the Proposal hinders the ability of the Trust Lands Administration to effectively manage trust lands, or diminishes the market value or revenue generating potential of trust land, the Proposal is in conflict with the objectives of both the State and federal policies for trust lands. Accordingly, the EIS must identify and fully discuss the presence of this conflict.

Notwithstanding the fact that no HLW is generated as a result of the operation of nuclear power plants within the State of Utah, the school children of Utah should not be forced to suffer an economic loss as a result of the storage of HLW pursuant to the Proposal. It is the hope of the Trust Lands Administration that NRC fully consider the purpose of trust lands and the issues submitted above in the drafting of the EIS. And if the EIS determines that the Proposal will hinder the ability of the Trust Lands Administration to effectively manage trust lands or adversely impact the economic value or revenue generating potential of trust lands, the United States, through NRC, should honor its duty as grantor of the trust and either compensate the Trust Lands Administration fully or deny the licensing of the Proposal.

NATURAL RESOURCE AND HAZARDS IMPACTS

In accordance with NRC regulations, the NRC has determined that the proposed license is a major federal action that warrants the preparation of an EIS. The Utah Geological Survey (UGS) has identified significant geotechnical issues that should be analyzed in depth, not only in the NRC's staff safety review but also in the EIS. These issues are crucial to the safe and responsible siting of the ISFSI and, to date, have not been satisfactorily addressed by PFS. The issues are summarized in following discussion:

- UGS believes that capable faults, as defined by the NRC, may underlie the proposed ISFSI; if so, earthquakes generated by the faults may produce greater vibratory ground motions than that for which the facility is designed, and may pose a threat of surface fault rupture.
- PFS has not conducted a rigorous and detailed investigation of subsurface conditions appropriate for a critical facility of this type; the current level of investigation is very preliminary and not a detailed determination of site suitability necessary for establishing design parameters. In some instances, the PFS characterization of subsurface foundation soils is not supported by their own test data.

These issues are significant and must be analyzed and resolved as a prerequisite for a responsible decision on the future of the proposed facility. Furthermore, Part 51.61 to Title 10 of the Code of

Federal Regulations (10 CFR Part 51.61) requires that the Environmental Report, which forms the basis for NRC's EIS, address the siting evaluation factors contained in 10 CFR Part 72, subpart E. Without proper analysis of geotechnical issues related to siting evaluation factors, including a detailed characterization of the geologic and seismic environment, the potential impacts of this critical facility may not be fully recognized. Thus, the issues described herein must be fully addressed in the EIS. *See* State's Contentions at 80-96. *See also* April 1998 memo to the Utah Department Environmental Quality that highlights potential earthquake hazards in Skull Valley, attached hereto as Exhibit B.

It is unclear how water will be obtained for the proposed site. The Utah Department of Natural Resources and the Division of Water Rights are concerned that the availability of water has not been sufficiently investigated. If the Tribe plans to make water available for the facility under a claim of a federal reserved water right, the Division foresees potential challenges to the validity and extent of the Tribe's water rights claims. If the Tribe plans to make water available for the facility under state-created water rights, the Department of Natural Resources and Division of Water Rights foresee potential challenges under the change application process conducted by the state engineer.

The Tribe's federal reserved water rights will depend on the number of practicably irrigable acres (PIA) located on the reservation. The process of determining PIA requires a detailed analysis of the hydrology, soils, engineering feasibility, economic feasibility and numerous legal issues related to the establishment of the reservation. This is a complex process in and of itself. Once the right is quantified, the type of water use must be changed from irrigation to the industrial or commercial uses associated with the fuel rod storage. Approval of this change of use, regardless of how it is undertaken, will be another time-consuming process fraught with difficulty and perhaps challenges by other water users.

Even if the Tribe chooses to forego claims of reserved rights and uses state-created rights it already holds, or purchases water rights held by others, it will need to file a change application to put the water to the new uses associated with fuel rod storage. Again, deliberations related to this change of use will be time-consuming and complicated -- many challenges can be expected.

The Division of Water Resources disagrees with the drainage area that was used to compute the Probable Maximum Flood (PMF) for the portion of the area that cuts across the access road east of the storage facility. The Applicant used a drainage area of 26 square miles. The State believes the drainage area is closer to 240 square miles. In wetter-than-average years, the large depressions south of the access road filled, the ground was saturated, and most of Skull Valley produced significant amounts of run-off. Wetter-than-average conditions which would occur during a probable maximum flood event would fill the depression and water running off from the southern end of Skull Valley would only drain through the depression near the northeast corner

of the area, causing flooding.

The Division is also concerned with potential contamination of the groundwater aquifer underlying the site and the potential for contamination of other water sources. These impacts would be critical also to springs which provide water to adjacent ranching operations.

According to the Division of Wildlife Resources, risks to ground and surface waters due to an accident either at the PFS facility or along any transportation corridor should not be underestimated nor should the value of those resources to local wildlife be disregarded. The nearby Horseshoe Springs (managed as a wildlife use area by the Bureau of Land Management) and Timpie Springs (managed as a wildlife management area by Utah Division of Wildlife Resources) areas represent important wetlands for migratory birds. They are simply extensions of the much larger Greater Great Salt Lake Wetland Ecosystem. The Great Salt Lake is an internationally recognized wetland as part of the Western Hemispheric Shorebird Reserve Network. Radionuclide contamination of the Great Salt Lake or its tributary waters and associated wetlands would represent an international tragedy.

Because of the unique wind patterns associated with the Stansbury Mountains along the east side of Skull Valley and the presence of an abundant prey source, multiple raptor species occur proximal to the PFS facility. Some of the raptors nest while others simply forage as they migrate through western Utah. Regardless, bioaccumulation of radionuclides in the raptor population from accidental contamination of the raptors' prey sources would have international consequences.

Super-human efforts must be made to avoid or minimize impacts, particularly radionuclide contamination to wildlife or their habitat use areas. Compensatory mitigation for unavoidable construction and operational or maintenance impacts must be planned. The Applicant is urged to coordinate with the division to develop acceptable mitigation strategies.

With respect to population impacts evaluated by the Division of Parks and Recreation, PFS did not meet the requirements of 10 CFR § 72.11, completeness and accuracy of information. The information provided in the initial application process was insufficient and incomplete. The stated impact on population distributions from potential contamination is vastly underestimated. The description of "influence zones" in the initial application process was misleading. The influence zone actually contains one of the most urbanized areas in the country (top third or fifth) -- the Wasatch Front. This was played down or not even mentioned in the original application. For example, there was no discussion of factors or conditions such as "wind travel/wind speed" to show how quickly materials could be broadcast by frequent winds from the north-west, west and south-west.

The Transtor Cask seems flawed. Rodent and insect barriers may be needed to prevent the spreading of waste and radiation from the site. Freeze thaw from moisture could also damage the cask (air inlets and outlets -- natural convection cooling in an area with extreme temperature changes; i.e., 30° below zero to over 105° F).

It seems incongruous to be destroying dangerous chemical warfare materials at Dugway, while introducing additional dangerous and toxic nuclear materials within a few miles. This area has high visual value from Deseret Peak Wilderness Area and freeway, and the Wasatch National Forest area. It is within eight miles of the old Hawaiian Historic settlement area and the Pony Express, California, Donner Party Historic trail alignment. After 20 to 40 years, the storage casks may have to be structurally and mechanically stabilized in order to move them. Do it right the first time!

The fact that USPCI, Aptus, Inc., and Envirocare are already in the area argues that enough is enough. The Wendover Range and aerial munitions testing area is seconds from an off-course F-16, an errant missile or artillery round. The historic pattern of errors, chemical leakages, dead sheep, frequency of carcinogenic anomalies, and nuclear fall-out over the past 50 years in western Utah, speaks poorly for attempting to locate such a dangerous facility this close to the Wasatch Front. The site is well within the active Great Basin Seismic belt. Terming the area "remote" is a relative term. Minutes from the Wasatch Front is not remote. The rate of urban development in Tooele County is rapidly increasing in terms of density and units.

The mission of many government divisions is to improve the "quality of life in Utah." How will this project meet that standard or shared statewide value? It clearly doesn't. Technology was allowed to develop that didn't know how to clean up its own mess. Why perpetuate it at such great economic, social and environmental costs? It may greatly enrich a few absentee reservation and property owners and protect a number of stockholders. But, it is the antithesis of the current, great statewide effort and huge capital development investment to improve infrastructure, provide more publicly accessible open space, and prepare for the 2002 Olympics. If any proposed action such as this cannot meet, implement or augment the array of reasonable State values, such as quality of life, safety, aesthetic beauty, and long-term development options, then it should be summarily dismissed.

Even though the proposed method of transporting these radioactive materials by rail may minimize human exposure, an elevated level of concern is associated with the transport through upland forested areas and associated watershed areas. Incidents and accidents are not uncommon along the various rail routes throughout the State. It is estimated by the Nuclear Information and Resource Service that more than 15,000 shipments could be made over the next 30 years, with each train cask carrying the long-lived radiological equivalent of 200 Hiroshima bombs. Many of the routes cut across key upland watershed areas providing downstream communities with

high quality water.

The rail route from the east runs adjacent to national forest and private forested lands and critical watershed areas. An ongoing project to create statewide water quality guidelines facilitated by the Department of Natural Resources and the Department of Environmental Quality per EPA requirements will assist in protecting these watersheds. However, the exposure from radioactive incidents along transportation corridors appears to offset any and all preventative measures that may be obtained through these guidelines.

The proposed transportation routes include rail lines coming into Utah from the west and east, continuing to Rowley Junction. At this point the radioactive materials would be transferred to trucks for shipment to Skull Valley which could increase the potential for accident. The rail route from the west travels parallel to Great Salt Lake and the state-administered sovereign lands -- an area impacted by extensive flooding in the recent past due to rising elevation of the lake. The obvious danger to nearby resources in Great Salt Lake include the riparian and wetland habitat, brine shrimp industry, mineral and salt extraction and extensive waterfowl habitat.

The potential for hazard to human health is just too high to allow the transportation of these materials through watershed and other key resource areas.

SOCIO-ECONOMIC IMPACTS

The NRC should not rely on the Applicant's inadequate discussion in the Environment Report of the socio-economic impacts of its proposed facility. See ER § 2.7. Furthermore, the Applicant's Environmental Report states: "the indirect costs, which are derived from socioeconomic and environmental impacts of the facility, are minimal due to the remote location and small size of the actual storage area." ER at 7.3-1. Conversely, the Applicant gives an over-inflated view of the indirect benefit of the project. ER at 7.2-3.

The license application also fails to address the impacts of the PFS proposal on future growth in this area of Utah. The population of Utah is projected to more than double in the next 25 years, with the most significant increases occurring along the Wasatch Front and adjacent counties to the east and west. Tooele County is already experiencing that growth in residential development. Various organizations and partnerships are currently assessing, through public scoping processes, options or scenarios for such growth. There is significant public information available. The NRC should consider that work as part of its EIS scoping, and must evaluate the impacts of transportation and storage of high level nuclear waste on the public and on infrastructure, for the entire life of the proposed facility and operations.

The Applicant's Environment Report fails to adequately analyze known and potential cultural resources in the area. The Utah Division of State History has informed the Applicant that there are at least nine archaeological sites in the area, that a significant portion of the area has yet to be surveyed for historic properties, and there is a high potential for location of other historic properties in the area. *See* April 30, 1997 letter from the Utah Division of State History to Stone & Webster, attached hereto as Exhibit C. Consequently, the draft EIS must address all known and potential cultural resources in the area.

LAWS, ENTITLEMENTS, REGULATIONS, AND PLANNING REQUIREMENTS

The NRC cannot rely on the Environmental Report prepared by the Applicant because it is inadequate to satisfy the requirements for writing a defensible Environmental Impact Statement. NRC regulations require Environmental Impact Statements to describe approvals, permits, and legal entitlements that the facility will need to undertake the proposed action and the status of compliance with those requirements. 10 CFR § 51.71(c). In addition, the Council on Environmental Quality regulations require full cooperation and lack of duplication with State and local procedures. For example, 40 CFR § 1506.2(d) states:

To better integrate environmental impact statements into State or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law.

State environmental permits or approval orders, both those authorized through delegated Federal programs and those required by State law, are designed to protect public health and the environment from the adverse effects of facilities and activities that might reasonably be expected to be a source or an indirect source of pollution. In addition to the media-specific environmental regulation, there are also State requirements for facility siting and public notice and review. Also, the State has long term plans in place for the management of the State's air resource (Utah Code Ann. § 19-2-104), radioactive waste (*id.* § 19-3-107), solid waste (*id.* § 19-6-104) and comprehensive emergency planning and response (*id.* § 53-2-104). Finally, Utah is a member of the North West Interstate Compact on Low-Level Radioactive Waste. Low-level waste generated in the State may be disposed of at the Compact site. However, as the PFS facility will be sited on the Skull Valley Reservation, it is unknown whether low-level waste generated on an Indian reservation would be eligible for disposal at the Compact site. The EIS scoping should evaluate all of the foregoing requirements, determine how to ensure those requirements are met, what the impacts of not meeting those requirements would be, and what impacts cannot be mitigated.

One of the contentions the State of Utah submitted in the PFS adjudicatory proceeding before the Atomic Safety and Licensing Board, discusses the entitlements, permits and approvals required under NEPA. The State incorporates by reference Utah Contention T and related responses into these comments. See State's Contentions, at 131-141; and State's Reply to NRC Staff's and Applicant's Response to State's Contentions A through DD dated January 16, 1998 (hereinafter "State's Reply") at 74-83.

The application does not address required legal entitlements for the Applicant to undertake critical activities associated with the ISFSI proposal. For example, the NRC must satisfy itself that the Applicant is entitled to use and control the proposed ISFSI site on the Skull Valley Reservation. This requires full disclosure of the lease between the Applicant and the Skull Valley Band of Goshutes. Currently, only a portion of the lease has been released and it is unknown whether the redacted portions of the lease contain termination clauses and other substantive lease provisions that the Applicant and the Band have withheld from scrutiny by the public or the NRC. Likewise, the Applicant has not shown that it is entitled to use or control the off-loading site and intermodal facility at Rowley Junction (or wherever else the Applicant intends to locate its transfer facility).

There is no record of the Applicant's legal entitlement from any governmental entity to widen public roads, rights-of-way or other property for use as a heavy haul road or rail spur from the railhead to the site.⁴ Nor is there a citation to any law or regulation that would allow such approvals. In fact, the Environmental Report is fatally flawed because the specific route to the site has yet to be chosen by the Applicant. The Applicant, for the first time and almost one year after it submitted its application to the NRC, announced at the public scoping meeting held on June 2, 1998 that it is studying a new transportation route somewhere west of Skull Valley Road. The Applicant did not publicly disclose any details of the new route. The public cannot legitimately comment on the scope of the EIS until such time as the Applicant submits a transportation and routing plan to NRC as part of its license application. In any event, most of the land between the Union Pacific mainline and the site is held by the State, the county or the federal government (e.g., military, Bureau of Land Management, Forest Service). Thus, the Applicant would need approval from these entities to construct a transportation corridor to the site. Such a route may trigger "major federal action" and the need for an additional independent EIS. The State reiterates its requests that NRC re-open the public comment period on scoping to allow legitimate public comment once the Applicant has deigned to inform the NRC, the State, and the public of its final and detailed plan for transporting and routing the casks to the proposed site.

⁴ See comments below regarding the State's jurisdiction over Skull Valley Road.

The Applicant must comply with environmental quality standards and requirements. The EIS must do more than the Applicant's inadequate assessment of air quality impacts from its construction and operation activities at the intermodal site, along the transportation route and at the proposed ISFSI site. The Environment Report has a totally inadequate analysis of air quality modeling techniques. *See* ER 4.3.3, 4.8-2. The Applicant appears to have used EPA "SCREEN3" model which is an inappropriate model for this operation. Furthermore, the Applicant has failed to adequately analyze whether it will be in compliance with the National Air Quality Standards, whether it will be subject to regulation under Section 111 of the Clean Air Act, whether it is a major stationary source of air pollution requiring a Prevention of Significant Deterioration permit. Moreover, the Applicant may require an Operating Permit in accordance with Title V of the Clean Air Act and also a State air quality Approval Order. The EIS must address and show how the Applicant will achieve compliance with these permitting requirements. *See* Utah Contention T at 137-39 and State's Reply at 77-79.

The State of Utah has jurisdiction over all groundwater within the State. Utah Code Ann. § 73-1-1. As such, the EIS must show how the Applicant will come into compliance with Utah's Groundwater Discharge Permit requirements. As is abundantly clear from the application, the retention pond proposed by the Applicant at the north end of the storage pad is designed to leach into groundwater. ER at 4.2-4. This is an unacceptable practice. Furthermore, the Applicant proposes to use a septic tank(s) for its wastewater disposal system. ER at 3.3-4, 5 and SAR 4.3-3. This is yet another unacceptable environmental practice and is a direct contaminant pathway to groundwater. The Environment Impact Statement must analyze the effect of the Applicant's questionable environmental water quality proposal on groundwater and downgradient resources and how the Applicant will achieve compliance with water quality regulations. Utah Contention O at 100-05, 107-08 and State's Reply at 60-61, and Utah Contention T at 139-140 and State's Reply at 81 are incorporated by reference into these comments.

In the arid West, water rights are a significant and often a contentious issue. The problem is exacerbated in this instance because the facility is proposed to be located on an Indian reservation. Not only does this implicate the State's jurisdiction over allocation of water rights within the State but it also raises the question of Federal reserved water rights and whether the Applicant's industrial use of water would fall within those rights. The EIS must address the legal authority of the Applicant to obtain water, the potential challenges from other water users, and the quantification of the amount of water the Applicant is entitled to use.⁵ The State has addressed this issue in its Contentions. *See* Utah Contention O at 105-06 and State's Reply at 60-61, and Utah Contention T at 140-41 and State's Reply at 79-82, which are incorporated by

⁵ *See also* discussion on water availability under the Natural Resource and Hazards Impact section above.

reference into these comments.

In addition to permits and approvals from the State of Utah, the EIS should evaluate what permits are required from the U.S. Environmental Protection Agency for activities that occur on the reservation, such as air quality or storm water permits. As currently proposed, the Applicant will disturb wetlands in the transportation corridor and the EIS must address how the Applicant will achieve compliance with the U.S. Army Corps of Engineers Section 404 dredge and fill permits. However, until such time as the Applicant provides a definitive transportation and routing plan, this scoping issue should remain open for public comment.

The State enacted new legislation in the 1998 General Legislative Session that the NRC should review for purposes of scoping. The High Level Nuclear Waste Disposal Act, S.B. 196, *inter alia*, places certain restrictions on the placement of high level nuclear waste and greater than class C radioactive waste in the State of Utah, establishes siting criteria, and requires certain findings and approvals be made by the Department of Environmental Quality. An enrolled copy of S.B. 196 is attached hereto as Exhibit D. In the 1998 session, the State designated SR-196 "[f]rom Route 199 near the control gate at Dugway Proving Grounds northerly via the Skull Valley Road to the west bound on and off ramps of Route 80 at the Rowley Junction Interchange" as a State highway. See S.B. 78 (1998). This means that the State of Utah has jurisdiction and control over the Applicant's proposed transportation route from Rowley Junction intermodal transfer facility to the proposed ISFSI site. The EIS must show whether it is feasible for the Applicant to undertake any road widening or rail spur construction activities involving the road and public right-of-way along Skull Valley Road.

The NRC has the obligation to write an EIS that addresses the effect of the Applicant's proposal, including construction, operation, transportation, and long term effects, on the State's overall environmental plans and duly enacted regulatory and legal requirements. Furthermore, the State expects cooperation and coordination from NRC and its contractors by showing that it is willing to openly discuss the full extent of the State's legal and regulatory authority involving the proposed action with appropriate State regulatory officials.

APPLICANT'S FINANCIAL AND CORPORATE STRUCTURE

Private Fuel Storage is a newly formed limited liability company without any independent assets. See LA at 1-3,4. PFS consists of seven or eight electric utilities; however, the member utilities merely make contributions to PFS, and the assets of the member utilities are shielded from liability associated with the PFS project. In Utah Contention E, the State discussed the Applicant's lack of financial qualification to engage in the Part 72 activities for which it seeks a license and in Utah Contention S, the Applicant's lack of assurance that it will have funds

necessary to decommission the facility. The State incorporates by reference Utah Contention F, Financial Assurance, State's Contentions at 27-38; and Utah Contention S, Decommissioning, State's Contentions at 123-130, into these comments.

Given that the Applicant appears to be nothing more than a shell company devoid of any assets or capital, it is critical that the EIS analyze the environmental consequences of licensing, constructing, operating and decommissioning a national centralized facility where spent fuel casks will be stored for 20, 40 or more years. The funding requirements for this project are not only critical to safety concerns but also to the level of maintenance, and timeliness and effectiveness of decommissioning. The environmental consequences that flow from undercapitalization and operating on a shoestring budget must be addressed in the EIS.

Another factor that the EIS must consider is the ability of this limited liability company to be accountable and responsible for the consequences of accidents and environmental contamination along the transportation route and at the site. The EIS should contrast this project with interim storage facilities authorized under the Nuclear Waste Policy Act which are owned and operated by the Department of Energy and have the full financial backing of the United States government.

ENVIRONMENTAL JUSTICE

Under Executive Order No. 12898 on Environmental Justice, issued on February 11, 1994, the U.S. Nuclear Regulatory Commission is required to:

... analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low income communities, when such analysis is required by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. section 4321 *et seq.*⁶

Environmental Justice is defined by the U. S. Environmental Protection Agency as:

...the fair treatment of people of all races, income, and cultures with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative environmental impacts resulting from the execution of

⁶ Clinton, W. J., President, February 11, 1994, Memorandum for the Heads of All Departments and Agencies.

environmental programs.⁷

Earlier policy of the Department of Energy, in seeking a Monitored Retrievable Storage (MRS) site, focused on siting the facility(ies) on Indian Reservations and clearly was in violation of this directive. Members of Private Fuel Storage LLC are also responsible for site selection decisions, and the license application for the ISFSI which, if licensed, would violate the Order. Even if the Chairman of the Skull Valley Band of Goshutes approached PFS to site the facility, rather than visa versa, that action does not outweigh the Environmental Justice impacts on members of the Tribe who oppose the facility or individuals who live and work adjacent to the proposed site. But for the protection provided under Environmental Justice provisions, these groups do not have equal protection under the law, equal protection regarding the siting decision, because the proposed facility is located on an Indian Reservation. Nor does the contractual arrangement between the Skull Valley Band of Goshutes and PFS absolve the NRC or the federal government from any responsibility under NEPA, Title VI of the Civil Rights Act, or Executive Order No. 12898.

Therefore, as part of the EIS process, the NRC must fully and completely analyze and evaluate the Environmental Justice data, criteria and impacts of the proposed facility.

- What are the impacts related to the proposed decision to locate the facility on an Indian Reservation?
- What groups of individuals are impacted?
- What are the environmental, human health, social, economic, and other impacts?
- Are these impacts mitigated under one or more of the alternative actions?

If Environmental Justice impacts cannot be mitigated, NRC should disallow the proposed site alternative in the EIS.

COOPERATING FEDERAL AGENCIES

The Council on Environmental Quality Regulations emphasizes the need for cooperation among Federal agencies early in the NEPA process. Other federal agencies who have jurisdiction by law or who have special expertise with respect to any environmental issue that should be considered in an EIS shall be made a "cooperating agency" at the request of the lead agency. 40 CFR § 1501.6. There are a number of federal agencies with whom the NRC should consult on

⁷ U. S. Environmental Protection Agency, April 22, 1997, Region VIII Environmental Justice Fact Sheet.

this action, including the U.S. Military (Army, Air Force), Bureau of Land Management, Forest Service and Department of Energy.

By contrast, the Bureau of Indian Affairs, Department of Interior, cannot be a cooperating agency with respect to its approval of the lease between the Skull Valley Band of Goshutes and the Applicant. Such an action requires an independent EIS by the BIA because different standards are used in evaluating the impacts of these two major federal actions under NEPA. The BIA has a trust responsibility to all tribal members in evaluating the effects of approving the lease whereas the NRC's EIS will not evaluate the fiduciary responsibility of the federal government to tribal members.

INCORPORATION OF CONTENTIONS AND OTHER PLEADINGS

Contentions and other pleadings which are filed as part of the licensing hearing before the Administrative Licensing and Appeals Board (ASLB) raise issues and address matters which are relevant and necessary for consideration in the EIS process, regardless of whether the contention or pleading was rejected for licensing board purposes. Therefore, the following contentions and pleadings are incorporated in this written response by reference and raised for evaluation as part of the EIS. As new contentions and pleadings are filed, just as when the license application is modified by NRC staff recommendations or PFS modifications and changes, the new or additional information should be evaluated as part of the EIS, and the NRC should provide an opportunity for public notification and comment.

The State of Utah's Contentions, dated November 23, 1997, are hereby incorporated by reference, and a copy is attached hereto as Exhibit E.

The State filed a 2.206 Petition with the NRC on June 26, 1997, which in part addressed the severity of wildfires in Skull Valley and challenged whether the Applicant had sufficient resources to handle fires at or near the ISFSI. The EIS must evaluate the effect of severe wildfire that occur in Skull Valley as it relates to siting the ISFSI and whether there are sufficient resources available to the Applicant to stave off a wildfire. In addition to incorporating the June 26, 1997, 2.206 Petition by reference into these comments, the State attaches hereto Exhibit F, a copy of the May 27, 1997 memorandum dealing with fire frequency in Skull Valley that was attached as Exhibit 5 to the 2.206 petition.

The following pleadings are also incorporated by reference into these comm

- State of Utah 2.206 Petition, dated June 27, 1998;
- State of Utah 2.206 Petition, dated July 21, 1997;

Comments From The State of Utah
EIS Scoping, Docket No. 72-22
June 19, 1998
Page 38

- Petition to Intervene and Request for Hearing filed by State of Utah, dated September 11, 1997; and
- State of Utah's Reply to the NRC Staff's and Applicant's Response to State of Utah's Contentions A through DD, dated January 16, 1998.

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))	September 29, 1998

STATE OF UTAH'S CONTENTIONS RELATING TO
THE LOW RAIL TRANSPORTATION LICENSE AMENDMENT

The Applicant submitted a significant license amendment dated August 28, 1998 to account for a proposed new rail transportation corridor and a proposed change in the location of the Rowley Junction intermodal transfer point ("ITP"). The State received a copy of the Applicant's license amendment on August 31, 1998.

The amendment describes a proposed new rail line which would originate off the Union Pacific mainline at the intersection of Interstate 80 and Low.¹ The new railroad would parallel the south side of Interstate 80 in a southeast direction for approximately 3 miles, turn due south for

¹ Low is located off Interstate 80 approximately 17 miles west of Rowley Junction. See Utah Highway map attached as Attachment 1 to NRC Staff's Response to Request for Hearing and Petition to Intervene Filed by the Confederated Tribes of the Goshute Reservation and David Pete

adequate consideration to the potential for fire hazards and the impediment to response to wild fires associated with constructing and operating the Applicant's proposed rail line in the Low corridor.

Basis: The ER must consider the environmental effects of the proposed action. 10 CFR § 51.45(c). The ER must also address the regional environmental effects of the proposed action. 10 CFR § 72.10(b). The Applicant's proposed movement of casks by locomotive in the Low rail line corridor presents a new wildfire ignition source. This is a serious matter in an area that is prone to wildfires.

There is a history of wildfires moving south to north through Skull Valley along the eastern side of the Cedar Mountains. See Affidavit of David Schen, attached hereto as Exhibit 1. Also fires are often known to cross the Cedar Mountains from the west into the western edge of Skull Valley. *Id.* at ¶ 7. The Applicant's proposed rail corridor will run south along the eastern edge of the Cedar Mountains for a distance of 26 miles from Interstate 80 to the northwestern side of the Skull Valley Reservation. The vegetation in this area is primarily desert shrub and grass land. Vegetation includes native grasses, sage brush and Utah juniper, and introduced species such as June grass (cheat grass) and crested wheat grass. Due to frequent and recurring wild fire and a history of heavy grazing, the primary vegetation is June grass. Fuels in this plant

community dry in early June and ignite very easily. Id. at ¶ 8. There are few, if any, irrigated areas in the vicinity of the rail line that would interrupt a fire caused by the Applicant's use of the rail line. Id. at ¶ 9. Thus, construction, operation and activities associated with the rail line will introduce a new potential fire source into an area that already has a high potential for wildfires. Id. at ¶ 7.

First, various activities that will take place because of the Applicant's rail transportation system will introduce new sources of igniting wildfire. During construction of the rail line, activities such as welding, grinding of rail and the presence of fuel for the operation of machinery will present potential fire hazards. Id. at ¶ 10. Most of these activities will not cease once construction is completed because on-going track maintenance will create similar hazards. Id. When the transportation corridor is in active use, a wildfire could start, for example, from sparks caused by friction or from the train exhaust stack. A fire could also be caused from a hot brake shoe sheering off the locomotive or rail carriage wheels. Id. at ¶ 11.

The ER is woefully deficient in its discussion of fire hazards posed by the new railroad and it does ^{not} discuss, at all, the potential for starting wildfires. There is no mention of the potential for the operation of the rail line to ignite wildfires or how the Applicant will respond if it is responsible for causing a

wildfire. The sum and substance of the Applicant's discussion about wildfires appear to be a statement that to reduce the potential for fires the Applicant's rail corridor will be 40 feet wide and cleared of vegetation and the rail line will be constructed to an elevation that will be close to grade. ER Rev. 1 at 4.4-9. It should be noted that the Applicant must rely on whatever width of right-of-way the BLM will grant it to cross public lands. Given the Applicant's plan to clear 776 acres of vegetation, there is no certainty that BLM will grant the Applicant the width it requests. See ER Rev. 1 at 4.4-1. Furthermore, a 40 foot wide corridor may not be sufficient to prevent sparks from being thrown beyond the cleared corridor. The ability of fire fighting equipment to cross the Applicant's rail line is discussed below.

Second, the ER fails to evaluate, or even mention, the increased risk of wildfires caused by an increase of human activity near the railroad. Presently, access to the west side of Skull Valley is poor but the railroad will be accompanied by more developed access. Usually, rail lines have an access road alongside to facilitate maintenance. In addition, improved points of access to the west side of Skull Valley may be developed during construction of the rail line. Thus, the improved access to the west side of Skull Valley may result in an increase in the occurrence of human caused fires. Schen Affidavit at ¶ 12.

Third, the Applicant's proposed rail line will create an impediment to

fighting wild fires. As mentioned above, current access to the west side of Skull Valley is poor. Id. at ¶ 13. Typically in this area responders use four-wheel drive vehicles and drive cross country to fight wild land fires. Hand crews may also be used but generally, heavy equipment is not used because of the damage it may cause to the fragile ecosystem. The four-wheel drive vehicles carry a water tank containing 200-300 gallons of water. The vehicles will have difficulty directly crossing the rail line. Even if the rail line is constructed close to existing grade, fire fighting vehicles will be unable to climb up the vertical grade and profile of the rail, especially given the gross weight of the vehicle and water tank and also because the vehicle will be unable to get any traction from the ballasted rail bed. Id. Thus, the rail line will cause response vehicles to detour to a constructed rail crossing instead of being able to follow a fire cross country. This is likely to significantly delay wildfire responses, thus increasing the risk that wildfires will spread.

In addition, responders to fires will be put at increased risk because of the potential for collisions with trains in the dense smoke of a range fire. Id. at ¶ 14. Furthermore, the presence of hazardous material such as spent nuclear fuel may further endanger responders as well as impede their fire fighting activities around such hazardous material because firefighters will be reluctant to pursue a wildfire in the vicinity of a train load of spent nuclear fuel casks. If

firefighters are aware that high level nuclear waste is within the perimeter of the fire they will err on the side of caution and personal safety and back off until the subject area specialist ascertains that the hazardous cargo is contained and fire fighter safety guaranteed. Id. at ¶ 15. This will be likely be the case whether or not the spent nuclear fuel in the transportation cask will be at risk if it is engulfed by a wildfire. Id. The ER fails to address these additional risks.

To be complete, the Environmental Report must address how activities in the Low rail corridor may cause the potential to ignite wildfires, what mitigation measures the Applicant intends to take, and how the presence of high level nuclear waste affects fire fighting efforts. The ER must also analyze how the 26 mile north-south rail line may impede fire fighting activities.

Contention II. Costs and effects associated with the Low Rail Corridor

Contention: The Low Corridor License Amendment does not comply with 10 CFR § 72.100(b) or NEPA, including 10 CFR § 51.45(c), and 40 CFR § 1508.25 because it fails to evaluate, quantify and analyze the costs and cumulative impacts associated with constructing and operating the rail line on the regional environment.

Basis: NRC regulations require Applicant to define the potential effects of the ISFSI on the region. In particular, 10 CFR § 72.100(b) requires an evaluation of "the effects on the regional environment resulting from

construction, operation, and decommissioning of the ISFSI...." Moreover, 10 CFR § 51.54(c) requires an analysis in the environmental report of "other benefits and costs of the proposed action." Furthermore, Council on Environmental Quality ("CEQ") regulations require that an Environmental Impact Statement consider cumulative impacts. 40 CFR § 1508.25(c).

"Cumulative impact" is defined in 40 CFR § 1508.7 as:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

CEQ regulations further require that "cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." Id. § 1508.25(a)(2).

The Low Rail Corridor is being constructed solely to move spent nuclear fuel casks from the Union Pacific mainline at the junction of Interstate 80 and Low across public lands to the Skull Valley reservation. The rail corridor has no other independent utility other than to serve the Applicant's ISFSI. Thus, the Low Rail Corridor is inextricably part of the Applicant's ISFSI project and as such must be evaluated under the criteria in 10 CFR §§ 72.100(b) and 51.54(c) and CEQ regulations.

The Low Corridor License Amendment is wholly without discussion of the direct and indirect costs or cumulative impacts associated with the construction and operation of the rail line. Rather the amendment describes only the indirect benefits of the rail line, *e.g.*, the rail line will provide "opportunities for further Band economic development projects." ER Rev. 1 at 7.2-3.

There are numerous costs and cumulative impacts associated with the Low Rail Corridor that must be evaluated and quantified, including the following:

1. The operation of the rail line creates an increased risk of fire in an area that is prone to range fire. See Contention ^{HH} ~~HEAVY HAUL~~ above, whose basis is incorporated herewith by reference. The ER fails to quantify the costs associated with fires ignited as a result of activities occurring in the rail corridor. Nor has the Applicant evaluated the cumulative impacts that these newly introduced fire hazards pose to the Skull Valley area.
2. There is the potential that endangered, threatened and candidate endangered species may be found in the Low Corridor, *e.g.*, Ute Ladies-Tresses, Least Chub, Spotted Frog, Peregrine Falcon, Bald Eagle and Mountain Plover ER Rev. 1, Table 2.3-2. These species, other sensitive species, and their food base may be impacted by construction activities, noise levels and operation of

the railroad. Furthermore, some wildlife species will be permanently driven out of the area either because of destruction of habitat or from noise and other activities associated with construction, operation, and maintenance of the railroad. ER Rev. 1 at 4.4-4. Noise levels from construction and operation of the railroad may also disrupt mating and breeding activities. Furthermore, the railroad may act as an artificial barrier to the traditional range of some wildlife. For example, the railroad will probably cut off winter feeding range for wild horses and it may disrupt other established wildlife migration patterns for mule deer and pronghorn antelope. Id. None of these costs associated with the railroad has been quantified, nor the cumulative impacts sufficiently analyzed in the ER.

3. No account has been taken of the visual impact the railroad will have on the nearby BLM Cedar Mountains Wilderness Study Area ("WSA") or other locations in Skull Valley. The Cedar Mountains WSA is located parallel to and to the west of the Applicant's rail line. See 2 Utah BLM Statewide Wilderness Final Environmental Impact Statement at "Cedar Mountains WSA" Map 2 (showing WSA boundaries) (November 1990) attached hereto as Exhibit 2. In some places the WSA boundary is less than two miles from the railroad. Cf. Exh. 2 and License Application, Rev. 1, Fig. 1-1. Moreover, the Applicant has not quantified the costs associated with noise levels from construction activities

and operation of the railroad on wilderness and recreational areas. The railroad will be visible from the WSA and other recreation areas in Skull Valley and noise from the operation of the rail line will be heard, thus destroying the solitary values associates with wilderness areas.

4. Clearing and grubbing activities prior to railroad construction will destroy as much as 776 acres of acres of vegetation. ER Rev. 1 at 4.4-3. This vegetation provides habitat for a variety of wildlife species. Id. The Applicant claims it will be able to revegetate a significant amount (621 acres) of vegetation destroyed during construction, with a permanent loss of 155 acres of vegetation. Id. The area of habitat destruction is located in a sensitive, slow growing, xeric environment. Such areas, notoriously sensitive to environmental impacts, are difficult to restore. The ER is inadequate because it fails to demonstrate how the Applicant plans to carry out revegetation of 621 acres in such an sensitive and slow growing environment. Any discussion of revegetation efforts must also show where and how the Applicant will obtain access to needed water.

5. The ER states that the rail line will cross the Hastings Trail and Donner-Reed Trail. ER Rev. 1 at 2.9-3. Thus, two significant historical resources may be lost where the rail line crosses these two pioneer trails. The ER does not quantify or otherwise evaluate this loss as a cost of obtaining a license to store

spent nuclear fuel on the Skull Valley reservation.

6. The Applicant's 26 mile long north-south railroad along Skull Valley will impede recreational users and ranchers from their established ability to cross Skull Valley from east to west (or west to east). While the ER mentions that the proposed rail line will cross several roads, it is unclear whether there will be constructed rail crossings for all roads, including dirt jeep trails. Moreover, the presence of the railroad nonetheless disrupts recreational activities such as off road vehicle use and hunting and it will also disrupt ranching activities. ER Rev. 1 at 4.4-8. Once again, the ER fails to quantify the costs or evaluate the cumulative impacts associated with the railroad – this time as they relate to recreational users and ranchers.

None of the above-mentioned costs and impacts have been adequately quantified and evaluated (if at all) by the Applicant in its Environmental Report and thus the ER is deficient to meet the requirements of NEPA.

Contention B-1. License Needed for Intermodal Transfer Facility

CONTENTION: PFS's application should be rejected because it does not seek approval for receipt, transfer, and possession of spent nuclear fuel at the Rowley Junction Intermodal Transfer Point ("ITP"), in violation of 10 CFR § 72.6(c)(1), in that the Rowley Junction operation is not merely part of the transportation operation but a de facto interim spent fuel storage facility at

which PFS will receive, handle, and possess spent nuclear fuel. Because the ITP is an interim spent fuel storage facility, it is important to provide the public with the regulatory protections that are afforded by compliance with 10 CFR Part 72, including a security plan, an emergency plan, and radiation dose analyses.²

BASIS (as amended): Initially the Applicant intended to locate an intermodal transfer point at Rowley Junction and either construct a rail line along Skull Valley Road or move casks from Rowley Junction by heavy haul truck along Skull Valley Road to the ISFSI. License Application, Rev. 0 at 1-1. In its recent license amendment, the Applicant retains two alternatives for shipping casks to the ISFSI: one by rail, the other by intermodal transfer from rail to heavy haul truck. The location of the rail line has changed from Rowley Junction to Low, but the Intermodal Transfer Point remains at Rowley Junction—albeit 1.8 miles to the west of the initial site.³ For all intents and

² The wording of this contention is as admitted by the Board. LBP-98-7 at 56-58, App. A at 1. The "Basis" is amended to account for proposed changes at the ITP as a result of the Applicant's license amendment dated August 28, 1998. Contention B-1 is supported by the Declaration of Dr. Marvin Resnikoff, attached hereto as Exhibit 3.

³ Although the Low railroad is the Applicant's professed preferred alternative for transporting the casks to the ISFSI (ER Rev. 1 at 2.1-3), many things need to happen before the Applicant may build and use the railroad. For this option to be viable, the Applicant must acquire a 776 acre (*i.e.* 32 mile long 200 foot wide) right-of-way across public lands from the U.S. Bureau of Land Management ("BLM"). ER Rev. 1 at 4.4-1. This major federal action will require BLM to prepare an EIS as well as comply with other procedures under the Federal Land Policy Management Act, 43 USC §§ 1701 to 1784. Consequently, the vitality of the Rowley

purposes, the factual and legal issues raised by the State and admitted by the Board in Contention B remain unchanged.

Like the original application, the proposed ITP consists of a "rail siding off the Union Pacific Railroad mainline, a 150 ton gantry crane, and a tractor/trailer yard area." SAR Rev. 2 at 4.5-3. The crane is single-failure proof, and housed in a weather enclosure. *Id.* At the ITP, spent fuel casks will be transferred from railroad cars to heavy-haul tractor/trailer trucks for transport along Skull Valley Road to the ISFSI. *Id.* at 4.5-4. The ITP would still be located next to the Union Pacific mainline and in close proximity to Interstate 80 and the industrial salt plant. ER Rev. 1 at 2.1-3, 4.4-1.

The Applicant's operations at Rowley Junction are not merely a part of the transportation operation. Cask receipt, handling and transfer mechanisms will be the same as proposed at the originally proposed ITP. The Applicant will be receiving and handing hundreds of tons of spent nuclear fuel at a fixed location, using fixed equipment that is owned and operated by the Applicant for the purpose of facilitating the onsite storage of spent fuel at the ISFSI.

Under the current license amendment, the ITP will still receive a substantial number of spent nuclear fuel casks. On average, the Applicant

Junction ITP as an integral of the Applicant's ISFSI operation still remains, at least until completion of the BLM approval process.

expects the Rowley Junction ITP to receive two shipments per week, with each shipment consisting of 1-3 transportation casks. See letter dated September 21, 1998, with attachment, from John Donnell, Private Fuel Storage to Glenn Carpenter, BLM, attached hereto as Exhibit 4. Thus, between 100-300 casks annually will be shipped to the Rowley Junction ITP. When the shipments come into Rowley Junction, the Applicant must offload each cask from the rail car using its gantry crane located at the ITP onto a heavy haul truck for transport along Skull Valley Road. It is doubtful that a heavy haul truck could perform more than one cask shipment due to the time required to load the cask onto the truck at the ITP, the vehicle's slow speed, and the time required to be spent at the ISFSI before the truck can be released for a return shipment. See SAR Table 5.1-2.

Neither the initial application nor the recent license amendment discusses the number of heavy haul trucks that will be available to transport the casks, the mechanical reliability of these units, and their performance under all weather conditions.⁴ SAR Rev. 2 at 4.5.4.2 states that the maximum weight of the loaded shipping cask will be 142 tons and require the use of overweight trailers. The tractor/trailer is 12 feet wide and travels at "low speeds." Given

⁴ Without such an explanation, a worse case scenario should be assumed.

the special design features, size and probable costs of these units (see SAR Fig. 4.5-4), it should be assumed that the Applicant will only have one unit available to transport casks from Rowley Junction ITP to the ISFSI.

Given the operational constraints on the ITP associated with the anticipated slow speeds and long travel distances (24 miles one-way) required for heavy haul transport from the transfer point to the proposed ISFSI, the anticipated number of shipments (100 to 300 casks annually, requiring 100 to 300 one-way heavy haul trips), and the anticipated use of a public highway (with no available heavy haul routing alternatives), a queuing of casks at the intermodal transfer point awaiting heavy haul transport is apparent. During the projected lifetime of the facility a large number of casks will be transported through Rowley Junction, and at least part of the time, a cask or casks will be present at Rowley Junction, thus making Rowley Junction a storage facility for nuclear materials.

Another factor that may significantly contribute to the queuing of casks at Rowley Junction is the fact that PFS intends to return defective or contaminated casks to the originating utility. Thus, there are likely to be heavy haul trucks going in both directions, necessitating greater use of cranes and more coordination of transfer operations.

As a result, the ITP will constitute a de facto interim spent fuel storage

facility, as defined in 10 CFR § 72.3, at which PFS will receive, handle, and possess spent nuclear fuel for extended periods of time. Accordingly, PFS should not be granted a license unless it includes possession of spent nuclear fuel at the ITP.

Moreover, Part 72 licensing is necessary in order to protect the public health and safety. The ITP is stationary in nature, including the construction and installation of a facility and heavy equipment, the continuous presence of spent fuel arriving at or departing from the ITP, and the potential long-term storage of some of the fuel. Because of the stationary nature of the ITP, it is important to provide the public with the regulatory protections that are afforded by compliance with 10 CFR Part 72. For instance, PFS should have a security plan that protects the site from intruders according to NRC standards. There should also be an emergency plan to protect workers and the public in the event of an accident at the ITP. PFS should also provide assurance that the ITP is designed in a way that protects public health and safety, using appropriate structures, equipment, and protective measures. The SAR and the recent license amendment fail to address these concerns. In the absence of such measures, the ITP poses an unacceptable safety and health risk to workers and the public.

The State Satisfies the Commission's Late-Filing Criteria.

The State submits that it satisfies the criteria under 10 CFR. § 2.714(a)(1) for late-filing the two new contentions and a contention with an amended basis:

First, the State has good cause for late filing, because the license amendment on which it relies only became available when PFS provided it to the State on August 31, 1998. Since that time the State has worked with State agencies and experts in reviewing the information and developing contentions based on the amendment. During the past month, the State's time and resources have also been consumed in reviewing informal discovery material and responding the Applicant's discovery requests. The State submits that, given the need to review the material and work with experts to evaluate it and prepare contentions, and given the other competing demands of litigation, it is reasonable to submit these contentions within thirty days of receiving the material.

Second, the State has no means, other than this proceeding, to protect its interests in the issues identified above.

Third, the State's participation in this proceeding can reasonably be expected to assist in developing a sound record. The State is represented by experienced counsel, and assisted by experts from State agencies as well as those whom the State has retained to provide expert assistance for this and other

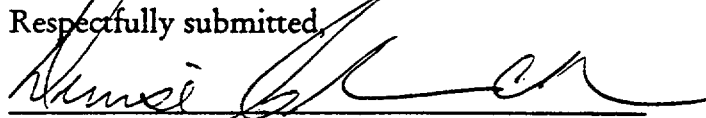
contentions. See Affidavit of David C. Schen (Exhibit 1) and Declaration of Dr. Marvin Resnikoff (Exhibit 3).

Fourth, there are no other parties who will represent the State's interests with respect to the issues raised in the above Contentions.

Finally, it is unlikely that admission of these contentions would broaden or delay the proceeding significantly, as the scope of issues submitted by the State and ruled on by the Board is quite broad already. Moreover, Contention B has already been admitted and Contention ^{HH}~~HEAVY HAUL~~ is similar to the fire issues admitted in Contention R. Moreover, other intervenors who have not yet received a copy of the license amendment will be entitled to file contentions after their review of the material. Thus, the State's filing now will not delay the proceeding. Furthermore, any delay is outweighed by the significance of this issue raised as a result of the new transportation corridor. Accordingly, the above Contentions satisfy the NRC's criteria for late consideration.

DATED this 29th day of September, 1998.

Respectfully submitted,



Denise Chancellor, Assistant Attorney General
Fred G Nelson, Assistant Attorney General
Diane Curran, Special Assistant Attorney General
Connie Nakahara, Special Assistant Attorney General

Attorneys for State of Utah
Utah Attorney General's Office
160 East 300 South, 5th Floor, P.O. Box 140873
Salt Lake City, UT 84114-0873
Telephone: (801) 366-0286, Fax: (801) 366-0292

CERTIFICATE OF SERVICE

I hereby certify that copies of STATE OF UTAH'S CONTENTIONS
RELATING TO THE LOW RAIL TRANSPORTATION LICENSE
AMENDMENT were served on the persons listed below by electronic mail
(unless otherwise noted) with conforming copies by United States mail first
class, this 29th day of September, 1998:

Attn: Docketing & Services Branch
Secretary of the Commission
U. S. Nuclear Regulatory
Commission
Mail Stop: O16G15
11555 Rockville Pike, One White
Flint North
Rockville, MD 20852-2738
E-mail: hearingdocket@nrc.gov
(original and two copies)

G. Paul Bollwerk, III, Chairman
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory
Commission
Washington, DC 20555
E-Mail: gpb@nrc.gov

Dr. Jerry R. Kline
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory
Commission
Washington, DC 20555
E-Mail: jrk2@nrc.gov

Dr. Peter S. Lam
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: psl@nrc.gov

Sherwin E. Turk, Esq.
Catherine L. Marco, Esq.
Office of the General Counsel
Mail Stop - 0-15 B18
U.S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: pfscase@nrc.gov
E-Mail: set@nrc.gov
E-Mail: clm@nrc.gov

Jay E. Silberg, Esq.
Ernest L. Blake, Jr.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N. W.
Washington, DC 20037-8007
E-Mail: Jay_Silberg@shawpittman.com
E-Mail:
ernest_blake@shawpittmen.com

Clayton J. Parr, Esq.
Parr, Waddoups, Brown, Gee &
Loveless
185 South State Street, Suite 1300
P. O. Box 11019
Salt Lake City, Utah 84147-0019
E-Mail: karenj@pwlaw.com

John Paul Kennedy, Sr., Esq.
1385 Yale Avenue
Salt Lake City, Utah 84105
E-Mail: john@kennedys.org

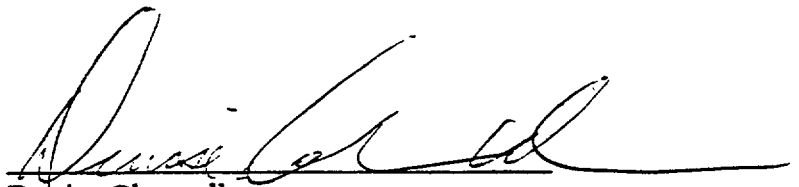
Richard E. Condit, Esq.
Land and Water Fund of the Rockies
2260 Baseline Road, Suite 200
Boulder, Colorado 80302
E-Mail: rcondit@lawfund.org

Joro Walker, Esq.
Land and Water Fund of the Rockies
165 South Main, Suite 1
Salt Lake City, Utah 84111
E-Mail: joro61@inconnect.com

Danny Quintana, Esq.
Danny Quintana & Associates, P.C.
50 West Broadway, Fourth Floor
Salt Lake City, Utah 84101
E-Mail: quintana@xmission.com

James M. Cutchin
Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
E-Mail: jmc3@nrc.gov
(electronic copy only)

Office of the Commission Appellate
Adjudication
Mail Stop: 16-G-15 OWFN
U. S. Nuclear Regulatory Commission
Washington, DC 20555
(United States mail, first class only)



Denise Chancellor
Assistant Attorney General
State of Utah

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

AFFIDAVIT OF DAVID C. SCHEN

I, DAVID C. SCHEN, being first duly sworn upon oath, depose and state as follows:

1. I am employed as Ecosystem Management Coordinator at the Division of Forestry, Fire, and State Lands, Utah Department of Natural Resources, and have worked within this Division since 1971.
2. I earned a Bachelors of Science degree in Forestry in 1971, from Utah State University.
3. I worked as Area Forester (1971-1979) in the Division's Bear River Area office, where I was responsible for the fire protection program; as

the Division's Regional Manager (1979-1982) responsible for delivering fire protection services to three areas; and as Forest Stewardship Coordinator (1982-1995).

4. As Ecosystem Management Coordinator (1995 to present), my duties have included oversight of the fire management program and management of fire crews within the Division, which is responsible for fire protection services on 15 million acres of forest, range, and watershed lands within the State of Utah. I have taken part in numerous fire qualification and certification courses as part of my duties. In addition, since 1985 I have served on incident management teams which are used for fire suppression, and am qualified as operations section chief, responsible for directing fire suppression during particular incidents.

5. As part of my duties, I have reviewed the License Amendment Application dated August 28, 1998, submitted to the Nuclear Regulatory Commission by Private Fuel Storage, LLC, Applicant for an Independent Spent Fuel Storage Installation on the Skull Valley Goshute Reservation.

6. The License Amendment Application describes a new transportation route along which the Applicant proposes to transport spent

nuclear fuel by rail spur from the Union Pacific main rail line near Low, Utah to the Skull Valley Goshute Reservation. The spur is proposed to be constructed along the eastern edge of the Cedar Mountains for a distance of 26 miles.

7. In my opinion, based upon my experience and training, the License Amendment Application does not adequately address a number of fire hazard issues pertinent to this new transportation corridor (the Low rail corridor), because this area is prone to wildfires. There is a history of fires moving south to north through Skull Valley along the eastern side of the Cedar Mountains; such fires have been known to frequently cross over the Cedar Mountain from the west spreading into the western part of Skull Valley.

8. The vegetation in Skull Valley is primarily desert shrub and grass land. Fuels in this plant community dry in early June and ignite very easily. Vegetation includes native grasses, sage brush, Utah juniper, and introduced species such as June grass (cheat grass) and crested wheat grass. Due to frequent and recurring wild fire and a history of heavy grazing, the primary vegetation is June grass.

9. I am aware of only a few irrigated areas in Skull Valley, but they

are located nearby the ranches on the east side of the valley and close to the reservation. There are also some mudflats in the north end of the valley. Neither of these two types of areas are sufficient to interrupt a wildfire occurring in Skull Valley.

10. The activity associated with the construction and maintenance of the rail spur, such as welding, grinding of rail and the presence of fuel for the operation of machinery will present potential fire hazards.

11. Additionally, fires can result in sparks caused by friction or from the train exhaust stack, or from a hot brake shoe sheering off the locomotive or rail carriage wheels.

12. The rail spur may result in an increase in the occurrence of human caused fires. Rail lines typically have an access road alongside to facilitate maintenance. In this case additional or improved points of access to the west side of Skull Valley might be developed from the highway during construction of the rail line. Since the Low Corridor is proposed to cross primarily public land, the improved access on the west side is likely to result in more recreational use of the area, and thus, a greater potential for human caused fires.

13. Access to the west side of Skull Valley has always been poor for fire response vehicles and personnel. In this area responders typically use four-wheel drive vehicles and drive cross country to fight wild land fires. Hand crews may also be used but generally, heavy equipment is not used because of the damage it may cause to the fragile ecosystem. The four-wheel drive vehicles carry a water tank containing 200-300 gallons of water. The vehicles will have difficulty directly crossing the rail line. Even if the rail spur is constructed close to existing grade, fire fighting vehicles will be unable to climb up the vertical profile of the grade and rail, especially given the gross weight of the vehicle and water tank and also because the vehicle will be unable to get any traction from the ballasted rail bed.

14. Responders to fires will be put at increased risk because of the potential for collisions with trains in the dense smoke of a range fire.

15. In my opinion, if fire fighters were aware that high level nuclear waste was within the perimeter of the fire, they would err on the side of caution and personal safety. Firefighters will be reluctant to pursue a wildfire in the vicinity of a train load of spent nuclear fuel casks. They may very likely back off until a subject area specialist ascertained that the hazardous cargo was

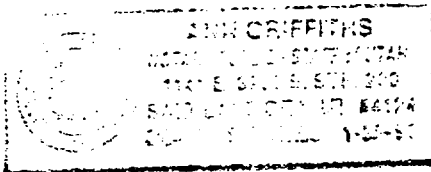
contained and fire fighter safety was guaranteed.

FURTHER AFFIANT SAYETH NOT.

DATED this September 29, 1998.

David C. Schen
DAVID C. SCHEN

Voluntarily signed and sworn to before me this 29 day of September, 1998, by the signer, whose identity is personally known to me or was proven to me on satisfactory evidence.



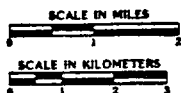
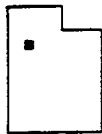
Ann Griffiths
NOTARY PUBLIC
Residing at: Murray UT
My Commission expires: 1-25-99

CEDAR MOUNTAINS WSA

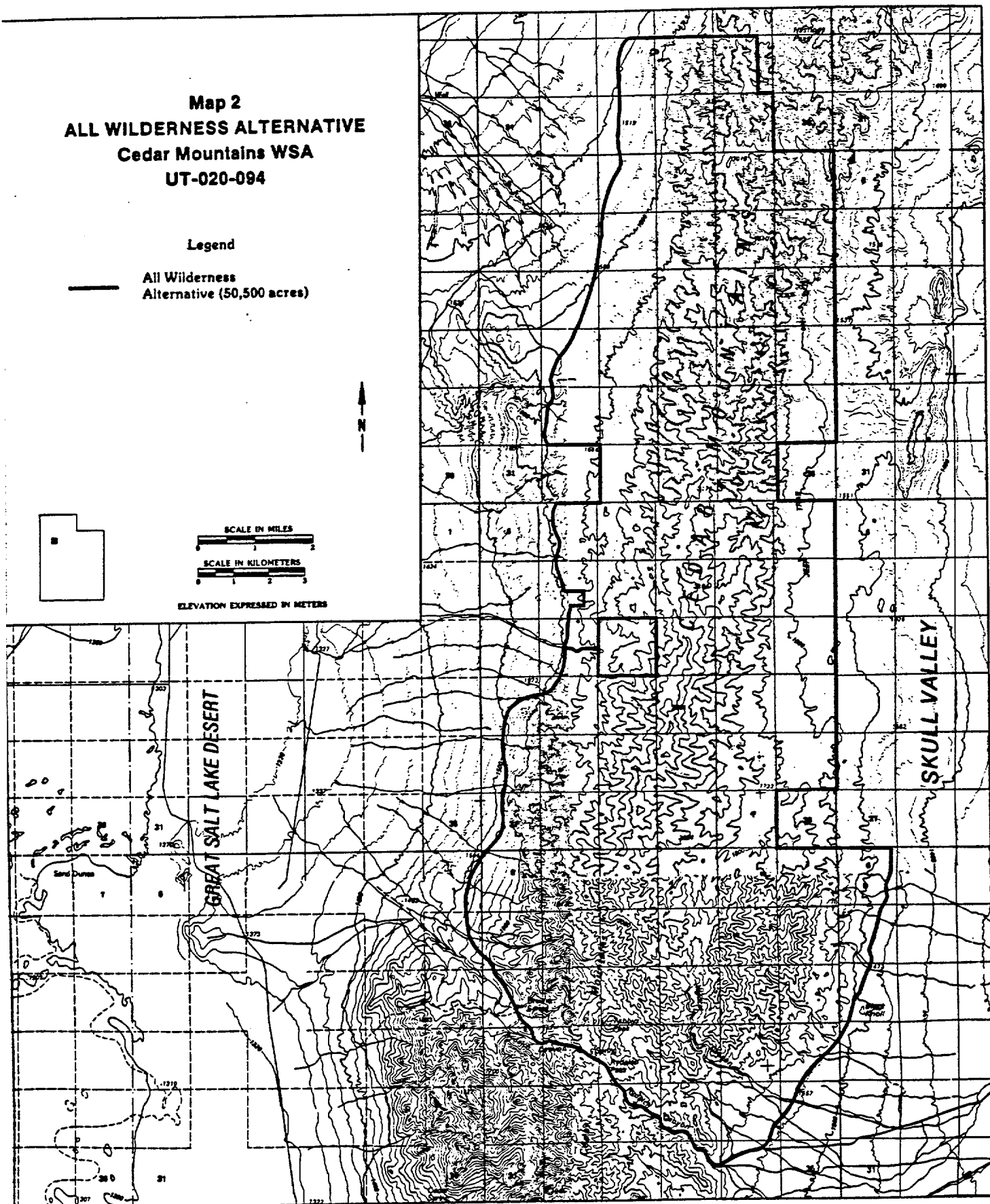
Map 2
ALL WILDERNESS ALTERNATIVE
Cedar Mountains WSA
UT-020-094

Legend

— All Wilderness
Alternative (50,500 acres)



ELEVATION EXPRESSED IN METERS



T. 2 S.

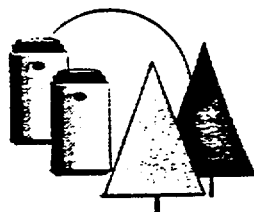
T. 3 S.

T. 4 S.

R. 11 W.

R. 10 W.

Marvin Resnikoff
Dr. Marvin Resnikoff



Private Fuel Storage, LLC

SEP 24

ENVIRONMENTAL

P.O. Box C4010, La Crosse, WI 54602-4010

Phone 303-741-7009 Fax: 303-741-7806

John L. Donnell, P.E., Project Director

September 21, 1998

Mr. Glenn Carpenter
District Manager
Bureau of Land Management
2370 South 2300 West
Salt Lake City, UT 84119

APPLICATION FOR TRANSPORTATION ON FEDERAL LANDS
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

Reference: 1) Private Fuel Storage LLC letter, Parkyn to Carpenter, Application for Transportation on Federal Lands, dated August 28, 1998

Enclosed is a revised first page to the right-of-way application for the Intermodal Transfer Point that was transmitted in Reference 1. A clarification has been made for Project Description items 7 (e) and (f) in explaining the number of rail shipments per week and transportation casks per shipment. The text has been changed from "less than one rail shipment per week" to "two rail shipments on average" in 7 (e), and from "each rail shipment consists of 3 - 5 transportation casks" to "1 - 3 transportation casks" in 7 (f).

We hope that this change has not cause you any inconvenience. If you have any questions, please contact me at 303-741-7009.

Sincerely,

John L. Donnell, Project Director
Private Fuel Storage L.L.C.

Enclosure

Copy to: L. Bear
D. Allison
M. Delligatti
J. Silberg
M. Swimmer

J. Donnell
~~D. Chancellor~~
D. Allison
P. Winmill

APPLICATION FOR TRANSPORTATION AND
UTILITY SYSTEMS AND FACILITIES
ON FEDERAL LANDS

FORM APPROVED
OMB NO. 1004-0060
Expires: August 31, 1998

FOR AGENCY USE ONLY

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

Application Number

Date Filed

1. Name and address of applicant (include zip code)

Private Fuel Storage L.L.C.
PO Box C4010
La Crosse, WI 54602-4010

2. Name, title, and address of authorized agent if different from item 1 (include zip code)

John Donnell, Project Director
PO Box 5406
Denver, CO 80217-5406

3. TELEPHONE (area code)
303-741-7009

Applicant Private Fuel Storage L.L.C.

Authorized Agent

4. As applicant are you? (check one)

- a. ☐ Individual
b. ☐ Corporation*
c. ☐ Partnership/Association*
d. ☐ State Government/State Agency
e. ☐ Local Government
f. ☐ Federal Agency
g. ☒ Limited Liability Corporation

* If checked, complete supplement page

5. Specify what application is for: (check one)

- a. ☒ New authorization
b. ☐ Renewing existing authorization No.
c. ☐ Amend existing authorization No.
d. ☐ Assign existing authorization No.
e. ☐ Existing use for which no authorization has been received*
f. ☐ Other*

* If checked, provide details under item 7

6. If an individual, or partnership are you a citizen(s) of the United States? ☐ Yes ☐ No

7. Project description (describe in detail): (a) Type of system or facility, (e.g., canal, pipeline, road); (b) related structures and facilities; (c) physical specifications (Length, width, grading, etc.); (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (Attach additional sheets, if additional space is needed.)

- (a) The right of way (ROW) will be used to construct an intermodal transfer point (ITP) next to the Union Pacific mainline 1.8 miles West of Timpie, Utah, on a parcel of ground within the N $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 12, T.1N., R.8W., SLBM, which is public land administered by the BLM. See attached Figure 2.1-1 drawings 0599601-EY-09 & 0599602-EY-14. The ITP is discussed in more detail in the Environmental Report (ER) at Section 3.2.1.4, "INTERMODAL TRANSFER POINT/SKULL VALLEY ROAD."
- (b) The ITP will be use as part of the transportation of spent commercial nuclear fuel to the Private Fuel Storage Facility (PFSF), a temporary spent fuel storage site. The sealed transportation casks will be transferred from rail cars to trucks at the ITP for further shipment to the PFSF via Skull Valley Road. See description of the PFSF in ER Sec. 3.2.1.2, "STORAGE FACILITY."
- (c) The ROW is approximately 9 acres of flat land located between the Union Pacific mainline and the I-80 frontage road (2 acres of Union Pacific land will also be used). The facilities will include one metal building (80 ft by 200 ft) and a 30 ft wide by 500 ft long access road connecting the ITP to an existing frontage road. The ITP also includes rail sidings, which are on Union Pacific right of way. See ER Sec. 3.2.1.4, "INTERMODAL TRANSFER POINT/SKULL VALLEY ROAD."
- (d) Term of use expected to be 50 years.
- (e) During the initial years of operation until the storage facility reaches its capacity of 4000 stored canisters, it is expected that between 100 to 200 shipments of transportation casks will be shipped to the site each year, resulting in two rail shipments on average per week being transferred to trucks at the ITP throughout the year. At the end of the storage facility's life, the 4000 canisters will be shipped from the site to the Department of Energy. See details in ER Section 3.3, "FACILITY OPERATION."
- (f) Each rail shipment consists of 1 - 3 transportation casks to be transferred to trucks. See ER Sec. 1.2, "NEED FOR THE FACILITY," for a more detailed discussion of the anticipated shipment volumes.
- (g) Construction of the ITP is scheduled to begin at the beginning of 2001 and last about 1 year. See ER Sec. 1.3, "PROPOSED PROJECT SCHEDULE."
- (h) All work will be performed within the request ROW boundaries and Union Pacific land.

8. Attach a map covering the area and show location of project proposal See attached Figure 2.1-1 and drawings 0599601-EY-09 and 0599602-EY-14

9. State or Local government approval: ☐ Attached ☐ Applied for ☒ Not Required

(Continued next page)



[Home](#) [Schedule](#) [News](#) [Contact](#) [Action](#) [Members](#)
[Subcommittees](#) [Publications](#) [Commerce-Democrats](#) [Search](#)

**Committee on Commerce Hearing
Witness
Hearing Regarding: Nuclear Waste Policy
Act of 1999**

Date	Subcommittee(s)	Status	Panel
03/12/99	Subcommittee on Energy & Power	Testified	Panel 1, Witness 1

**Statement of The Honorable Bill
Richardson**

Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

See Also

[Energy](#)

[Yucca
Mountain](#)

[H.R. 45](#)

**Thomas
Links**

[H.R. 45](#)

Thank you, Mr. Chairman, and Members of the Subcommittee, for the opportunity to appear before you today to discuss alternatives for the management of spent nuclear fuel from civilian nuclear power plants until we are able to permanently dispose of it in a geologic repository.

The Administration continues to believe that the overriding goal of the Federal Government's high-level radioactive waste management policy should be the establishment of a permanent, geologic repository. Such a repository is essential not only to dispose of commercial spent fuel, but also to dispose of: spent fuel and high-level waste from the cleanup of the Department's nuclear weapons complex, unique commercial spent fuel transferred to the Department (such as Three Mile Island and Fort St. Vrain spent fuel), and spent fuel and high-level waste associated with the Navy's nuclear-powered fleet. A permanent repository is also important to our non-proliferation efforts to demonstrate alternatives to reprocessing, important for the disposition of foreign research reactor fuel being returned to the U.S., and an option for disposition of surplus plutonium from nuclear weapons stockpiles.

YUCCA MOUNTAIN

Before addressing the proposed legislation -- H.R. 45, the Nuclear Waste Policy Act of 1999 --and an alternative approach, I would like to review quickly how this

Administration has moved the Civilian Radioactive Waste Management Program forward in the last several years. In many of the earlier years it appeared that there was little progress towards siting a repository. In 1993, however, the Department broke ground and began drilling the miles of tunnel needed for scientific investigations, completing the five-mile loop in 1997. We also drilled a cross-drift at the horizon of the potential repository area. Reaching these areas, we are now able to verify model predictions that could not be confirmed without being inside the mountain. We are conducting three different thermal tests to evaluate how the heat of the waste could impact the surrounding rock and the repository structure. We are also now able to study water movement through the mountain. The verification of our models with real data from the mountain reduces the uncertainties in our assessment of whether Yucca Mountain will work as a permanent repository.

We are reaching the conclusion of our site characterization effort at Yucca Mountain. In December 1998, I submitted the Viability Assessment of a Repository at Yucca Mountain to the Congress and to the President. This subcommittee received testimony on the Viability Assessment in February when the Acting Director, Lake Barrett, appeared before you.

The Viability Assessment revealed no technical "showstoppers," but it did identify additional scientific and technical work needed before a decision can be made whether to recommend Yucca Mountain as the site for a repository. Consequently, we have asked for close to a \$50 million increase in the FY2000 budget for site characterization activities to address these concerns - a 17.4 per cent increase. We will study the presence and movement of water through the repository block, the effects of water movement on the waste package, and the effects of heat from the decay of radioactive materials inside the waste packages on the site's geologic and hydrologic behavior.

It is important to underscore that the scientific and technical work being carried out at Yucca Mountain represents cutting-edge science on a first-of-a-kind project. The United States is at the forefront in developing a geologic repository, and the decisions we make will have impacts throughout the international community.

We are on target to decide in 2001 whether Yucca Mountain is suitable to be the location of a repository and to submit a license application to the U.S. Nuclear Regulatory Commission in 2002. In short, since 1993, although we were

not able to make up for time lost during the early years of the program, we have maintained steady progress and met the key milestones of our Program Plan.

CONTRACTUAL OBLIGATIONS FOR SPENT FUEL MANAGEMENT

I want to assure you that I am very conscious of the Department's contractual obligation to take spent fuel from utilities beginning in 1998. Notwithstanding the progress being made at Yucca Mountain, the nuclear utility industry and state utility commissions are understandably concerned about the Department's inability to accept spent fuel on the schedule anticipated at the time of enactment of the Nuclear Waste Policy Act of 1982. The inventory of spent fuel in the United States continues to grow. Spent fuel from nuclear power reactors is now stored at 72 commercial reactor sites in 33 states. We know some have already reached their capacity and many are reaching their capacity. Each year reactor sites will require additional on-site storage either in pools or with dry cask storage. There are currently 10 utilities with dry storage facilities in 8 states, and many utilities are concerned about the costs and physical and regulatory limitations on their continued storage of spent fuel at their reactor sites.

As you are aware, the Department is in litigation with a number of utilities related to the Department's contractual obligation to take spent fuel from utilities. The U.S. Circuit Court of Appeals for the District of Columbia has found that the Department has a contractual obligation to commence spent fuel disposal no later than January 31, 1998. The Court, however, has twice rejected the request from utilities for an order directing the Department to physically move spent fuel from their sites and found that the contracts the Department has with the utilities provide a potentially adequate mechanism for relief. Pursuant to the ruling of the Court of Appeals, the Department announced that it would process claims presented to it under the contract, and we have entered into settlement discussions with several utilities.

In separate litigation, ten utilities have filed claims for damages. In the first three cases the Court found that the Department had breached its contracts, and the Department is now engaged in determining the amount of damages owed to these utilities. The other Court of Claims cases are in very preliminary stages with potentially years of litigation still ahead. As indicated by the Justice Department in its testimony before this Subcommittee on February 10, the damages being sought by the ten utilities before the Court of Claims could

total \$8.5 billion. This is more than the existing balance in the Nuclear Waste Fund and is roughly 85 percent of the remaining cost to open the repository in 2010. Potential claims from other utilities could be many times this amount.

The Justice Department also stated that a decision on whether payments for these judgments would come out of the Nuclear Waste Fund is still pending. Should it become necessary to use the Fund to pay these claims, the Department's ability to complete the repository program would be in jeopardy. Ironically, claims against the Fund could also require a significant increase in the fee charged utilities to maintain the program, and could trigger yet another round of litigation and claims.

I also want to point out that several utilities have come and talked to us about their specific problems and proposed potential solutions. Some of these utilities have asked the Department to take title to their spent fuel onsite at their reactors.

ADMINISTRATION VIEWS OF H.R. 45

The Administration opposes H.R. 45, which would require the Department to begin accepting waste at an interim storage facility in Nevada no later than June 30, 2003. Making a decision now to put interim storage in Nevada is not the right approach. It simply does not make sense to transport spent fuel across country to Yucca Mountain until we have completed the scientific work and know where a final repository will be. Spent fuel is currently being stored safely at reactor sites, under U.S. Nuclear Regulatory Commission oversight, and can continue to be stored safely until a repository is open.

From a budgetary standpoint, enactment of H.R. 45 could also have several negative impacts on the repository program. First, it will add the cost of construction of an interim storage facility to the program budget, and it will advance the costs of transportation much earlier than now planned. Between now and the year 2010, we estimate that H.R. 45 would add approximately \$1.5 billion to the total cost of the civilian radioactive waste program because of the additional cost of the interim storage facility. It would also require expending \$2-3 billion dollars for transportation prior to knowing whether Yucca Mountain will be the site for a permanent repository.

In addition to these new budgetary burdens, and perhaps more significantly, H.R. 45 would not provide the Department or the Federal Government relief from the billions of dollars of potential damages likely to be awarded through litigation. By

imposing new statutorily defined obligations and deadlines, H.R. 45 would also create the potential for new litigation if the Department were unable to meet these requirements or if it had the effect of altering the existing utility contracts.

As I stated in my introductory remarks, it is critical to many national goals that we develop the capability to permanently dispose of high-level radioactive waste and spent fuel. We believe H.R. 45 could seriously jeopardize our ability to carry out this effort. For these reasons, and because of the central fact that we have not completed the work necessary to make a decision to recommend Yucca Mountain as a permanent repository site, the Administration remains unequivocally opposed to the enactment of legislation requiring construction and operation of an interim storage facility at Yucca Mountain, and I would recommend a veto of any such legislation.

PROPOSAL TO TAKE TITLE ON-SITE

As the Subcommittee has requested, I would like to discuss the Department taking legal title to utilities' spent fuel at reactor sites until a repository is opened. Let me emphasize first that the Department is only at the beginning of the process of analyzing this approach and discussing it with the utility industry and other interested parties. However, it appears to be a practical option that would provide a near-term solution to utilities' spent fuel storage needs and would be relatively easy to implement. The chairman's invitation letter raised a number of specific questions such as how it would be funded, when it would be implemented, who would own and regulate these sites, and how it would affect the Department's contractual liability. These are all very important questions that the Department is in the process of answering, and many of those answers will depend upon the specific needs of individual utilities.

Let me discuss briefly some of the concepts we believe are appropriate to consider as part of that discussion.

Conceptually, the Department could offer to take title to spent fuel consistent with our schedule for acceptance provided under its contracts with utilities. By taking title to the spent fuel, the Department could either assume financial responsibility for the utility's continued management of the spent fuel or possibly assume possession and responsibility for management of the spent fuel. We assume that utilities may have differing opinions on these alternatives, based upon their individual circumstance. For example, a utility with a permanently shut down reactor and no ongoing nuclear operations may want the Department to assume complete

responsibility for the management of the spent fuel and storage facilities, while other utilities with operating reactors may prefer the Department only to take financial responsibility.

As part of an agreement to take title, the Department could agree either to reimburse the utility for the incremental cost of storing that spent fuel or to take a more direct role in the management of the spent fuel and storage facilities. We believe we could implement this proposal by modifying the existing contracts with utilities. We would still have to address a range of issues, including liability, financial and operational responsibilities.

While we want to hear from utilities and other interested parties on how taking title to spent fuel could most efficiently be implemented, our initial thoughts are that a continued reliance on the utilities to manage their spent fuel, rather than the Department, would be most practical and least intrusive on utility operations. Again, the purpose of initiating this dialogue is to better understand what the utilities think and to obtain other relevant perspectives on the issue. Under any approach, the Nuclear Regulatory Commission would continue to provide regulatory oversight of spent fuel storage activities at sites.

In return for the Department taking title and financial responsibility for the spent fuel, the Department would expect the utilities to terminate their litigation and claims; something that H.R. 45 does not address. This would end the uncertainty that continuing the litigation brings to all parties and ensure the continuance of a repository program. The potential cost of current litigation damages already places the repository program in jeopardy. If the Department is unable to proceed with a permanent solution, future costs could be even greater. Consequently, the cost to take title appears to be minimal compared to the potential cost of damages, which as I noted above could end up being assessed against the Nuclear Waste Fund.

The cost of taking title onsite would depend on the final arrangements worked out with utilities for spent fuel management. We have not done a detailed cost estimate. Our rough estimate is that it could cost up to \$2 to \$3 billion between now and 2010. That cost estimate assumes that we would take title of the fuel in accordance with our contract acceptance schedule. There may also be ways in which these costs can be reduced. For example, one of the major costs of continued onsite storage is the cost of dry storage casks. It may be possible to consider federal purchase or lease of these

casks. Here again, we need to hear from the industry on their views on how we can best address these issues.

Funding for the DOE to take title on-site could be achieved through a variety of means, ranging from deferral of ongoing spent fuel disposal fee payments, to direct reimbursement for costs incurred, to advance payments for anticipated costs. As with other program costs, payments could come from a mix of Nuclear Waste Fund balances, current payments, or appropriated funds. Again, we need to hear from the industry on their views of payment and funding options.

PROGRAM FUNDING REQUIREMENTS

As we continue to discuss and develop the specifics of a take title alternative to centralized interim storage, we need to take a serious look at how such a proposal would be paid for without imposing undue burdens on either utility ratepayers or the taxpayers. I also want to analyze further proposals that would ensure that the revenues raised by the nuclear waste fee remain available to complete the job of safe management and disposal of nuclear waste.

Both the Administration and the Congress have been aware for some time that the overall constraints of the federal budget process have the potential to limit the availability of funding for the nuclear waste program in the out years. Therefore, I would like to work together with the Congress to assure the repository program continues to be adequately funded. If the Yucca Mountain site is found suitable, it is critical that funding is available after 2001 to meet our obligations as program demands increase and to ensure our ability to meet a date certain for disposal of waste.

In exploring any funding alternatives, I want to preserve the two important objectives I mentioned above : (1) that we do not impose undue burdens on either utility ratepayers or the taxpayers; and (2) that the revenues raised by the nuclear waste fee remain available to complete the job.

CONCLUSION

Mr. Chairman, we are reaching the conclusion of our site characterization effort. We know technical questions about the site remain. We need to finish our scientific and technical work. Ultimately, it is not only the Department of Energy, but also the Nuclear Regulatory Commission (NRC) that will need to pass judgment on whether a repository can be constructed and operated safely. Therefore, in completing the remaining work at the site, we need to ensure that we have an adequate

technical basis to support a rigorous NRC licensing process. This will require a continued and sustained effort over the next couple of years. However, the completion of the characterization effort is in sight.

I know that you and many other Members of Congress are frustrated because we have not accepted spent fuel and want to be responsive to utilities and state regulatory commissions that have had to deal with additional spent fuel management responsibilities. I want to reiterate the Administration's view that enactment of interim storage legislation is not the solution. Shipping 10,000 metric tons of spent fuel to Yucca Mountain, as proposed in H.R. 45, is inconsistent with the process and principles established for making a decision on the permanent disposal of our Nation's spent nuclear fuel.

I ask this Subcommittee not to proceed with adoption of interim storage legislation and to work with me to fashion a more practical solution. This legislation would place significant additional financial, programmatic, and legal liabilities on the Department's civilian nuclear waste repository program. It would prejudice the selection of Yucca Mountain. And it would not resolve the billions of dollars in claims arising out of the delay in accepting utility spent fuel. We need to address the utilities' spent fuel problems, and I believe that we are at a point where there is a genuine opportunity to explore alternatives.

| [Action](#) | [Schedule](#) | [News](#) | [Contacts](#) | [Members](#) |

| [Subcommittees](#) | [Publications](#) | [Commerce-Democrats](#) | [Search](#) |



**The House Committee on
Commerce**
2125 Rayburn House Office Building
Washington, DC 20515
(202) 225-2927
Commerce@mail.house.gov



State of Utah

ATTACHMENT D

DEPARTMENT OF PUBLIC SAFETY DIVISION OF COMPREHENSIVE EMERGENCY MANAGEMENT

Michael O. Leavitt
Governor
Craig L. Dearden
Commissioner
Ferris E. Groll
Deputy Commissioner

State Office Building, Room 1110
Box 141710
Salt Lake City, Utah 84114-1710
(801) 538-3400
(801) 538-3770 FAX Line

Earl R. Morris
Director

May 4, 1999

Mr. Scott C. Flanders
Senior Environmental Project Manager
Spent Fuel Project Office
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Flanders:

The Utah Department of Public Safety, Division of Comprehensive Emergency Management (CEM) is the sole State agency designated to mitigate, prepare for, respond to, and recover from the effects of disasters and emergencies throughout Utah. Our vital mission is specifically mandated by Utah statute, and we work closely with local, State and federal agencies, and private sector organizations in the fulfillment of this important work. CEM's long history of service has been recognized to be among the finest in the emergency management field.

As CEM Director, I am appointed as the Governor's Authorized Representative (GAR) in times of emergency and disaster, with specific duties and responsibilities delineated in the State of Utah Emergency Operations Plan that correlate to the Federal Response Plan. I also hold the primary State relationship with the Federal Emergency Management Agency through Region VIII in Denver, Colorado. For example, the GAR coordinates all wildfire suppression activities throughout the State, working closely with the Utah State Forester and the federal Interagency Fire Center.

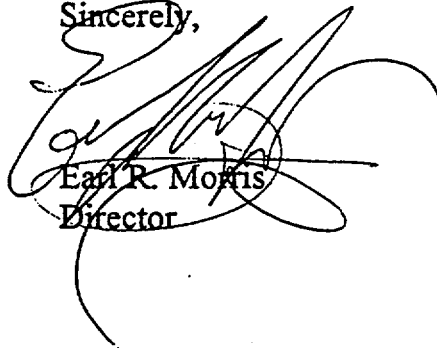
From this perspective, it is incomprehensible that Private Fuel Storage, L.L.C. (PFS) persists in ignoring the health and safety requirements of the residents of Utah by avoiding contact and coordination with CEM, a posture it has maintained since the inception of its initial proposal to store high-level nuclear waste on the Skull Valley Band, Goshute Indian Reservation in Tooele County. CEM has previously provided extensive oral and written comments during previous public scoping processes related to the PFS proposal, and has directly provided substantial information to PFS and Nuclear Regulatory Commission representatives. To-date, PFS has made no attempt to address any of the critical issues and emergency planning elements brought forth by CEM.

Mr. Scott C. Flanders
May 4, 1999
Page 2

In the absence of PFS' recognition of its responsibility to follow the precedent of "maximum protection" of the public and environment previously established by CEM, and PFS' continuing failure to cooperate, communicate and coordinate with CEM on all emergency management planning requirements, this agency must vigorously oppose any efforts by PFS to establish the high-level nuclear waste storage facility at Skull Valley. Accordingly, CEM expresses its complete lack of confidence in Private Fuel Storage's proposal of this ill-conceived facility that is so clearly not in the best interests of the people of Utah.

Thank you for your consideration and support of our position.

Sincerely,



Earl R. Morris
Director

ERM/dc/lr

cc: Dr. Dianne Nielson, Executive Director
Utah Department of Environmental Quality

Ferris E. Groll, Deputy Commissioner
Utah Department of Public Safety

Mr. Leo Berggen, Resource Advisor
U.S. Department of the Interior
Bureau of Land Management

Mr. Dale Hamberg
Land Operation Officer
U.S. Department of the Interior
Bureau of Indian Affairs



State of Utah

School and Institutional
TRUST LANDS ADMINISTRATION

Michael O. Leavitt
Governor

David T. Torry
Director

675 East 500 South, Suite 500
Salt Lake City, Utah 84102-2818
801-538-5100
801-355-0922 (Fax)
<http://www.trustlands.com>

ATTACHMENT E

April 14, 1999

LINDA COVILLE
ACTING STATE DIRECTOR
USDI, BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
PO BOX 45155
SALT LAKE CITY, UTAH
84145-0155

Dear Ms. Coville:

Let me take this opportunity to congratulate you on your appointment to this position. I look forward to continuing our productive relationship. Please accept this letter as a formal nomination of lands to the BLM/State of Utah Exchange MOU FOCUS LIST:

All public lands in the following sections:

Township 1 South, Range 8 West, SLB&M
Sections 1-12

Township 1 North, Range 8 West, SLB&M
Section 31

Township 1 North, Range 9 West, SLB&M
Sections 7-9, 17, 18, 21, 22, 23, 25-27, & 35

Township 1 North, Range 10 West, SLB&M
Sections 13, 14, 22-24, 26, 27, 33-35

As we contemplate growth along the Wasatch Front, we anticipate that these lands will have potential for long-term industrial development. We would appreciate your immediate attention to this proposal. If you have any questions regarding this nomination, please don't hesitate to contact me.

Sincerely

KEVIN S. CARTER
ASSISTANT DIRECTOR - SURFACE

TESTIMONY OF
GOVERNOR MICHAEL O. LEAVITT
STATE OF UTAH
Regarding the
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE CONSTRUCTION AND OPERATION OF AN INDEPENDENT
SPENT FUEL STORAGE INSTALLATION ON THE RESERVATION OF THE SKULL
VALLEY BAND OF GOSHUTE INDIANS AND THE RELATED TRANSPORTATION
FACILITY IN TOOELE COUNTY, UTAH
Docket No. 72-22, Private Fuel Storage, LLC

Salt Lake City Utah
July 27, 2000

I want to thank the Nuclear Regulatory Commission, Bureau of Land Management, Bureau of Indian Affairs, and the Surface Transportation Board for the opportunity for the public to provide comments, tonight in Salt Lake City, and tomorrow evening in Grantsville, regarding the plan by Private Fuel Storage, a limited liability corporation, to "temporarily" store high level nuclear waste fuel rods on the Goshute Reservation in Skull Valley.

The decision you are preparing to make is an extremely important one to the future of Utah, to the Goshutes, and to the Nation as a whole. It could have significant, long-term impacts on the health and safety of Utah's citizens, and of individuals who live on high level nuclear waste transportation corridors throughout the Nation. Approval of PFS' proposal would cause the unprecedented movement of massive amounts of high level nuclear waste throughout the Nation, creating risks that may, in the end, turn out to be unnecessary. It could also have significant, long-term impacts on Utah's economy, and could even harm the nation's military readiness.

Such an important decision deserves your very careful review and consideration. This Draft EIS will not support that careful review.

The DEIS is seriously deficient in information and analysis required by the National Environmental Policy Act, by federal regulations, and by common sense. It will not come as a surprise to you that I continue to oppose the transportation and storage of high level nuclear waste within Utah. The initial review of this Draft EIS only heightens my concern.

The PFS high level nuclear waste storage facility is the largest facility of its kind ever proposed for licensing by the NRC. The consequences and cumulative impacts are equally significant, and have not been adequately analyzed.

I'm sure the NRC is aware of the magnitude of this proposal, but the cooperating agencies and the public should be made aware of the extreme nature of this proposal. This site will store 40,000 metric tons of high level nuclear waste in 4,000 casks. To put this in perspective, today there are only 436 storage units or casks for commercial spent fuel in the entire United States, 1/10th the number proposed for Skull Valley. Furthermore, 12 of the 13 storage sites are within ¾ mile of a nuclear power plant. The experience to date with transportation of commercial waste involves short distances compared to the cross-country route required for the PFS facility.

The DEIS ignores or inadequately addresses many issues that could have a significant impact on the health and safety of Utah's citizens. Potentially significant risks associated with earthquakes are not analyzed at all in the DEIS. Nor are risks associated with nearby military activities. Information about the risks resulting from the transportation of high level nuclear waste to the facility is scarce in the DEIS. It is surprising that, given the unprecedented volumes of high level nuclear waste that would be transported if this project were approved, NRC has chosen to rely on outdated studies, with little project-specific analyses.

The individual and cumulative impacts on military installations and operations in, over, and near Skull Valley are not even described, much less analyzed in the Draft EIS. The risks from Cruise Missile and F-16 crashes, the emergency evacuation route through Skull Valley in case of a chemical agent leak, the essential ongoing use of the airspace over Skull Valley for access to the Utah Test and Training Range (UTTR) – discussions of all of these and numerous other military activities are missing from the analysis in the Draft EIS. Furthermore, the socio-economic impacts to Hill Air Force Base and its surrounding communities if UTTR operations are curtailed are never considered in the Draft EIS. These are critical impacts of significant consequence. They cannot be ignored or overlooked.

The Draft EIS does not address potential economic costs of a storage or transportation accident. Despite the fact that the Price Anderson Act does not indemnify a private away-from-reactor storage facility, NRC has no onsite nuclear property or insurance requirements. If there is an accident or other problem, PFS' liability under the lease agreement with the Skull Valley Band is normally limited to the money available through commercially reasonable nuclear liability insurance, even if actual costs are much higher. There are no assurances that potential on or off Reservation impacts from an onsite incident will be properly addressed.

It is unclear whether the Price Anderson Act will cover accidents that occur during transportation of high level nuclear waste to or from this facility. But, even if it does, nuclear utilities would be liable for a maximum of \$9.43 billion of accident costs. The federal government - U.S. taxpayers - would be responsible for the rest, and the rest could be significant. The estimated economic costs for a transportation accident in a metropolitan area ranges from \$14 to \$313 billion. Just to put this into perspective, \$313 billion is nearly 47 times my state government's annual budget.

The PFS Facility is not temporary. Once a utility ships its spent fuel to the PFS facility, it can shut down its nuclear power reactors and decommission the power plant. At that point, spent nuclear fuel cannot be returned to the power plant. If a permanent deep geologic storage facility is not completed or lacks sufficient capacity, the spent nuclear fuel cannot be moved to a permanent storage facility. Therefore, even though utilities in the east, midwest, and California may have liability for their spent fuel rods, those spent fuel rods will be sitting here, in Skull Valley, at a de facto permanent storage site. Amending the license or the EIS in the future will not solve the problem. The facility and the problem will be permanent. The Draft EIS ignores that problem.

The list of problems with the Draft EIS as well as the underlying license proposal is long.

- Benefits considered are skewed in favor of utilities and costs to Utah communities are undervalued or ignored altogether.
- There is no analysis of impacts to Salt Lake City or the Wasatch front from the PFS project, including high level nuclear waste transportation.

- Transportation infrastructure costs are ignored.
- Impacts of transportation accidents and the equipment and costs needed to respond are not adequately considered.
- PFS' financial responsibility and liability are not addressed.
- Interstate transportation routes are not specifically identified or evaluated, and hence the impacts to communities along the transportation corridors are not adequately considered.
- The DEIS fails to acknowledge or consider that transportation casks are not designed or tested to withstand transportation accidents and sabotage.
- The DEIS fails to acknowledge or consider that storage casks are not designed for long-term storage.
- Earthquake and seismic evaluations are excluded from the Draft EIS, effectively prohibiting participating agencies from evaluating risks, costs and benefits, and separate and cumulative impacts. This also eliminates the opportunity for public review and comment.
- Existing restrictions in the BLM Resources Management Plan on transport of hazardous wastes are ignored in the Draft EIS.
- Impacts to RS2477 roads have not been evaluated.
- Wildfire danger, including fires sparked by train operations in Skull Valley, has received inadequate evaluation.

I also have a concern about the public process for DEIS review. The two hearings scheduled are too few and too early in the Draft EIS comment period. The State of Utah's request to reschedule the public hearings and extend the comment period was denied by the NRC. However, citizens have attempted to review a copy of the Draft EIS at the NRC official document repository at the University of Utah Marriott Library only to be told that there was no copy on file. The purpose of this public comment period is to inform the public as well as the cooperating agencies. Therefore, I hope the federal agencies will recognize the importance of timely, available information in the NEPA process and reconsider the request.

In the interest of time, I will not address other concerns this evening. The State is continuing its evaluation of the Draft EIS. Additional written comments will be submitted by the deadline for the Draft EIS, and I will be exercising my consistency review of the BLM Resource Management Plan as provided under BLM regulation.

In closing, I will say simply that the Draft EIS is deficient in so many respects that it cannot serve as the basis for the careful analysis and consideration that a project of this magnitude deserves. It cannot be approved. I also urge you to expand the comment period and availability of the Draft EIS to ensure adequate opportunity for public input.

And, as I have said many times, if temporary storage is so safe, then high level nuclear waste can stay where it is.

Thank you.

DEPARTMENT OF ENERGY**Additional Public Hearing for Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV**

AGENCY: Office of Civilian Radioactive Waste Management (OCRWM), Department of Energy (DOE).

ACTION: Notice of additional public hearing.

SUMMARY: On August 13, 1999, the U.S. Department of Energy (DOE) published a Notice of Availability (64 FR 44200) of its Draft Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS-0250-D) and announced a 180-day public comment period ending February 9, 2000. Subsequently, 16 public hearings were announced on September 9, 1999 (64 FR 48996). DOE is now announcing one additional public hearing. To schedule a time to provide oral comments during the hearings, please call 1-800-967-3477. Persons wishing to provide oral comments who have not registered in advance may register at the hearings.

DATES: The additional public hearing will be held on December 2, 1999, from 12:00 noon to 3:00 p.m. and from 6:00 p.m. to 10:00 p.m., in Carson City, Nevada.

ADDRESSES: The additional public hearing will be held at the following location: Carson City, Nevada—Nevada State Legislature, Room 4100, 401 South Carson Street, Carson City, Nevada 89701.

FOR FURTHER INFORMATION CONTACT: Ms. Wendy R. Dixon, EIS Project Manager, M/S 010, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Yucca Mountain Site Characterization Office, P.O. Box 30307, North Las Vegas, NV 89036-0307, Telephone 1-800-967-3477, Facsimile 1-800-967-0739.

SUPPLEMENTARY INFORMATION: Public hearings have been scheduled for the following dates at the following locations:

1. September 27, 1999, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, Amargosa Valley Community Center, 821 East Farm Road, Amargosa Valley, Nevada 89020
2. September 30, 1999, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, Bob Ruud Community Center, 150 North

Highway 160, Pahrump, Nevada 89048

3. October 4, 1999, 10:00 am—1:00 pm, 6:00 pm—10:00 pm, Goldfield Community Center, 403 Crook Street, Goldfield, Nevada 89013
4. October 5, 1999, 10:00 am—1:00 pm, 6:00 pm—10:00 pm, Boise Centre on the Grove, 850 West Front Street, Boise, Idaho 83702
5. October 19, 1999, 10:00 am—1:00 pm, 4:00 pm—8:00 pm, Bristlecone Convention Center, 150 Sixth Street, Ely, Nevada 89301
6. October 21, 1999, 12:00 pm—3:00 pm, 6:00 pm—10:00 pm, Georgia International Convention Center, 1902 Sullivan Road, College Park, Georgia 30337
7. October 26, 1999, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, Hall of States, 444 North Capitol Street, N.W., Washington, DC 20001
8. November 4, 1999, 12:00 pm—3:00 pm, 7:00 pm—10:00 pm, Statham Hall, 138 North Jackson Street, Lone Pine, California 93545
9. November 9, 1999, 12:00 pm—3:00 pm, 6:00 pm—10:00 pm, Caliente Youth Center, U.S. Highway 93 North, Caliente, Nevada 89008
10. November 16, 1999, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, Denver Convention Complex, 700 14th Street, Denver, Colorado 80202
11. December 1, 1999, 12:00 pm—3:00 pm, 6:00 pm—10:00 pm, Lawlor Events Center, 1664 North Virginia Street, Reno, Nevada 89557
12. December 2, 1999, 12:00 pm—3:00 pm, 6:00 pm—10:00 pm, Nevada State Legislature, Room 4100, 401 South Carson Street, Carson City, Nevada 89701
13. December 7, 1999, 11:00 am—2:00 pm, 5:30 pm—9:30 pm, Austin Town Hall, 137 Court Street, Austin, Nevada 89310
14. December 9, 1999, 10:00 am—1:00 pm, 6:00 pm—10:00 pm, Crescent Valley Town Hall, 5045 Tenabo Avenue, Crescent Valley, Nevada 89821
15. January 11, 2000, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, Grant Sawyer State Building, 555 East Washington, Las Vegas, Nevada 89101
16. January 13, 2000, 10:00 am—1:00 pm, 6:00 pm—10:00 pm, Salt Lake City Hilton Inn, 150 West 500 South, Salt Lake City, Utah 84101
17. January 20, 2000, 11:00 am—2:00 pm, 6:00 pm—10:00 pm, America's Center, 701 Convention Plaza, St. Louis, Missouri 63101

Issued in Washington, DC, October 4, 1999.

Lake Barrett,

Acting Director, Office of Civilian Radioactive Waste Management.

[FR Doc. 99-26552 Filed 10-8-99; 8:45 am]

BILLING CODE 6450-01-P.

DEPARTMENT OF ENERGY**Idaho Operations Office; Notice of Availability of Solicitation for Awards of Financial Assistance**

AGENCY: Idaho Operations Office, DOE

ACTION: Notice of availability of solicitation Number DE-PS07-00ID13865—University Reactor Instrumentation (URI) Program.

SUMMARY: The U.S. Department of Energy, Idaho Operations Office, is soliciting applications for awards of financial assistance (i.e., grants) that will support educational institutions in updating their nuclear reactors or related radiation laboratory equipment and instrumentation. The issuance date of Solicitation Number DE-PS07-00ID13865 is October 5, 1999. The solicitation is available in its full text via the Internet at the following URL address: <http://www.id.doe.gov/doeid/PSD/proc-div.html> under "Current Solicitations and Sources Sought". The deadline for receipt of applications is 63 days after the issuance date of the solicitation or by December 8, 1999.

ADDRESSES: Applications should be submitted to: Connie H. Osborne, Procurement Services Division, U.S. Department of Energy, Idaho Operations Office, 850 Energy Drive, Mail Stop 1221, Idaho Falls, Idaho 83401-1563.

FOR FURTHER INFORMATION CONTACT: Connie Osborne, Contract Specialist at osbornchl@id.doe.gov.

SUPPLEMENTARY INFORMATION: The solicitation was issued pursuant to 10 CFR 600.6(b). Eligibility for awards under this University Reactor Instrumentation (URI) Program will be restricted to U.S. colleges and universities having a duly licensed, operating nuclear research or training reactor. The purpose of this program is to upgrade, purchase, or maintain equipment and instrumentation related to the performance, control, or operational capability of the reactor facility. The program will increase the quality and/or efficiency of the operation of the reactor facility and/or will improve or expand the research and training capabilities of the reactor facility.

DEPARTMENT OF ENERGY**Additional Public Hearings for Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV****AGENCY:**

Office of Civilian Radioactive Waste Management, Department of Energy

ACTION:

Notice of Additional Public Hearings

SUMMARY:

On August 13, 1999, the U.S. Department of Energy (DOE) published a Notice of Availability (64 FR 44200) of its *Draft Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250-D) and announced a 180-day public comment period ending February 9, 2000. DOE announced that it would hold 16 public hearings on September 9, 1999 (64 FR 48996). On October 12, 1999 (64 FR 55260), DOE announced one additional hearing, which has been concluded. DOE is now announcing three additional public hearings to be held in Lincoln, Nebraska; Cleveland, Ohio; and Chicago, Illinois on the dates listed below. To schedule a time to provide oral comments during these hearings, please call 1-800-967-3477. Persons wishing to provide oral comments who have not registered in advance may register at the hearings.

DATES:

The three additional public hearings will be held from 11:00 a.m. until 2:00 p.m. and from 6:00 p.m. until 9:00 p.m. on the following dates at the following locations:

- January 24, 2000, in Lincoln, Nebraska;
- January 28, 2000, in Cleveland, Ohio; and
- February 1, 2000, in Chicago, Illinois.

ADDRESSES:

The three additional public hearings will be held at the following locations:

Lincoln, Nebraska

Ramada Inn - Airport
1101 West Bond Street
Lincoln, Nebraska 68521

Cleveland, Ohio

Holiday Inn Lakeside City Center
1111 Lakeside Avenue
Cleveland, Ohio 44114

Chicago, Illinois

Hotel Intercontinental
505 North Michigan Avenue

Chicago, Illinois 60611

FOR FURTHER INFORMATION CONTACT:

Ms. Wendy R. Dixon
EIS Program Manager, M/S 010
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307, North Las Vegas, NV 89036-0307
Telephone 1-800-967-3477, Facsimile 1-800-967-0739.

Issued in Washington, DC, January 6, 2000

Ivan Itkin

Director, Office of Civilian Radioactive Waste Management

[Return to Environmental Impact Statement](#)



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 6, 2000

Mr. Jason Groenwald, Director
Familias Against Incinerator Risk
165 South Main Street, Suite 1
Salt Lake City, UT 84111

Dear Mr. Groenwald:

I am responding to the August 21, 2000, letter from you and your colleagues representing 21 other organizations, to Mr. David Meyer of the U.S. Nuclear Regulatory Commission's (NRC's) Office of Administration, regarding several issues related to the "Draft Environmental Impact Statement (DEIS) for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah," NUREG-1714, dated June 2000.

Your letter requests a 180-day extension to the established 90-day public comment period for the DEIS. In consultation with the U.S. Bureau of Land Management, the U.S. Bureau of Indian Affairs, and the Surface Transportation Board (the three Federal agencies cooperating with NRC in the development of this DEIS), we have determined that such an extension is not warranted. A 90-day public comment period generally is longer than the time period required by three of the four cooperating Federal agencies for noticing a DEIS prepared under our jurisdictions (see, e.g., 10 CFR 51.73). However, we believe that 90 days is a sufficient time period for review and comment on this document. Some comments have already been received, well in advance of the closing date. There has been ample opportunity for public involvement in the DEIS development process. This has been accomplished through the environmental impact statement scoping process and through the existing extensive public comment period. At the several public DEIS scoping meetings in Salt Lake City (1998 and 1999) and Tooele (1999), Utah, the staff discussed its proposed schedule and provided contact information for parties interested in further information or discussions. The scoping meetings were noticed in the Federal Register (63 Fed. Reg. 24197, 64 Fed. Reg. 18491). Nonetheless, it should also be noted that, to the extent practical, comments received after the close of the comment period will be considered.

Your letter also requested additional meetings in Utah to discuss the proposed Private Fuel Storage (PFS) facility. We do not believe that it is appropriate to have these additional meetings at this time. Several of the issues of concern that have been mentioned at the recent meetings which the cooperating agencies held in Utah to elicit oral comments on the DEIS are the subjects of contentions that are part of the adjudicatory proceeding before the Atomic Safety and Licensing Board (ASLB). These include seismicity at the proposed PFS site, and military aircraft use of the Skull Valley air corridor. In addition, there are currently a number of environmental contentions before the ASLB. As you may know, both Ohngo Gaudadeh Devia and the Southern Utah Wilderness Alliance, which are signatories to the letter to Mr. Meyer, are parties to the ASLB proceeding.

J. Groenwald

- 2 -

September 6, 2000

Regarding your request for meetings along transportation routes, it is not appropriate to hold such meetings now because no specific routes have been established. However, members of the public should feel free to contact us with additional comments, questions, and concerns about this subject.

Please contact Mr. Mark Delligatti, Senior Project Manager for the PFS license application review, at 301-415-8518, if you wish any further information regarding NRC staff activities associated with the PFS license application.

Sincerely,



E. William Brach, Director
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket 72-22

cc: Service List

cc's for PFS EIS

Glenn Carpenter, Supervisor
U.S. Bureau of Land Management
Salt Lake District Office
2370 south 2300 West
Salt Lake City, UT 84119

David Allison, Superintendent
U.S. Bureau of Indian Affairs
Unitah and Ouray Agency
P. O. Box 130
Fort Duchesne, UT 84026

Amy Heuslein, Environmental Specialist
U.S. Bureau of Indian Affairs
Phoenix Area Office
P.O. Box 10
Phoenix, AZ 85001

Alice Stephenson, Environmental Specialist
U.S. Bureau of Land Management
Salt Lake District Office
2370 South 2300 West
Salt Lake City, UT 84119

Dale Hanberg, Land Operations Officer
U.S. Bureau of Indian Affairs
Unitah and Ouray Agency
P.O. Box 130
Fort Duchesne, UT 84026

Greg Zimmerman, Project Manager
P.O. Box 2008, 4500 N, MS 6200
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6200

Michael J. Scott, Staff Scientist
Pacific Northwest National Laboratory
P.O. Box 99
MSIN: K8-17
Richland, WA 99352

Paul R. Nickens, Senior Research Scientist
5168 N. Windriver Place
Tucson, AZ 85750

Phillis Johnson Ball, Project Manager
Surface Transportation Board
Section of Environmental Analysis
1925 K Street NW, 5th Floor
Washington, DC 20423

Joro Walker
Land and Water Fund of the Rockies
2056 East 3300 South, Suite 1
Salt Lake City, UT 84109

Asadul Chowdhury, Manager
Mining, Geotechnical and Facility
Engineering
Center for Nuclear Waste Regulatory
Analyses
Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78228-5166

Dr. Dianne R. Nielson, Executive Director
Department of Environmental Quality
State of Utah
168 North 1950 West
P.O. Box 144810
Salt Lake City, Utah 84114-4810

The Honorable Leon D. Bear, Chairman
Skull Valley Band of Goshute Indians
2480 South Main, No. 110
Salt Lake City, UT 84115

John D. Parkyn
Chairman of the Board
Private Fuel Storage, L.L.C.
P.O. Box C4010

SEC. 2815. STUDY AND REPORT ON IMPACTS TO MILITARY READINESS OF
PROPOSED LAND MANAGEMENT CHANGES ON PUBLIC LANDS IN
UTAH.

(a) UTAH NATIONAL DEFENSE LANDS DEFINED.--In this section, the term "Utah national defense lands" means public lands under the jurisdiction of the Bureau of Land Management in the State of Utah LM{124} that are adjacent to or near the Utah Test and Training Range and Dugway Proving Ground or beneath the Military Operating Areas, Restricted Areas, and airspace that make up the Utah Test and Training Range.

EP{1097}BP{1098} (b) READINESS IMPACT STUDY.--The Secretary of Defense shall conduct a study to evaluate the impact upon military training, testing, and operational readiness of any proposed changes in land designation or management of the Utah national defense lands. In conducting the study, the Secretary of Defense shall consider the following:

(1) The present military requirements for and missions conducted at Utah Test and Training Range, as well as projected requirements for the support of aircraft, unmanned aerial vehicles, missiles, munitions, and other military requirements.

(2) The future requirements for force structure and doctrine changes, such as the Expeditionary Aerospace Force concept, that could require the use of the Utah Test and Training Range.

(3) All other pertinent issues, such as overflight requirements, access to electronic tracking and communications sites, ground access to respond to emergency or accident locations, munitions safety buffers, noise requirements, ground safety and encroachment issues.

(c) COOPERATION AND COORDINATION.--The Secretary of Defense EP{1098}BP{1099} shall conduct the study in cooperation with the Secretary of the Air Force and the Secretary of the Army.

(d) EFFECT OF STUDY.--Until the Secretary of Defense submits to Congress a report containing the results of the study, the Secretary of the Interior may not proceed with the amendment of any individual resource management plan for Utah national defense lands, or any statewide environmental impact statement or statewide resource management plan amendment package for such lands, if the statewide environmental impact statement or statewide resource management plan amendment addresses wilderness characteristics or wilderness management issues affecting such lands.



IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF THE SOLICITOR
Washington, D.C. 20240

Honorable James V. Hansen
Chairman, Subcommittee on National Parks and Public Lands
Committee on Resources
House of Representatives
Washington, DC 20515-6207

Dear Chairman Hansen:

The Secretary has asked me to respond to your letter of October 6, 1999, which requested that he "immediately stop any BLM Wilderness Study Area (WSA) planning in the State of Utah" until a study to be conducted by the Secretary of Defense is completed. The basis of this request is section 2815 of the National Defense Authorization Act, which was signed into law on October 5. Subsection 2815(b) directs the Secretary of Defense to conduct a study to evaluate the impact upon military training, testing, and operational readiness of any proposed changes in land management of "the Utah national defense lands." Those lands are defined in subsection 2815(a) to mean:

public lands under the jurisdiction of the Bureau of Land Management in the State of Utah that are adjacent to or near the Utah Test and Training Range and Dugway Proving Ground or beneath the Military Operating Areas, Restricted Areas, and airspace that make up the Utah Test and Training Range.

BLM informs me that this definition encompasses approximately 186,205 acres of public lands in what is known as the West Desert region of Utah, as shown on the enclosed map.

The other relevant subsection, 2815(d), provides that until the Secretary of Defense submits a report to Congress containing the results of the study:

the Secretary of the Interior may not proceed with the amendment of any individual resource management plan for Utah national defense lands, or any statewide environmental impact statement or statewide resource management plan amendment package for such lands, if the statewide environmental impact statement or statewide resource management plan amendment addresses wilderness characteristics or wilderness management issues affecting such lands.

As you know, BLM some time ago initiated a statewide process, including preparation of an environmental impact statement, to consider amendments to several resource management plans that would establish new wilderness study areas. Four of the resource management plans being considered for amendment as part of that process involve "Utah national defense lands" as

defined in section 2815(a). Under the terms of section 2815(d), the Secretary "may not proceed with the amendment of" these plans until the Secretary of Defense's study is completed.

The prohibition on amending "any individual resource management plan for Utah national defense lands" is not limited to plan amendments that have wilderness as their focus. Rather, the Secretary is prohibited, until the Defense Department study is completed, from amending "any individual resource management plan for Utah national defense lands" for any purpose. Planning is, in other words, frozen in its current form pending completion of the study.

Subsection 2815(d) also provides that we may not proceed with "any statewide environmental impact statement or statewide resource management plan amendment for such lands" if that statewide process addresses "wilderness characteristics or wilderness management issues affecting such lands." Because the statewide process BLM has initiated includes "such lands" -- that is, "Utah national defense lands" -- and because it addresses wilderness issues affecting these lands, it will be halted.

As I understand your letter, it goes beyond asking for a halt in any planning effort that involves "Utah national defense lands." Instead, it reads the statute to prohibit the Secretary, until the Secretary of Defense makes his report, from addressing any wilderness issues on any of the millions of acres of public lands anywhere in the entire State of Utah--not just on the 186,205 acres of "Utah national defense lands."

With all due respect, we do not think the text of the statute can be stretched that far. Instead, we read it as not prohibiting Interior from proceeding with a plan amendment and environmental impact statement process on less than a statewide basis, so long as the process does not involve "Utah national defense lands." Specifically, the plain meaning of the prohibition in subsection 2815(d) is that it applies to: (1) plans for "Utah national defense lands," or (2) a statewide planning process "for such lands" if it addresses wilderness issues affecting "such lands." "Such lands" can only mean the "Utah national defense lands," not all public lands under the jurisdiction of the BLM in the State. Therefore, if the planning process that has been underway is modified to eliminate consideration of wilderness amendments to plans for or that affect such lands, in our view it would fully comply with the statute.

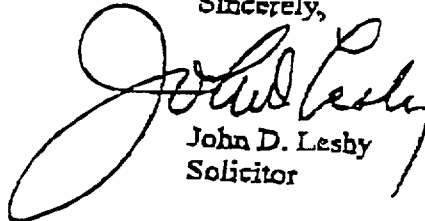
Not only is this interpretation firmly grounded in the text of the statute, but it is also the only one that is in accord with the context. The Defense Department study addresses the possible impact of "proposed changes in land management of the Utah national defense lands" on military training, testing, and operational readiness (emphasis added). One can imagine a policy reason to halt planning for those particular lands while that study proceeds; it is much harder to understand why wilderness planning on all public lands everywhere within Utah borders should stop while that study goes forward. (If the desire were to freeze planning on public lands near the "Utah national defense lands" while the study proceeds, there are many public lands in Nevada and Idaho much closer to the "Utah national defense lands" than other public lands in Utah.)

Accordingly, BLM is going forward with a process to look at wilderness issues in resource management plans in Utah, dropping out of that process (at least until the Secretary of Defense

completes the study) any consideration of amendments addressing "wilderness characteristics or wilderness management issues affecting [Utah national defense] lands."

I appreciate your interest in writing; please feel free to call or write with any further questions.

Sincerely,



John D. Lesby
Solicitor

Enclosure

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

PRIVATE FUEL STORAGE, LLC
(Independent Spent Fuel
Storage Installation)

) Docket No. 72-22-ISFSI
)
) ASLBP No. 97-732-02-ISFSI
)
) July 27, 2000

STATE OF UTAH'S REQUEST FOR ADMISSION OF
LATE-FILED UTAH CONTENTION KK
(Potential Impacts to Military Training and Testing and State Economy)

Pursuant to 10 CFR § 2.714, the State of Utah hereby seeks the admission of late-filed Utah Contention KK which challenges the failure of the draft Environmental Impact Statement¹ ("DEIS") to assess the impacts to military training and testing, overall military readiness and national security, and subsequent impacts to the economy in the State of Utah.

The State meets the late-filed factors and, for the reasons stated below, the State requests the Board to admit Utah Contention KK. This contention is supported by the Declarations of Major General Michael D. Pavich, USAF (Ret.) and John A. Harja, attached hereto as Exhibit 1.

BACKGROUND

The proposed Private Fuel Storage ("PFS") facility and the proposed Low rail spur will be located near the Utah Test and Training Range ("UTTR") and Dugway Proving

¹ NUREG - 1714, *Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah*, June 2000.

Ground ("DPG"). The UTTR includes restricted airspace over Department of Defense and public lands and air space designated as military operating areas ("MOAs"). UTTR Capabilities Guide at 3, excerpts attached hereto as Exhibit 2. The UTTR is the largest overland special use airspace within the continental U.S. *Id.* The UTTR, including the MOAs, is an irreplaceable testing and pilot training area, and its continued availability is critical to the military readiness of the United States. *See* Statement by Utah First District Congressman, Representative James V. Hansen, Limited Appearance Session, Salt Lake City, June 23, 2000, Tr. 13-19, attached hereto as Exhibit 3. Various military organizations conduct military training and weapons testing in the UTTR airspace.

The proposed PFS facility and the proposed Low rail spur will be located under the Sevier B MOA. *See* SAR, rev. 13, at 2.2-8. Activities conducted in the Sevier B MOA include flight ingress and egress to restricted airspace over the UTTR-DPG land mass, weapons testing, and air-to-air combat training.

Contention Utah K – Inadequate Consideration of Credible Accidents – addresses the Applicant's failure to adequately assess the risks from credible accidents including aircraft crashes. Unlike Contention K, Contention KK addresses the adverse impacts from locating a facility storing 40,000 MTU of high level nuclear waste and a rail spur transporting high level nuclear waste on the military's ability to train or test in the Sevier B MOA. Additionally, Contention Utah KK addresses the negative cumulative and socioeconomic impacts on the military's ability to test or train in the Sevier B MOA due to the proposed PFS facility and rail spur. Finally, Contention Utah KK addresses the potential socioeconomic impacts on Utah's economy from the negative cumulative impacts of PFS's

project on military operations. Contention K does not address such impacts under the National Environmental Policy Act ("NEPA"), nor does the DEIS.

CONTENTION KK. Military Training Impacts

The draft Environmental Impact Statement fails to comply with the National Environmental Policy Act and 10 CFR § 51.71(d) because it does not adequately assess the cumulative and socioeconomic impacts from loss of military operations area airspace use, including a reduction in military readiness and national security, and potential socioeconomic impacts to Utah communities that rely on employment and patrons of military agencies that use the Sevier B military operating area.

BASIS:

In an EIS scoping comment, the State raised the issue that the proposed storage and transportation of spent fuel may "impact the vitality and mission of the Utah Test and Training Range, operated by Hill Air Force Base, and such an impact should be considered because Hill Air Force Base is a major part of the State economy." See DEIS, Appendix A, Environmental Impact Statement Scoping Process, Supplemental Scoping Report, Private Fuel Storage Facility, Skull Valley Indian Reservation, Tooele County, Utah, November 1999, at 8. The scope of the EIS, according to the Staff, would include "potential cumulative impacts, if any, of the proposed facility in the context of other existing and proposed facilities and activities in the area" and "the direct and indirect economic effects (both beneficial and adverse) on employment, taxes, residential and commercial development, agriculture, and public services in the area." *Id.* at 12. The clear implication

from the Scoping Report is that the EIS would address the impacts to the vitality and mission of the UTTR, which is a cumulative and socioeconomic impact that the State raised in its supplemental scoping comments. Moreover, Section 3.2 of the Supplemental Scoping Report addresses “Issues Outside the Scope of the EIS,” such as issues relating to conflicts in State-Tribal jurisdiction and U.S. Department of Energy responsibilities and activities, as well as issues relating to health and safety that will be evaluated in the Safety Evaluation Report. *Id.* at 15. Nowhere in Section 3.2 of the Supplemental Scoping Report can the impacts to the vitality and mission of the UTTR and the effect on Utah’s economy be seen to be outside the scope of the draft EIS.

The DEIS, however, fails to address the potential cumulative and socioeconomic impacts of building and operating the PFS storage facility and the Low rail spur under the Sevier B MOA, limiting currently authorized use of Sevier B MOA airspace and any subsequent socioeconomic impacts on the communities that support activities conducted in the Sevier B MOA. *Sæ eg*, DEIS 5-21 to -29. The DEIS makes a brief reference to the facts that the military is a major land owner in Tooele County (DEIS at 3-36), and that the government, including the military, provides more jobs by far than any other employer in Tooele County (DEIS at 3-39). There is not even a reference in the DEIS that the PFS facility or the Low rail spur is under the Sevier B MOA, let alone an analysis of the impacts on the military or Utah’s economy. Accordingly, for the reasons discussed below, the DEIS does not comply with NEPA because it omits an analysis or assessment of the cumulative and socioeconomic impacts that the PFS facility and Low rail spur may have on Hill AFB and Utah's economy.

Various military organizations conduct military training and weapons testing in the UTTR-DPG airspace. The various military missions require use of the range to train combat-ready forces. For example, Hill Air Force Base, Utah ("Hill AFB") was selected as headquarters for one of the ten new "expeditionary" forces for deployment to troubled areas around the world. Economic Report to the Governor, State of Utah Governor's Office of Budget and Planning, January 2000 at 153, excerpts attached hereto as Exhibit 4.

Fighter Wings stationed at Hill AFB use the Sevier B MOA to conduct low and medium altitude entries into restricted airspace over the UTTR-DPG land mass. Sæ letter from Colonel Ronald G. Oholendt to Governor Michael O. Leavitt, May 3, 1999², attached hereto as Exhibit 5. As described below, there is a conflict between the military's use of the area and the proposed PFS facility and the proposed Low rail spur, which will be located under the Sevier B MOA, and which must be addressed in any NEPA analysis of the PFS project.

Activities conducted in the Sevier B MOA include flight ingress and egress to restricted airspace over the UTTR-DPG land mass, weapons testing, and air-to-air combat training. Furthermore, the "UTTR has the largest overland special use airspace . . . within the continental United States." Sæ UTTR Capabilities Guide, Exh. 2 at 3. Without the full use of UTTR, Hill AFB has the potential of becoming just another Air Force base and this may subject it to closure under the Base Closure and Realignment Act. Therefore, the UTTR is important to the vitality of Hill AFB primarily because of the use of UTTR as the

² It should be noted that Colonel Oholendt's letter inadvertently references the storage facility as located under the Sevier A MOA instead of Sevier B MOA.

largest overland active combat-ready training zone in the continental United States. *Sæ* Exh. 2 and Exh. 3.

To simulate combat conditions, Hill AFB aircraft carrying live ammunition must use the Sevier B MOA in Skull Valley in order to make an undetected approach to war targets located on UTTR-DPG. There is no other suitable nearby airspace in which Hill AFB aircraft may perform undetected combat exercises such as low and medium altitude approaches and terrain masking. Exhibit 5 (Oholendt letter). Accordingly, Sevier B MOA is needed for shielding and low level ingress and egress to the range. Even a five nautical mile overflight prohibition above the PFS ISFSI would basically eliminate the use of the Sevier B MOA. *Id.* Thus, the UTTR-DPG airspace, including the MOA, is an irreplaceable testing and pilot training area and its continued availability is critical to the military readiness of the United States. *Sæ* Hansen Statement, Exh. 3 at 1.

Regardless of the outcome of Contention Utah K, it is reasonably foreseeable that, in order to avoid potential liability, the military will be forced to voluntarily restrict or eliminate military training or weapons testing activities currently authorized over the area of the proposed PFS facility. This action would result in a decrease in military readiness and threaten national security.

In addition, restrictions in military training or weapons testing may have subsequent socioeconomic impacts on Utah communities that rely on employment at the UTTR and Hill Air Force Base. "Weakening of the UTTR will cripple the military value of Hill Air Force Base and subject it to possible closure." Hansen Statement, Exh. 3 at 2.

Hill AFB is Utah's largest basic³ employer. Economic Report, Exh. 4 at 153. Currently, Hill Air Force Base employs 11,628 civilians, 4,619 military personnel, 1,112 reservists and 3,718 contractors for a total of 21,077 positions.⁴ The State estimates an additional 12,351 jobs are attributable to the operation of Hill AFB. Additionally, new contracts and other realignments are expected to create 2,700 to 3,000 additional new jobs in the next three years. See Economic Report, Exh. 4, at 153.

Reductions in operations related to UTTR and Hill AFB will result in a variety of negative socioeconomic impacts to Utah. For example, in fiscal year 1993 a total \$578 million in wages were paid to civilian, military personnel, and reservists at Hill AFB. See Realignment Scenarios, Exh. 6, at 11. Additionally, \$196.8 million in goods and services were purchased by Hill AFB in fiscal year 1993. *Id.* The existence and operation of Hill AFB has also led to increases in indirect and induced employment. *Id.*

The State and local communities may also experience a loss in tax revenue (e.g., state income, sales, and property). Socioeconomic impacts related to the PFS proposal may occur beyond the boundaries of Tooele County. Direct and indirect socioeconomic impacts from the loss of Hill Air Force Base will affect the entire state, including Davis, Weber, Morgan,

³ "Economists distinguish between basic and non-basic employment. In general, basic employment associated with economic activities that result in the export of goods or services from the state and therefore generate income from the outside. Non-basic employment serves the internal needs of the residents of the region." Hill Air Force Base and Utah's Defense Sector: An Economic Analysis of Two Realignment Scenarios, State of Utah Governor's Office of Planning and Budget, September 21, 1994 (excerpts attached hereto as Exhibit 6) at 1, n.1.

⁴ July 21, 2000 phone conversation between Robert Spendlove, State of Utah, Office of Budget and Planning, and Hill Air Force Base, Public Affairs Office.

Box Elder, Cache, and Salt Lake Counties. NEPA requires such impacts to be assessed.

LATE FILED FACTORS

The State meets the 10 CFR § 2.714(a) late filed factors for proposing its Contention Utah KK.

Good Cause: The State has good cause for late filing Contention KK. The Federal Register notice for the draft EIS was published June 23, 2000. The State was handed a copy of the draft EIS on or about June 21, 2000 during the evidentiary hearings in Salt Lake City. Because the State was fully occupied with evidentiary hearings and the limited appearance sessions before the Licensing Board from June 19 through June 27, 2000, the State could not reasonably be expected to commence copying and reviewing the DEIS until after June 27. The State has filed this contention within 30 days of June 27, 2000, the end of the evidentiary hearing.

The State became aware of the significance of the potential impacts to the military in May 1999. *Sæ* Oholendt letter, Exh. 5. The State filed supplemental EIS scoping comments on May 27, 1999 informing Staff of those potential impacts. *Sæ* DEIS, Exhibit D, State of Utah supplemental EIS scoping comments. Although the Applicant's Environmental Report does not address the cumulative or socioeconomic impacts from locating the storage facility and rail spur under the Sevier B MOA, based on the November 1999 Supplemental Scoping Report, the State reasonably believed the DEIS would address such cumulative and socioeconomic impacts. Thus, the State has not idly waited until the DEIS was published to make its concerns known to the Staff. The State followed the NEPA process by timely making specific comments on the scope of the EIS. Furthermore, the national significance

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

PRIVATE FUEL STORAGE, LLC
(Independent Spent Fuel
Storage Installation)

Docket No. 72-22-ISFSI

ASLBP No. 97-732-02-ISFSI

July 27, 2000

DECLARATION OF MICHAEL D. PAVICH IN SUPPORT OF
STATE OF UTAH'S REQUEST FOR ADMISSION OF LATE-FILED
BASES FOR UTAH CONTENTION KK

I, Michael D. Pavich, hereby declare under penalty of perjury and pursuant to 28 U.S.C. § 1746, that:

1. I am a Major General USAF (Ret.). I am familiar with the military activities that occur at, over, and from Dugway Proving Grounds ("DPG"), Hill Air Force Base ("HAFB"), Utah Test and Training Range ("UTTR"), and the Sevier B Military Operating Area ("MOA"). I am also knowledgeable about the importance of military training and testing on and over DPG, UTTR, and the Sevier B MOA to the military's operational readiness and national security. I am intimately aware of economic impacts to Utah due to restrictions in military training and testing, including possible base closure of HAFB.

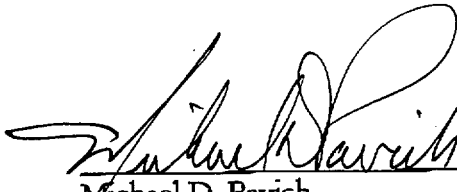
Currently I am the Executive Director, Ogden Local Redevelopment Authority, an organization responsible for the reuse planning and transition of Defense Depot Ogden ("DDO") facilities and property from U.S. Department of Defense ("DoD") to the private sector. Since 1994, I have been the President of Hill/DDO '95 Inc., a non-profit group organized to promote the economic growth and welfare of the Utah Wasatch Front area by supporting the continuing prosperity and development of Hill Air Force Base and Defense Depot Ogden in northern Utah.

My 29 years experience in an assortment of Air Force operations included considerable time working in acquisition and foreign military sales positions including headquarters planning and budgeting, as well as engineering technical and executive management. As Commander of the Sacramento Air Logistics Center, I was responsible for a 12,000 member workforce and a \$3.6 billion annual budget; major areas of emphasis included life cycle support for major aircraft systems, including the stealth fighter (F-117) and advanced tactical fighter (F-22), ground

based radar and communications support for space systems, and associated computer software, and ground communication systems for the Air Force. I held senior staff positions at Headquarters Air Force Logistics Command where I was responsible for planning, budgeting, and customer support of all Air Force weapon systems, and worked to establish a life cycle support structure for space systems for the newly established U.S. Space Command. As Director of Theater Force Analysis for the Center for Air Force Studies and Analysis, I was responsible for studies and analyses to support acquisition strategies for all tactical Air Force systems. Additional information can be found in my resume and biography which describe my qualifications, experience, and training, and are attached hereto.

2. I earned a bachelor of science degree in military science from the U.S. Air Force Academy in 1964, and a master of science degree in aerospace engineering through the Air Force Institute of Technology, Wright-Patterson AFB, Ohio, in 1972. I also completed Squadron Officer School in 1968, Armed Forces Staff College in 1975, National War College in 1979, and the Program for Senior Executives in National and International Security at the John F. Kennedy School of Government, Harvard University, in 1986. I completed pilot training at Williams AFB Arizona in August 1965, and spent ten years flying the RF-4C with assignments in Thailand, Mountain Home, Idaho, and Shaw AFB, South Carolina. I also commanded the 62nd Tactical Reconnaissance Squadron and flew over 100 missions in Vietnam.
3. I am familiar with the circumstances and materials in this case generally, and specifically as they relate to impacts on military training and testing in the UTTR airspace (eg, restricted airspace over DPG and UTTR, and MOAs).
4. I assisted in the preparation of, and have reviewed, the State of Utah's Contention KK. I am prepared to offer testimony as described in the contention. Furthermore, the technical facts presented in Contention KK are true and correct to the best of my knowledge, and the conclusions drawn from those facts are based on my best professional judgment.

DATED this July 27, 2000.

 7/27/00
Michael D. Pavich,
Major General USAF (Ret.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

PRIVATE FUEL STORAGE, LLC
(Independent Spent Fuel
Storage Installation)

)
) Docket No. 72-22-ISFSI
)
) ASLBP No. 97-732-02-ISFSI
)
) July 27, 2000

**DECLARATION OF JOHN A. HARJA IN SUPPORT OF
STATE OF UTAH'S REQUEST FOR ADMISSION OF LATE-FILED
BASES FOR UTAH CONTENTION KK**

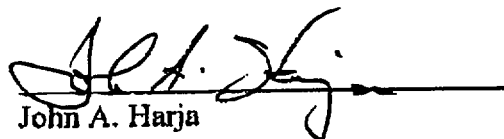
I, John A. Harja, hereby declare under penalty of perjury and pursuant to 28 U.S.C. § 1746, that:

1. I am the Manager of Legal Analysis for the Governor's Office of Planning and Budget. I am familiar with the military activities that occur at, over, and from Dugway Proving Grounds ("DPG"), Hill Air Force Base ("Hill AFB"), Utah Test and Training Range ("UTTR"), and the Sevier B Military Operating Area ("MOA"). I am also knowledgeable about the importance of the military training and testing at DPG, UTTR, and the Sevier B MOA and the importance of those activities to Hill AFB. I am aware of potential economic impacts to Utah that may result from curtailment of Hill AFB's use of UTTR/DPG.

As the Manager of Legal Analysis for the Governor's Office of Planning and Budget for the past 12 years, I review over 400 environmental reports annually for all federal and State projects within the State, and for coordinating comments on such studies from all State agencies. These studies have required discussion of any socioeconomic impacts from the project under review, which include applying NEPA concepts to these projects. I act as advisor to the Governor on federal and State land management issues, as well as conduct policy and legal review of special statewide issues, including school trust lands, wild and scenic rivers, endangered species act, rural roads, etc. Additional information can be found in my resume which describes my qualifications, experience, and training, and is attached hereto.

2. I earned a Juris Doctor degree from the University of Utah College of Law in 1983, a bachelor of science degree in both physics and geophysics in 1980, and a bachelor of science degree in elementary education in 1978.
3. I am familiar with the circumstances and materials in this case generally, and specifically as they relate to potential impacts on Hill AFB due to curtailed use of the UTTR airspace (*e.g.*, restricted airspace over DPG and UTTR, and MOAs).
4. I assisted in the preparation of, and have reviewed, the State of Utah's Contention KK. I am prepared to offer testimony as described in the contention. The technical facts presented in those contentions are true and correct to the best of my knowledge, and the conclusions drawn from those facts are based on my best professional judgment.

DATED this July 27, 2000.


John A. Harja



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 388TH FIGHTER WING (ACC)
HILL AIR FORCE BASE, UTAH

May 3, 1999

Colonel Ronald G. Ohlendt
Vice Commander, 388 Fighter Wing
5887 D. Avenue, Suite 232
Hill Air Force Base, Utah 84056

Honorable Michael O. Leavitt
Governor of Utah
Attn: Major General John Matthews, UTANG, Retired
210 State Capitol
Salt Lake City, Utah 84114

Dear Governor Leavitt

I am writing this letter to explain the potential impacts to United States Air Force operations on the Utah Test and Training Range (UTTR) arising from overflight restrictions associated with the proposed Goshute Nuclear Waste Storage Facility. These comments are similar to those the Air Force anticipates making during the comment period for the Environmental Impact Statement that is being prepared for the storage site.

Any overflight restrictions associated with the proposed Goshute Nuclear Waste Storage Facility could have dire consequences for Air Force training and testing conducted in the UTTR. The proposed storage site is located in the center of the Sevier-A Military Operating Area (MOA) airspace. This particular piece of airspace provides low-level and medium altitude ingress to the South UTTR from Hill AFB. The South UTTR contains the majority of test and training complexes comprised within the range. Access to the South UTTR through the Sevier-A MOA permits flights to proceed to the different range complexes without interrupting ongoing training or testing at other sites. Overflight prohibition, even if limited to a 5 nautical mile radius, would for all practical purposes eliminate use of the MOA. Failure to preserve the Sevier MOA would result in a decrease in military readiness. This decrease would be caused by elimination of low-altitude entries to the South UTTR from Hill AFB, and loss of training for medium altitude missions that would have to fly further distances around the restriction while still avoiding conflicts with ongoing activity at other South UTTR sites.

To illustrate the current use of the MOA, the following information is provided:

Published hours of operations	1200Z to 0300Z, Monday-Saturday, other times by NOTAM
-------------------------------	---

Global Power for America

Published Altitudes	100 feet above ground level to 14,500 feet mean sea level
Days used in FY98	325 days
Military sorties using airspace in FY98	3,871 sorties
Hours of use in FY98 by military	4,562 hours
Hours released to public use	4,175 hours

It should be noted that less than 500 sorties annually carry live munitions through the MOA. However, on any sortie an aircraft emergency, such as an engine problem, could result in the pilot having to jettison aircraft external stores to include fuel tanks and live ordnance if carried. Though a rare occurrence, stores jettison is a possibility that must be considered when addressing nuclear waste storage safety.

Numerous other test and training activities occur in close proximity to the proposed site. They could affect safe storage of nuclear waste. These activities include test and training sorties, cruise missile testing, special weapons testing, major exercises and aircraft/missile mishaps that occur in the restricted airspace adjacent to the Sevier-A MOA. Though an unintentional consequence, any emergency or malfunction during these activities could result in a ground impact of an aircraft or munitions in close proximity to the proposed storage site. However, weapons launch envelopes and impact area locations are closely sited with restrictions to reduce risk of such a mishap. Additionally, test ordnance is equipped with flight termination systems to reduce the possibility of hardware impacting beyond the range boundary. Since 1988, there have been 10 F-16 mishaps and 20 missile mishaps on the UTTR.

Again, any overflight restrictions associated with the proposed Goshute Nuclear Waste Storage Facility would result in a decrease of military readiness. Further, location of a nuclear waste storage site underneath a MOA and in close proximity to extensive military test and training activities pose significant safety considerations.

Please contact me at COMM 1-(801)-777-3881 if you have any further questions.

Sincerely



RONALD G. OHLENDT

Colonel, USAF

Vice Commander

30 November 1998

MEMORANDUM FOR AIR FORCE REPRESENTATIVE (ANM-900)
FAA Northwest Mountain Region
1601 Lind Avenue, S.W.
Renton WA 98055-4056

FROM: 388 RANSAM
6067 Boxelder Lane
Hill AFB UT 84056-5811

SUBJECT: Annual Military Operating Area Usage Report

1. Sevier B Military Operating Area
2. Period of Report: 1 October 1997 through 30 September 1998
3. Published Hours of Operation: 1200 ZULU to 0300 ZULU, Mon-Sat. other times by NOTAM
4. Published Altitude: 100 feet AGL to 9,500 feet MSL.
5. Activities

a. Aircraft Operations

- (1) Aircraft Type: F15, F16, F111, F4, B52, B1, A10, KC135, EC135, RC135, C130, C141, A4, F18, F117A, A6, A4, H1, C117, and B2
- (2) Maximum Altitude/Flight Level: 9,500 feet MSL
- (3) Activities Conducted: Air-to-air training LOWAT training, cruise missile testing, major exercises.
- (4) Supersonic operations are not authorized.

b. Artillery Mortar Missile

- (1) Type: Cruise missile, advanced cruise missile, unmanned vehicles
- (2) Purpose/Mission: Test, evaluation, and training.

6. Area Coverage Available:

- a. Communications (Frequencies Available): 118.45, 121.5, 122.9, 134.1, 138.05, 139.6, 142.3, 225.3, 226.0, 229.2, 233.4, 238.9, 243.0, 254.4, 266.3, 271.1, 271.35, 275.9, 279.9, 282.7, 286.25, 287.0, 295.8, 297.1, 298.0, 298.6, 301.7, 308.65, 311.3, 315.9, 319.6, 324.7, 325.7, 325.9, 327.6, 339.0, 344.9, 349.3, 351.0, 354.4, 359.2, 361.4, 375.9, 381.3, 383.0, 383.2, 384.7, 388.1, 389.8, 398.1.

tel

COPY

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, OGDEN AIR LOGISTICS BASE (AFMC)
HILL AIR FORCE BASE, UTAH

23 Aug 99

Captain Mary A. Enges-Maas
Office of the Staff Judge Advocate
6026 Cedar Lane, Building 1278
Hill Air Force Base, Utah 84056-5812

Ms. Connie S. Nakahara
State of Utah Department of Environmental Quality
168 North 1950 West
Salt Lake City, UT 84116

Dear Ms Nakahara

Please find attached responses to your requests for information regarding flight activities at the Utah Test and Training Range. This should answer questions posed in letters dated July 1 and July 9, 1999, except for the probability questions you asked on pages 2 and 3 of your July 1 letter. As has been indicated to me, that information is not able to be deduced to any level of satisfaction.

If you have questions that I have not addressed from earlier correspondence, or if this new information provokes additional queries, please contact me as soon as possible. I will try to respond as quickly as I can.

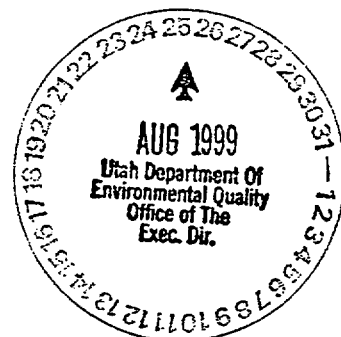
Sincerely



MARY A. ENGES-MAAS, Capt, USAF
Deputy Chief, Environmental Law
Office of the Staff Judge Advocate

Attachments

1. Answers 1-8 to queries
2. 18 pages of mishap information



1. Question 1 (July 9, 1999 letter):

"In the November 30, 1998 "Memorandum for Air Force Representative" concerning the Annual Military Operating Area Usage Report for Sevier B Military Operating Area, (t)he document indicates activities allowed in the Sevier B MOA include air-to-air LOWAT training, major exercises, cruise missile, and advanced cruise missile activities. Please provide a description of those activities, i.e., altitude, location, and whether ingress to the UTTR is the only use for the MOA. Also, what frequency do these activities occur in the Sevier B MOA?"

Cruise missile and advanced cruise missile activities do occur in the Sevier B MOA, according to Mr. James Bishop, cruise missile program manager, Hill AFB and UTTR. In fact, cruise missile exercises are flown in the Sevier A, B, C and D portions of the MOA.

Ingress to the UTTR is not the only use for the MOA. In fact, the cruise missile flights occur within the range, which obviates the need to ingress within it. The altitude and location varies, as the test flights are usually about five hours long and run several patterns through the airspace allowed. In every case, that airspace is "sanitized," in other words, all other flights are forbidden to enter the space that has been blocked. The missile flies within the range airspace boundaries (including Military Operating Areas) for approximately two to five hours. During this time, a terrain following profile might take the CM to 300 to 500 feet above ground level (AGL) in the MOAs and to 100 feet AGL in the restricted airspaces (RAs). After flight operations on the range, it will fly to its target, and simulate the detonation of its warhead.

2. Question 3 (July 1, 1999 letter):

"FOIA Response 1, Attachment 7 and 8, identify an "Air Launched Cruise Missile Incident and "missile crashes." Please verify that all the crashes occurred within Department of Defense (i.e., UTTR or Dugway) boundaries. Also, please provide the cause of the crashes."

All cruise missile incidents or mishaps have not occurred within Department of Defense boundaries. The most recent incident of June 1999, occurred in the southern part of Sevier B area in the Military Operating Area (MOA) on Bureau of Land Management property and required liaison with BLM officials as to clean-up, etc.

Since 1983, 19 Air Launched and Advanced Cruise Missiles have crashed, 17 in the restricted area and at least two in the Military Operating Area (MOA). The latter two both crashed in the Southern part of the South Range, one in the Sevier Lake region of Sevier B, the other in Sevier A.

In addition to the 19 crashes, two other Conventional Air Launched Cruise Missiles have crashed. No other information is available on those mishaps.

All the above were considered "uncontrolled crashes," in other words, they crashed before they could achieve their programmed target. The causes cannot be

divulged due to security reasons. However, the usual cause of the crashes has been a missile anomaly. Contrary to what might have been indicated in an earlier response, the U.S. Air Force has had to self-destruct a missile using the remote control flight termination system (RCFTS). Two CMs were terminated using the flight termination system in addition to the 21 mishaps above.

The CMs tested at the UTTR are the AGM-86B Air Launched CM (ALCM), AGM-86C Conventional Air Launched CM (CALCM), and AGM-129 Advanced CM (ACM). Though the CALCM is tested with a live warhead, the missiles being tested at the UTTR carry no nuclear devices.

The missile is normally launched over DoD lands, west of Granite Mountain, and impacts at the Parkersville target complex, about five miles northwest of Wig Mountain. Other CMs with inert warheads may impact at the Sand Island target complex

3. Question 5 (July 1, 1999 letter):

"Records of the type of aircraft, number of sorties per type of aircraft, and flying hours per type of aircraft for the UTTR South for fiscal year 96. (Similar to the FOIA Response 1, attachments 1 and 3.) We would like to compare three years of data."

Total sorties flown on the Utah Test and Training Range (UTTR) for FY 96 were 9,518.

Type	Sorties Flown
B-1	821
B-52	354
A-6	24
AV-8	131
A-10	8
F-14	100
F-15	665
F-16	6,139
F-18	217
F-111	27
	<hr/> 8,486
Support aircraft	1,032
	<hr/>
FY 96 Total	9,518

4. Questions 1(a)-(g) (July 1, 1999 letter):

a. *"Will aircraft that ingress into the UTTR South range always use IR-420?"*

No. Aircraft can enter the South UTTR from other than the IR-420 route.

b. *"At what altitude will aircraft fly while using route IR-420?"*

IR-420 altitudes are 7500' MSL to 8000' MSL from point A to point C, and 100' AGL to 8000' MSL from point C to point D. Hill AFB aircraft will fly no lower than 500' AGL due to training restrictions.

c. *"What route(s) will be used for medium or high altitude missions?"*

A ground track that approximates the IR-420 route structure is used for aircraft flying higher than the 8000' MSL cap of IR-420. Aircraft will fly south through the Sevier Military Operating Areas to a point south of the restricted area of the UTTR. Aircraft may turn west and enter the range complex at any point, assuming they are scheduled for the appropriate sector of the UTTR, and are cleared to do so by Clover control. Medium and high altitude missions not turning south through the Sevier MOA will continue on a westerly heading just north of Interstate 80 until cleared south into the range by Clover control. Those flights will typically be between 9000' MSL and 14,000' MSL enroute to the south UTTR.

d. *"What are the restrictions for IR-420, if any?"*

IR-420 will not be flown unless scheduled in conjunction with the appropriate Sevier MOA by aircraft departing Hill AFB on the DV-420 departure. IR-420 route width is 2 NM either side of centerline from A to C; 5 NM either side of centerline from C to D.

e. *"At what point do aircraft actually ingress into the South range? Do the aircraft ingress the South range from the south through Dugway Proving Ground? Or can aircraft enter directly from Skull Valley?"*

Reference question 1(c). Aircraft can enter the South range from any point in the Sevier MOAs as long as they are scheduled for the sector and are cleared by Clover.

f. *"Why does IR-420 end at N4033.0, W11248.0? After that point, what path will aircraft follow?"*

IR-420 ends at the northern border of Sevier B MOA. After the end of IR-420, aircraft typically fly south through the MOA as described above. Aircraft operating in the northern portion of Sevier B adhere to a 1000' AGL minimum altitude until they are south of N4013.0 latitude.

g. *"Do aircraft fly single file, or in some type of formation?"*

Aircraft will do both, depending on the type of mission to be flown. Aircraft may be within one to two miles of each other, or may be separated by up to 15 miles, depending on time of day and mission requirements.

Question 2 (July 1, 1999 letter):

"FOIA Response 1, Attachment 7, identifies the F-16 aircraft from HAFB that have crashed on or near the UTTR. For the last ten years, please provide data on all F-16 mishaps from HAFB and all aircraft mishaps from any base if the mishap occurred on or near the UTTR. In addition, if available, please indicate the cause, distance from first sign of distress to actual crash, and the distance of a crash off of the UTTR from the border of the UTTR."

Please find the response, incorporated on the first page of an 18-page attachment, enclosed with this letter.

5. Question 4 (July 1, 1999 letter):

"Describe procedures for practicing "terrain masking" while aircraft are enroute to the South range. What are the risks of terrain masking in comparison to cruising?"

Terrain masking involves flying in the low altitude structure to take advantage of available terrain to hide from enemy detection. Putting a mountain between your aircraft and a threat radar can greatly hamper enemy acquisition of your formation and delay enemy response. Aircraft terrain masking will typically fly between 500' AGL to 1500' AGL, keeping the available terrain between them and the threat. Terrain masking altitudes may be higher, especially with the very high mountains in northern Utah. Risks are only marginally higher than cruising, as terrain masking is a task fliers train to and practice every day.

6. Question 7 (July 1, 1999 letter):

"What types of maneuvering occur in the Sevier B MOA? How do the risks of maneuvering an aircraft in the MOA compare to tactical or threat maneuvering?"

Normally, maneuvering in the Sevier MOAs is limited to low-level navigation; however, tactical and threat maneuvering can also occur there. The Seviars are Military Operating Areas, and, as such, are available for full tactical and threat maneuvering (including Air Combat Training, Air-to-Ground gunnery practice and LANTIRN operations) within the altitude constraints of the MOA.

7. Question 8 (July 1, 1999 letter):

"What are the procedures in the event of an F-16 engine problem?"

First response for any engine problem is to trade any excess airspeed for altitude in order to have more time to evaluate the problem. This altitude gain may require jettison of stores, including empty or filled fuel tanks and practice or live bombs and/or missiles. Following the altitude gain, the aircraft will be pointed to the nearest field suitable for landing, in case the engine quits. In the Sevier MOAs and most of the South UTTR, the primary emergency landing base is Michaels Army Air Field at Dugway Proving Grounds. Aircraft in the extreme northwest portion of the South UTTR can use Wendover Airport. If Hill AFB or Salt Lake City International Airport is closer, aircraft will attempt to land there. If the engine does quit, pilots are taught to attempt to steer the aircraft toward unpopulated areas prior to ejecting.

8. Question 9 (July 1, 1999 letter):

"What are the crash rates for each type of aircraft that utilize the UTTR? Are the crash rates standard for the military in determining risks?"

Please find the response, incorporated in an 18-page attachment, enclosed with this letter.

Hill AFB F-16 Mishaps Utah Test & Training Range

DATE	LOCATION	CAUSE	ORGANIZATION
September 13, 1988	Near Great Salt Lake	Lightning Strike	388th TFW
March 22, 1990	UTTR	Mid-Air Collision	419th TFW
November 14, 1991	Near UTTR	Impact w/ mtn. ridge	419th TFW
January 14, 1992	Near UTTR	Weather	388th FW
October 25, 1994	Wendover, Utah	Faulty turbine seal	388th FW
November 30, 1995	UTTR (Fish Springs)	Pilot error	388th FW
February 7, 1997	UTTR	Engine failure	419th FW
January 7, 1998	UTTR	Mid-air collision	388th FW
January 8, 1998	UTTR	Engine failure	388th FW
November 9, 1998	UTTR	Unavailable	388th FW

Air-Launched Cruise Missile Incident

December 10, 1997	UTTR	Communications malfunction	388th FW
-------------------	------	-------------------------------	----------

C-130 History

C-130... Statistics

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY55	1	2173.91	0	0.00	0	0.00	0	0	46	46
CY56	1	186.22	0	0.00	0	0.00	0	0	537	583
CY57	0	0.00	0	0.00	0	0.00	0	0	22,633	23,216
CY58	4	5.04	1	1.26	1	1.26	2	6	79,290	102,506
CY59	4	3.98	1	1.00	1	1.00	1	10	100,457	202,963
CY60	1	0.82	0	0.00	0	0.00	0	0	121,844	324,807
CY61	4	2.79	0	0.00	1	0.70	0	0	143,363	468,170
CY62	6	3.42	6	3.42	3	1.71	8	33	175,479	643,649
CY63	2	0.79	3	1.18	1	0.39	0	0	254,331	897,980
CY64	4	0.94	3	0.71	1	0.24	0	1	424,034	1,322,014
CY65	9	1.62	6	1.08	5	0.90	9	25	554,079	1,876,093
CY66	16	2.20	11	1.51	6	0.83	8	23	727,191	2,603,284
CY67	13	1.98	12	1.83	9	1.37	5	78	656,986	3,260,270
CY68	11	1.85	6	1.01	6	1.01	0	8	593,976	3,854,246
CY69	8	1.49	7	1.30	4	0.74	9	35	537,126	4,391,372
CY70	3	0.60	4	0.79	3	0.60	8	60	504,113	4,895,485
CY71	2	0.41	5	1.03	1	0.21	3	10	487,137	5,382,622
CY72	7	1.46	4	0.83	5	1.04	12	29	480,989	5,863,611
CY73	1	0.25	4	1.00	1	0.25	3	7	399,605	6,263,216
CY74	5	1.39	3	0.83	3	0.83	4	12	360,549	6,623,765
CY75	3	0.82	1	0.27	2	0.55	3	8	365,181	6,988,946
CY76	0	0.00	1	0.30	0	0.00	0	0	336,592	7,325,538
CY77	1	0.30	12	3.59	0	0.00	0	1	334,524	7,660,062
CY78	7	2.01	37	10.63	5	1.44	11	29	348,168	8,008,230
CY79	0	0.00	1	0.28	0	0.00	0	0	360,806	8,369,036
CY80	2	0.56	0	0.00	2	0.56	4	22	354,589	8,723,625
CY81	4	1.09	2	0.54	3	0.81	4	39	368,433	9,092,058
CY82	2	0.53	1	0.27	2	0.53	8	34	376,261	9,468,319
CY83	1	0.27	1	0.27	1	0.27	2	6	376,939	9,845,258
CY84	3	0.80	1	0.27	1	0.27	3	18	374,577	10,219,835
CY85	3	0.79	2	0.52	3	0.79	5	27	381,929	10,601,764
CY86	2	0.54	0	0.00	2	0.54	3	14	367,186	10,968,950
TY87	1	0.36	3	1.09	1	0.36	1	5	274,706	11,243,656
FY88	2	0.58	0	0.00	1	0.29	2	6	344,160	11,587,816
FY89	1	0.29	0	0.00	1	0.29	0	1	339,149	11,926,965
FY90	0	0.00	0	0.00	0	0.00	0	0	325,201	12,252,166
FY91	0	0.00	0	0.00	0	0.00	0	0	401,615	12,653,781
FY92	2	0.63	0	0.00	2	0.63	8	24	315,952	12,969,733
FY93	1	0.33	0	0.00	1	0.33	2	6	300,157	13,269,890
FY94	1	0.36	1	0.36	1	0.36	0	8	279,923	13,549,813
FY95	1	0.35	1	0.35	1	0.35	2	6	282,864	13,832,677
FY96	1	0.34	1	0.34	1	0.34	2	9	294,075	14,126,752
FY97	2	0.70	1	0.36	2	0.73	2	13	275,756	14,402,508
FY98	0	0.00	0	0.00	0	0.00	0	0	280,159	14,682,667
LIFETIME	142	0.97	142	0.97	83	0.57	134	613	14,682,667	
5 YR AVG	1.0	0.35	0.8	0.28	1.0	0.35	1.2	7.2	282,555.4	
10 YR AVG	0.9	0.29	0.4	0.13	0.9	0.29	1.6	6.7	309,485.1	

C-12 History

YEAR	#	CLASS A RATE	#	CLASS B RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY75	0	0.00	0	0.00	0	0.00	0	0	435	435
CY76	0	0.00	0	0.00	0	0.00	0	0	3,146	3,581
CY77	0	0.00	0	0.00	0	0.00	0	0	7,017	10,598
CY78	0	0.00	0	0.00	0	0.00	0	0	6,651	17,249
CY79	1	23.36	1	23.36	1	23.36	2	5	4,280	21,529
CY80	0	0.00	0	0.00	0	0.00	0	0	4,484	26,013
CY81	0	0.00	0	0.00	0	0.00	0	0	5,978	31,991
CY82	0	0.00	0	0.00	0	0.00	0	0	6,094	38,085
CY83	0	0.00	0	0.00	0	0.00	0	0	3,665	41,750
CY84	1	11.05	0	0.00	0	0.00	0	1	9,046	50,796
CY85	0	0.00	0	0.00	0	0.00	0	0	29,222	80,018
CY86	0	0.00	0	0.00	0	0.00	0	0	33,674	113,692
TY87	0	0.00	0	0.00	0	0.00	0	0	25,413	139,105
FY88	0	0.00	0	0.00	0	0.00	0	0	33,018	172,123
FY89	0	0.00	0	0.00	0	0.00	0	0	37,707	209,830
FY90	0	0.00	0	0.00	0	0.00	0	0	34,928	244,758
FY91	0	0.00	0	0.00	0	0.00	0	0	34,944	279,702
FY92	0	0.00	0	0.00	0	0.00	0	0	28,893	308,595
FY93	0	0.00	0	0.00	0	0.00	0	0	27,099	335,694
FY94	0	0.00	0	0.00	0	0.00	0	0	16,500	352,194
FY95	0	0.00	0	0.00	0	0.00	0	0	21,461	373,655
FY96	0	0.00	0	0.00	0	0.00	0	0	4,740	378,395
FY97	0	0.00	0	0.00	0	0.00	0	0	4,728	383,123
FY98	0	0.00	0	0.00	0	0.00	0	0	5,641	388,764
LIFETIME	2	0.51	1	0.26	1	0.26	2	6	388,764	
5 YR AVG	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.0	10,614.0	
10 YR AVG	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.0	21,664.1	

C-17 History

YEAR	#	CLASS A RATE	#	CLASS B RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
FY91	0	0.00	0	0.00	0	0.00	0	0	8	8
FY92	0	0.00	0	0.00	0	0.00	0	0	539	547
FY93	0	0.00	0	0.00	0	0.00	0	0	1,252	1,799
FY94	0	0.00	0	0.00	0	0.00	0	0	4,454	6,253
FY95	0	0.00	0	0.00	0	0.00	0	0	12,968	19,221
FY96	1	4.75	1	4.75	0	0.00	0	0	21,050	40,271
FY97	1	3.78	1	3.78	0	0.00	0	0	26,486	66,757
FY98	1	2.40	0	0.00	0	0.00	0	0	41,695	108,452
LIFETIME	3	2.77	2	1.84	0	0.00	0	0	108,452	
5 YR AVG	0.6	2.81	0.4	1.88	0.0	0.00	0.0	0.0	21,330.6	

C-12 & C-17... Statistics

C-141 History

C-141... Statistics

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HF
CY64	0	0.00	0	0.00	0	0.00	0	0	2,469	2,469
CY65	0	0.00	0	0.00	0	0.00	0	0	35,316	37,785
CY66	1	0.53	0	0.00	0	0.00	0	0	189,246	227,031
CY67	4	0.87	1	0.22	2	0.43	3	12	461,704	688,735
CY68	0	0.00	4	0.59	0	0.00	0	0	672,627	1,361,362
CY69	0	0.00	1	0.16	0	0.00	0	0	642,291	2,003,653
CY70	1	0.16	2	0.33	0	0.00	0	0	612,518	2,616,171
CY71	1	0.20	0	0.00	0	0.00	0	0	487,929	3,104,100
CY72	0	0.00	2	0.42	0	0.00	0	0	471,440	3,575,540
CY73	2	0.55	0	0.00	1	0.28	3	24	362,532	3,938,072
CY74	2	0.70	0	0.00	1	0.35	3	7	286,377	4,224,449
CY75	4	1.27	0	0.00	1	0.32	3	16	314,771	4,539,220
CY76	3	1.07	2	0.71	2	0.71	7	41	281,622	4,820,842
CY77	2	0.67	5	1.67	0	0.00	0	0	299,191	5,120,033
CY78	1	0.35	4	1.42	0	0.00	0	0	282,594	5,402,627
CY79	3	1.03	4	1.37	1	0.34	0	0	291,223	5,693,850
CY80	1	0.36	0	0.00	1	0.36	2	13	281,411	5,975,261
CY81	1	0.34	1	0.34	0	0.00	0	0	290,389	6,265,650
CY82	1	0.35	0	0.00	1	0.35	2	9	284,675	6,550,325
CY83	0	0.00	2	0.68	0	0.00	0	0	294,531	6,844,856
CY84	1	0.35	0	0.00	1	0.35	3	9	286,443	7,131,299
CY85	0	0.00	0	0.00	0	0.00	0	0	293,380	7,424,679
CY86	1	0.35	0	0.00	0	0.00	0	0	288,339	7,713,018
TY87	1	0.45	0	0.00	0	0.00	0	0	220,161	7,933,179
FY88	0	0.00	0	0.00	0	0.00	0	0	264,201	8,197,380
FY89	1	0.36	0	0.00	1	0.36	2	8	276,770	8,474,150
FY90	0	0.00	0	0.00	0	0.00	0	0	304,106	8,778,256
FY91	0	0.00	0	0.00	0	0.00	0	0	442,406	9,220,662
FY92	0	0.00	0	0.00	0	0.00	0	0	226,312	9,446,974
FY93	1	0.49	0	0.00	2	0.98	4	13	203,264	9,650,238
FY94	0	0.00	0	0.00	1	0.78	0	0	127,938	9,778,176
FY95	0	0.00	0	0.00	0	0.00	0	0	157,059	9,935,235
FY96	0	0.00	0	0.00	0	0.00	0	0	146,417	10,081,652
FY97	1	0.83	1	0.83	1	0.83	2	9	121,043	10,202,695
FY98	1	0.97	0	0.00	0	0.00	0	0	102,627	10,305,322
LIFETIME	34	0.33	29	0.28	16	0.16	34	161	10,305,322	
5 YR AVG	0.4	0.31	0.2	0.15	0.4	0.31	0.4	1.8	131,016.8	
10 YR AVG	0.3	0.13	0.1	0.04	0.5	0.22	0.8	3.0	226,951.6	

C-135 History

C-135... Statistics

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY57	0	0.00	0	0.00	0	0.00	0	0	4,497	4,497
CY58	3	6.94	2	4.63	2	4.63	7	20	43,204	47,701
CY59	3	2.53	1	0.84	2	1.69	4	8	118,426	166,127
CY60	3	1.94	2	1.29	5	3.23	3	9	154,579	320,706
CY61	2	0.99	0	0.00	0	0.00	0	0	201,263	521,969
CY62	5	1.78	5	1.78	5	1.78	13	60	280,695	802,664
CY63	3	0.89	0	0.00	4	1.19	7	21	336,771	1,139,435
CY64	1	0.26	2	0.52	2	0.52	2	83	385,681	1,525,116
CY65	4	1.00	0	0.00	5	1.25	11	126	400,572	1,925,688
CY66	2	0.44	1	0.22	3	0.67	6	21	449,445	2,375,133
CY67	2	0.48	3	0.71	2	0.48	4	10	419,651	2,794,784
CY68	6	1.19	2	0.40	5	1.00	15	43	502,467	3,297,251
CY69	5	1.16	3	0.69	4	0.93	4	23	431,849	3,729,100
CY70	1	0.27	1	0.27	0	0.00	0	0	376,930	4,106,030
CY71	2	0.54	1	0.27	2	0.54	7	29	372,410	4,478,440
CY72	4	0.91	3	0.68	1	0.23	3	5	438,029	4,916,469
CY73	4	1.21	1	0.30	1	0.30	2	3	329,410	5,245,879
CY74	2	0.67	2	0.67	1	0.34	1	2	296,320	5,542,199
CY75	1	0.38	3	1.13	1	0.38	2	4	266,522	5,808,721
CY76	2	0.77	0	0.00	2	0.77	11	22	259,785	6,068,506
CY77	2	0.76	33	12.58	2	0.76	2	20	262,304	6,330,810
CY78	0	0.00	34	12.51	0	0.00	0	0	271,819	6,602,629
CY79	3	1.11	6	2.23	1	0.37	3	5	269,432	6,872,061
CY80	1	0.39	2	0.78	0	0.00	0	0	256,761	7,128,822
CY81	3	1.16	2	0.77	2	0.77	3	27	259,602	7,388,424
CY82	2	0.77	0	0.00	2	0.77	6	33	260,007	7,648,431
CY83	0	0.00	0	0.00	0	0.00	0	0	258,777	7,907,208
CY84	0	0.00	3	1.15	0	0.00	0	0	261,112	8,168,320
CY85	2	0.77	0	0.00	2	0.77	5	10	260,908	8,429,228
CY86	1	0.39	0	0.00	1	0.39	2	4	256,743	8,685,971
TY87	2	1.02	0	0.00	2	1.02	3	7	196,423	8,882,394
FY88	0	0.00	1	0.39	0	0.00	0	0	254,973	9,137,367
FY89	3	1.14	1	0.38	2	0.76	4	26	263,910	9,401,277
FY90	1	0.37	0	0.00	1	0.37	2	4	270,624	9,671,901
FY91	1	0.34	0	0.00	0	0.00	0	0	298,070	9,969,971
FY92	1	0.39	0	0.00	1	0.39	0	0	255,073	10,225,044
FY93	0	0.00	1	0.41	0	0.00	0	0	245,711	10,470,755
FY94	0	0.00	0	0.00	0	0.00	0	0	219,206	10,689,961
FY95	0	0.00	1	0.45	0	0.00	0	0	219,880	10,909,841
FY96	0	0.00	1	0.46	0	0.00	0	0	215,105	11,124,946
FY97	0	0.00	3	1.41	0	0.00	0	0	212,070	11,337,016
FY98	1	0.48	0	0.00	0	0.00	0	0	208,958	11,545,974
LIFETIME 78		0.68	120	1.04	63	0.55	132	625	11,545,974	
5 YR AVG	0.2	0.09	1.0	0.47	0.0	0.00	0.0	0.0	215,043.8	
10 YR AVG	0.7	0.29	0.7	0.29	0.4	0.17	0.6	3.0	240,860.7	

C-5 History

C-5... Statistics

YEAR	CLASS A # RATE	CLASS B # RATE	DESTROYED A/C RATE	FATAL PILOT ALL	HOURS	CUM HI
CY68	0 0.00	0 0.00	0 0.00	0 0	24	
CY69	0 0.00	0 0.00	0 0.00	0 0	472	49
CY70	2 20.66	0 0.00	1 10.33	0 0	9,680	10,172
CY71	1 4.05	0 0.00	0 0.00	0 0	24,699	34,871
CY72	0 0.00	1 2.14	0 0.00	0 0	46,735	81,606
CY73	0 0.00	0 0.00	0 0.00	0 0	49,656	131,262
CY74	2 3.98	3 5.97	1 1.99	0 0	50,263	181,525
CY75	1 2.19	0 0.00	1 2.19	2 155	45,601	227,126
CY76	1 2.44	0 0.00	0 0.00	0 0	40,946	268,072
CY77	0 0.00	3 6.09	0 0.00	0 0	49,289	317,361
CY78	1 2.02	5 10.09	0 0.00	0 0	49,543	366,904
CY79	0 0.00	2 4.04	0 0.00	0 0	49,477	416,381
CY80	1 1.94	3 5.81	0 0.00	0 0	51,594	467,975
CY81	0 0.00	1 1.85	0 0.00	0 0	53,969	521,944
CY82	1 1.95	2 3.89	0 0.00	0 0	51,374	573,318
CY83	2 3.59	2 3.59	0 0.00	0 0	55,681	629,000
CY84	0 0.00	3 5.06	0 0.00	0 0	59,260	688,260
CY85	0 0.00	1 1.67	0 0.00	0 0	59,967	748,227
CY86	1 1.65	0 0.00	0 0.00	0 0	60,516	808,743
TY87	0 0.00	1 1.68	0 0.00	0 0	59,544	868,287
FY88	0 0.00	0 0.00	0 0.00	0 0	56,958	925,245
FY89	1 1.55	0 0.00	0 0.00	0 0	64,346	989,591
FY90	1 1.13	0 0.00	1 1.13	3 13	88,390	1,077,981
FY91	0 0.00	1 0.60	0 0.00	0 0	166,676	1,244,657
FY92	0 0.00	1 1.51	0 0.00	0 0	66,324	1,310,981
FY93	0 0.00	2 2.55	0 0.00	0 0	78,319	1,389,300
FY94	0 0.00	4 5.49	0 0.00	0 0	72,899	1,462,200
FY95	0 0.00	1 1.55	0 0.00	0 0	64,608	1,526,808
FY96	0 0.00	0 0.00	0 0.00	0 0	67,499	1,594,307
FY97	0 0.00	1 1.58	0 0.00	0 0	63,120	1,657,427
FY98	0 0.00	0 0.00	0 0.00	0 0	64,088	1,721,515
LIFETIME	15 0.87	37 2.15	4 0.23	5 168	1,721,517	
5 YR AVG	0.0 0.00	1.2 1.81	0.0 0.00	0.0 0.0	66,442.8	
10 YR AVG	0.2 0.25	1.0 1.26	0.1 0.13	0.3 1.3	79,626.9	

C-9 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY68	0	0.00	0	0.00	0	0.00	0	0	2,184	2,184
CY69	0	0.00	0	0.00	0	0.00	0	0	14,158	16,342
CY70	0	0.00	0	0.00	0	0.00	0	0	21,448	37,790
CY71	1	5.09	0	0.00	1	5.09	3	3	19,644	57,434
CY72	0	0.00	0	0.00	0	0.00	0	0	27,434	84,868
CY73	0	0.00	0	0.00	0	0.00	0	0	29,342	114,210
CY74	0	0.00	0	0.00	0	0.00	0	0	25,835	140,045
CY75	0	0.00	0	0.00	0	0.00	0	0	27,732	167,777
CY76	0	0.00	0	0.00	0	0.00	0	0	28,141	195,918
CY77	0	0.00	0	0.00	0	0.00	0	0	28,908	224,826
CY78	0	0.00	0	0.00	0	0.00	0	0	28,817	253,643
CY79	1	3.49	0	0.00	0	0.00	0	0	28,633	282,276
CY80	0	0.00	1	3.56	0	0.00	0	0	28,061	310,337
CY81	0	0.00	0	0.00	0	0.00	0	0	27,730	338,067
CY82	0	0.00	0	0.00	0	0.00	0	0	28,417	366,484
CY83	0	0.00	0	0.00	0	0.00	0	0	29,450	395,934
CY84	0	0.00	0	0.00	0	0.00	0	0	29,326	425,260
CY85	0	0.00	0	0.00	0	0.00	0	0	29,821	455,081
CY86	0	0.00	0	0.00	0	0.00	0	0	27,851	482,932
CY87	0	0.00	0	0.00	0	0.00	0	0	21,676	504,608
FY88	0	0.00	0	0.00	0	0.00	0	0	28,914	533,522
FY89	0	0.00	0	0.00	0	0.00	0	0	28,730	562,252
FY90	0	0.00	0	0.00	0	0.00	0	0	28,610	590,862
FY91	0	0.00	0	0.00	0	0.00	0	0	26,728	617,590
FY92	0	0.00	0	0.00	0	0.00	0	0	27,260	644,850
FY93	0	0.00	0	0.00	0	0.00	0	0	26,072	670,922
FY94	0	0.00	0	0.00	0	0.00	0	0	25,087	696,009
FY95	0	0.00	1	3.83	0	0.00	0	0	26,119	722,128
FY96	0	0.00	0	0.00	0	0.00	0	0	24,602	746,730
FY97	0	0.00	0	0.00	0	0.00	0	0	23,260	769,990
FY98	0	0.00	0	0.00	0	0.00	0	0	21,200	791,190
LIFETIME	2	0.25	2	0.25	1	0.13	3	3	791,190	
5 YR AVG	0.0	0.00	0.2	0.83	0.0	0.00	0.0	0.0	24,053.6	
10 YR AVG	0.0	0.00	0.1	0.38	0.0	0.00	0.0	0.0	26,508.2	

C-9... Statistics

C-20 & B-1... Statistics

C-20 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY83	0	0.00	0	0.00	0	0.00	0	0	501	501
CY84	0	0.00	0	0.00	0	0.00	0	0	2,478	2,979
CY85	0	0.00	0	0.00	0	0.00	0	0	2,647	5,626
CY86	0	0.00	0	0.00	0	0.00	0	0	2,831	8,457
TY87	0	0.00	0	0.00	0	0.00	0	0	4,013	12,470
FY88	0	0.00	0	0.00	0	0.00	0	0	8,192	20,662
FY89	0	0.00	0	0.00	0	0.00	0	0	8,454	29,116
FY90	0	0.00	0	0.00	0	0.00	0	0	8,495	37,611
FY91	0	0.00	0	0.00	0	0.00	0	0	8,244	45,855
FY92	0	0.00	0	0.00	0	0.00	0	0	6,994	52,849
FY93	0	0.00	0	0.00	0	0.00	0	0	6,046	58,895
FY94	0	0.00	0	0.00	0	0.00	0	0	6,617	65,512
FY95	0	0.00	0	0.00	0	0.00	0	0	6,472	71,984
FY96	0	0.00	0	0.00	0	0.00	0	0	6,403	78,387
FY97	0	0.00	0	0.00	0	0.00	0	0	6,380	84,266
FY98	0	0.00	0	0.00	0	0.00	0	0	6,804	91,571
LIFETIME	0	0.00	0	0.00	0	0.00	0	0	91,571	
5 YR AVG	0	0.00	0	0.00	0	0.00	0	0	6,535	
10 YR AVG	0	0.00	0	0.00	0	0.00	0	0	7,091	

B-1 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY84	0	0.00	1	512.82	0	0.00	0	0	195	195
CY85	0	0.00	1	184.16	0	0.00	0	0	543	738
CY86	0	0.00	0	0.00	0	0.00	0	0	2,676	3,414
TY87	1	11.96	2	23.93	1	11.96	2	3	8,359	11,773
FY88	0	0.00	1	5.08	0	0.00	0	0	19,701	31,474
FY89	2	7.66	0	0.00	2	7.66	0	0	26,100	57,574
FY90	1	3.74	1	3.74	0	0.00	0	0	26,705	84,279
FY91	2	8.56	0	0.00	0	0.00	0	0	23,355	107,634
FY92	3	11.12	0	0.00	0	0.00	0	0	26,970	134,604
FY93	1	3.31	1	3.31	1	3.31	2	4	30,179	164,783
FY94	0	0.00	1	3.40	0	0.00	0	0	29,383	194,166
FY95	0	0.00	3	10.80	0	0.00	0	0	27,781	221,947
FY96	0	0.00	1	3.79	0	0.00	0	0	26,371	248,318
FY97	1	4.03	3	12.10	1	4.03	2	4	24,803	273,121
FY98	1	4.11	2	8.23	1	4.11	0	0	24,310	297,431
LIFETIME	12	4.03	17	5.72	6	2.02	6	11	297,431	
5 YR AVG	0.4	1.51	2.0	7.54	0.4	1.51	0.4	0.8	26,529.6	
10 YR AVG	1.1	4.14	1.2	4.51	0.5	1.88	0.4	0.8	26,595.7	

B-52 History

YEAR	#	CLASS A RATE	#	CLASS B RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY55	0	0.00	0	0.00	0	0.00	0	0	4,979	4,979
CY56	4	26.92	0	0.00	3	20.19	5	19	14,860	19,839
CY57	6	10.17	0	0.00	3	5.09	7	16	58,971	78,810
CY58	8	6.50	0	0.00	6	4.88	12	41	123,030	201,840
CY59	5	2.19	1	0.44	3	1.32	1	4	227,973	429,813
CY60	4	1.50	2	0.75	4	1.50	3	8	267,331	697,144
CY61	6	1.77	0	0.00	6	1.77	5	25	338,662	1,035,806
CY62	1	0.25	8	1.98	0	0.00	0	0	403,043	1,438,849
CY63	4	0.98	7	1.71	3	0.73	5	18	408,239	1,847,088
CY64	5	1.22	8	1.95	3	0.73	2	10	409,382	2,256,470
CY65	1	0.25	6	1.51	2	0.50	3	8	397,405	2,653,875
CY66	3	0.74	3	0.74	2	0.50	3	12	403,037	3,056,912
CY67	6	1.66	4	1.11	5	1.38	6	21	361,754	3,418,666
CY68	6	1.54	4	1.03	6	1.54	6	15	389,843	3,808,509
CY69	9	2.97	4	1.32	8	2.64	13	33	302,949	4,111,458
CY70	1	0.43	5	2.17	1	0.43	0	0	230,746	4,342,204
CY71	1	0.47	2	0.94	1	0.47	2	9	212,003	4,554,207
CY72	5	1.44	8	2.31	4	1.16	4	14	346,021	4,900,228
CY73	2	0.93	4	1.85	1	0.46	0	0	216,165	5,116,393
CY74	3	1.88	7	4.39	3	1.88	4	12	159,563	5,275,956
CY75	1	0.71	5	3.54	1	0.71	1	3	141,204	5,417,160
CY76	0	0.00	5	3.64	0	0.00	0	0	137,469	5,554,629
CY77	1	0.74	32	23.75	1	0.74	3	8	134,722	5,689,351
CY78	1	0.75	33	24.80	1	0.75	2	5	133,038	5,822,389
CY79	1	0.75	3	2.25	0	0.00	0	0	133,234	5,955,623
CY80	1	0.77	1	0.77	0	0.00	0	0	130,405	6,086,028
CY81	1	0.75	7	5.24	1	0.75	2	8	133,677	6,219,705
CY82	2	1.64	0	0.00	2	1.64	3	9	122,121	6,341,826
CY83	1	0.95	0	0.00	1	0.95	3	7	104,866	6,446,692
CY84	2	1.92	1	0.96	1	0.96	1	2	103,933	6,550,625
CY85	0	0.00	0	0.00	0	0.00	0	0	105,566	6,656,191
CY86	0	0.00	0	0.00	0	0.00	0	0	102,381	6,758,572
TY87	0	0.00	1	1.25	0	0.00	0	0	80,014	6,838,586
FY88	2	2.04	0	0.00	1	1.02	0	1	98,004	6,936,590
FY89	1	0.99	0	0.00	1	0.99	0	0	100,516	7,037,106
FY90	0	0.00	0	0.00	0	0.00	0	0	91,037	7,128,143
FY91	1	1.09	0	0.00	1	1.09	0	3	91,454	7,219,597
FY92	0	0.00	0	0.00	0	0.00	0	0	69,056	7,288,653
FY93	0	0.00	1	1.88	0	0.00	0	0	53,293	7,341,946
FY94	1	3.11	1	3.11	1	3.11	4	0	32,146	7,374,092
FY95	1	4.13	1	4.13	0	0.00	0	0	24,223	7,398,315
FY96	0	0.00	0	0.00	0	0.00	0	0	25,506	7,423,821
FY97	0	0.00	1	4.29	0	0.00	0	0	23,297	7,447,118
FY98	0	0.00	0	0.00	0	0.00	0	0	23,190	7,470,308
LIFETIME	97	1.30	165	2.21	76	1.02	100	311	7,470,308	
5 YR AVG	0.4	1.56	0.6	2.34	0.2	0.00	0.8	0.0	25,672.4	
10 YR AVG	0.4	0.75	0.4	0.75	0.3	0.56	0.4	0.3	53,371.8	

B-52... Statistics

A-10 & F-117... Statistics

A-10 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY72	0	0.00	0	0.00	0	0.00	0	0	32	32
CY73	0	0.00	0	0.00	0	0.00	0	0	124	156
CY74	0	0.00	0	0.00	0	0.00	0	0	403	560
CY75	0	0.00	0	0.00	0	0.00	0	0	936	1,496
CY76	0	0.00	0	0.00	0	0.00	0	0	3,678	5,174
CY77	2	11.96	4	23.92	2	11.96	1	2	16,722	21,896
CY78	7	15.72	16	35.92	5	11.23	2	2	44,538	66,434
CY79	8	9.24	2	2.31	8	9.24	4	4	86,544	152,977
CY80	5	3.84	4	3.07	6	4.61	4	4	130,159	283,136
CY81	5	2.86	9	5.15	5	2.86	4	4	174,924	458,060
CY82	4	1.82	1	0.46	3	1.37	0	0	219,349	677,409
CY83	7	3.10	0	0.00	9	3.98	4	4	226,129	903,538
CY84	6	2.68	1	0.45	5	2.23	3	4	224,058	1,127,596
CY85	4	1.78	2	0.89	4	1.78	2	2	224,133	1,351,729
CY86	3	1.37	2	0.91	4	1.82	1	1	219,334	1,571,063
TY87	5	2.92	1	0.58	5	2.92	5	5	171,089	1,742,152
FY88	3	1.37	2	0.92	3	1.37	1	1	218,289	1,960,441
FY89	7	3.03	0	0.00	7	3.03	3	8	230,655	2,191,096
FY90	3	1.35	0	0.00	3	1.35	3	3	222,399	2,414,974
FY91	2	0.88	0	0.00	3	1.31	2	2	228,273	2,641,768
FY92	3	1.79	0	0.00	3	1.79	1	1	167,648	2,809,416
FY93	2	1.74	0	0.00	2	1.74	1	1	115,064	2,924,480
FY94	4	3.35	0	0.00	5	4.19	1	1	119,329	3,043,809
FY95	2	1.69	1	0.84	2	1.69	1	1	118,602	3,162,411
FY96	2	1.63	0	0.00	2	1.63	1	1	122,953	3,285,364
FY97	3	2.40	1	0.80	3	2.40	2	2	125,100	3,410,464
FY98	1	0.79	0	0.00	1	0.79	0	0	126,417	3,536,881
LIFETIME	88	2.49	46	1.30	90	2.54	46	53	3,536,881	
5 YR AVG	2.4	1.96	0.4	0.33	2.6	2.12	1.0	1.0	122,480.2	
10 YR AVG	2.9	1.84	0.2	0.13	3.1	1.97	1.5	2.0	157,644.0	

F-117 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
FY91	0	0.00	0	0.00	0	0.00	0	0	17,875	17,875
FY92	1	8.71	0	0.00	1	8.71	0	0	11,481	29,356
FY93	0	0.00	2	15.95	0	0.00	0	0	12,538	41,894
FY94	0	0.00	0	0.00	0	0.00	0	0	12,136	54,030
FY95	2	15.62	0	0.00	1	7.81	1	1	12,804	66,834
FY96	0	0.00	1	7.59	0	0.00	0	0	13,171	80,005
FY97	3	23.69	0	0.00	1	7.90	0	0	12,661	92,666
FY98	0	0.00	0	0.00	0	0.00	0	0	12,730	105,396
LIFETIME	6	5.69	3	2.85	3	2.85	1	1	105,396	
5 YR AVG	1.0	7.87	0.2	1.57	0.4	3.15	0.2	0.2	12,700.4	

F-111 History

YEAR	#	CLASS A RATE	#	CLASS B RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY65	0	0.00	0	0.00	0	0.00	0	0	272	272
CY66	0	0.00	0	0.00	0	0.00	0	0	1,342	1,614
CY67	2	53.60	0	0.00	2	53.60	1	1	3,731	5,345
CY68	5	36.14	4	28.91	5	36.14	0	0	13,837	19,182
CY69	8	25.97	0	0.00	4	12.98	4	4	30,806	49,988
CY70	0	0.00	0	0.00	0	0.00	0	0	10,933	60,921
CY71	2	4.03	3	6.04	2	4.03	2	2	49,673	110,594
CY72	5	6.68	3	4.01	5	6.68	4	4	74,797	185,391
CY73	10	11.39	2	2.28	8	9.11	4	6	87,774	273,165
CY74	3	3.57	2	2.38	2	2.38	2	3	83,957	357,122
CY75	7	8.82	1	1.26	6	7.56	1	2	79,393	436,515
CY76	8	12.75	0	0.00	5	7.97	0	0	62,750	499,265
CY77	7	9.51	12	16.30	7	9.51	4	8	73,628	572,893
CY78	3	4.72	7	11.02	2	3.15	1	2	63,537	636,430
CY79	13	17.11	11	14.48	10	13.16	6	10	75,989	712,419
CY80	4	5.45	6	8.17	4	5.45	4	10	73,431	785,850
CY81	3	3.86	12	15.45	1	1.29	0	0	77,648	863,498
CY82	10	12.68	0	0.00	9	11.41	2	4	78,890	942,388
CY83	3	3.76	1	1.25	3	3.76	1	2	79,755	1,022,143
CY84	3	3.80	1	1.27	3	3.80	3	4	78,973	1,101,116
CY85	0	0.00	1	1.24	0	0.00	0	0	80,870	1,181,986
CY86	0	0.00	1	1.19	0	0.00	0	0	83,921	1,265,907
TY87	3	4.66	0	0.00	3	4.66	1	2	64,344	1,330,251
FY88	3	3.58	2	2.39	3	3.58	3	4	83,686	1,413,937
FY89	2	2.32	0	0.00	2	2.32	1	2	86,262	1,500,199
FY90	5	5.86	0	0.00	4	4.69	1	2	85,357	1,585,556
FY91	1	1.13	7	7.89	1	1.13	1	2	88,710	1,674,266
FY92	2	2.82	1	1.41	2	2.82	1	2	71,029	1,745,295
FY93	1	2.18	0	0.00	1	2.18	0	0	45,924	1,791,219
FY94	0	0.00	1	3.31	0	0.00	0	0	30,180	1,821,399
FY95	1	3.33	3	9.99	1	3.33	0	0	30,016	1,851,415
FY96	1	6.84	0	0.00	1	6.84	0	0	14,617	1,865,760
FY97	0	0.00	0	0.00	0	0.00	0	0	7,262	1,873,294
FY98	0	0.00	0	0.00	0	0.00	0	0	3,172	1,876,466
LIFETIME	115	6.13	81	4.32	96	5.12	47	76	1,876,466	
5 YR AVG	0.4	2.35	0.8	4.69	0.4	2.35	0.0	0.0	17,049.4	
10 YR AVG	1.3	2.81	1.2	2.59	1.2	2.59	0.4	0.8	46,252.9	

F-111... Statistics

F-15 & T-3... Statistics

F-15 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROY A/C	DESTROY RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY72	0	0.00	0	0.00	0	0.00	0	0	25	25
CY73	0	0.00	0	0.00	0	0.00	0	0	826	851
CY74	0	0.00	2	94.79	0	0.00	0	0	2,110	2,961
CY75	1	22.02	0	0.00	1	22.02	0	0	4,541	7,502
CY76	0	0.00	0	0.00	0	0.00	0	0	17,803	25,305
CY77	6	14.16	15	35.40	2	4.72	1	2	42,369	67,674
CY78	8	11.59	30	43.46	7	10.14	1	1	69,023	136,697
CY79	5	5.16	15	15.47	5	5.16	3	3	96,959	233,656
CY80	5	4.57	20	18.30	3	2.74	2	2	109,309	342,965
CY81	5	3.78	4	3.02	6	4.54	5	6	132,291	475,256
CY82	3	1.96	4	2.61	4	2.61	2	2	153,369	628,625
CY83	4	2.36	5	2.95	6	3.54	1	1	169,438	798,063
CY84	3	1.71	2	1.14	4	2.28	1	2	175,515	973,578
CY85	5	2.70	5	2.70	4	2.16	2	2	185,324	1,158,902
CY86	7	3.53	5	2.52	8	4.04	4	4	198,095	1,356,997
TY87	3	1.94	0	0.00	3	1.94	2	2	154,821	1,511,818
FY88	1	0.50	3	1.49	2	0.99	0	0	201,099	1,712,917
FY89	5	2.33	0	0.00	4	1.86	2	2	214,592	1,927,509
FY90	7	3.08	6	2.64	7	3.08	4	5	227,617	2,155,126
FY91	3	1.09	2	0.72	3	1.09	0	0	276,393	2,431,519
FY92	5	2.26	2	0.91	5	2.26	2	3	220,866	2,652,385
FY93	3	1.38	5	2.30	3	1.38	0	0	217,547	2,869,932
FY94	4	1.90	3	1.43	4	1.90	1	1	210,241	3,080,173
FY95	4	1.94	5	2.42	3	1.45	1	2	206,649	3,286,822
FY96	4	1.99	2	1.00	3	1.49	0	0	200,766	3,487,588
FY97	3	1.56	5	2.60	2	1.04	0	0	192,081	3,679,669
FY98	3	1.61	2	1.07	5	2.68	0	0	186,588	3,866,257
LIFETIME	97	2.51	142	3.67	94	2.43	34	40	3,866,257	
5 YR AVG	3.6	1.81	3.4	1.71	3.4	1.71	0.4	0.6	199,265.0	
10 YR AVG	4.1	1.90	3.2	1.49	3.9	1.81	1.0	1.3	215,334.0	

T-3 History

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
FY94	0	0.00	0	0.00	0	0.00	0	0	2,663	2,663
FY95	1	4.34	0	0.00	1	4.34	1	2	23,062	25,725
FY96	1	3.30	0	0.00	1	3.30	1	2	30,337	56,062
FY97	1	3.08	0	0.00	1	3.08	1	2	27,044	83,106
FY98	0	0.00	0	0.00	0	0.00	0	0	53,817	136,923
LIFETIME	3	2.19	0	0.00	3	2.19	3	6	136,923	
5 YR AVG	0.6	2.19	0.0	0.00	0.6	2.19	0.6	1.2	27,384.6	

F-16 History

YEAR	CLASS A #	RATE	CLASS B #	RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY75	1	621.12	0	0.00	0	0.00	0	0	161	161
CY76	1	442.48	0	0.00	0	0.00	0	0	226	387
CY77	0	0.00	0	0.00	0	0.00	0	0	856	1,243
CY78	0	0.00	0	0.00	0	0.00	0	0	1,402	2,645
CY79	2	30.64	0	0.00	2	30.64	0	0	6,527	9,172
CY80	5	18.65	2	7.46	4	14.92	0	0	26,803	35,975
CY81	5	8.86	0	0.00	4	7.09	1	1	56,423	92,398
CY82	17	15.83	0	0.00	16	14.90	4	4	107,389	199,787
CY83	11	7.30	0	0.00	9	5.97	5	6	150,728	350,515
CY84	10	5.01	0	0.00	9	4.51	6	6	199,761	550,276
CY85	10	4.55	0	0.00	11	5.01	5	5	219,647	769,923
CY86	11	4.32	2	0.79	11	4.32	3	3	254,491	1,024,414
TY87	8	3.43	4	1.71	9	3.85	3	3	233,560	1,257,974
FY88	23	6.80	5	1.48	20	5.92	6	8	338,039	1,596,013
FY89	14	3.63	1	0.26	14	3.63	3	3	385,179	1,981,192
FY90	13	3.19	4	0.98	14	3.43	4	7	408,078	2,389,270
FY91	21	4.55	1	0.22	21	4.55	5	5	461,451	2,850,721
FY92	18	4.04	1	0.22	18	4.04	8	9	445,201	3,295,922
FY93	18	4.15	2	0.46	18	4.15	4	5	433,960	3,729,882
FY94	17	4.00	2	0.50	15	3.75	3	27	400,484	4,130,366
FY95	9	2.33	2	0.52	9	2.33	1	1	386,445	4,516,811
FY96	8	2.14	5	1.34	7	1.87	0	1	374,530	4,891,341
FY97	11	3.00	1	0.27	10	2.72	1	1	367,045	5,258,386
FY98	14	3.85	1	0.28	12	3.30	4	6	363,527	5,621,913
LIFETIME	246	4.38	33	0.59	233	4.14	66	101	5,621,913	
5 YR AVG	11.6	3.07	2.2	0.58	10.6	2.80	1.8	7.2	378,406.2	
10 YR AVG	14.2	3.53	2.0	0.50	13.8	3.43	3.3	6.5	402,590.0	

T-1 History

YEAR	CLASS A #	RATE	CLASS B #	RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
FY92	0	0.00	0	0.00	0	0.00	0	0	1	1
FY93	0	0.00	0	0.00	0	0.00	0	0	18,063	18,064
FY94	0	0.00	0	0.00	0	0.00	0	0	32,304	50,368
FY95	0	0.00	0	0.00	0	0.00	0	0	41,055	91,423
FY96	0	0.00	0	0.00	0	0.00	0	0	48,186	139,609
FY97	0	0.00	0	0.00	0	0.00	0	0	58,420	198,029
FY98	0	0.00	0	0.00	0	0.00	0	0	78,857	276,886
LIFETIME	0	0.00	0	0.00	0	0.00	0	0	276,886	
5 YR AVG	0	0.00	0	0.00	0	0.00	0	0	51,764.4	

F-16 & T-1... Statistics

T-37 History

T-37... Statistics

YEAR	CLASS A #	RATE	CLASS B #	RATE	DESTROYED A/C	RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY56	1	149.25	0	0.00	0	0.00	0	0	670	670
CY57	1	14.90	0	0.00	1	14.90	0	0	6,713	7,383
CY58	5	8.79	2	3.51	3	5.27	0	3	56,908	64,291
CY59	14	9.23	2	1.32	14	9.23	0	4	151,713	216,004
CY60	8	3.17	2	0.79	7	2.77	0	5	252,361	468,365
CY61	9	4.08	3	1.36	7	3.18	1	2	220,362	688,727
CY62	14	4.70	2	0.67	15	5.04	3	7	297,765	986,492
CY63	5	1.53	3	0.92	5	1.53	3	6	326,348	1,312,840
CY64	8	2.11	4	1.06	7	1.85	1	5	378,410	1,691,250
CY65	7	1.99	1	0.28	8	2.27	3	7	351,848	2,043,098
CY66	2	0.53	0	0.00	3	0.80	1	1	376,716	2,419,814
CY67	4	0.99	0	0.00	4	0.99	2	4	405,880	2,825,694
CY68	4	0.92	0	0.00	4	0.92	0	1	433,597	3,259,291
CY69	9	1.79	1	0.20	10	1.99	5	11	502,492	3,761,783
CY70	5	0.99	0	0.00	5	0.99	1	4	503,447	4,265,230
CY71	2	0.43	1	0.22	3	0.65	0	0	463,844	4,729,074
CY72	4	0.91	1	0.23	5	1.14	1	2	439,929	5,169,003
CY73	3	0.71	1	0.24	2	0.47	1	2	422,721	5,591,724
CY74	1	0.33	1	0.33	1	0.33	0	1	305,106	5,896,830
CY75	1	0.33	1	0.33	1	0.33	1	1	301,353	6,198,183
CY76	2	0.70	4	1.41	2	0.70	0	0	284,548	6,482,731
CY77	1	0.38	0	0.00	1	0.38	0	0	263,718	6,746,449
CY78	3	1.16	2	0.78	3	1.16	0	0	257,599	7,004,048
CY79	1	0.34	0	0.00	1	0.34	0	0	295,890	7,299,938
CY80	4	1.42	0	0.00	4	1.42	0	3	282,066	7,582,004
CY81	2	0.68	0	0.00	2	0.68	0	1	295,614	7,877,618
CY82	2	0.63	0	0.00	1	0.31	1	2	318,348	8,195,966
CY83	1	0.30	0	0.00	1	0.30	0	1	328,836	8,524,802
CY84	1	0.31	0	0.00	1	0.31	0	0	320,175	8,844,977
CY85	1	0.32	0	0.00	1	0.32	0	0	312,805	9,157,782
CY86	1	0.32	0	0.00	1	0.32	0	0	312,587	9,470,369
TY87	0	0.00	0	0.00	0	0.00	0	0	240,762	9,711,131
FY88	1	0.31	0	0.00	1	0.31	0	0	318,268	10,029,399
FY89	1	0.32	0	0.00	1	0.32	0	0	314,105	10,343,504
FY90	0	0.00	0	0.00	0	0.00	0	0	306,885	10,650,389
FY91	0	0.00	0	0.00	0	0.00	0	0	279,593	10,929,982
FY92	2	0.85	0	0.00	3	1.28	2	2	234,830	11,164,812
FY93	1	0.56	0	0.00	1	0.56	0	0	179,933	11,344,745
FY94	0	0.00	0	0.00	0	0.00	0	0	151,651	11,496,396
FY95	1	0.74	0	0.00	1	0.74	0	0	134,425	11,630,821
FY96	0	0.00	0	0.00	0	0.00	0	0	144,079	11,774,230
FY97	1	0.62	0	0.00	1	0.63	0	0	159,826	11,934,726
FY98	0	0.00	0	0.00	0	0.00	0	0	184,604	12,119,330
LIFETIME	133	1.10	31	0.26	131	1.08	26	75	12,119,330	
5 YR AVG	0.4	0.26	0.0	0.00	0.4	0.26	0.0	0.0	154,917.0	
10 YR AV	0.6	0.29	0.0	0.00	0.7	0.33	0.2	0.2	208,993.1	

T-38 History

YEAR	CLASS A # RATE	CLASS B # RATE	DESTROYED A/C RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY60	0 0.00	0 0.00	0 0.00	0	0	974	974
CY61	0 0.00	0 0.00	0 0.00	0	0	5,386	6,360
CY62	3 7.15	1 2.38	3 7.15	0	1	41,945	48,305
CY63	5 4.63	3 2.78	4 3.70	1	3	108,106	156,411
CY64	6 2.87	3 1.43	6 2.87	1	2	209,285	365,696
CY65	10 3.83	2 0.77	10 3.83	4	7	260,961	626,657
CY66	13 3.63	2 0.56	10 2.79	3	5	358,001	984,658
CY67	13 2.91	1 0.22	13 2.91	3	8	447,443	1,432,101
CY68	10 1.98	1 0.20	9 1.78	5	10	504,977	1,937,078
CY69	9 1.55	5 0.86	7 1.21	3	5	579,768	2,516,846
CY70	17 2.81	1 0.17	17 2.81	7	12	605,430	3,122,276
CY71	7 1.22	2 0.35	5 0.87	4	7	571,569	3,693,845
CY72	9 1.68	1 0.19	10 1.87	2	5	535,538	4,229,383
CY73	7 1.49	1 0.21	5 1.07	2	3	468,761	4,698,144
CY74	9 2.24	0 0.00	9 2.24	6	10	402,336	5,100,480
CY75	1 0.26	1 0.26	1 0.26	0	0	378,955	5,479,435
CY76	8 2.52	2 0.63	8 2.52	4	9	317,300	5,796,735
CY77	8 2.37	17 5.04	8 2.37	5	6	337,071	6,133,806
CY78	7 2.25	23 7.40	7 2.25	1	4	310,702	6,444,508
CY79	5 1.51	3 0.91	4 1.21	0	0	330,325	6,774,833
CY80	4 1.19	4 1.19	4 1.19	2	4	335,813	7,110,646
CY81	6 1.77	1 0.29	6 1.77	3	3	338,986	7,449,632
CY82	3 0.83	0 0.00	6 1.66	5	5	362,514	7,812,146
CY83	5 1.36	2 0.54	5 1.36	1	3	367,891	8,180,037
CY84	3 0.80	3 0.80	4 1.07	3	5	373,825	8,553,862
CY85	2 0.55	3 0.83	2 0.55	1	2	362,845	8,916,707
CY86	4 1.14	1 0.29	4 1.14	2	3	349,457	9,266,164
TY87	2 0.75	1 0.37	3 1.12	3	6	267,009	9,533,173
FY88	2 0.57	2 0.57	2 0.57	1	1	351,132	9,884,305
FY89	2 0.54	1 0.27	2 0.54	2	2	370,026	10,254,331
FY90	2 0.55	2 0.55	2 0.55	0	0	361,878	10,616,209
FY91	1 0.30	0 0.00	1 0.30	0	2	337,134	10,953,343
FY92	1 0.38	0 0.00	0 0.00	1	1	265,369	11,218,712
FY93	3 1.33	0 0.00	3 1.33	0	0	225,105	11,443,817
FY94	0 0.00	0 0.00	0 0.00	0	0	194,161	11,637,978
FY95	1 0.63	0 0.00	1 0.63	0	0	158,422	11,796,400
FY96	1 0.75	0 0.00	1 0.75	0	0	133,959	11,930,359
FY97	0 0.00	0 0.00	0 0.00	0	0	135,015	12,065,374
FY98	0 0.00	1 0.81	1 0.81	0	0	123,241	12,188,615
LIFETIME	189 1.55	90 0.74	183 1.50	75	134	12,188,615	
5 YR AVG	0.4 0.27	0.2 0.13	0.6 0.40	0.0	0.0	148,959.6	
10 YR AVG	1.1 0.48	0.4 0.17	1.1 0.48	0.3	0.5	230,431.0	

T-38... Statistics

T-41 History

T-41... Statistics

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HRS
CY64	0	0.00	0	0.00	0	0.00	0	0	114	114
CY65	0	0.00	0	0.00	0	0.00	0	0	64	178
CY66	0	N/A	0	N/A	0	N/A	0	0	0	178
CY67	1	101.52	0	0.00	0	0.00	0	0	985	1,163
CY68	2	8.51	2	8.51	1	4.25	0	0	23,502	24,665
CY69	3	12.89	0	0.00	0	0.00	0	0	23,271	47,936
CY70	0	0.00	1	4.78	0	0.00	0	0	20,940	68,876
CY71	0	0.00	1	5.13	0	0.00	0	0	19,475	88,351
CY72	0	0.00	0	0.00	0	0.00	1	2	17,589	105,940
CY73	1	5.28	1	5.28	1	5.28	0	0	18,950	124,890
CY74	0	0.00	0	0.00	0	0.00	0	0	17,188	142,078
CY75	0	0.00	0	0.00	0	0.00	0	0	17,984	160,062
CY76	0	0.00	0	0.00	0	0.00	0	0	18,488	178,550
CY77	0	0.00	0	0.00	0	0.00	0	0	17,083	195,633
CY78	0	0.00	0	0.00	0	0.00	0	0	18,368	214,001
CY79	0	0.00	0	0.00	0	0.00	0	0	16,992	230,993
CY80	1	5.84	0	0.00	1	5.84	0	0	17,124	248,117
CY81	1	5.86	0	0.00	1	5.86	0	0	17,076	265,193
CY82	0	0.00	0	0.00	0	0.00	0	0	16,040	281,233
CY83	0	0.00	0	0.00	0	0.00	0	0	20,898	302,131
CY84	0	0.00	0	0.00	0	0.00	0	0	20,523	322,654
CY85	0	0.00	0	0.00	0	0.00	0	0	34,731	357,385
CY86	0	0.00	0	0.00	0	0.00	0	0	33,349	390,734
TY87	0	0.00	0	0.00	0	0.00	0	0	28,752	419,486
FY88	0	0.00	0	0.00	0	0.00	0	0	35,228	454,714
FY89	0	0.00	0	0.00	0	0.00	0	0	33,592	488,306
FY90	0	0.00	0	0.00	0	0.00	0	0	30,742	519,048
FY91	0	0.00	0	0.00	0	0.00	0	0	24,172	543,220
FY92	0	0.00	0	0.00	0	0.00	0	0	26,293	569,513
FY93	0	0.00	0	0.00	0	0.00	0	0	23,755	593,268
FY94	0	0.00	0	0.00	0	0.00	0	0	17,881	611,149
FY95	0	0.00	0	0.00	0	0.00	0	0	578	611,727
FY96	0	0.00	0	0.00	0	0.00	0	0	671	612,398
FY97	0	0.00	0	0.00	0	0.00	0	0	622	613,020
FY98	0	0.00	0	0.00	0	0.00	0	0	736	613,756
LIFETIME	9	1.47	5	0.81	4	0.65	1	2	613,756	
5 YR AVG	0	0.00	0	0.00	0.0	0.00	0	0	4,098	
10 YR AVG	0	0.00	0	0.00	0.0	0.00	0	0	15,904	

T-43 History

YEAR	CLASS A		CLASS B		DESTROYED		FATAL PILOT	ALL	HOURS	CUM HRS
	#	RATE	#	RATE	A/C	RATE				
CY74	0	0.00	0	0.00	0	0.00	0	0	10,481	10,481
CY75	0	0.00	0	0.00	0	0.00	0	0	15,855	26,336
CY76	0	0.00	1	7.73	0	0.00	0	0	12,931	39,267
CY77	0	0.00	3	20.34	0	0.00	0	0	14,749	54,016
CY78	0	0.00	1	7.34	0	0.00	0	0	13,624	67,640
CY79	0	0.00	0	0.00	0	0.00	0	0	15,396	83,036
CY80	0	0.00	1	5.77	0	0.00	0	0	17,338	100,374
CY81	0	0.00	0	0.00	0	0.00	0	0	17,259	117,633
CY82	0	0.00	0	0.00	0	0.00	0	0	17,809	135,442
CY83	0	0.00	0	0.00	0	0.00	0	0	17,252	152,694
CY84	0	0.00	0	0.00	0	0.00	0	0	16,473	169,167
CY85	0	0.00	0	0.00	0	0.00	0	0	15,820	184,987
CY86	0	0.00	0	0.00	0	0.00	0	0	16,049	201,036
TY87	0	0.00	0	0.00	0	0.00	0	0	12,166	213,202
FY88	0	0.00	0	0.00	0	0.00	0	0	13,806	227,008
FY89	0	0.00	0	0.00	0	0.00	0	0	14,589	241,597
FY90	0	0.00	0	0.00	0	0.00	0	0	14,370	255,967
FY91	0	0.00	0	0.00	0	0.00	0	0	13,296	269,263
FY92	0	0.00	0	0.00	0	0.00	0	0	11,005	280,268
FY93	0	0.00	0	0.00	0	0.00	0	0	9,179	289,447
FY94	0	0.00	0	0.00	0	0.00	0	0	7,069	296,516
FY95	0	0.00	0	0.00	0	0.00	0	0	7,917	304,433
FY96	1	14.28	0	0.00	1	14.28	2	23	7,003	311,436
FY97	0	0.00	0	0.00	0	0.00	0	0	6,496	317,932
FY98	0	0.00	0	0.00	0	0.00	0	0	4,866	322,798
LIFETIME	1	0.31	6	1.86	1	0.31	2	23	322,798	
5 YR AVG	0	3.00	0	0.00	0	3.00	0	5	6,670	
10 YR AVG	0	0.82	0	0.00	0	0.82	0	2	12,176	

H-60 History

YEAR	CLASS A		CLASS B		DESTROYED		FATAL PILOT	ALL	HOURS	CUM HRS
	#	RATE	#	RATE	A/C	RATE				
CY82	0	0.00	0	0.00	0	0.00	0	0	112	112
CY83	0	0.00	0	0.00	0	0.00	0	0	3,147	3,259
CY84	0	0.00	0	0.00	0	0.00	0	0	4,132	7,391
CY85	0	0.00	0	0.00	0	0.00	0	0	2,992	10,383
CY86	0	0.00	0	0.00	0	0.00	0	0	3,955	14,338
TY87	1	44.42	0	0.00	1	44.42	2	4	2,251	16,589
FY88	0	0.00	0	0.00	0	0.00	0	0	4,216	20,805
FY89	0	0.00	0	0.00	0	0.00	0	0	5,591	26,396
FY90	0	0.00	0	0.00	0	0.00	0	0	7,849	34,245
FY91	1	6.85	0	0.00	0	0.00	0	0	14,594	48,839
FY92	1	5.15	0	0.00	1	5.15	0	1	19,401	68,240
FY93	1	4.37	0	0.00	1	4.37	1	12	22,871	91,111
FY94	2	8.25	1	4.13	1	4.13	0	0	24,229	115,340
FY95	1	3.75	1	3.75	1	3.75	2	5	26,666	142,006
FY96	0	0.00	0	0.00	0	0.00	0	0	27,809	169,815
FY97	0	0.00	0	0.00	0	0.00	0	0	26,009	195,824
FY98	1	3.76	0	0.00	2	7.53	4	12	26,572	222,396
LIFETIME	8	3.60	2	0.90	7	3.15	9	34	222,396	
5 YR AVG	0.8	3.05	0.4	1.52	0.6	2.29	0.6	3.4	26,257.0	
10 YR AVG	0.7	3.47	0.2	0.99	0.6	2.98	0.7	3.0	20,159.1	

T-43 & H-60... Statistics

H-53 History

H-53... Statistics

YEAR	CLASS A #	CLASS A RATE	CLASS B #	CLASS B RATE	DESTROYED A/C	DESTROYED RATE	FATAL PILOT	ALL	HOURS	CUM HF
CY66	0	0.00	0	0.00	0	0.00	0	0	22	2
CY67	0	0.00	0	0.00	0	0.00	0	0	1,517	1,53
CY68	0	0.00	0	0.00	0	0.00	0	0	5,272	6,81
CY69	2	21.66	0	0.00	1	10.83	2	3	9,232	16,04
CY70	0	0.00	0	0.00	0	0.00	0	0	13,922	29,96
CY71	1	4.87	0	0.00	1	4.87	0	0	20,528	50,49
CY72	0	0.00	0	0.00	0	0.00	0	0	23,299	73,79
CY73	2	10.94	1	5.47	1	5.47	0	0	18,279	92,07
CY74	0	0.00	0	0.00	0	0.00	0	0	16,439	108,51
CY75	3	18.81	0	0.00	3	18.81	6	43	15,947	124,45
CY76	1	7.01	0	0.00	1	7.01	2	4	14,261	138,71
CY77	2	13.08	4	26.16	2	13.08	0	1	15,292	154,01
CY78	0	0.00	6	40.16	0	0.00	0	0	14,942	168,95
CY79	1	8.05	0	0.00	1	8.05	2	3	12,429	181,35
CY80	2	15.90	0	0.00	1	7.95	0	1	12,578	193,95
CY81	2	14.38	0	0.00	1	7.19	3	6	13,912	207,87
CY82	1	7.43	0	0.00	1	7.43	3	4	13,452	221,32
CY83	0	0.00	2	14.49	0	0.00	0	0	13,805	235,12
CY84	2	14.53	0	0.00	2	14.53	2	6	13,762	248,85
CY85	1	8.56	0	0.00	1	8.56	3	7	11,687	260,57
CY86	2	16.39	1	8.19	2	16.39	1	1	12,205	272,75
TY87	1	11.20	0	0.00	0	0.00	0	1	8,925	281,70
FY88	0	0.00	0	0.00	0	0.00	0	0	10,804	292,51
FY89	1	9.57	0	0.00	0	0.00	0	0	10,453	302,95
FY90	0	0.00	0	0.00	0	0.00	0	0	12,223	315,15
FY91	0	0.00	1	8.63	0	0.00	0	0	11,594	326,75
FY92	0	0.00	0	0.00	0	0.00	0	0	12,238	339,01
FY93	0	0.00	0	0.00	0	0.00	0	0	12,019	351,03
FY94	0	0.00	0	0.00	0	0.00	0	0	12,106	363,14
FY95	1	8.43	1	8.43	1	8.43	0	0	11,857	375,00
FY96	1	7.44	0	0.00	0	0.00	0	0	13,436	388,41
FY97	0	0.00	0	0.00	0	0.00	0	0	12,522	400,95
FY98	0	0.00	0	0.00	0	0.00	0	0	14,024	414,95
LIFETIME	26	6.27	16	3.86	19	4.58	24	80	414,983	
5 YR AVG	0.4	0.00	0.2	0.00	0.2	0.00	0.0	0.0	12,388.0	
10 YR AVG	0.3	0.00	0.2	0.00	0.1	0.00	0.0	0.0	11,925.2	

UH-1 History

YEAR	CLASS A		CLASS B		DESTROYED		FATAL	ALL	HOURS	CUM HRS
	#	RATE	#	RATE	A/C	RATE	PILOT			
CY71	0	0.00	0	0.00	0	0.00	0	0	15,900	15,900
CY72	3	14.22	0	0.00	2	9.48	1	3	21,097	36,997
CY73	0	0.00	0	0.00	0	0.00	0	0	20,026	57,023
CY74	1	5.18	0	0.00	1	5.18	0	2	19,315	76,338
CY75	0	0.00	1	4.51	0	0.00	0	0	22,197	98,535
CY76	0	0.00	0	0.00	0	0.00	0	0	12,896	111,431
CY77	0	0.00	0	0.00	0	0.00	0	0	19,729	131,160
CY78	1	4.19	2	8.39	1	4.19	0	0	23,838	154,998
CY79	0	0.00	0	0.00	0	0.00	0	0	24,703	179,701
CY80	1	4.34	0	0.00	1	4.34	0	0	23,041	202,742
CY81	0	0.00	0	0.00	0	0.00	0	0	24,385	227,127
CY82	0	0.00	1	4.07	0	0.00	0	0	24,547	251,674
CY83	0	0.00	0	0.00	0	0.00	0	0	24,978	276,652
CY84	1	4.02	0	0.00	1	4.02	2	5	24,846	301,498
CY85	0	0.00	0	0.00	0	0.00	0	0	46,977	348,475
CY86	1	2.17	0	0.00	1	2.17	2	5	46,101	394,576
TY87	0	0.00	0	0.00	0	0.00	0	0	32,895	427,471
FY88	0	0.00	0	0.00	0	0.00	0	0	30,774	458,245
FY89	0	0.00	0	0.00	0	0.00	0	0	31,253	489,498
FY90	0	0.00	0	0.00	0	0.00	0	0	30,704	520,202
FY91	1	3.32	1	3.32	1	3.32	1	2	30,087	550,289
FY92	2	7.21	0	0.00	2	7.21	3	7	27,729	578,018
FY93	0	0.00	0	0.00	0	0.00	0	0	25,945	603,963
FY94	1	4.15	1	4.15	1	4.15	0	0	24,099	628,062
FY95	1	4.60	0	0.00	1	4.60	0	0	21,761	649,823
FY96	1	4.73	0	0.00	1	4.73	0	0	21,141	670,964
FY97	0	0.00	0	0.00	0	0.00	0	0	20,725	691,689
FY98	1	5.15	0	0.00	1	5.15	0	0	19,412	711,101
LIFETIME	15	2.11	6	0.84	14	1.97	9	24	711,101	
5 YR AVG	0.8	3.73	0.2	0.93	0.8	3.73	0.0	0.0	21,427.6	
10 YR AVG	0.7	2.77	0.2	0.79	0.7	2.77	0.4	0.9	25,285.6	

UH-1... Statistics

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))	January 31, 2000

**STATE OF UTAH'S OBJECTIONS AND RESPONSES TO APPLICANT'S
FOURTH SET OF DISCOVERY REQUESTS TO INTERVENORS STATE OF
UTAH AND CONFEDERATED TRIBES**

The State responds to Applicant's January 14, 2000 Fourth Set of Discovery Requests, which relate to Utah Contentions E (Financial Assurance), H (Inadequate Thermal Design), L (Geotechnical), S (Decommissioning), and GG (Failure to Demonstrate Cask-Pad Stability During Seismic Event for TranStor Casks). The State and the Applicant have agreed that the party responding to Requests for Admissions and Interrogatories, during the formal discovery period, may have eight working days in which to timely file a response. In addition, counsel for the Applicant agreed that the State may file responses to the Applicant's 4th Set of Discovery at the same time as it files responses to the Applicant's 5th Set of Discovery (*i.e.* January 31, 2000).

GENERAL OBJECTIONS

These objections apply to the State of Utah's responses to all of the Applicant's Forth Set of Discovery Requests.

1. The State of Utah objects to the Applicant's instructions and definitions on

no documents that satisfy this request.

E. CONTENTION UTAH GG (FAILURE TO DEMONSTRATE CASK-PAD STABILITY)

1. Request for Admissions – Utah GG

1. Do you admit that a value of 0.2 conservatively bounds the lower limit of the coefficient of friction between steel and concrete?

RESPONSE TO ADMISSION REQUEST NO. 1 - UTAH GG. Request for Admission No. 1 is denied. A uniform coefficient of friction of 0.20 does not represent the actual flexible behavior of the foundation pad under static and dynamic loading. Thus, a value of 0.2 does not conservatively bound the lower limit of the coefficient of friction between steel and concrete.

2. Do you admit that a value of 0.8 conservatively bounds the upper limit of the coefficient of friction between steel and concrete?

RESPONSE TO ADMISSION REQUEST NO. 2 - UTAH GG. Request for Admission No. 2 is denied. The Applicant has not addressed the cold bonding condition that may develop between the cask and the foundation pad. In addition, use of a uniform coefficient of 0.80 does not consider the flexible behavior of the pad and the change of frictional forces due to the pad's local displacement. Thus, a value of 0.8 does not conservatively bound the upper limit of the coefficient of friction between steel and concrete.

2. Interrogatories – Utah GG

1. Identify and fully explain the upper and lower limits of the coefficient of

friction between steel and concrete, and the scientific and technical bases therefor?

RESPONSE TO INTERROGATORY NO. 1 - UTAH GG. Under cold bonding a complete bond develops between the cask and the pad. This bond may or may not break during seismic loading depending on the contact stresses. The breakage of the bond, if it occurs, will be non-uniform at the contact points. Moreover, the simplified analysis used by the Applicant to model the interaction of the pad and the cask does not consider the real behavior of the interaction forces on a flexible pad. The coefficient of friction chosen by the Applicant to represent the interaction between the cask and the pad should represent the real behavior of the pad. Under the flexible behavior of the pad, the coefficient of friction varies over the surface of the pad. Therefore, the actual interaction between the pad and the cask cannot simply be bound by the application of two uniform values of coefficients of friction.

2. Identify and fully explain any events that would occur during a seismic event that would change the material properties of either the TranStor storage cask or the concrete pad that would affect the coefficient of friction and the scientific and technical bases therefor.

RESPONSE TO INTERROGATORY NO. 2 - UTAH GG. The material properties of the two media (cask and the pad) are not expected to change during the seismic event. However, because the pad is flexible, the contact condition between the pad and the cask are expected to change during static and seismic loading. The assumption that frictional forces are independent of foundation pad behavior as was assumed by the Applicant does not represent the real condition of the interaction forces.

3. Identify and fully explain the range of values for the coefficient of friction that would be expected to occur between steel and concrete and the scientific and technical bases therefor.

RESPONSE TO INTERROGATORY NO. 3 - UTAH GG. *See response to Interrogatory No. 1.* In addition, an applicable range of coefficients of friction within the modeling technique adopted by the Applicant should be developed from a detailed and a through analysis of the foundation pad behavior and the interaction forces between the cask and the pad under both static and dynamic loading. The contact points between the cask and a rigid pad will cause the coefficient of friction to vary across the contact points. The cold bonding condition and the variation of the coefficient of friction need to be properly represented.

4. Identify and explain in detail any and all errors, and the consequences thereof and the bases therefor, that the State alleges to be in the “TranStor Dynamic Response to 2000 year Return Seismic Event,” HI-992295 (Exhibit 2 to PFS’s Motion for Summary Disposition of Utah GG) related to the use of the coefficient of friction in that analysis, including the shift from the static case to the kinetic case.

RESPONSE TO INTERROGATORY NO. 4 - UTAH GG. The foundation pad acts as a flexible member under both static and seismic loading. Thus, the interaction forces between the cask and the pad are a function of the pad’s local behavior. The Applicant incorrectly assumes a rigid pad behavior and thus, applies uniform coefficients of friction. A rigid pad does not represent the real behavior of the pad. The application of uniform coefficients of friction at 0.2 and 0.8 do not bound the coefficient of friction because the coefficient of friction varies across the surface of the pad.

Moreover, the Applicant has not considered the condition of the cold bonding that

may develop between the cask and the pad. The cold bonding may break in a non-uniform pattern depending upon the seismic load at the cask and pad contact points in terms of shear and overturning moment. Thus, effects of cold bonding are not bound by the 0.8 coefficient of friction.

3. Document Requests – Utah GG

1. All documents, data or other information describing, reviewing, analyzing, evaluating or otherwise relating to the proper coefficient of friction between the TranStor storage cask and the concrete pad.

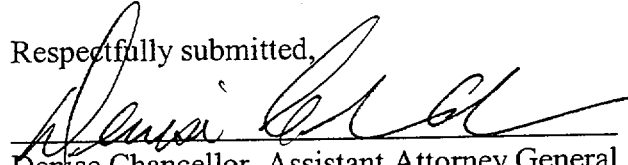
RESPONSE TO DOCUMENT REQUEST NO. 1 - UTAH GG. The State objects to this request to the extent that it calls for production of privileged information. Notwithstanding this objection, documents will be available for review at the Office of the Attorney General. In addition, the following publications relate to the State's evaluation of the proper coefficient of friction between the TranStor storage cask and the concrete pad:

1. Bowels, Joseph E., *Foundation Analysis and Design*, Fourth edition, McGraw Hill Company, 1988.
2. Iguchi and Luco, *Dynamic response of Flexible Rectangular Foundations on an Elastic Halfspace*, Journal of Earthquake Engineering and Structural dynamics, 1981, Vol. 9.

The above described publications are readily available to the Applicant and will not be produced by the State.

DATED this 31st day of January, 2000.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Denise Chancellor", is written over a horizontal line.

Denise Chancellor, Assistant Attorney General

Fred G Nelson, Assistant Attorney General

Connie Nakahara, Special Assistant Attorney General

Diane Curran, Special Assistant Attorney General

Laura Lockhart, Assistant Attorney General

Attorneys for State of Utah

Utah Attorney General's Office

160 East 300 South, 5th Floor, P.O. Box 140873

Salt Lake City, UT 84114-0873

Telephone: (801) 366-0286, Fax: (801) 366-0292

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
(Independent Spent Fuel
Storage Installation)

) ASLBP No. 97-732-02-ISFSI

) September 14, 2000

STATE OF UTAH'S REQUEST TO WITHDRAW
CONTENTION UTAH GG

In its September 5, 2000 Order, the Board requested the parties provide a joint report indicating whether any further action on Contention Utah GG, Failure to Demonstrate Cask-Pad Stability During Seismic Event for TranStor Casks, is appropriate given the discussion on pages 2-22 to -23 of the Staff's draft Environmental Impact Statement.¹ In early September the State received a copy of the Applicant's license application amendment No. 17 in which the Applicant removed all references to the TranStor cask system -- with the exception of information associated with TranStor which Private Fuel Storage, LLC ("PFS") has now characterized at a "representative spent fuel storage system." See Letter from John D. Parkyn, PFS, dated August 31, 2000, transmitting license application amendment No. 17 to NRC. Given the Applicant's license amendment No. 17, the State now seeks withdrawal of Contention Utah GG. As such, there is no need for the parties to submit a joint report to the Board as requested under the Board's

¹ NUREG -1714, *Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah*, June 2000.

September 5 Order.

The State attempted to have admitted for hearing the adequacy of PFS's cask stability analysis as it related to both the Holtec casks² and the TranStor casks. The Board ruled that the Contention Utah EE did not meet the late-filed factors and did not admit the contention.³ Contention Utah GG, relating to the TranStor casks, did not suffer the same fate; it was admitted for hearing.⁴

In its Reply to the Applicant's Response to the Board's Order Requesting Clarification of Contention Utah GG, dated February 16, 2000 ("State's Reply"), the State advised the Board that "unless and until PFS amends its license application to remove the use of the TranStor cask system from the PFS facility, the issues in Contention GG still present a live controversy in this proceeding." State's Reply at 2-3. It now appears that PFS has removed all references to the use of TranStor casks at the PFS facility. Therefore, the issues in Contention Utah GG as they relate the TranStor cask no longer present a live controversy.

While the issues relating to the TranStor are no longer litigable, the same shortcomings with PFS's cask sliding analysis that the State enunciated in its January 21, 2000 Response to PFS's Motion for Summary Disposition of Contention GG also apply to the Holtec casks. Whether the casks are Holtec casks or TranStor casks, PFS's cask sliding

² See State of Utah's Request for Consideration of Late-Filed Contentions EE and FF (December 23, 1997).

³ Private Fuel Storage, LLC (Independent Spent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 207-209 (1998).

⁴ Id. at 210-211.

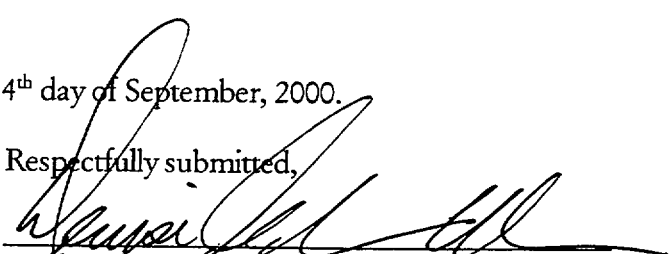
analysis fails to consider the potential range of conditions that may occur during a seismic event, such as whether the pad will remain rigid under cask loading; whether the simple frictional elements applied in the soil-structure interaction model are appropriate; and whether the analyzed coefficients of friction of 0.2 and 0.8 bound the actual behavior of the cask-pad interface under dynamic loading. It is the State's hope that the Staff will continue to require PFS to perform a more complete analysis that addresses the concerns raised by the State in Contention Utah GG.

Finally, in requesting withdrawal of Contention Utah GG, the State notes that results from PFS's cask design and sliding analyses have also been used in the foundation design of the cask pads. Accordingly, by requesting withdrawal of Contention Utah GG, the State is not relinquishing any ability to use PFS's cask sliding calculations as they may relate to soil stability and foundation loading in Contention Utah L.

For the foregoing reasons, the State requests the withdrawal of Contention Utah GG.

DATED this 14th day of September, 2000.

Respectfully submitted,



Denise Chancellor, Assistant Attorney General
Fred G Nelson, Assistant Attorney General
Connie Nakahara, Special Assistant Attorney General
Diane Curran, Special Assistant Attorney General
Laura Lockhart, Assistant Attorney General
Attorneys for State of Utah
Utah Attorney General's Office
160 East 300 South, 5th Floor, P.O. Box 140873
Salt Lake City, UT 84114-0873
Telephone: (801) 366-0286, Fax: (801) 366-0292

CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S REQUEST TO WITHDRAW
CONTENTION UTAH GG was served on the persons listed below by electronic mail
(unless otherwise noted) with conforming copies by United States mail first class, this 14th
day of September, 2000:

Rulemaking & Adjudication Staff
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington D.C. 20555
E-mail: hearingdocket@nrc.gov
(original and two copies)

G. Paul Bollwerk, III, Chairman
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: gp@nrc.gov

Dr. Jerry R. Kline
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: jrk2@nrc.gov
E-Mail: kjerry@erols.com

Dr. Peter S. Lam
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: psl@nrc.gov

Sherwin E. Turk, Esq.
Catherine L. Marco, Esq.
Office of the General Counsel
Mail Stop - 0-15 B18
U.S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: set@nrc.gov
E-Mail: clm@nrc.gov
E-Mail: pfscase@nrc.gov

Jay E. Silberg, Esq.
Ernest L. Blake, Jr., Esq.
Paul A. Gaukler, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N. W.
Washington, DC 20037-8007
E-Mail: Jay_Silberg@shawpittman.com
E-Mail: ernest_blake@shawpittman.com
E-Mail: paul_gaukler@shawpittman.com

John Paul Kennedy, Sr., Esq.
1385 Yale Avenue
Salt Lake City, Utah 84105
E-Mail: john@kennedys.org

Joro Walker, Esq.
Land and Water Fund of the Rockies
2056 East 3300 South Street, Suite 1
Salt Lake City, Utah 84109
E-Mail: joro61@inconnect.com

Danny Quintana, Esq.
Danny Quintana & Associates, P.C.
68 South Main Street, Suite 600
Salt Lake City, Utah 84101
E-Mail: quintana@xmission.com

Office of the Commission Appellate
Adjudication
Mail Stop: O14-G-15
U. S. Nuclear Regulatory Commission
Washington, DC 20555

James M. Cutchin
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
E-Mail: jmc3@nrc.gov
(*electronic copy only*)

A handwritten signature in black ink, appearing to read "Denise Chancellor", written over a horizontal line.

Denise Chancellor
Assistant Attorney General
State of Utah



Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Don A. Ostler, P.E.
Director

State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER QUALITY

288 North 1460 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870
(801) 538-6146 Voice
(801) 538-6016 Fax
(801) 536-4414 T.D.D.

ATTORNEY
GENERAL

JUL 10 1997

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Water Quality Board
Leroy H. Wullstein, Ph.D.
Chairman

Lynn F. Pett
Vice Chairman

Robert G. Adams
R. Rex Ausburn, P.E.
David S. Bowles, Ph.D., P.E.
Nan Bunker

Leonard Ferguson
Dianne R. Nielson, Ph.D.
K.C. Shaw, P.E.
J. Ann Wechsler
Don A. Ostler, P.E.
Executive Secretary

July 8, 1997

John D. Parkyn
Chairman of the Board
Private Fuel Storage L.L.C.
PO Box C4010
La Crosse WI 54602-4010

Dear Mr. Parkyn:

This letter is to notify you that Private Fuel Storage (PFS) will be required to obtain state approvals and permits to insure protection of the state resources of surface water and ground water for the proposed high level nuclear waste storage facility on the Goshute Reservation and for any proposed transfer facility.

Attached is a copy of the state water quality rules.

Sincerely,

Utah Water Quality Board

Don A. Ostler, P.E.
Executive Secretary

DAO:mhf

Enclosure

cc: Mark Delligatti, Nuclear Regulatory Commission

K:\WQ\DIRECTOR\OSTLER\WPPARKYN.LTR
FILE:PRIVATE FUEL STORAGE LLC



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, LLC (Independent Spent Fuel Storage Installation)	ASLBP No. 97-732-02-ISFSI November 23, 1997

**STATE OF UTAH'S CONTENTIONS ON THE
CONSTRUCTION AND OPERATING LICENCE APPLICATION
BY PRIVATE FUEL STORAGE, LLC FOR
AN INDEPENDENT SPENT FUEL STORAGE FACILITY**

Pursuant to 10 CFR § 2.714(b), the State of Utah hereby submits its contentions regarding the construction and operating license application by Private Fuel Storage, LLC's for an Independent Spent Fuel Storage Installation on the Skull Valley Band of Goshutes reservation, Utah. Contentions regarding general NEPA issues, the intermodal transfer site, quality assurance, financial assurance, emergency planning, geotechnical and seismic issues are supported by the Declaration of Lawrence White, PE, Executive Vice President and Senior Program Manager of Versar, Inc., attached hereto as Exhibit 1. Contentions regarding NRC dose limits, facilitation of

L. Geotechnical

CONTENTION: The Applicant has not demonstrated the suitability of the proposed ISFSI site because the License Application and SAR do not adequately address site and subsurface investigations necessary to determine geologic conditions, potential seismicity, ground motion, soil stability and foundation loading.¹⁹

BASIS:

1. **Surface faulting.** NRC regulations recognize that areas west of the Rocky Mountains may potentially be seismically active. 10 CFR § 72.102(b). These areas, including the proposed ISFSI site, must be evaluated by the techniques of 10 CFR Part 100, Appendix A. Specifically, Appendix A, IV(b)(2) requires the "[e]valuation of tectonic structures underlying the site, whether buried or expressed at the surface, with regard to their potential for causing surface displacement at or near the site." The purpose of the evaluation is to define capable faults which exhibit "[m]ovement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years." 10 CFR Part 100, Appendix A, III(g)(1).

Although the Applicant concludes that there is "[n]o evidence of fault offset of the surficial soils" (SAR at 2.6-35), the SAR does not provide sufficient supporting evidence of the presence or absence of buried capable faults that have moved at least

¹⁹ This contention is supported by the Affidavit of Barry J. Solomon and the Declaration of Lawrence A. White, attached hereto as Exhibits 11, and 1, respectively.

once within the past 35,000 years or repeatedly within the past 500,000 years. Surficial material at the site was deposited by Lake Bonneville sometime between 10,000 and 25,000 years ago; however, additional material beneath the lake deposits may range in age from 500,000 to 25,000 years old. Dorothy Sack, Quaternary Geologic Map of Skull Valley, Tooele County, Utah, Utah Geological Survey Map 150 (1993).

The Applicant conducted seismic-reflection surveys to detect subsurface geologic structure in deeper bedrock and unconsolidated material directly overlying the bedrock, and seismic-refraction surveys to detect subsurface geologic structure in shallower unconsolidated material. The Applicant detected buried faults in Paleozoic bedrock beneath the site in a seismic reflection survey (SAR Appendix 2B), but concluded that the faults "do not appear to extend into the overlying unconsolidated sediments." SAR at 2.6-36. However, based on a review of the reflector profiles, several of these faults apparently displace a significant reflector above what the Applicant interpreted as the top of the bedrock, and extend upwards into the overlying unconsolidated sediments. Irregular surfaces in layers in seismic-refraction profiles of overlying shallow sediments may support an interpretation of displacement in younger material during more recent times than the Applicant determined.

Of particular concern are faults in the western half of seismic line 2 (SAR Appendix 2B, figure 4.6) which directly underlie the proposed ISFSI area; other faults which may offset unconsolidated sediments are found in seismic line 3 crossing the

proposed easement area. The faults in both areas, if capable, may produce greater vibratory ground motion than that for which the facility is designed. Moreover, the faults beneath the storage area may also pose a threat of surface fault rupture which must be accommodated in facility siting and design.

Regardless of the evidence showing displacement within the last 35,000 years, the Nevada Bureau of Mines recently determined that 64 percent of the surface-rupturing historical earthquakes in the Basin and Range physiographic province, which includes Skull Valley, occurred on faults with no prior evidence of Holocene (within the last 10,000 years) movement. DePolo, C.M., and Slemmons, D.B., 130,000 Year vs. 10,000 Year (Holocene) Classification of "Active" Faults in the Basin and Range Province (abstract), *in* Basin and Range Province Seismic Hazards Summit Program and Abstracts: Reno, Nevada, Western States Seismic Policy Council, 1997, at 28. Many of the earthquakes were on faults that had not experienced prior large earthquakes for up to 130,000 years. The Hickman Knolls Horst block, where the Skull Valley Reservation is located, may include similar faults which may be buried. Thus, the Applicant should extend its evaluation to determine the potential for seismic activity from earthquakes on faults in the site vicinity.

2. **Ground motion.** The site may also be subject to ground motions greater than those anticipated by the Applicant due to spatial variations in ground motion amplitude and duration because of near surface traces of potentially capable faults (the

Stansbury and Cedar Mountain faults). Sommerville, P.G., Smith, N.F., Graves, R.W., and Abrahamson, N.A., Modification of empirical strong ground motion attenuation relations to include the amplitude and duration effects of rupture directivity, in 68 Seismological Research Letters (No. 1) 199 (1997). Failure to adequately assess ground motion places undue risk on the public and the environment and fails to comply with 10 CFR § 72.102(c).

3. **Characterization of subsurface soils.** Perhaps the most significant shortcoming in the license application and SAR is the lack of any rigorous and detailed investigation of subsurface conditions that would be appropriate for any nuclear facility. The level of investigations presented is more typical of very preliminary studies for site screening efforts and not a detailed determination of site suitability for establishing design parameters.

a. **Subsurface investigations.** The location plans for completed subsurface investigations, cross-sections, and profiles showing subsurface soil and rock layering at the site contained in the license application is deficient in that these data could not be compared with the Applicant's boring logs. Structure specific cross sections and profiles were not prepared utilizing the boring log records. Only a generalization of the boring logs were used to establish the site geologic characterization. It is not possible to ascertain whether or not all the data collected, particularly data on zones of soft/loose conditions encountered in the explorations,

have been used to characterize subsurface conditions and to establish design values and that the uncertainties normally associated with the estimation of the thickness and extent of various materials occurring at the site have been conservatively considered in developing the soil and rock layering.

Additionally, SAR section 2.6 defining geologic features is not acceptable because the discussions, geologic maps, profiles of the site stratigraphy, structural geology, geologic history, and engineering geology are not complete and are not supported by investigations sufficiently detailed to obtain an unambiguous representation of the site geology. The maps do not provide the requisite detail to evaluate the assumed geologic conditions stated in the text. For example, only 25 borings were taken across the site, and from this a single generalized geologic profile in an obtuse angle across the canister fuel storage facility is presented. SAR figure 2.6-5. The geologic profile cannot be correlated with surface topography, geologic deposition soil characteristics, or seismic profiling completed for the site. Details missing include the interrelationship of the subsurface conditions with geologic history of the site.

Further, the application does not discuss the geochemical effects of the environment (weather and rain water) on the physical and strength characteristics of the soil and rock at the ISFSI site, particularly if there is potential for geochemical weathering and leaching of soils and rocks at the storage site. Correlations should be

made with previous groundwater conditions which led to the calcareous deposition and probable cementation of the subsoils.

b. **Sampling and analysis.** Site specific investigations and laboratory analyses must show that soil conditions are adequate for the proposed foundation loading. 10 CFR 72.102(d). However, PFS's sampling program is not adequate in quantity (number of samples) and quality (suitable recovery of disturbed and undisturbed samples)²⁰ to ensure that all materials that are critical for geotechnical evaluation of the site have been adequately sampled. For example, only five undisturbed samples were collected, and only five consolidation tests with accompanying physical properties analyses, and two unconsolidated undrained strength tests were made. Unless subsurface conditions are predictably uniform across the site, the number of tests and analyses are inadequate to accurately model the expected behavior of the soil foundation under static and dynamic loading. The prediction of soil foundation performance cannot be predicted adequately with limited data.

²⁰ Soil samples from each predominant soil type within the site stratigraphy should comply with the following criteria: they should contain no visible distortion of strata, or opening or softening of materials; specific recovery ratio (length of sample recovered divided by length of sampler extension) should exceed 95 percent; and they should be taken with a sampler with an area ratio (annular cross-sectional area of sampling tube divided by full area of the outside diameter of samples) less than 15 percent. Naval Facilities Engineering Command Soil Mechanics Volume Design Manual 7.1 at 7.1-73, Dept. of the Navy (May 1982).

The investigations (sampling and analysis) to determine the properties of various materials underlying the site are not sufficient. The scope of investigations should match the design requirements of the facility and complexities of the site. For example, the analysis of soil is not based on the results of dynamic testing of insitu samples either in a stress or strain controlled manner. These data are essential in order to correlate with the field seismic profiling (shear wave determination) for use in the analysis of the seismic response of the buildings and their contents, and to determine the potential for soil collapse.

There are insufficient soil test data presented in the application to determine that strength tests have been performed on undisturbed samples and that there are sufficient relevant test data to support the selection of design parameters. *See e.g., SAR App. 2A, Attach. 2, at 2 and tables immediately following.* For example, the soil test data did not include samples taken from each of the soil strata, did not include each foundation of buildings or structures, did not include the PMF diversion dike foundation, and did not evaluate compacted soils. There is also insufficient data to conclude whether or not soil and rock characteristics derived from the investigations have been completely and conservatively interpreted to develop design parameters. If site building foundations and soil structures have not been investigated and laboratory tests to measure and quantify the soil performance not documented, a decision regarding suitability or applicability cannot be made.

The collected field data must be compared with the soil information found in the literature, and correlated with other data for similar soils when comparing the shear modulus values. The Applicant must obtain representative undisturbed samples of each of the site soils and determine their dynamic properties. The apparent differences in Poisson's ratio as cited in SWECO calculations should be evaluated, not assumed to be an appropriate value, and then used for safety related calculations. See e.g., PFS calculation package, Vol. I, Subdivision 7 at 17A and B (calculation number 01-1).

The license application does not provide a detailed and quantitative discussion of the criteria used to determine if samples were taken in accordance with acceptable test methods and tested in sufficient number to define all the soil and rock parameters needed for characterizing the site and borrow areas in accordance with the general guidance of ASTM Standards. The basis for the selection of samples and the type of test to be made is a function of the structure, anticipated loading, duration of loading (seismic) and the need to modify the soil's physical characteristics. The boring location plan appears to be merely a grid across the site and not structure specific. See, SAR, figure 2.6-2.

The descriptions of the test results for field and laboratory tests are generally insufficient to allow detailed analysis. While the conditions of the testing were explained to be in accordance with accepted testing procedure, any deviations from the

normal procedure recommended in the standard test should be documented. For example, throughout calculation number 04-3, the criteria for the assignment of unit weight of soil, typically used in most all soil analysis (strength, consolidation, and dynamic response) are assumed values without justification of the effects of percent clay or calcareous materials. See PFS calculation package Vol. II, Subdivision 10 (calculation number 04-3). The justification of the values should be provided before their use is permitted in static and dynamic analysis, particularly when determining the dynamic strain response of soils under triaxial testing. Calculation number 04-3 involving bearing capacity reports the foundation soil to consist of compacted structural fill with a unit weight of 125 pounds per cubic foot, while laboratory data calculation 05996.01-G(B)-01 in the Geomatrix (1997B) For Bases For Dynamic Soil Properties (*referred to in* PFS calculation package Vol.II Subdivision 11 at 4 (calculation number 05)), reports a value almost 50% lower (unit weight of 80 pounds per cubic foot).

A major failing in the application is the lack of a detailed discussion of field and laboratory sample preparation for testing, the omission of which prevents independent review and assessment of the quality of data collected. How samples are prepared and tests performed can significantly impact test results and their interpretation, potentially making the test results and interpretations meaningless. Additionally, the tests results may not reflect those conditions to be modeled in the field and therefore either

underestimate or overestimate the response of the foundation system to actual field loading conditions. For strength tests conducted in the laboratory, full details must be given; for example, how saturation of the sample was determined and maintained during testing and how the pore pressures changed. For sites that are underlain by cohesionless soils and sensitive clays that are or may become saturated, particularly at depths greater than 30 feet, the Applicant should show that all zones that could become unstable because of liquefaction or strain-softening phenomena have been sampled and tested to evaluate their ground-failure potential. The Applicant must also show that the static and dynamic engineering properties of the soils, such as unconfined compressive strength, shear strength parameters for strength parameters from cyclic triaxial tests, were properly determined and that reasonable and conservative values were used in the design. This demonstration should explain how the developed data were used in design analyses, how the test data were enveloped for design, and why the design envelope is conservative. A table indicating the values of the parameter used in design should be provided and should be supported by field and laboratory test records.

c. Physical property testing for engineering analysis. The static and dynamic properties of materials needed for geotechnical analyses and design should be determined by performing appropriate laboratory and field tests which are conservative and accepted in practice by the geotechnical engineering profession. This

is especially a complex site from the standpoint of assessing potential earthquakes and resulting ground motion that may affect plant operation. However, it is not possible to ascertain if the Applicant's field and laboratory test data have been conservatively interpreted to determine the design parameters recommended for the various materials at the site. The SAR relies heavily on the published values for static and dynamic strength and the performance of compacted materials, not the physical characteristics of specific site soils. PFS calculation package, Vol. I, Subdivision 7 at 35 (calculation number 01-1). Because of the limited number of tests and generalizations made with respect to the soil profile and use of general uncorroborated published soil data, a reasonable judgment cannot be made regarding the applicability of the averaging conditions as assumptions used in the design calculations. There is too much uncertainty regarding the applicability of published data to the site. For example, The dynamic analyses presented instead use published information from 1970²¹ which is extrapolated to the site without any basis for such extrapolation. The variation of shear modulus determined from testing cited in this reference is based upon a very small strain derived for laboratory compacted loose to medium dense sand materials. This data is not applicable for characterizing dynamic properties of slightly cemented

²¹ Seed and Idress (1970) is referred to in the PFS Calculation Package, Vol. 1, Subdivision 1 at 41 (calculation 05996.01-G(P05)-1 entitled "Development of soil and foundation parameters in support of dynamic soil structure interaction analysis" (Rev O, 3/13/97)).

silts found at the site based on SW-AJA (1972) at 39 of SWECO calculation. Please note the variation in shear modulus is reported on the graph "Range for Sands" while the recommended range of values defined by the curve for use for layer 1 curve is for silts, clays, and clayey silt. The Applicant should explain why the data extrapolated from this curve is appropriate considering the various shear strain levels. In addition, strain controlled dynamic triaxial tests should be conducted to reference one or more strain intervals to support the basis of the curves. See e.g., PFS calculation package, Vol. II Subdivision 9 at 33 (calculation number 03-1).

Also some of the data do not fit together, and it appears data presented from different sources have been combined without assessing their applicability to the site. For example, the void ratio for soils indicate very loose soil conditions yet blow counts from standard penetration test are indicative of dense soils. The void ratio equation which represents the volume of soil voids divided by the volume of solids in the soil is in excess of two. See laboratory data results, PFS calculation package, Vol. II Subdivision 11 at 4 (calculation number 05). This soil structure may be typical of cemented sands, but no data are available to confirm that this is the case. Consolidation tests indicate the value e_0 varies between 1.615 and 2.285. Id.

$$\text{The equation } e_0 = \frac{\text{Volume Voids}}{\text{Volume Solids}} = 2 +$$

based on these consolidation test values indicates that the volume of voids in the soil is more than twice the volume of the solid materials in the soil. The Applicant should verify if this abnormally high void ratio is typical of cemented soils.

Further, the Applicant performed only limited soil engineering tests (*see*, SAR App. 2A, Attachment 2), omitting a number of additional widely accepted index and engineering properties tests, such as unit weights, porosity, compaction, etc., which should be performed for layer 1 and 2 soils. *See*, 4 Annual Book of ASTM Standards § 04.08 (Soil and Rock Dimension Stone), American Society for Testing and Materials Annual Publication (1997). Such additional tests will allow a reviewer to make a reasonable judgment about how the soil will perform under the anticipated static and dynamic loading of the short and long term conditions.

4. Soil stability and foundation loading. Based on its investigations, the SAR apparently did not consider the potential for the presence of collapsible soils beneath the site to be significant. Although collapsible soils have considerable strength when dry, they are subject to hydro-compaction and settle dramatically when wetted. Thus, settlement associated with wetting may result in significant foundation damage.

Collapsible soils typically exhibit a loose, honeycomb structure associated with a low unit weight. Rollins, K.M., and Williams, Tonya, Collapsible Soil Hazard Mapping for Cedar City, Utah, in Proceedings of the 1991 Annual Symposium on Engineering Geology & Geotechnical Engineering, No. 27: Pocatello, Idaho State

University 31-1 (1991). These characteristics are exhibited by three of the five soil samples subjected to consolidation tests by the Applicant; samples C-1/U-3C, C-1/U-3D, and C-2/U-2E. The three samples have void ratios ranging from 1.952 to 2.285, compared to void ratios of 1.615 and 1.625 in the other two samples, and unit weights ranging from 51.7 to 57.5 pounds/cubic foot (pcf), compared to unit weights of 64.7 and 64.9 pcf in the other two samples. SAR Appendix 2A.

Collapsible soils also have intergranular bonds composed of silt, clay, evaporites, or other cementing agents that separate larger grains, forming the loose structure and imparting a high dry strength. The tested samples were alkaline, suggesting a possible evaporitic cement component, and reacted immediately with a dilute solution of hydrochloric acid, probably indicating carbonate cement. SAR Appendix 2A, attachment 2 at 2.

When saturated, the cement in collapsible soils weakens or dissolves and the larger grains collapse into a denser, grain-to-grain soil structure. Therefore, test samples must be saturated during consolidation testing to determine their collapse potential, but only two of the three samples, C-1/U-3D and C-2/U2E, were saturated. The Applicant states that after inundation with distilled water and the application of incremental loads over time, the test data for these two samples "appeared to indicate primary consolidation was not complete" after a considerable test interval. SAR Appendix 2A, attachment 2 at 2.

The low unit weight, high void ratios, alkalinity, reactivity with hydrochloric acid, and incomplete consolidation after a substantial test interval indicate a significant potential for the presence of collapsible soils beneath the site. The Applicant's data do not support its conclusion that "there is no potential for . . . collapse . . . or excessive settlement" of foundation soils. SAR at 2.7-2.

The SAR also concludes "there is no evidence of soluble mineral deposits in unconsolidated materials beneath the site to at least a depth of 100 feet." SAR at 2.6-37; ER at 2.6-19. However, the Applicant presents data that show evidence of alkaline shallow soil samples that reacted immediately with a dilute solution of hydrochloric acid. SAR Appendix 2A, attachment 2 at 2. These data argue for the presence of soluble minerals (evaporites and carbonates) in shallow unconsolidated materials.

Outcrops of white marl, a calcareous, laminated, open-water deposit of Lake Bonneville, were mapped throughout Skull Valley. Dorothy Sack, Quaternary Geologic Map of Skull Valley, Tooele County, Utah, Utah Geological Survey Map 150 (1993). The white marl is typically exposed in ephemeral stream cuts, underlying lake deposits similar to those at the surface of the site. Surficial samples of the marl analyzed by Sack have calcium-carbonate contents ranging from 23.2 to 52.5 percent and are texturally similar (silt) to unconsolidated materials encountered in boreholes drilled by the Applicant. Id. Thus, the Applicant did not consider the presence of

such soluble minerals during the evaluation of adequate soil conditions for the proposed foundation loading as required under 10 CFR § 72.102(d).

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))	September 29, 1998

STATE OF UTAH'S CONTENTIONS RELATING TO
THE LOW RAIL TRANSPORTATION LICENSE AMENDMENT

The Applicant submitted a significant license amendment dated August 28, 1998 to account for a proposed new rail transportation corridor and a proposed change in the location of the Rowley Junction intermodal transfer point ("ITP"). The State received a copy of the Applicant's license amendment on August 31, 1998.

The amendment describes a proposed new rail line which would originate off the Union Pacific mainline at the intersection of Interstate 80 and Low.¹ The new railroad would parallel the south side of Interstate 80 in a southeast direction for approximately 3 miles, turn due south for

¹ Low is located off Interstate 80 approximately 17 miles west of Rowley Junction. See Utah Highway map attached as Attachment 1 to NRC Staff's Response to Request for Hearing and Petition to Intervene Filed by the Confederated Tribes of the Goshute Reservation and David Pete

approximately 26 miles, then turn east for approximately 3 miles where it would terminate at the ISFSI. Environmental Report ("ER") Rev.1 at 2.1-3. The Applicant intends to construct the railroad on public lands and the Applicant has applied to the U.S. Bureau of Land Management ("BLM") for a 200 foot right-of-way to accommodate the proposed 32 mile route. ER Rev. 1 at 2.1-3, 4.4-1.

In the license amendment, the Applicant proposed a change in the location of the Rowley Junction ITP 1.8 miles to the west of the location described in the initial license application. Safety Analysis Report ("SAR"), Rev. 2 at 3.1-3. The ITP would still be located next to the Union Pacific mainline and in close proximity to Interstate 80 and the industrial salt plant. ER Rev 1 at 4.7-5 & 6. The facilities at the ITP remain the same as in the initial license application, *i.e.*, rail sidings off the Union Pacific mainline, a building housing a 150 ton gantry crane and a tractor/trailer yard. SAR Rev. 2 at 4.5-3.

The State has reviewed the license amendment and now files additional contentions based on the amendment. The States also amends the basis for admitted Contention B relating to Rowley Junction.

Contention HH. The Low Rail Corridor and Fire Hazards

CONTENTION: The Applicant's Environmental Report fails to give

adequate consideration to the potential for fire hazards and the impediment to response to wild fires associated with constructing and operating the Applicant's proposed rail line in the Low corridor.

Basis: The ER must consider the environmental effects of the proposed action. 10 CFR § 51.45(c). The ER must also address the regional environmental effects of the proposed action. 10 CFR § 72.10(b). The Applicant's proposed movement of casks by locomotive in the Low rail line corridor presents a new wildfire ignition source. This is a serious matter in an area that is prone to wildfires.

There is a history of wildfires moving south to north through Skull Valley along the eastern side of the Cedar Mountains. *See* Affidavit of David Schen, attached hereto as Exhibit 1. Also fires are often known to cross the Cedar Mountains from the west into the western edge of Skull Valley. *Id.* at ¶ 7. The Applicant's proposed rail corridor will run south along the eastern edge of the Cedar Mountains for a distance of 26 miles from Interstate 80 to the northwestern side of the Skull Valley Reservation. The vegetation in this area is primarily desert shrub and grass land. Vegetation includes native grasses, sage brush and Utah juniper, and introduced species such as June grass (cheat grass) and crested wheat grass. Due to frequent and recurring wild fire and a history of heavy grazing, the primary vegetation is June grass. Fuels in this plant

community dry in early June and ignite very easily. Id. at ¶ 8. There are few, if any, irrigated areas in the vicinity of the rail line that would interrupt a fire caused by the Applicant's use of the rail line. Id. at ¶ 9. Thus, construction, operation and activities associated with the rail line will introduce a new potential fire source into an area that already has a high potential for wildfires. Id. at ¶ 7.

First, various activities that will take place because of the Applicant's rail transportation system will introduce new sources of igniting wildfire. During construction of the rail line, activities such as welding, grinding of rail and the presence of fuel for the operation of machinery will present potential fire hazards. Id. at ¶ 10. Most of these activities will not cease once construction is completed because on-going track maintenance will create similar hazards. Id. When the transportation corridor is in active use, a wildfire could start, for example, from sparks caused by friction or from the train exhaust stack. A fire could also be caused from a hot brake shoe sheering off the locomotive or rail carriage wheels. Id. at ¶ 11.

The ER is woefully deficient in its discussion of fire hazards posed by the new railroad and it does ^{not} discuss, at all, the potential for starting wildfires. There is no mention of the potential for the operation of the rail line to ignite wildfires or how the Applicant will respond if it is responsible for causing a

wildfire. The sum and substance of the Applicant's discussion about wildfires appear to be a statement that to reduce the potential for fires the Applicant's rail corridor will be 40 feet wide and cleared of vegetation and the rail line will be constructed to an elevation that will be close to grade. ER Rev. 1 at 4.4-9. It should be noted that the Applicant must rely on whatever width of right-of-way the BLM will grant it to cross public lands. Given the Applicant's plan to clear 776 acres of vegetation, there is no certainty that BLM will grant the Applicant the width it requests. *See* ER Rev. 1 at 4.4-1. Furthermore, a 40 foot wide corridor may not be sufficient to prevent sparks from being thrown beyond the cleared corridor. The ability of fire fighting equipment to cross the Applicant's rail line is discussed below.

Second, the ER fails to evaluate, or even mention, the increased risk of wildfires caused by an increase of human activity near the railroad. Presently, access to the west side of Skull Valley is poor but the railroad will be accompanied by more developed access. Usually, rail lines have an access road alongside to facilitate maintenance. In addition, improved points of access to the west side of Skull Valley may be developed during construction of the rail line. Thus, the improved access to the west side of Skull Valley may result in an increase in the occurrence of human caused fires. *Schen Affidavit at ¶ 12.*

Third, the Applicant's proposed rail line will create an impediment to

fighting wild fires. As mentioned above, current access to the west side of Skull Valley is poor. Id. at ¶ 13. Typically in this area responders use four-wheel drive vehicles and drive cross country to fight wild land fires. Hand crews may also be used but generally, heavy equipment is not used because of the damage it may cause to the fragile ecosystem. The four-wheel drive vehicles carry a water tank containing 200-300 gallons of water. The vehicles will have difficulty directly crossing the rail line. Even if the rail line is constructed close to existing grade, fire fighting vehicles will be unable to climb up the vertical grade and profile of the rail, especially given the gross weight of the vehicle and water tank and also because the vehicle will be unable to get any traction from the ballasted rail bed. Id. Thus, the rail line will cause response vehicles to detour to a constructed rail crossing instead of being able to follow a fire cross country. This is likely to significantly delay wildfire responses, thus increasing the risk that wildfires will spread.

In addition, responders to fires will be put at increased risk because of the potential for collisions with trains in the dense smoke of a range fire. Id. at ¶ 14. Furthermore, the presence of hazardous material such as spent nuclear fuel may further endanger responders as well as impede their fire fighting activities around such hazardous material because firefighters will be reluctant to pursue a wildfire in the vicinity of a train load of spent nuclear fuel casks. If

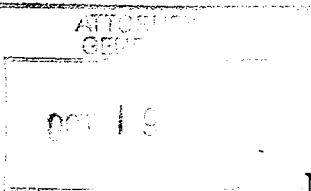
firefighters are aware that high level nuclear waste is within the perimeter of the fire they will err on the side of caution and personal safety and back off until the subject area specialist ascertains that the hazardous cargo is contained and fire fighter safety guaranteed. Id. at ¶ 15. This will be likely be the case whether or not the spent nuclear fuel in the transportation cask will be at risk if it is engulfed by a wildfire. Id. The ER fails to address these additional risks.

To be complete, the Environmental Report must address how activities in the Low rail corridor may cause the potential to ignite wildfires, what mitigation measures the Applicant intends to take, and how the presence of high level nuclear waste affects fire fighting efforts. The ER must also analyze how the 26 mile north-south rail line may impede fire fighting activities.

Contention II. Costs and effects associated with the Low Rail Corridor

Contention: The Low Corridor License Amendment does not comply with 10 CFR § 72.100(b) or NEPA, including 10 CFR § 51.45(c), and 40 CFR § 1508.25 because it fails to evaluate, quantify and analyze the costs and cumulative impacts associated with constructing and operating the rail line on the regional environment.

Basis: NRC regulations require Applicant to define the potential effects of the ISFSI on the region. In particular, 10 CFR § 72.100(b) requires an evaluation of "the effects on the regional environment resulting from



October 14, 1998

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

PRIVATE FUEL STORAGE, LLC

(Independent Spent
Fuel Storage Installation)

)
)
)
)
)
)

Docket No. 72-22-ISFSI

NRC STAFF'S RESPONSE TO STATE OF UTAH'S
CONTENTIONS RELATING TO THE LOW RAIL
TRANSPORTATION LICENSE AMENDMENT

INTRODUCTION

Pursuant to the Atomic Safety and Licensing Board's "Order (Schedules for Contentions Responses and Discovery Status Report)," dated October 1, 1998 (Order), and 10 C.F.R. § 2.714(c), the staff of the Nuclear Regulatory Commission ("Staff") hereby files its response to the "State of Utah's Contentions Relating to the Low Rail Transportation License Amendment" ("Low Rail Contentions"), filed September 29, 1998. For the reasons set forth below, the State's Low Rail Contentions should be admitted in part, and rejected in part, in the manner and to the extent set forth below.

BACKGROUND

In its "Memorandum and Order (Ruling on Motions to Suspend Proceeding and for Extension of Time to File Contentions)" ("Extension Order"), dated October 17, 1997, the Licensing Board ordered that contentions be filed by November 24, 1997. On or about November 24, 1997, contentions were filed by the State and other petitioners for leave to

intervene in this proceeding. Thereafter, the State filed three late-filed contentions: Utah EE, which was dismissed as untimely; Utah FF, which was withdrawn; and Utah GG, which was admitted in part and denied in part. See *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 206-211 (1998).

On August 28, 1998, the Applicant submitted a license application revision that, among other things, proposed a new rail spur corridor as well as a new location for the Intermodal Transfer Point.¹ On September 28, 1998, the State of Utah filed its Low Rail Contentions.² By Order dated October 1, 1998, the Board directed other parties to respond to the State's Low Rail Contentions on or before October 14, 1998.

DISCUSSION

A. Legal Standards for Late-Filed Contentions.

The criteria to be considered when determining the admissibility of a late-filed contention are set forth in 10 C.F.R. § 2.714(a)(1)(i)-(v). *Sacramento Municipal Utility Dist.* (Rancho Seco Nuclear Generating Station), CLI-93-12, 37 NRC 355, 363 (1993). The five factors are:

- (i) Good cause, if any, for failure to file on time.
- (ii) The availability of other means whereby the petitioner's interest will be protected.

¹ Letter to Director, Office of Nuclear Material Safety and Safeguards, NRC, from John D. Parkyn, Chairman, PFS, dated August 28, 1998.

² On September 28, 1998, the State filed "State of Utah's Motion for Leave to Exceed the Ten Page Limitation for the State's Contentions Relating to the Low Rail Transportation License Amendment." The Board permitted the State to have up to twenty pages for its contentions and accorded the same page extension for responses thereto. See Order (Granting Motion to Exceed Page Limit), dated September 29, 1998.

(iii) The extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record.

(iv) The extent to which the petitioner's interest will be represented by existing parties.

(v) The extent to which the petitioner's participation will broaden the issues or delay the proceeding.

10 C.F.R. § 2.714(a)(1). Although the regulations call for a balancing of these factors, it has long been held that where a petitioner fails to show good cause for filing its contention late, the other four factors must weigh heavily in its favor in order for its late contentions to be admitted (or for its late petition to be granted). *See, e.g., Virginia Elec. Power Co.* (North Anna Station, Units 1 and 2), ALAB-289, 2 NRC 395, 398 (1975); *Public Serv. Co. of New Hampshire* (Seabrook Station, Units 1 and 2), LBP-90-1, 31 NRC 19, 34 (1990), *aff'd on other grounds*, ALAB-938, 32 NRC 75 (1990); *Commonwealth Edison Co.* (Braidwood Nuclear Power Station, Units 1 and 2), LBP-85-11, 21 NRC 609, 629 (1985). In addition to the showing that a balancing of the five factors favors intervention, a petitioner must also meet the requirements for setting forth a valid contention. 10 C.F.R. § 2.714(d)(2).

B. The State Has Failed to Establish Good Cause
For the Late Filing of Contention HH.³

In its Extension Order, the Licensing Board established November 24, 1997, as the due date for filing contentions. Therefore, any contentions submitted after this date -- such as the State's Low Rail Contentions, submitted on September 28, 1998 -- are deemed to be late filed.

³ For the reasons set forth in the following discussion, portions of Contention II that are based on Contention HH should also be deemed to have failed to satisfy the standards for late-filed contentions. *See* Low Rail Contentions at 9 ¶ 1 (increased risk of fire).

The State contends that it has good cause for the late filing of these contentions because it did not receive the Applicant's license application revision until August 31, 1998. Low Rail Contentions at 19-20. The State further asserts that following its receipt of the revision to the application, it has worked with State agencies and experts in reviewing the information and framing contentions and, at the same time, has been engaging in informal discovery associated with this proceeding. *Id.* at 20. For these reasons, the State asserts that it is reasonable for it to submit these contentions within thirty days of its receipt of the revision to the application. *Id.*

Notwithstanding these assertions, the Staff submits that the State's filing of Contention HH is untimely, in that the State has not identified any information contained in the revision to the application that it needed in order to formulate Contention HH. This contention pertains to the potential for fire hazards and the alleged impediment to firefighting associated with the rail spur transportation option. This is not new information, however. The original application alerted parties that the Applicant may construct a new railroad spur to connect the ISFSI to the Union Pacific railroad mainline. *See* Environmental Report (ER) § 4.4 (original application). While the change made by the revision to the application provides new information relative to the location of the rail spur, it does not raise any issue that does not appear to apply as well to the rail spur alternative contained in the original application. *Compare* original ER § 4.4 (indicating that a rail spur is to be installed "parallel to the existing Skull Valley Road" and "adjacent" thereto, with a feasibility study to be performed to determine "on which side of [the] Road the track will be located"), *with* revised ER § 4.4 (indicating that the rail spur is to be installed "from the mainline on the south side of Interstate 80 at Low" to the ISFSI). While the revised application describes a new location for the rail spur, that location does not differ materially from the original

proposal, in that both locations are in Skull Valley and thus share the same fire hazard siting characteristics. Inasmuch as the State has been aware of the Applicant's proposed option to construct a rail spur in Skull Valley since its receipt of the original application, well before the November 24, 1997 date for filing contentions, good cause has not been shown for the late filing of this contention.

This conclusion is buttressed by an examination of the affidavit of David C. Schen, submitted by the State in support of Contention HH.⁴ In his affidavit, Mr. Schen describes the pertinent vegetation and irrigation characteristics of Skull Valley in general, rather than any characteristics that are unique to the revised rail spur location. *See* Schen Affidavit at ¶¶ 8 and 9. While Mr. Schen points out that some areas near Skull Valley Road (*i.e.*, close to the rail spur's original proposed location) are irrigated, he states that even the irrigated areas are "not sufficient to interrupt a wildfire occurring in Skull Valley." *Id.* at ¶ 9. Thus, this issue applies as well to the original application. Likewise, Mr. Schen discusses potential fire hazards associated with the construction and maintenance of the rail spur, without particularizing any hazards that are unique to the western location of the rail spur within Skull Valley. *See id.* at ¶¶ 10-11. While Mr. Schen articulates two firefighting concerns that relate to the rail spur option (potential for collisions between firefighting vehicles and trains, and a potential fear of nuclear material), *Id.* at ¶¶ 14-15, these allegations would apply equally (if at all) to any site, and are not unique to the new rail spur location. Similarly, Mr. Schen's concerns with respect to the potential for increased occurrence

⁴ *See* "Affidavit of David C. Schen," Ecosystem Management Coordinator, Division of Forestry, Fire, and State Lands, Utah Department of Natural Resources, dated September 29, 1998 ("Schen Affidavit").

of human-caused fires in the west side of Skull Valley, and potential vehicle access difficulties there (*Id.* at ¶¶ 7, 12, and 13), would also appear to apply to the original rail spur location. In this regard, the Skull Valley Road provides easy access for humans, raising the risk of human-induced fires adjacent to the road; and Mr. Schen's statement that "responders typically use four-wheel drive vehicles and drive cross country to fight wild land fires" in the west side of Skull Valley (*Id.* at ¶ 13), does not suggest that such vehicles would not be used, as well, to respond to wild fires occurring elsewhere in Skull Valley (such as near Skull Valley Road), to prevent such fires from spreading to other areas.

The State has been aware of specific information provided by Mr. Schen pertaining to the danger of wildfires in Skull Valley at least since the Spring of 1997. Indeed, the State even filed such information in this proceeding a year ago, prior to filing its initial set of contentions.⁵ Nonetheless, the State has not raised a fire-related contention concerning the construction of a rail spur until now. Inasmuch as these matters could have been raised with respect to the rail spur location described in the original application, the Staff submits that good cause has not been shown for the late filing of this contention now.

With respect to the four other factors specified in 10 C.F.R. § 2.714(a)(1), the Staff believes that those factors weigh against the admission of Contention HH. Regarding factors two and four, other means do not appear to be available to protect the State's interest with respect to the issues raised in Contention HH; and the State's interest may not be represented by existing

⁵ See Memorandum from Dave Schen, Forestry, Fire & State Lands to Jamie Dalton, Energy & Resource Planning, dated May 27, 1997, attached to Exhibit 2 to "State of Utah's Motion to Suspend Licensing Proceedings . . .," dated October 1, 1997.

parties with respect to these issues. Factors two and four, however, carry less weight than the three other factors specified in the regulation. See *Commonwealth Edison Co.* (Braidwood Nuclear Power Station, Units 1 and 2), CLI-86-8, 23 NRC 241, 245 (1986); *Private Fuel Storage*, LBP-98-7, 47 NRC at 208.

With respect to factor three, whether the State's participation may be expected to assist in developing a sound record, the State has merely identified the affiant who supported its contention and has referenced unnamed "experts from State agencies." Low Rail Contentions at 20. Without further identification of these experts, or a summary of what they would say in support of this contention, this factor must be viewed as weighing against the contention's admission. See *Braidwood*, CLI-86-8, 23 NRC at 246; *Private Fuel Storage*, LBP-98-7, 47 NRC at 208-09.

With respect to the fifth factor, the admission of this contention will broaden the issues and will commensurately delay the proceeding. Contention HH raises certain matters that have not been previously alleged.⁶ Informal discovery is now in progress, formal discovery is scheduled to commence in about two months, and hearings are scheduled to commence in 10 months. The admission of this contention now will likely require some adjustment of the hearing schedule, will broaden the issues to be heard, and will cause delay in the completion of hearings. Accordingly, this factor weighs against the admission of this contention.

⁶ The State asserts that Contention HH is similar to the fire issues admitted in Contention R. However, the fire issues admitted in Contention R pertain to on-site water availability and equipment maintenance for the purpose of extinguishing a fire at the ISFSI itself, whereas Contention HH pertains to wildfire concerns in the Low rail corridor. Further, Contention R relates to Emergency Plan deficiencies, whereas Contention HH pertains to alleged deficiencies in the Environmental Report. Admission of Contention HH, therefore, would involve issues different from those already admitted and would broaden the scope of the proceeding.

In sum, the Staff submits that the State has failed to establish good cause for the late filing of Contention HH, given the State's awareness that a rail spur in Skull Valley had been proposed in the original application and the fact that its concerns regarding the fire hazards associated with construction and operation of a rail spur could have been raised a year ago (*i.e.*, by November 24, 1997). Further, the Staff submits that the State's lack of good cause for filing this contention late has not been overcome by a balancing of the factors specified in 10 C.F.R. § 2.714(a)(1). For these reasons, Contention HH should be rejected.

C. **Contentions HH and II Generally Fail to Satisfy the
Requirements Governing the Admissibility of Contentions.**

In the following discussion, the Staff addresses the admissibility of Utah Contentions HH and II, apart from the factors governing late-filed contentions discussed above. For the reasons set forth below, the Staff submits that, except in certain limited respects, these contentions fail to satisfy the Commission's requirements governing the admissibility of contentions.

Utah Contention HH. The Low Rail Corridor and Fire Hazards

The Applicant's Environmental Report fails to give adequate consideration to the potential for fire hazards and the impediment to response to wild fires associated with constructing and operating the Applicant's proposed rail line in the Low corridor.

Staff Response:

Contention HH is comprised of three overall assertions: (1) various activities associated with the construction and operation of the new rail spur will introduce a new source of igniting wildfires; (2) the increase in human activity near the railroad may increase the risk of wildfires; and (3) the rail spur will impede firefighting activities. The Staff opposes the admission of these assertions, except in certain limited respects, as failing to meet the standards of 10 C.F.R.

§ 2.714(b), in that they are not supported by the requisite facts or expert opinion and/or do not show that a genuine dispute exists with the Applicant on a material issue of fact, and/or do not refer to any allegedly deficient portion of the application. *See* 10 C.F.R. § 2.714(b)(ii) and (iii).

As recognized by the State (Low Rail Contentions at 5), the Applicant's ER contains the following provision concerning the increased risk of fire posed by the rail spur:

To reduce the potential for increased range fires that may be caused by rail transport, the 40 ft wide rail corridor will be cleared of vegetation to provide a buffer zone in preventing fires.

ER Rev. 1 § 4.4.8. Notwithstanding the State's recognition of this provision concerning the creation of a fire buffer zone, the State fails to indicate any reason to believe that the buffer zone is inadequate to eliminate or substantially reduce the potential for fires. At best, the State discounts the Applicant's discussion based on its wholly speculative assertion that the Bureau of Land Management may not grant the Applicant the width of right-of-way it requests, and that the 40 foot wide corridor "may not be sufficient to prevent sparks from being thrown beyond the cleared corridor." Low Rail Contention at 5. Significantly, these assertions are absolutely unsupported by any facts or expert opinion, and do not sufficiently show with specificity that a genuine dispute of material fact exists with the Applicant. Indeed, Mr. Schen's affidavit, while describing the potential for a train to generate sparks, nowhere addresses the Applicant's description of the 40 foot buffer zone proposed to prevent fires, and fails to provide any indication that he is aware of that buffer zone or considers it to be inadequate. Similarly, the State's concern with respect to the fire hazards posed by construction activities such as rail welding and grinding (Low Rail Contentions at 4; Schen Affidavit at ¶ 10), provides no facts or expert opinion to challenge the adequacy of the 40-foot wide fire buffer zone -- which is to be established by the

Applicant prior to rail construction activities. See Revised ER § 3.2.1.5. Accordingly, these portions of Contention HH, pertaining to the potential introduction of a new source of wildfire ignition the construction and use of the Low rail spur, should not be admitted. See *Private Fuel Storage*, LBP-98-7, 47 NRC at 178.

The State's second issue, concerning the potential for human activity near the railroad to increase the risk of wildfires, should also be rejected. In support of this issue, the State cites Mr. Schen's Affidavit at 12 (see Contention HH at 5). However, no facts or expert opinion are provided in the Schen affidavit to support this concern -- and at best, the State appears to rest this concern upon the unsupported speculation that increased human use of the area "may" result following construction of the rail spur. *Id.* Such a speculative concern is insufficient to support a contention under 10 C.F.R. § 2.714(b). *Private Fuel Storage*, LBP-98-7, 47 NRC at 180-81.

The State's third issue, the potential for the rail spur to impede firefighting activities due to the inability of four-wheel drive vehicles to cross such a spur even if it is built "close to existing grade" is supported by statements contained in Mr. Schen's affidavit (at ¶ 13). Although no supporting documentation or specific facts are provided in support of this assertion, Mr. Schen's affidavit appears to afford sufficient support for this concern, given his experience and apparent expertise in forest fire management. Accordingly, the Staff does not oppose the admission of this aspect of Contention HH.⁷

⁷ Notwithstanding this conclusion, the Staff notes that this concern would appear to apply, as well, to the rail spur proposed in the original application, thus rendering this a late-filed issue. See discussion *supra*, at 6.

In its third basis statement, the State also alleges that fire fighters may hesitate to respond to a fire near spent nuclear fuel, and that "the presence of hazardous material such as spent nuclear fuel may further endanger responders." Low Rail Contentions at 7. These statements are not supported by any showing of credible fact or expert opinion, and do not provide an adequate basis for the admission of this issue. The only support for these assertions is the unsupported personal opinion of Mr. Schen, who states as follows:

In my opinion, if fire fighters were aware that high level nuclear waste was within the perimeter of the fire, they would err on the side of caution and personal safety. Firefighters will be reluctant to pursue a wildfire in the vicinity of a train load of spent nuclear fuel casks. They may very likely back off until a subject area specialist ascertained that the hazardous cargo was contained and fire fighter safety was guaranteed.

Schen Affidavit at ¶ 15. No showing has been made that Mr. Schen has any expertise in fire management involving hazardous cargos generally, or nuclear materials in particular, or that he is aware of any facts to support this assertion; further, his opinion conflicts with the Commission's generic determination, in its emergency preparedness regulations, that offsite authorities and organizations may be relied upon in the event of an emergency involving nuclear materials. *See* 10 C.F.R. § 72.32; *see generally*, 10 C.F.R. § 50.47. Mr. Schen's inclusion of this unsupported personal opinion in his affidavit does not afford it any more weight than it would otherwise be entitled to receive; and it fails to satisfy the requirements of 10 C.F.R. § 2.714(b)(ii) and (iii). Accordingly, this issue should be rejected.

In sum, the Staff does not oppose the admission of the State's concern regarding the potential inability of four-wheel drive vehicles to cross the Low rail spur; in all other respects, however, the issues raised in this contention should be rejected.



State of Utah

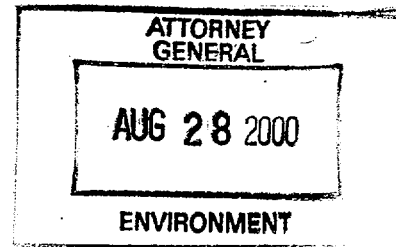
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF RADIATION CONTROL

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

William J. Sinclair
Director

168 North 1950 West
P.O. Box 144850
Salt Lake City, Utah 84114-4850
(801) 536-4250
(801) 533-4097 Fax
(801) 536-4414 T.D.D.
www.deq.state.ut.us Web



August 23, 2000

Attention: Rulemakings and Adjudications Staff
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

To Whom It May Concern:

Please find attached the State of Utah's comments on a proposed rule by the Nuclear Regulatory Commission ("NRC") to amend 10 CFR Part 72 and allow storage of Greater Than Class C ("GTCC") waste at an independent spent fuel storage installation ("ISFSI") or at a monitored retrievable storage installation. If you have any questions, please do not hesitate to contact me.

Sincerely,

William J. Sinclair, Director

cc: Dianne R. Nielson, Ph.D., Executive Director, UDEQ
Denise Chancellor, Utah Attorney General's Office

**COMMENTS BY THE STATE OF UTAH ON
“INTERIM” STORAGE OF GREATER THAN CLASS C WASTE**

The State of Utah submits the following comments in response to a proposed rule by the Nuclear Regulatory Commission (“NRC”) to amend 10 CFR Part 72 and allow storage of Greater Than Class C (“GTCC”) waste at an independent spent fuel storage installation (“ISFSI”) or at a monitored retrievable storage installation. *See* 65 Fed. Reg. 37,712 (June 16, 2000).

SUMMARY OF COMMENTS

The State of Utah is greatly concerned that NRC will allow the storage of GTCC waste at away-from-reactor ISFSIs, including at a centralized spent fuel storage site such as the one being proposed in Utah by Private Fuel Storage, LLC (“PFS”). There is the potential that most of the nation’s spent nuclear fuel (“SNF”) and GTCC waste could be shipped to Utah and that, once here, it will never leave the State. There are absolutely no plans for the long term disposal of GTCC waste. If the NRC intends to allow storage of GTCC waste at an ISFSI, as a matter of national policy, NRC must restrict storage to at-reactor ISFSIs and not allow GTCC waste to be shipped across the country unless and until decisive plans have been made for the permanent disposition of GTCC waste.

BACKGROUND

The NRC has established near surface burial requirements for Class A, B and C wastes under 10 CFR Part 61. Of the three classes of waste, Class C wastes have the highest level of radioactivity. The concentration limits for Class C wastes are described in 10 CFR 61.55, Tables 1 and 2. Wastes with concentrations above Class C wastes are not suitable for near surface disposal. 10 CFR § 61.55(a)(2)(iv). Part 61 requires that Greater Than Class C waste must be

disposed of in a geologic repository “unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.” Id.

Currently, Greater Than Class C waste is being stored under Part 50 licenses, either within the reactor vessel or in a radioactive material storage area. Authority to allow a Part 50 licensee to store such waste generated at a reactor site is authorized under Parts 30 and 70 and is included as part of a Part 50 license. When a Part 50 license terminates, so too does its Parts 30 and 70 authority to store Greater Than Class C waste. The licensee must then apply to the NRC or Agreement State for a specific license under Parts 30 and 70. In addition, a Part 72 general license, allowing the storage of SNF at the reactor site, would also terminate along with the Part 50 license.

NRC’s proposal is to allow a Part 50 licensee, upon termination of its Part 50 license, to store Greater Than Class C waste under a Part 72 license. To accomplish this, NRC proposes to add the term “GTCC waste” to various sections and paragraphs in Part 72 and thus allow Greater Than Class C wastes to be licensed under Part 72. NRC will also take jurisdiction from Agreement States to issue licenses under Parts 30 and 70 for the storage of GTCC waste after a Part 50 license has terminated.

SPECIFIC COMMENTS

1. The Proposed Rule Is Premature.

In general, there are two categories of GTCC waste: (a) activated metals (irradiated metal components from the nuclear reactor core) and (b) process wastes. The U.S. Department of Energy ("DOE") is responsible for disposing of GTCC waste under PL 99-240. DOE currently anticipates that nuclear utilities store GTCC waste "at the generator site, where it will remain until a disposal option becomes available." *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, DOE/EIS-0250/D (July 1999) ["Yucca DEIS"] at A-56. The DOE has admitted "[t]he final disposition method of Greater-Than-Class-C waste is not known." Yucca DEIS at A-57. Furthermore, in the Federal Register notice the NRC recognizes "[t]here currently are no routine disposal options for GTCC waste." 65 Fed. Reg. at 37714.

NRC's proposed rulemaking has not fully matured. The proposed rule contains no separate design criteria for GTCC waste storage containers. NRC merely expects the safe storage of GTCC waste to be governed by the Parts 20 and 72. 65 Fed. Reg. at 37714. Furthermore, the NRC expects the applicant to ensure that the co-location of GTCC waste does not have an adverse affect on the safe storage of SNF and the operation of the ISFSI. *Id.* Rather than solicit comments on an explicit proposal, the NRC is seeking a way to make it financially more attractive for utilities to store GTCC waste after decommissioning their nuclear plants. NRC also appears to have initiated rulemaking, in part, to solicit information from DOE on its GTCC disposal policies. *Id.*

NRC will allow commingling of specific components of GTCC waste associated with

and integral to spent fuel (such as reactor core components) to be stored in the same cask with spent fuel. The rule as proposed, however, solicits public input on whether certain GTCC waste should be prohibited from storage at an ISFSI; be stored separately from SNF; be commingled in the same cask as SNF; and whether storage may be permitted if performance criteria can be established. Thus, the scope of the proposed rule is still in the nascent stages as there are significant decisions relating to technical, safety, and performance criteria yet to be made by the Commission. Accordingly, the State objects to this rulemaking as not being within the spirit or the letter of the Administrative Procedures Act notice and comment rulemaking.

2. NRC Should Not Usurp Agreement State Jurisdiction

Currently, NRC has jurisdiction of GTCC waste at nuclear reactors licensed under Part 50. After termination of a Part 50 license, an Agreement State has authority to issue specific licenses under Part 70 for the storage of GTCC waste. If NRC allows GTCC waste to be stored under a Part 72 license, then NRC argues that the same type of waste may be regulated in some instances by the State and in others by the NRC. The NRC also argues that neither Part 30 nor Part 70 include explicit criteria for storage of GTCC waste.¹ 65 Fed. Reg. at 37715. Thus, the NRC intends to circumvent the State's jurisdiction by regulating GTCC waste under Parts 30 and 70, as well as under Part 72.

There are other areas in which jurisdiction over Atomic Energy Act materials may be either State or Federal. As in the case of Utah, the State is not an Agreement State for 11e(2)

¹ This is rather a disingenuous argument by NRC because it is soliciting comments from stakeholders under the proposed Part 72 rule on whether performance criteria can be established to co-locate and commingle GTCC waste with SNF.

materials, in which case the NRC regulates 11e(2) materials. But should Utah become an Agreement State, then regulation will shift to the State.

In the case of an active Part 50 license, it is not unreasonable that NRC retains jurisdiction over GTCC waste because of the pervasive federal regulation of the facility. A different scenario exists, however, once a plant has decommissioned. NRC then plays a diminished regulatory role and the oversight of the facility and regulatory presence at the site is more likely to fall to the State. There may be cases in which SNF has been shipped off-site and only GTCC or low level radioactive waste remains on site. In such instances, an Agreement State may have a greater regulatory rôle at the site than the NRC. Thus, reactor generated GTCC waste would not be "surrounded on all sides by Federal regulatory authority and responsibility" as NRC has claimed. 65 Fed. Reg. at 37,716. The one area in which the State agrees that Agreement States do not have jurisdiction is the NRC's licensing of casks in which GTCC waste may be stored.

3. No Away-from-reactor Storage of GTCC Waste

The supposed impetus for the proposed rule was to avoid overlapping State-federal jurisdiction and a specific rulemaking petition to store GTCC waste at an on-site ISFSI.² The NRC, however, has greatly expanded on this concept. Under the proposed amendment to Part 72, the NRC will allow storage of GTCC waste irrespective of the physical location of the ISFSI.

The State of Utah adamantly opposes away-from-reactor storage of GTCC waste for several reasons. First and foremost, the DOE has no plans for the permanent disposal of GTCC

² The rulemaking petition is now moot because the licensee no longer needs to store GTCC waste on site. 65 Fed. Reg. 37,712, n.2.

waste. Yucca DEIS at A-57. Second, DOE anticipates that nuclear utilities will store GTCC waste “at the generator site, where it will remain until a disposal option becomes available.” Yucca DEIS at A-56. Third, NRC gives short shrift to the potential volume of GTCC waste, merely comparing the relative volume of GTCC waste with the large volume of SNF generated by a nuclear power plant. Such a comparison does not address whether the highly radioactive GTCC waste should be permitted to be shipped away from the reactor site.³ Fourth, NRC is silent on the transportation of GTCC waste. There is no discussion about the type of containers suitable for transportation of the waste or the exposure level and the population at risk from transportation of the waste. Finally, the NRC is also mute on the disposition of the waste at the end of a Part 72 ISFSI license.

4. Need for a Programmatic or Generic EIS

The Commission has decided that the final rule, if enacted, will not be “major federal action” under the National Environmental Policy Act (NEPA) or require an environmental impact statement (“EIS”) under 10 CFR Part 51. 65 Fed. Reg. at 37717. The Commission has thus issued a “Finding of No Significant Impact.” Id.

NEPA requires an EIS for major federal action significantly affecting the quality of the human environment. Moreover, 10 CFR § 51.20(a)(9) requires an EIS to be prepared for the issuance of an away-from-reactor ISFSI license. The Commission also has discretion under § 51.20 to determine that a proposed action will be covered by an EIS. 10 CFR § 51.20(a)(2).

NRC views its proposed rule as another licensing option available upon termination of a

³ The total nuclide radioactivity GTCC waste from commercial light-water reactors, projected by DOE to 2055, is 8.8×10^7 curries. Yucca DEIS at Table A-52.

Part 50 license. Rather than merely an additional licensing option, however, the proposed rule has the potential for causing the relocation of GTCC waste away from a reactor site. In particular, the Private Fuel Storage, LLC centralized ISFSI on the Skull Valley Goshute Indian reservation in Utah could become the prime location for this waste. To the extent that NRC will allow away-from-reactor storage of GTCC waste, it is a significant departure from the current regulatory scheme. As such, the new rule would permit the mass movement across country of GTCC waste. In this respect, the NRC cannot rely on its "waste confidence rule" because the waste confidence rule only relates to SNF. Moreover, the DOE has openly stated it has no plans on how or when it will dispose of GTCC waste. Therefore, the policy decision on the disposition of GTCC waste is in the hands of the DOE and not the NRC. But NRC's licensing action will have a significant affect on the quality of the human environment if GTCC waste is removed off-site without any hint of how it will be disposed of permanently. The NRC simply does not address the final disposition of GTCC waste. In fact, the NRC decommissioning rule under Part 72 only requires a Part 72 applicant to propose and fund a decommissioning plan after removal of GTCC waste. See proposed 10 CFR § 72.30(a), 65 Fed. Reg. at 37720. This may never occur.

No EIS has ever been prepared on the transportation of GTCC waste. Table S-4 (WASH-1238), NUREG-170 and more recent technical reports, such as the Modal Study, are silent on this issue. GTCC waste may be long-lived and can contain millions of curies of radioactivity. For example, niobium-94 is a strong gamma emitter and has a half-life of 20,000 years. In particular, an EIS must be done for the transportation of GTCC resins and evaluation of the hazard of an accident involving a long-duration fire.

RADTRAN is a computer model developed by Sandia National Laboratories to estimate population risks and the financial impact of accidents from the transportation of radioactive materials. The NRC cannot rely on RADTRAN for the shipments of GTCC waste because GTCC shipments containing ion exchange resins are primarily composed of radioactivity, water and plastic. RADTRAN does not address such resins.

Furthermore, NRC cannot rely on an EIS conducted for a site specific away-from-reactor ISFSI. The PFS draft EIS, for example, does not mention GTCC waste. Moreover, PFS's application, at the moment, is only for storage of SNF – not GTCC waste. However, under NRC's proposed rule change it would not be difficult for PFS to amend its license to allow it to store GTCC waste. Such a potential at the PFS site, or any other away-from-reactor ISFSI site, demands that NRC conduct a generic or programmatic EIS to analyze all issues implicated by away-from-reactor storage of GTCC waste.

5. Technical Issues

The State is particularly concerned about the commingling or shipment of GTCC waste that contain resins. In decontaminating a reactor, by flushing out pipes before dismantling the reactor, GTCC waste may be created in reactor resins which decontaminate the flushed reagents. "Dewatered" resins are about 50% water, but have little free standing water. Resins would contain cobalt-60, Mn-54, Fe-55, Cs-137 and longer-lived materials, such as Ni-59, Ni-63, niobium-94 and transuranics, such as Pu and Am-241. Thus, reactor resins and reactor internals contain alpha, beta and gamma emitting radionuclides. Unlike the shipment of solid reactor internals; the hazard in transporting reactor resins which are primarily composed of radioactivity, water and plastic, pose a much different transportation risk – a risk that has not been analyzed by

the NRC and a risk for which performance criteria cannot act as a substitute.

The basic problem for ion exchange resins is that the resins are essentially plastic and water, in comparison to a high-level waste shipment which is solid. In a severe accident involving a fire, water in the ion exchange resins would quickly evaporate and the plastic would melt, then burn. Therefore, the dynamics of a GTCC accident involving a fire are inherently different than for a high-level waste shipment accident and, thus, RADTRAN cannot be adapted to these shipments.

In addition to the dynamics of how an accident unfolds, the dose pathways assumed in RADTRAN do not encompass all possible pathways. RADTRAN estimates a dose due to inhalation, groundshine (gamma rays from material deposited downwind on the ground), resuspension, cloudshine and ingestion. But, in addition, an accident involving ion exchange resins requires consideration of dispersal on the ground of molten radioactive plastic, which yields a direct gamma radiation dose to emergency personnel and the public at the accident scene. Further, burning plastic produces toxic chemical fumes containing dioxins and furans, which are chemical carcinogens. Low doses of dioxin are dangerous and the effects of chemical and radiation exposure are synergistic. See US Environmental Protection Agency, Integrated Risk Information System (IRIS).

The commingling of GTCC reactor resins and irradiated fuel poses unresolved safety issues. Alpha-emitting materials from irradiated fuel can hydrolize water, creating hydrogen gas. Further, the high heat in storage canisters can evaporate water in reactor resins and build up pressure within a canister. These issues have not been investigated by the NRC. The State opposes any mixture of gas-generating materials within a storage canister. Furthermore, the

State questions the safety of merely developing performance criteria to allow the co-location and commingling of GTCC waste with SNF instead of an in-depth technical analysis of the ramification of such a proposal.

6. Insurance and Liability

If GTCC may be stored at away-from reactor ISFSIs, and if a Part 50 license no longer exists, then there is a serious void in insurance coverage. Such waste would no longer be covered under the nuclear insurance umbrella for the nuclear facility. Furthermore, the Price Anderson Act would not cover transportation incidents because the material is not classified as high level nuclear waste. Moreover, there is nothing in Part 72 that requires an ISFSI licensee to carry on-site property insurance. Thus, accidents or releases involving GTCC waste would probably not be covered by insurance.

In addition to a void in insurance coverage, there may also be difficulty in assigning liability for accidents and releases of GTCC waste. If stored at a centralized ISFSI with waste owned by others, it may be difficult to ascertain who is responsible for a release or accident. Moreover, upon termination of a Part 50 license and decommissioning of a reactor site, there may no longer be a "deep-pocket" utility who will "own" the GTCC waste. The whole liability scheme and waste ownership has not been thought through by NRC under the proposed rule.

Finally, the State is concerned that if a release or accident did occur, the State, in order to protect public health and safety, may be forced to take action even though it is not the regulator of the GTCC waste.

7. Conclusion

The State reiterates that the NRC is premature in its rulemaking; it has not presented a solid rulemaking proposal. Furthermore, NRC has not fully investigated the technical hazards associated with commingling and co-locating GTCC waste with SNF nor has NRC analyzed transportation impacts from the shipment of GTCC waste. To this end, the NRC must conduct a generic or programmatic EIS.

The State of Utah adamantly opposes the storage of GTCC waste at away-from-reactor ISFSIs. Thank you for the opportunity to comment.

September 21, 2000

Errata
to
Attachment 19 (Comments on Transportation Sections of
DEIS on Proposed PFS Facility)
to

COMMENTS SUBMITTED BY THE STATE OF UTAH
on September 20, 2000

Erratum No. 1: Pages 15 (last line)-16 (first line) (paragraph starting with "This calculation is not logical.."). *Attached is corrected page 16; please substitute corrected page 16 for the original incorrect page 16.*

Original Sentence:

"This is acknowledged by the DEIS in Table D-2 at D-6, where it is stated that CRUD can be released in the event of a category 6 accident."

Change to:

This is acknowledged by the DEIS in Table D-2 at D-6, where it is stated that CRUD can be released in the event of a category 3 accident."

(change "category 6" to "category 3" in this sentence)

Basis for Requesting Change:

This sentence comes from a section criticizing the DEIS for not considering the release of CRUD separately from other spent fuel particulates. The intent was to show that in Table D-2 of the DEIS, it is acknowledged that CRUD can be released in the event of a relatively minor accident (Category 3), when there is no rupture of fuel rod cladding which would lead to a potential release of spent fuel particulates. By not specifying a different release fraction for the Cobalt-60 contained in CRUD, the DEIS appears to neglect the impacts of the accidents in which CRUD can be released but spent fuel particulates will not. This underscores the error in considering the same release fraction for the Co-60 in CRUD as is used for other particulates.

Erratum No. 2: On page 27, the description of each column in Table 5 appears to be obscured by excessive use of "filler." *Attached is page 27, with the filler removed so that the column description text is visible; please substitute the attached page 27 for the original page 27.*

released in the event of a category 3 accident. The NRC analysis for the DEIS does not take the behavior of CRUD into account. In a Category 6 accident, involving damage to fuel, Cobalt-60 that adheres to the outside of fuel assemblies *and* Cobalt-60 within the metal matrix will be released. In contrast, the other particulates would be released only in the event of damage to the fuel cladding.¹³

Moreover, the Staff's calculation of the release fraction for Cobalt-60 is also inconsistent with other studies. As discussed previously, SAND88-1358 assumed that 100% of CRUD would be spalled from fuel rods for all impact-related releases. Moreover, the consequence assessment for the "maximum reasonably foreseeable accident scenarios" performed for the DEIS for the Yucca Mountain repository is based on default assumptions contained in the RISKIND computer code, which include a 100% spallation and release of CRUD into the environment in the event of a severe accident.¹⁴ As seen in the following table, the State's calculations show that including CRUD and employing the software program RISKIND, a person residing in an area contaminated by an accidental release for one week would incur a 10% greater dose. If a person resided in a contaminated area for one year, the increased dose due to CRUD release would be 23.5%.

Table 3: CRUD contribution to Population Dose using RISKIND					
long-term exposure time	100% CRUD Release Fraction ¹		10 ⁻⁵ CRUD release Fraction ²		% difference
	population- dose	LCF	population- dose	LCF	
1 week	6880	3.44	6190	3.095	10.0
1 year	24300	12.15	18600	9.3	23.5
50 years	194000	97	157000	78.5	19.1

1. Release Fraction Assumed in SAND88-1358 and ANL/EAD-1

2. Release Fraction given in DEIS

Accordingly, the DEIS underestimates the radiological consequence of a severity 6 accident and, thus, does not comply with NEPA.

¹³ The State notes that the listing of "physical/chemical group" and "dispersibility category" do not appear in the PFS ER. These have been constructed by Staff contractors for the DEIS.

¹⁴ ANL/EAD-1, Yuan et al., "RISKIND - A Computer Program for Calculating Radiological Consequences and Health Risks for Transportation of Spent Nuclear Fuel" (November 1995), Argonne National Laboratory.

Accident Scenario

The accident analyzed in this report is a severe rail accident in which one of the 4 casks carried by a typical rail shipment of spent nuclear fuel is damaged sufficiently to cause the release of a fraction of its contents. Specifically, it is assumed that 63% of the radioactive gas inventory is released, along with 0.2% of volatile solids and 0.002% of particulates (values obtained from Table D.4 of the DEIS) and 100% of the CRUD inventory.

Results

Table 5, given below, presents the results of our RADTRAN 4 analysis. The two variables in the runs are the atmospheric stability and the assumed evacuation time. In general, the more stable the atmosphere is in the event of an accident (stability class F is the most stable), the more concentrated the effects of the accident. However, the economic impacts will be greatest for accidents occurring under more neutral conditions, where released material is dispersed a greater distance.

Table 5: RADTRAN 4 Calculations: Impact of Severe (Category 6) Rail Accident in Salt Lake City, Utah

File Name	Pasquill Stability Category	Evacuation Time Days	Population Dose person-rem	Expected LCFs	Economic Cost 2000\$
utaha1.in4	A	1	6.04E+04	30.2	\$590,000,000
utaha7.in4	A	7	6.10E+04	30.5	\$590,000,000
utahb1.in4	B	1	6.27E+04	31.35	\$2,580,000,000
utahb7.in4	B	7	6.40E+04	32	\$2,580,000,000
utahc1.in4	C	1	1.24E+05	62	\$10,400,000,000
utahc7.in4	C	7	1.29E+05	64.5	\$10,400,000,000
utahd1.in4	D	1	2.17E+05	108.5	\$20,900,000,000
utahd7.in4	D	7	2.24E+05	112	\$20,900,000,000
utahel.in4	E	1	2.64E+05	132	\$23,900,000,000
utahel7.in4	E	7	2.66E+05	133	\$23,900,000,000
utahf1.in4	F	1	3.52E+05	176	\$1,100,000,000
utahf7.in4	F	7	3.54E+05	177	\$1,100,000,000
utahavg1.in4	averaged over all	1	2.29E+05	114.5	\$14,300,000,000
utahavg7.in4	averaged over all	7	2.34E+05	117	\$14,300,000,000

The results show that, under average atmospheric conditions, a severe accident resulting in a release of a small fraction of the radioactive contents of a rail cask carrying 5-year cooled fuel will result in 115-117 additional latent cancer fatalities to the population of exposed individuals. The economic impacts associated with evacuation, interdiction, and restoration are calculated by RADTRAN 4 to be on the order of \$14.3 billion dollars, ranging up to \$23.9 billion. This is for a population density of 567 persons/km², corresponding to a low-density urban area such as Salt Lake City. Population doses will scale with population density.

Comments on Transportation Sections DEIS on Proposed PFS Facility NUREG-1714

September 20, 2000

These comments pertain to the transportation analysis sections of the Draft Environmental Impact Statement ("DEIS"), Chapter 5 and Appendices C and D, for the proposed PFS facility in Skull Valley, Utah (NUREG-1714)¹. The NRC analysis evaluates the impact of incident-free transport and accidents in transporting half of the nation's anticipated commercial irradiated fuel to the PFS facility, by studying and generalizing the specific case of shipping irradiated fuel from the Maine Yankee reactor to the proposed PFS facility in Skull Valley. The comments were prepared by Radioactive Waste Management Associates² ("RWMA") on behalf of the State of Utah. The staff of RWMA has considerable expertise in technical issues associated with spent nuclear power plant transportation and disposal. Copies of their resumes have previously been served on the NRC Staff during the PFS licensing proceeding.

In general the transportation impact analysis prepared by NRC contractors SAIC, Oak Ridge, bears little resemblance to and hardly relies on the entirely inadequate PFS Environmental Report. In terms of methodology and scope, this is the type of analysis requested by the State in its Petition to Intervene in the PFS license proceeding and so vigorously resisted by NRC staff and the applicant. Unfortunately, however, the new analysis performed in the DEIS is seriously deficient.

In fundamental respects, the DEIS completely fails to satisfy the requirement of the National Environmental Policy Act for a hard look at the environmental impacts of spent fuel transportation. The DEIS does not reflect joint consideration or preparation with the federal Surface Transportation Board ("STB"), another federal agency with significant responsibility for oversight of this project. Moreover, the DEIS ignores or distorts significant contributors to the environmental impacts of spent fuel transportation, including radiation doses under incident-free and accident conditions during intermodal transfer near reactors, and sabotage events. The DEIS also underestimates the risks of spent fuel transportation through the internally inconsistent manipulation of data and disregard of the risks posed by the transportation equipment that PFS proposes to use. A particularly egregious omission is the DEIS's complete lack of any discussion of the economic risks and consequences of a spent fuel transportation accident; nor does the DEIS address the consequences of a serious spent fuel transportation accident in terms of health effects or economic impacts. Instead, the DEIS provides abstract calculations of overall risk that shed little or no light on the potential health and economic injury that

¹ NUREG-1714. "Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah". June 2000. U.S. Nuclear Regulatory Commission

² Marvin Resnikoff, PhD, and Matthew R. Lamb

could be caused by the proposed transportation of large quantities of spent nuclear power plant fuel through the State of Utah and elsewhere.

DIFFERENCES BETWEEN THE DEIS AND THE ENVIRONMENTAL REPORT

The DEIS represents a complete departure from the Applicant's Environmental Report ("ER") for the PFS facility. The ER's transportation analysis relied heavily, indeed almost exclusively, on the generic and outdated Table S-4 in 10 C.F.R. Part 51. As discussed below, the DEIS does a much more specific analysis of the PFS project, using more up-to-date analytical tools.

The differences between the ER and the DEIS are discussed in this section in order to illustrate the extent to which the Staff's analysis does not depend on any work by the Applicant, and to provide some background on the methodology used by the Staff. The State considers that the Staff has made significant improvements to the Applicant's environmental analysis, but the DEIS remains seriously deficient. The State also objects to the fact that the Staff has resisted these changes in the context of the PFS licensing hearing, and yet has gone ahead and made many of them behind the scenes. In the State's view, this illustrates the Staff's general resistance to public participation in the PFS licensing proceeding, and generally undermines the Staff's credibility in this environmental review process.

Rather than employing the outdated and generic report, WASH-1238, "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants," published in 1972, as the Applicant has done in the ER, the DEIS utilizes the RADTRAN 4 computer program to model specific routes, and the population zones and radiation risks along each route.

RADTRAN is a computer model developed by Sandia National Laboratories to estimate population risks associated with the transportation of radioactive material. The first version of RADTRAN was issued in the late 1970s. In the context that it was used for the DEIS, the term "risk" has special meaning. It refers to the product of the probability of a given event and its likely consequences, summed up over the entire range of possible events. That is, the RADTRAN 4 computer code was used in the DEIS to calculate an expected risk to populations over the duration of the transportation campaign.

RADTRAN 4 also includes an economic model designed to provide order of magnitude estimates for the financial impact of transportation accidents involving a release of radioactive material. It estimates, based on the calculated concentration of radioactive material following an accident, the cost of emergency response, surveying, evacuation, and cleanup. The assumptions and methodology are contained in the technical manual³ for RADTRAN 4.

³ SAND89-2370, Neuhauser, K.S. and Kanipe, F.L., "RADTRAN 4 Volume II: Technical Manual, Revision 1 (March 1995).

Using the RADTRAN 4 model, the Staff compares the calculated impacts to its most recent generic transportation analysis, NUREG-170, prepared in 1976. This is the same type of analysis conducted in NUREG-1437, Addendum 1, "Generic Environmental Impact Statement of License Renewal of Nuclear Plants," August 1999, which employs RADTRAN 4. NUREG-1437 analyzes the cumulative impacts of transporting commercial irradiated fuel through Nevada, akin to the cumulative impact of transporting half the nation's commercial irradiated fuel through Utah.

There are great differences between the DEIS and the Applicant's ER with respect to transportation of spent fuel. The ER addresses the transportation-related impacts of the ISFSI in Sections 4.7 (radioactive material movement) and 5.2 (transportation accidents). According to the Applicant, the environmental impacts of spent fuel transportation are addressed in 10 C.F.R. ' 51.52 and the accompanying Table S-4. ER at 4.7-1, 5.2. The ER uses the numerical values in Table S-4 for its evaluation of the transportation-related environmental impacts of the proposed ISFSI, claiming that these values are conservative with respect to the scope of activities of the PFS facility. Id. The generic impact of shipping irradiated fuel from a reactor to a final repository or reprocessing plant is then multiplied by the number of expected shipments to determine the generic cumulative impact.

Table S-4 makes many assumptions that are different from the assumptions used in the DEIS. For instance, based on WASH-1238, Table S-4 assumes a transportation distance of 1,000 miles and calculates a total dose to the crew of 1.2 person-rem. In contrast, the DEIS uses the distance between the PFS facility and the Maine Yankee reactor, which is 2,781 miles. DEIS at 5-39. For the general public along transportation routes at a rest stop, WASH-1238 assumes ten persons spend an average of 3 minutes at an average distance of 3 feet. RADTRAN assumes persons will be exposed as passengers, crew, and handlers during storage and stops, both on and off route. Assumptions for specific shipments are input into the RADTRAN program. Based on standard assumptions for the Maine Yankee shipment, the DEIS estimates incident-free radiological consequences of 10.4 person-rem/year if shipments are completely by rail from reactor sites to the PFS facility, and 23 person-rem/year if fuel is transferred to the PFS facility via an intermodal transfer facility at Timpie. DEIS at 5-37.

The assumptions underlying the dose analysis differ in Table S-4 and in the DEIS. Table S-4 estimates a population dose of 1.8×10^{-5} person-rem/cask mile. In contrast, the Staff estimates that, over the 20 years of shipping fuel to PFS, the population dose will be 23×20 or 460 person-rem if an intermodal transfer is used at Timpie, and 10.4×20 or 208 person-rem if the fuel is shipped directly to the PFS facility by rail. DEIS at 5-46. Since the total distance over a 20 year period is given in the DEIS as 2.1×10^6 miles and there are 4 casks per train, the total incident-free dose calculated using Table S-4 is 152 person-rem. DEIS at 5-37. Further, WASH-1238 assumes 300,000 persons reside along the 1,000 mile route, whereas the DEIS assumes that almost 1.25 million persons will reside along the Maine Yankee route by the year 2020. DEIS at 5-40.

There are other differences in assumptions between Table S-4 and the DEIS. Table S-4 assumes that a cask will weigh 70 to 100 tons, but the Applicant's ER assumes that the cask plus rail carriage will weigh more than 211 tons. WASH-1238 assumes 7 PWR fuel assemblies in a rail cask, and 650 curies of fission products released in the event of a serious accident. In contrast, the DEIS assumes a cask containing 24 PWR fuel assemblies, with a release of 3,300 curies of cesium in the event of a severe accident. In addition, other radionuclides as semi-volatiles, gases and particulates would also be released in a severe accident, including up to 520 curies of Cobalt-60. To this end, the DEIS (Appendix D) provides a listing of "physical/chemical group" and "dispersibility category" for each radionuclide, and calculates releases for volatiles, gases and particulates. The DEIS then uses RADTRAN 4 to multiply the probabilities and consequences of credible accidents to arrive at a specific risk estimate. In contrast, Table S-4 does not calculate the risk of an accident, but instead concludes that it is small without any analysis.

In addition to the difference in assumptions, the methodology used in the DEIS is radically different from the methodology used in the ER. For an accident, Table S-4 assumes the probability is so small that the risk does not have to be calculated. In order to calculate incident-free transportation doses, the Applicant in the ER simply multiplies the numbers in Table S-4 for shipments from a reactor to a final repository or reprocessing plant by the expected number of shipments from reactors to PFS. In evaluating incident-free transportation doses, in contrast, the DEIS evaluates a specific route, from Maine Yankee to the PFS facility, taking into account the fraction of urban, suburban, and rural populations along a specific route.

DEFICIENCIES IN DEIS

The NRC's analysis of the transportation impacts associated with the operation of the PFS facility is seriously deficient in a number of areas. First, the DEIS does not contain a thorough analysis of the regulatory criteria of one of the key cooperating agencies, the STB. Second, the DEIS underestimates the risks posed by transportation of spent fuel to the PFS facility because it ignores the impacts of intermodal transfer at the reactor end of the transportation activities, from heavy-haul trucks to railheads near reactor sites. Third, the DEIS does not describe the type of railroad cars to be used for transporting casks to the PFS facility, or evaluate the accident risks posed by putting extremely heavy loads on the rails. Fourth, the DEIS underestimates the risk of the most severe category of accidents by understating both their probability and consequences. Finally, the DEIS does not calculate the environmental impacts of a maximum credible accident that is reasonably foreseeable, nor does it address economic risks or consequences of a transportation accident.

SURFACE TRANSPORTATION BOARD ENVIRONMENTAL CRITERIA NOT APPLIED

As described in Section 1.5 of the DEIS, the NRC is serving as the lead agency, with the Surface Transportation Board of the Department of Transportation ("STB") and the Bureau of Land Management ("BLM") and the Bureau of Indian Affairs ("BIA") of the Department of Interior serving as cooperating federal agencies. DEIS at 1-14. According to the DEIS:

Because each agency must take an action and because those actions are interrelated, the NRC, BIA, BLM, and STB have agreed to cooperate in the preparation of a *single DEIS*.

DEIS at 1-14 (emphasis added). Elsewhere in the DEIS, however, the NRC Staff makes it clear that the STB has not yet undertaken its environmental analysis:

STB *will review* both the merits of the proposal and the potential environmental impacts. STB *will prepare* a ROD [record of decision] providing the basis for its decision to either grant or deny the PFS application with appropriate conditions, including environmental conditions.

DEIS at 1.16 (emphasis added). Consistent with this second statement, the DEIS does not reflect a comprehensive evaluation by the STB of the PFS proposal against STB's regulatory criteria for information that must be provided in applicants' environmental reports. *See* 49 CFR Part 1105. What little involvement by the STB is reflected in the DEIS is haphazard at best.

For instance, one of the STB criteria of great concern to the State of Utah is 49 C.F.R. § 1105.7(e)(7), which requires a description of "contingency plans to deal with accidental spills." The DEIS contains no description whatsoever of contingency plans to deal with radiation spills. This is not just a regulatory violation but a failure to address a major mitigative measure. The DEIS should be substantially revised to address the potential for accidental spills and contingency planning for those spills. In order to describe contingency plans, the DEIS must first describe how material may be released and dispersed, i.e., the extent of the spill. This involves an analysis of the range of potential credible accidents, and the consequences of these accidents. Accidents should include credible and foreseeable accidents due to derailments, fire or purposeful sabotage. The DEIS should describe the environmental impact of these accidents, including the degree of environmental contamination that can be expected, and the adverse health effects that can be expected. It should also describe the type of contingency measures that are

needed, including evacuation and cleanup; the cost of those measures; and how and by whom they will be carried out.

In numerous other respects, the DEIS addresses the STB criteria or the substantive issues raised by the criteria, but does an incomplete or inaccurate job. For instance, the NRC's discussion of whether transportation of spent fuel to the PFS facility meets the STB's threshold criteria for preparing an EIS thoroughly understates the significance of the impacts of the activity. The DEIS states that the proposed action does not meet the minimum threshold limits for an EIS set out in '§§1105.7(e) (4) and (5), i.e., an increase of rail line traffic so as to cause a minimum threshold increase in energy usage or air pollution, but that nevertheless, based on the hazardous nature of irradiated fuel, the STB "is considering potential environmental impacts" along the railroad lines that PFS proposes to use. DEIS at 5-2. This conclusion is simply absurd. Under any reasonable definition of an action "significantly" affecting the environment, the proposed action of moving half the nation's commercial irradiated fuel must be considered a "significant" federal action. This is of major concern to the State because the DEIS's inadequate diagnosis of the impacts of spent fuel transportation connected with the PFS project appears to have adversely affected the vigor and thoroughness of the NRC's review of transportation impacts.

In any event, having committed to perform a full environmental review, the NRC Staff and STB were required to do just that. A full environmental review includes the thorough discussion of the environmental impacts of spent fuel transportation against the STB regulatory criteria in the DEIS. But the DEIS reflects only partial consideration of those criteria for assessing environmental impacts.

For example, for the proposed rail line between Skunk Ridge on the main Union Pacific line and the PFS facility, the DEIS describes the proposed route (§1105.7 (e)(11)(i)) and the alternative heavy-haul route (§1105.7 (e)(11)(ii)). However, the construction plans for the intermodal transfer facility are not fully described, as required by §1105.7 (e)(11)(iii)). The DEIS should describe the design and components of the intermodal transfer facility, particularly those aspects relevant to spent fuel transfer and transportation. These components include the size, location, and capacity of the crane, the building dimensions, locations and operation of any siding switches, fence/barrier locations, size and location of any storage docks. Further, a discussion of the ability of the facility to withstand seismic events and tornadoes should be included in the DEIS. Finally, since the applicant contends that the intermodal transfer facility is part of the transportation section of PFS operations, it should be evaluated by the Department of Transportation.

In addition, the precise manner in which casks will be transferred from the rail line to a heavy-haul trailer within the ITF is not described. The radiation exposures of workers are

calculated, but the equipment itself, such as the cranes that lift the cask plus skid off the rail car onto the heavy-haul trailer bed, are not described. For example, the height to which casks will be raised and their orientation during the transfer are important considerations in assessing impacts at this facility.

As required by 49 C.F.R. § 1105.7 (e)(11)(iv), the DEIS describes the following rail operations: the estimates of freight to be transported (in carloads and tonnage), the anticipated daily and annual number of train movements, number of cars per train and motive power requirements. However, the DEIS does not describe the types of cars, the labor force requirements and the proposed maintenance of way practices, which are also required by § 1105.7(e)(11). Particularly important is the type of car. According to discovery materials, the applicant may be using Maxson-type rail cars with 3-axle fixed trolleys⁴. Description of the type of rail car to be used is important for safety considerations. Cars with 3-axle fixed trolleys have higher accident rates.⁵ Although the Applicant has stated more recently that it does not intend to use Maxson-type cars with fixed 3-axle fixed trolleys, it has not made any firm commitment in this regard. Moreover, the Applicant may be forced to use Maxson-type rail cars because the load of a shipping cask may be too heavy for other types of rail cars. The DEIS should discuss the types of cars that PFS will use.

The STB regulations also require the applicant's Environmental Report to "describe any effects of the proposed action on public health and safety," and thus this criteria should be addressed in the DEIS. *See* 49 C.F.R. §1105.7(e)(7)(i). As discussed below, the DEIS's description of environmental impacts – including impacts on public health and safety – is completely inadequate. These inadequacies include failure to consider the radiological impacts of intermodal transfer near reactor sites, and failure to provide a consequence analysis that shows the potential health effects of serious accidents.

The STB regulations also require that the applicant's Environmental Report must "identify the materials and quantity; the frequency of service; the safety practices (including any speed restrictions); the applicant's safety record on derailments, accidents and hazardous spills; the contingency plans to deal with accidental spills and the likelihood of an accidental release of hazardous materials." (1105.7 (e)(7)(ii)). If this information is required in the ER, it should be analyzed in the DEIS. However, the DEIS is gravely deficient on these matters. The frequency of service is described, but the safety practices and the safety record on derailments, using the 3-axle fixed trolley type of cars PFS intends to employ, are not described at all.

⁵ *Ibid.*

Finally, the STB's environmental criteria include a requirement to describe "the likelihood of an accidental release of hazardous materials." Although the DEIS discuss accident rates in great detail, significant information is omitted from this analysis, and the likelihood of an accidental release is seriously underestimated. This is discussed in further detail below.

FAILURE TO CONSIDER NO-ACTION ALTERNATIVE

The DEIS describes the proposed routes and offers alternative routes, but does not adequately describe the no-build alternative and why this alternative was not selected. While the no-action alternative is discussed at several locations in the DEIS, the impact on transportation is not evaluated. If the PFS facility is not built, and if reactors continue to produce irradiated fuel, dry storage facilities will have to be built at numerous reactors sites across the country; that is, decentralized rather than centralized ISFSI's. For several reasons, this no-action alternative is very viable, indeed preferable.

First, because the proposed PFS facility is handling only half of the nation's anticipated commercial irradiated fuel, the other half must remain at reactors. As a result, nuclear power plant licensees must commit to onsite storage, regardless of whether the PFS facility is built.

Second, onsite dry storage is a proven technology whose use is expanding in the U.S. In the DEIS, the NRC mentions that eight specific at-reactor ISFSI applications have been approved. The NRC has never denied a license amendment for an ISFSI and does not consider decentralized ISFSI's unsafe.

Third, onsite storage has economic benefits that offset the claimed economic benefits of the PFS facility. Any decreased economic benefits at Skull Valley due to lower tax revenues, local payrolls and other expenditures correspond to increased benefits at each reactor site. In other words, with respect to economic benefits, a comparison of the two alternatives is a wash.

A highly significant benefit of the no-action alternative is that total transportation distances would be reduced. Rather than ship irradiated fuel to the PFS facility and then on to the proposed Yucca Mountain repository, as is assumed in the DEIS, irradiated fuel would go directly to the ultimate repository, if and when that repository became available.

The NRC has not committed to a specific repository, and thus the DEIS errs by assuming that Yucca Mountain will be the chosen repository. For example, a recent NRC document assessing the risk of spent fuel transportation (NUREG-6672) considers three potential sites for an ultimate repository, one each in the southeast, south-central, and

southwest. Both the NRC and the Applicant have relied on the flawed assumption that a repository will be built at Yucca Mountain, something the NRC does not concede anywhere else. The DEIS should evaluate the PFS proposal in light of a variety of potential locations for the permanent repository, including Nevada.

Taking Nevada as a potential repository, and looking at spent fuel transportation from California reactors as an example, it is plainly important to consider the benefits of the no-action alternative, i.e., delaying shipments of spent fuel until a final repository is ready. If PFS were licensed, irradiated fuel from California reactors would go through Nevada to the PFS facility in Utah, then return when the Yucca Mountain repository was opened. Under the no-action alternative, irradiated fuel would remain at California reactors until a waste repository were available in Nevada. By waiting to ship spent fuel until a final repository were ready, the number of transport miles would be reduced, and the number of intermodal transfers would be reduced, thus eliminating radiation doses from incident-free transportation and reducing the chance of accidents involving radiological releases.

Finally, an extremely important benefit of decentralized ISFSI's, not discussed in the DEIS, is that irradiated fuel stored at reactor sites would be allowed to cool until a permanent repository were available. If temporary storage took place over a 25-year period, five half-lives for Co-60, then 1/32 of the original Co-60 activity would remain. The activity of Cesium-137 would decrease by approximately one half-life. Other radionuclides would decline as well, although not as dramatically. This would significantly decrease the dose rates outside of shipping casks, thus greatly reducing radiation exposures to workers and the public during an accident or during incident-free transport.

DEIS DOES NOT ADDRESS IMPACTS THAT SIGNIFICANTLY CONTRIBUTE TO ENVIRONMENTAL HARM AND RISK

Intermodal Transfers Near Reactor Sites

The DEIS claims to comprehensively consider the risks of transporting spent fuel by rail and intermodal transfer. DEIS at Chapter 5. However, the DEIS ignores the impacts of incident-free transportation that results from the intermodal transfer from trucks to railheads near reactor sites. The Maine Yankee-to-PFS route, chosen for specific analysis by the NRC Staff, is not representative in this respect. The Maine Yankee reactor has a rail line directly into the plant. In contrast, among the 22 reactors owned by PFS members, 17 cannot accommodate the rail cask proposed for use in the transportation

campaign, due to lack of a direct rail connection, insufficient bay size, or insufficient crane capacity. Therefore, these sites would require intermodal transfer to move spent nuclear fuel from heavy-haul truck or barge to rail. Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (July 1999), U.S. Department of Energy ("Yucca Mt. DEIS") Table J-12 at 4-5; Operational Throughput for the Multi-Purpose Canister System, prepared by TRW Environmental Safety Systems, Inc. for the DOE's Civilian Radioactive Waste Management System (September 30, 1993). For these reactors, as well as additional reactors owned by PFS's non-member customers, irradiated fuel will have to be transported by heavy-haul truck or barge to the nearest railhead, where it would be transferred to a rail car for transport to the proposed PFS facility. Because of the additional doses to workers during the transfer of casks to rail cars at intermodal transfer points, and because heavy-haul truck transportation involves greater incident-free radiation exposures to workers and the general public than does rail transportation, as further described below, this lack of analysis means that incident-free risks have been underestimated.

For each reactor that requires intermodal transfer from the reactor to the railhead, the radiological impacts on workers as a result of cask loading and transfer operations would be comparable to radiological impacts at the Timpie intermodal transfer facility. Those impacts are estimated in the DEIS to be 11.98 person-rem per year. DEIS at 5-47. According to the DEIS, the additional occupational dose to crew members resulting from this exposure at the Timpie end of the operation is 0.50 person-rem per year. Total exposure from these two operations would be 12.48 person-rem per year. DEIS at 5-45 to 5-46. In addition, reactor personnel who initially load and seal the canisters, and who transfer the canisters to a transportation overpack would also receive doses that are not included in the DEIS

Since the additional exposure to workers from these operations on the reactor end of the spent nuclear fuel transport will mirror exposure on the Timpie end, an equivalent amount of exposure, adjusted for the smaller number of reactors affected, should be added to the calculations. Specifically, since 17 of the 22 reactors owned by PFS members will require intermodal transfer from a heavy-haul truck to a rail line, an additional dose to crew members of 9.64 person-rem per year ($17/22^{\text{th}}$ of 12.48) is expected.

In addition, there would be additional radiological exposures to members of the public due to intermodal transportation from reactor sites to railheads. Heavy-haul trucks travel at much slower speeds than trains, resulting in more prolonged exposure to the surrounding population. The population dose attributed to heavy-haul transport from Timpie to the PFS facility was listed in the DEIS as 0.23 person-rem per year. DEIS at 5-45 to 5-46. This number was calculated by the Staff assuming a population density of

1.3 persons/km² along the heavy-haul route from Timpie to the PFS facility. Near the reactors, the population density is expected to be much greater, closer to suburban densities. Assuming a population density of 719 persons/km² along the heavy-haul routes, the default suburban population density in RADTRAN 4, the increased annual population dose is therefore expected to be $719/1.3 \times 0.23$ person-rem/s or 127.2 person-rem/s/year. Assuming only 17 of 22 reactors require heavy-haul transport, the additional population dose due to heavy-haul transport at the reactor sites is 98.3 person-rem/s/yr.

Including the additional exposures arising from heavy-haul transport from reactors to railheads, the predicted increase in latent cancer fatalities from the 20-year operation is calculated to be over 6 times greater than that given in the DEIS. DEIS at 5-37.⁶

DEIS DOES NOT DESCRIBE THE TYPE OF RAILROAD CARS TO BE USED FOR TRANSPORTING CASKS TO THE PFS FACILITY, OR EVALUATE THE ACCIDENT RISKS POSED BY PUTTING EXTREMELY HEAVY LOADS ON THE RAILS

The DEIS uses an average accident rate, eliminating certain minor accidents, such as

⁶ The DEIS uses the conversion factors of .0005 LCFs per person-rem for exposures to the general public, and .0004 LCFs per person-rem for exposures to crew members. To determine the expected increase in LCFs over the 20 year campaign, the expected annual population doses are obtained by adding the population doses given in the DEIS to the additional population dose due to intermodal transfer at 17/22 reactor sites. Tables 1 and 2 below summarizes these results.

Table 1: Estimated Population Dose due to Intermodal Transfer at 17 Reactors and at Timpie
Annual Dose, person-rem/year

	Total Additional Population Dose from reactor-side ITF	Exposure calculated in DEIS	Total Dose, ITF at 17/22ths of reactors and at Timpie
General Public	98.3	9.41	107.71
Crew Members	9.64	13.7	23.34
Total	107.94	23.11	131.05

Table 2: Estimated Risk (Latent Cancer Fatalities) due to Transportation Activities, Assuming Intermodal Transfer at 17 Reactors

	Risk (LCF)/year	Total Risk (LCF) over 20 years	Risk (LCF) Presented in DEIS
General Public	.054	1.08	.0942
Crew Members	.009	0.19	.109
Total	.063	1.26	.203

grade-crossing and rail yard accidents. The standard railroad car is a two-axle trolley; therefore the accidents in this accident database will primarily relate to this standard car. However, as discussed above, the Applicant is considering the use of flat-bed rail cars with 3-axle fixed trolleys (also known as "Maxson-type" cars). Regardless of PFS's recent claims that it will be using different cars, no information has been provided in discovery materials to indicate that PFS will in fact use a rail car other than the 3-axle fixed trolley.

Maxson-type 3-axle fixed trolleys can be expected to have a higher accident rate than the standard rail cars evaluated. *See* letter from Peter Conlon, Director of Railway Technology and Training for the Transportation Technology Center, to John Donnell, Stone & Webster (June 16, 1998). According to Mr. Conlon, 3-axle fixed freight cars "have a higher probability of derailment," due to the "relatively rigid nature of the assemblies." He further explains that:

Insufficient damping and poor load equalization in these trucks also compromises performance over track geometry deviations. Forces that railcars exert on curved track can become quite high with these rigid trucks. For 3-axle fixed trucks, high lateral forces are because these trucks have no capability to move the axles longitudinally (yaw) in curves and the long wheel base and central axle makes curving performance worse than normal 2-axle three piece trucks.

Conlon letter at 1. The DEIS is inadequate because it fails to address the contribution to accident risks caused by the potential use of Maxson-type 3-axle fixed trolley cars.

DEIS UNDERSTATES PROBABILITY AND CONSEQUENCES OF MOST SEVERE TRANSPORTATION ACCIDENTS

The most severe transportation accident considered in the DEIS is a "Severity Category 6" accident, involving "[s]evere impact damage plus fire severe enough to cause fuel oxidation with release of greater amounts of fuel particulates than category 5." DEIS at D-6, Table D.2. The DEIS estimates that the probability of an accident of this severity is 1×10^{-12} per mile for shipment by rail. DEIS at D-7. This is a significant underestimate, for a number of reasons discussed below.

The DEIS Employs the Average Rail Accident Rate, Not the Rail Accident Rate for Specific Rail Lines That Will Be Used.

The DEIS's transportation analysis for the proposed action focuses on transportation by rail from the Maine Yankee reactor. To remove irradiated fuel from the PFS facility to

the proposed Yucca Mountain repository, rail shipments from the proposed PFS facility to the Nevada state border were also considered in the DEIS.

In order to assess transportation impacts, the DEIS considers and generalizes from one specific route, from the Maine Yankee reactor to the PFS facility. DEIS at 5-39. The DEIS employs the computer program Interline to specify the rail routes by minimizing the number of transfers between railroad companies. As a result the main line routes, which generally consist of passenger routes and have the lowest accident rates, are not necessarily chosen, nor are the most direct routes necessarily chosen. For example, the rail route in New York State does not follow a direct route across the state, but dips down from Schenectady to Binghamton then back up to Buffalo. DEIS at 5-41. The DEIS accident rate analysis employs the average rail accident rate for the country. This rate includes better-maintained high speed tracks, rather than using the accident rate for tracks actually taken. Similar to accident rates the NRC employs for different types of highways (interstate rural, interstate urban, rural, urban, and so on), the Staff must discuss the accident rates for different types (quality) of rail lines if the DEIS is to comply with NEPA. In other words, the assumptions contained in Interline, which are used to choose the rail routes, should be consistently applied in the process of evaluating accident rates.

The Probability of a Severe Accident is Higher Than Estimated in the DEIS.

According to the 1987 Modal Study, the probability of an accident of any severity occurs with a frequency 1.19×10^{-5} accidents/train mile.⁷ This accident rate is based on the accident database of the Federal Railroad Administration ("FRA"). Assuming, as the DEIS does, that the average distance from a reactor to the proposed PFS facility is 2,120 rail miles (DEIS at 5-35) and that 50 shipments of 4 casks will occur each year for 20 years, an estimated 25 rail accidents will occur transporting loaded casks to the proposed PFS facility⁸. An additional 7 rail accidents will occur transporting loaded casks from the PFS facility to the Nevada line⁹. Similarly, an estimated 32 accidents will occur moving empty HI-STAR overpacks from the proposed PFS facility. These will be accidents of varying severity, some severe and some minor.

⁷ Fischer et al, 1987. "Shipping Container Response to Severe Highway and Railway Accident Conditions." (Frequently referred to as the Modal Study). NUREG/CR-4829. Lawrence Livermore National Laboratory. Prepared for U.S. Nuclear Regulatory Commission.

⁸ $50 \text{ shipments/yr} \times 2120 \text{ mi/shipment} \times 1.19 \times 10^{-5} \text{ accidents/mi} \times 20 \text{ yrs} = 25 \text{ accidents to the PFS facility.}$

⁹ $100 \text{ shipments/year} \times 10 \text{ years} \times 590 \text{ miles/shipment} \times 1.19 \times 10^{-5} \text{ accidents/mile} = 7 \text{ accidents going from PFS to the proposed repository at Yucca Mountain.}$

To estimate the probability of a severe accident, the conditional probability that an accident will be severe is multiplied by the accident rate. The DEIS for the proposed PFS facility uses the conditional probabilities developed by the Modal Study in its transportation risk assessment. The most severe accident, a category 6 accident, has a conditional probability of 1.25×10^{-4} . That is, approximately 1.25 in 10,000 accidents are classified as a category 6 accident. An estimated 4.36×10^6 train-km will be traversed in the course of the PFS campaign. DEIS at 5.35. The probability of a category 6 accident occurring during the PFS transportation campaign is therefore:

$$(1.19 \times 10^{-5} \text{ accidents/1.6 train-km}) \times 4.36 \times 10^6 \text{ train-km} \times 1.25 \times 10^{-4} \text{ Category 6 accident/accident} = 4/1000$$

Thus, the probability of a category 6 accident occurring over the duration of the shipping campaign is 4 in 1,000 (or 4×10^{-3}).

The DEIS further underestimates the likelihood of the occurrence of a Category 6 accident because the conditional probabilities assigned to accidents take into account minor accidents which are not tabulated in determining the overall frequency of accidents. The database from which the accident rates was obtained does not include specific minor accidents, such as grade-crossing or railyard accidents. The DEIS discussion of injury and fatality rates is based on a 1994 study by Saricks and Kvitek of railcar accidents across the country between the year 1986 and 1988.¹⁰ DEIS at D-7. The Saricks and Kvitek study carefully considers the DOT rail accident database but generally eliminates accidents that are minor, such as grade crossing accidents, since these will not lead to a release from a shipping cask. The DEIS relies on the Saricks study to calculate transportation risk, without accounting for the fact that the Saricks study has eliminated a number of accidents from consideration which are considered in the Modal Study determination of conditional probabilities of accidents. As a result, the DEIS does not accurately reflect the frequency of a category 6 accident. Thus, if one employs the Saricks study of accident rates, then one must also change the accident severity distributions to reflect the fact that minor accidents have been removed. If not, the likelihood of a severe accident is then too low. In order for the DEIS not to be based on misleading assumptions, the DEIS must re-examine the methodology it employed. *See e.g., Hughes River*, 81 F.3d 437, 446 (4th Cir. 1996). In calculating the risk of a Category 6 accident, the DEIS must either include all accidents and the accident severity fractions that appear in RADTRAN 4; or, if it chooses to remove minor accidents from consideration, alter the accident severity distributions accordingly.

The DEIS Underestimates the Radiological Consequences of a Severity Category 6 Accident, by Underestimating the Release Fraction for CRUD.

¹⁰ ANL/ESD TM-68, Saricks, C. and Kvitek, T., "Longitudinal Review of State-Level Accident Statistics for Carriers of Interstate Freight" (March 1994), Argonne National Laboratory.

As recognized in the DEIS, a corrosion product known as Chalk River Unidentified Deposits ("CRUD") is deposited on fuel cladding during reactor operation, and is observed to be loosely adhered on power reactor fuel. DEIS at D-6, note 8. CRUD contains neutron-activated nuclides and may also contain fissile particles and fission products¹¹. It must therefore be considered in estimating overall radionuclide inventory which is, in turn, critical to evaluating the radiological consequences of a severe accident.

As measured at Sandia National Laboratories, the amount of CRUD on a fuel assembly can be extremely variable. Generally BWR fuel assemblies have much higher surface concentrations. The Sandia report estimating CRUD contribution to radioactive inventory, SAND88-1358,¹² provides a range of CRUD surface activity densities for both PWR and BWR reactors. This surface activity density is multiplied by the total surface area inside a cask in order to obtain an estimate of the CRUD inventory for a cask.

CRUD may escape from a breached or leaking canister, even if the fuel is undamaged. Yuan 1995 (referenced in footnote 11). Since CRUD resides on the outer surface of fuel assemblies, the cladding does not have to be broken to release CRUD to the interior of a shipping cask. Id. Further, all spalled CRUD may be released into the environment if there is a leakage path available, such as a failed seal or open vent.

The major radioactive component contained in CRUD is Cobalt-60. Therefore, although the DEIS does not specifically address the environmental impacts of a CRUD release, it is possible to determine whether the DEIS has considered those impacts by evaluating its treatment of Cobalt-60 releases. As shown in Table D.5, the DEIS considers Cobalt-60 to behave like a particulate in the event of an accident. Id. Eleven other radionuclides are also listed in Table D.5 as having the properties of particulates (other radionuclides are listed as volatiles or gases). Table D.4 of the DEIS provides release fractions for particulates, volatiles, and gases, in each of the six categories of accidents. No distinction is made in Table D.4 between the release fraction for Cobalt-60 and the release fraction for the eleven other radionuclides listed in Table D.5: the same release fraction is given for each category of accident. For instance, the release fraction in the event of the severe accident (category 6), is calculated at 2.0×10^{-5} .

This calculation is not logical, and appears to significantly underestimate the release fraction for Cobalt-60. The release fraction for Cobalt-60 should be higher, since the Co-60 in CRUD does not require rod rupture to be released into the environment. This is acknowledged by the DEIS in Table D-2 at D-6, where it is stated that CRUD can be

¹¹ ANL/EAD-1, Yuan, et al, RISKIND - A Computer Program for Calculating Radiological Consequences and Health Risks for Transportation of Spent Nuclear Fuel (November 1995), Appendix D.

¹² SAND88-1358. Sandoval et al. Estimate of Crud Contribution to Shipping Cask Containment Requirements. January 1991.

released in the event of a category 6 accident. The NRC analysis for the DEIS does not take the behavior of CRUD into account. In a Category 6 accident, involving damage to fuel, Cobalt-60 that adheres to the outside of fuel assemblies *and* Cobalt-60 within the metal matrix will be released. In contrast, the other particulates would be released only in the event of damage to the fuel cladding.¹³

Moreover, the Staff's calculation of the release fraction for Cobalt-60 is also inconsistent with other studies. As discussed previously, SAND88-1358 assumed that 100% of CRUD would be spalled from fuel rods for all impact-related releases. Moreover, the consequence assessment for the "maximum reasonably foreseeable accident scenarios" performed for the DEIS for the Yucca Mountain repository is based on default assumptions contained in the RISKIND computer code, which include a 100% spallation and release of CRUD into the environment in the event of a severe accident.¹⁴ As seen in the following table, the State's calculations show that including CRUD and employing the software program RISKIND, a person residing in an area contaminated by an accidental release for one week would incur a 10% greater dose. If a person resided in a contaminated area for one year, the increased dose due to CRUD release would be 23.5%.

Table 3: CRUD contribution to Population Dose using RISKIND					
long-term	100% CRUD Release		10 ⁻⁵ CRUD release		% difference
exposure time	Fraction ¹		Fraction ²		
	population-dose	LCF	population-dose	LCF	
1 week	6880	3.44	6190	3.095	10.0
1 year	24300	12.15	18600	9.3	23.5
50 years	194000	97	157000	78.5	19.1

1. Release Fraction Assumed in SAND88-1358 and ANL/EAD-1

2. Release Fraction given in DEIS

Accordingly, the DEIS underestimates the radiological consequence of a severity 6 accident and, thus, does not comply with NEPA.

¹³ The State notes that the listing of "physical/chemical group" and "dispersibility category" do not appear in the PFS ER. These have been constructed by Staff contractors for the DEIS.

¹⁴ ANL/EAD-1, Yuan et al., "RISKIND - A Computer Program for Calculating Radiological Consequences and Health Risks for Transportation of Spent Nuclear Fuel" (November 1995), Argonne National Laboratory.

The DEIS Does Not Describe or Analyze the Environmental Impacts of a Maximum Credible Accident.

Significantly, in the DEIS, the NRC has declined to analyze or describe the environmental and economic impacts of a maximum credible accident. It has instead calculated the transportation “risk.” This risk is expressed in terms of the fractional likelihood of latent cancer fatalities, calculated for various volumes of spent fuel shipped. *See*, for example, DEIS Table 5.7 at page 5-38, which calculates “Annual expected latent cancer fatalities (LCFs) for potential accident risk to the public during SNF transport.” Assuming 200 shipments per year, the DEIS estimates an accident risk of 2.2×10^{-3} for both rail and intermodal transport. Although the DEIS identifies six categories of accident severity in Appendix D (*see* page D-6), nowhere does the DEIS explain what the health and/or economic consequences would be for an accident of any of those severity categories. Thus, the reader is left with a numerical abstraction that has no factual content. One is left to wonder what would happen in a Category 6 accident: how many people would die? How many people would get sick? What would be the effects on wildlife? How much land would be contaminated? How long would the contamination last? How much would it cost to clean up the contamination and compensate people for death, illness, and property loss? None of these questions is answered by the DEIS. Reliance on a numerical abstraction to describe risks is inconsistent with the approach taken by federal agencies in other cases. For instance, DOE’s Environmental Impact Statement prepared for the Yucca Mountain repository contains an extensive discussion of the consequences of severe transportation accidents. Yucca Mt. DEIS at App. J. A consequence analysis is also generally provided in EIS’s for nuclear power plants. *See, e.g.*, Final Environmental Statement related to the operation of Seabrook Station, Units 1 and 2, NUREG-0895 at 5.34 through 58 (health consequences); 5-58 through 5-60 and 5-64 through 71 (economic consequences); and 5-65 through 71 (health and economic risks).

In the context of the litigation before the NRC’s Atomic Safety and Licensing Board, the NRC Staff has argued that the State has no basis for seeking a consequence analysis for a Category 6 accident, because it has not demonstrated the credibility of the accident. The Staff argued that:

[T]he Yucca Mountain DEIS states that “[t]he analysis evaluated the impacts for these accidents, assuming the accident occurred without regard to the estimated probability.” Yucca Mountain DEIS at H-1; *emphasis added*. Inasmuch as Appendix H of the Yucca Mountain DEIS disregarded the question of whether the accident was credible (versus remote and speculative), reference to Appendix H of the Yucca Mountain DEIS does not assist the State in meeting the requirements of 10 C.F.R. § 2.714 for this contention. (Staff Response at 40).

The NRC staff's interpretation of the Yucca Mountain DEIS is incorrect and leads to the wrong conclusion about the DOE's approach to estimating the consequences of severe yet credible accidents. Contrary to the NRC's claim that "the Yucca Mountain DEIS disregarded the question of whether the accident was credible," the sentence following the one quoted by the Staff from Appendix H of the Yucca Mountain EIS states that "...the analysis provides the impacts that could occur from the worst *credible* accidents." (emphasis added) Clearly the DOE never "disregarded the question" of whether accidents are credible, since it goes on to define various "maximum credible accident scenarios."

Further, chapter 6 of the Yucca Mountain DEIS provides specific criteria for determining the maximum credible accident scenario based on its probability of occurrence. It states that "in general, this EIS considers accidents with conditions that have a chance of occurring more often than 1 in 10 million times in a year to be reasonably foreseeable." (6-28).

The DEIS for the PFS facility uses accident rates developed from an ANL study and accident distributions from the Modal Study. The State opposes the use of these studies together, as has been discussed above. Putting aside this opposition, for the moment, it is clear that the criteria for determining the credibility of an accident used for the Yucca Mountain DEIS has been met assuming the same accident probabilities used by the Staff. The PFS DEIS assumed the probability of a rail accident was 5.57×10^{-8} accident/railcar-km (2.2×10^{-7} accidents/train-km, assuming 4 railcars/train). (PFS DEIS at 5-35). Multiplying this number by the estimated 4.36×10^6 train-km that will be traversed during the campaign (DEIS at 5.35), the probability of an accident during the campaign is 0.96. According to the Modal Study, the conditional probability of a severe (category 6) rail accident is 1.25×10^{-4} . Multiplying this by the probability that *any* accident will occur will obtain the probability of a severe (category 6) accident, which turns out to be 1.2×10^{-4} . Thus, using the probabilities selected by NRC for the DEIS, the probability of a severe (category 6 accident) occurring during the shipping campaign involved with the proposed PFS facility is 1.2×10^{-4} , or 1.2 in 10,000. Using the accident probability given in the Modal Study (1.19×10^{-5} accidents/train-mile, or 7.4×10^{-6} accidents/train-km), 32 accidents are expected to occur (25 in transport from reactors to PFS, 7 in transport from PFS to Nevada state line), with the probability of a severe accident being approximately 4 in 1,000. These results are presented below.

Table 4: Probability of Severe (Category 6) Accident

Source of Accident Frequency	Accident Frequency (accidents/train-km)	Probability of an accident over lifetime of transportation campaign	Probability of Severe (category 6) accident
Modal Study	7.39×10^{-6}	32	4 in 1,000
ANL/ESD/TM-68	2.2×10^{-7}	0.96	1.2 in 10,000

Regardless of the accident frequency used, the probability of a severe accident clearly falls within the criteria given in the Yucca Mountain EIS for a maximum reasonably foreseeable accident scenario. The NRC often limits consideration of events to those having a probability of less than one in a million. A category 6 accident clearly fulfills this criterion.

It is important to understand that the State seeks to have the DEIS perform a consequence assessment of severe yet credible accident scenarios, similar to that performed in the Yucca Mountain DEIS but also including an economic consequence assessment. Thus, it is not enough to contend that the risks associated with improbable yet severe accidents have been accounted for through the use of RADTRAN software. The consequences of a severe yet credible accident are important to estimate in order to determine emergency response readiness.

The DEIS also wrongly presents information about the risks of such an accident without addressing its consequences. This violates the NEPA rule of reason that an EIS must be written in a fashion that enlightens and assists government decisionmakers in weighing the costs and benefits of their actions. Rather than informing decisionmakers of the possible health and economic consequences of their decisions, the DEIS requires them to be content with an abstraction of the overall risk. This is hardly a sufficient basis for weighing alternatives or evaluating mitigative measures.¹⁵

In the ALSB hearing, Staff has also argued that any problems with the PFS DEIS are a “no-never-mind” because the transportation impacts are embraced in the Commission’s Part 71 environmental analysis, as reported in NUREG-0170. NUREG-0170, however, did not contemplate shipping a huge fraction of the country’s spent fuel to a single repository, located 50 miles outside of Salt Lake City, within the space of 20 years. The

¹⁵ The Staff’s position is not aided by *City of New York v. U.S. Department of Transportation*, 715 F.2d 732, 751 (2nd Cir. 1983). See Staff’s Response at 34. There, the Court affirmed the Department of Transportation’s decision not to prepare an EIS for transportation of radioactive waste via highways. The Court determined that an overall risk assessment was sufficient for purposes of an *Environmental Assessment*, not a full-blown EIS.

Governor and the citizens of Utah are entitled to an EIS for this project that evaluates the health and economic impacts that would result from storing most of the nation's commercial spent nuclear fuel in Utah. In any event, the important factor to bear in mind is that EIS for the PFS facility is a tool that will be used by federal and state officials to make important decisions, and it will also be the primary tool that the public uses to understand the impacts of the PFS facility. Now that the Staff has taken on the task of preparing an EIS for this project, it must prepare the thorough, competent and informative report that is required by NEPA.

The DEIS does not address economic risks or consequences of a transportation accident

NRC regulations at 10 C.F.R. ' 51.71(d) require that a DEIS must include consideration of "economic benefits and costs" of a proposed project. It is beyond dispute that an accident involving a radiological release during transportation of nuclear waste could have extremely large costs associated with it, for cleaning up contamination, evacuating residents, compensating victims of contamination and businesses and railroads for income losses, and repairing the railroad. Yet, nowhere in the DEIS is there a discussion of the economic risks or consequences of a transportation accident involving spent fuel shipments to the PFS facility.

The NRC Staff failed to avail itself of readily available economic modeling capability in the RADTRAN 5 computer program, which includes an economic model designed to provide order of magnitude estimates for the financial impact of transportation accidents involving a release of radioactive material.¹⁶ The model estimates, based on the calculated concentration of radioactive material following an accident, the cost of emergency response, surveying, evacuation, and cleanup. The stand-alone economic model found in RADTRAN 5 is currently available to NRC and the public on the Transnet system run by Sandia National Laboratories (<http://ttd.sandia.gov/risk/tnet.htm>). RADTRAN 5 is a sensitive and comprehensive model that yields important information on the "costs of compensation for damaged property and lost income, site characterization, demolition, transportation, waste disposal, and ecological restoration." (SAND96-0957, xi.) This readily available information should be included in the DEIS for the consideration of federal decisionmakers, as it has been in other environmental impact statements. *See* Seabrook, NUREG-0895, *supra*.

¹⁶ RADTRAN 5 was initially developed to estimate the economic consequences of plutonium-dispersal accidents. It is documented in SAND96-0957, Chanin, D.I. and Murfin, W.B. "Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents." May 1996. Both the model and its documentation are available on the RADTRAN web site hosted by Sandia National Laboratories (<http://ttd.sandia.gov/risk/rt.htm>), which may be approached by first going to <http://ttd.sandia.gov>, then using the "risk" and "rt.htm" links.

As discussed below, RWMA has prepared estimates of costs resulting from a severe rail accident in an average urban area. Those estimates ranged from \$31.9 billion to \$313 billion. There is no justification for the DEIS's failure to evaluate and consider potential consequences of this magnitude.

Significantly, in the DEIS, the NRC has declined to calculate the environmental and economic impacts of a maximum credible accident. It has instead calculated the transportation risk. In declining to assess this impact and the emergency response plan, the NRC staff has not met the regulatory requirements of one of its cooperating agencies, the Surface Transportation Board. In addition, the NRC has failed to evaluate the health and economic impacts of a credible sabotage event. In this report, we do these calculations. That is, we estimate the health and economic impacts of a severe, but credible accident and sabotage event, that leads to a release of radioactive materials. Further, we point out certain deficiencies and errors that should be corrected in the final EIS.

Sabotage Impacts Not Considered

NRC regulations provide for only the most minimal protection against sabotage during transportation of spent fuel. The regulations, 10 CFR § 73.37, require only a small armed escort crew of two, with the ability to communicate with law enforcement agencies. The regulations are designed to prevent physical access to the shipments. This minimal protection will not prevent a sabotage event. Yet, the DEIS lacks any discussion of sabotage impacts. Nor does the DEIS discuss mitigative measures such as contingency planning for sabotage events, although contingency planning is required by STB regulations.

The explanation offered by the Staff for not discussing sabotage impact is that since "sabotage is a deliberate malevolent act, a meaningful probability of likelihood cannot be assigned." DEIS at 5-53. The committing of sabotage is not just dependent on deliberate intent, but on availability and effectiveness of weapons and the vulnerability of facilities to attack. The increasing effectiveness and lethality of terrorist acts has been graphically demonstrated by such incidents as the 1983 bombing of the Marine barracks in Beirut; the 1993 bombing of the World Trade Center; the February 1993 intrusion into the Three Mile Island site, in which the intruder crashed his station wagon through the security gate and rammed it under a partly opened door in the turbine building; the 1995 bombing of the Federal Courthouse in Oklahoma City; the 1995 release of SARIN nerve gas in the Tokyo subway; and the 1998 bombing of the U.S. embassies in Tanzania and Kenya. The threat of sabotage is equally applicable to nuclear waste transportation. *See, e.g.,* State of Nevada's Petition to Amend Requirements, available at:

http://ruleforum.llnl.gov/cgi-bin/library?source=*&library=NV_PETITION_lib&file=*

As the State of Nevada petition makes clear, much more effective devices have been

developed that do not require physical access, namely, anti-tank weapons.¹⁷ Anti-tank artillery such as the MILAN Anti-Tank Missile and the US TOW 2 Anti-Tank missile, can be used effectively at a distance from the target. These weapons are also easily transported. To date, tens of thousands of these devices have been manufactured. Both devices can be accurately fired from a distance of one km. The MILAN has an armor-penetrating capability of greater than 1000mm (39.4 inches) and the US TOW has an armor-penetrating capability greater than 700 mm (28.5 inches). In contrast, the M3A1, employed by Sandia in 1980 tests has armor-penetrating capabilities of 20 inches. In comparison, the HI-STAR 100 transportation cask has approximately 9 inches of steel surrounding the fuel. This means that either of the anti-tank missiles will penetrate deeper into a spent fuel cask and likely completely through. This can be accomplished at a distance up to 1 km from the cask.

It is not a basis that sabotage risk is not subject to numerical quantification. NRC regulations governing the content of draft EIS's require that "[t]o the extent that there are important qualitative considerations or factors that cannot be quantified, these considerations or factors will be discussed in qualitative terms." 10 C.F.R. § 51.71(d).

The NRC's refusal to address the environmental impacts of sabotage is all the more objectionable because of the devastating consequences that a sabotage event could have. The NRC's position in the DEIS is that the robustness of the casks used for storage and transportation make the consequences of a successful sabotage attack "not unacceptably large," giving no indication of what this means. NRC experimental studies done in the early 1980's show that 1% of the contents of a spent fuel cask could be released in a sabotage event employing a shaped charge. These studies focused on estimating the consequences of a successful sabotage attack using a "High Energy Density Device" (HEDD). A 1983 Sandia report (referred to as the Sandoval report in this document) presents the results of physical tests performed on truck casks in the early 1980s.¹⁸ In these studies a shaped charge device was detonated on a GE IF-200 truck cask, resulting in a hole penetrating 16.5 inches into the cask, damaging 50% of the fuel rods. The detonation resulted in a release of more than 1% of the total fuel from the cask. According to the results of the measurements performed after detonation, approximately 1.5×10^{-5} of the total fuel mass was released as an aerosol.

In a quarter-scale test performed in a similar manner, a larger respirable release fraction was obtained, mainly due to the fact that in this scenario the shaped charge penetrated completely through the test cask. Schmidt et al, 1981. "Shipping Cask Sabotage Source

¹⁷ See also Halstead and Ballard, Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments, prepared for the Nevada Agency for Nuclear Projects (October 1997); Tuler, Kaspersen and Ratick, The Effects of Human Reliability in the Transportation of Spent Nuclear Fuel (Clark University, June 1988). These reports were attached as Exhibits 3 and 16 to the State of Utah's Contentions on the Construction and Operating License Application by Private Fuel Storage, LLC for an Independent Spent Fuel Storage Facility (November 23, 1997), which was served on counsel for the NRC Staff.

¹⁸ Sandoval et al, 1983. *An Assessment of the Safety of Spent Fuel Transportation in Urban Environs*. SAND82-2365, Sandia National Laboratories.

Term Investigation.” NUREG/CR-2472. Batelle Columbus Laboratories. In a subsequent report (referred to as the “Luna Report” in these comments), Sandia explained that “all other factors being equal, the total effect of a full penetration event may be to increase aerosol release by approximately 10 times the aerosol release fraction from partial (i.e., one-hole) penetration.”¹⁹

The amount of material that is released from a shipping cask in the event of a successful sabotage event directly correlates with the calculated consequences of such an event. To our knowledge, the Luna report, using computer simulation to estimate the amount of material released from a rail cask resulting from the detonation of a High Energy Density Device (HEDD), is the only government-sponsored study estimating the response of a rail cask to targeted attack. A computer analysis regarding the response of more modern shipping containers to HEDDs is documented in the Luna report. This document uses computer simulation in an attempt to benchmark their analysis with the previous physical tests performed at Sandia. It also attempts to predict container response to penetration by a “device that could be delivered by a remote location by a launcher/guidance system typical of the weapons designed for infantry support that are man-portable.” Luna Report at 27. It appears that this is in reference to an anti-tank missile, but the details of the chosen design (most significantly, of its armor-penetrating ability) are not given. These computer analyses, which considered a rail cask and a truck cask, estimated a larger respirable release fraction for a truck cask than was previously obtained from the Sandia physical tests, due in part to the identification of an additional source term not accounted for in the Sandia tests. The computer analysis of rail cask response to HEDD detonation showed a significantly smaller respirable release fraction than that of the truck cask, which the Luna study states was due to the smaller volume of the truck cask increasing the release of material due to blowdown.

Outside of the observation in the Luna report that a full penetration would increase the amount of respirable aerosol by an order of magnitude over a single-hole penetration, there is no discussion of the consequences of such an event for a rail cask. A full penetration (or multiple-hole penetration) will create a pathway through which outside air can flow through the container, increasing the amount of material swept into the environment, and the amount of aerosol. The sabotage analyses performed by Sandia National Laboratories assume that there will only be one detonation in the event of a sabotage attack, and that this detonation will not completely penetrate a shipping cask. We believe that potential saboteurs, especially those with access to remote-delivery devices such as anti-tank missiles, will be able to attack a shipping cask using more than one missile. The release of radioactive material due to a multiple-missile event has not been approached by Sandia or any other government organization. Thus, there is no data available to estimate the additional damage to a shipping container that would be caused by a multiple-missile strike. It is certain that the damage would be significantly higher for the case of a multiple-missile strike.

¹⁹ Luna et al, 1999. *Projected Source Terms for Potential Sabotage Events Related to Spent Fuel Shipments*. SAND99-0963, Sandia National Laboratories.

RWMA's analysis of the consequences of a successful sabotage attack on a rail cask is presented later on in this document.

DEIS Fails to Evaluate Impacts of Inability to Satisfy DOT and NRC Regulations

US Department of Transportation ("DOT") regulations require that freight cars containing hazardous materials must be forwarded within 48 hours. 49 CFR 174.14 (a). NRC regulations also that require that shipments of spent fuel must be planned in order to avoid storage times in excess of 24 hours. 10 CFR 73.26(b). These regulations cannot be satisfied for the heavy-haul option. If a 4-cask train pulls into the intermodal transfer facility, only one cask per day can be transferred to the PFS facility. Further, PFS has stated that it only intends to move spent fuel via heavy-haul during the day. DEIS at 5-48. That is, 3 cars would remain at the intermodal transfer facility for several days, which is much longer than 24 hours. The DEIS should address this practical impossibility of satisfying federal transportation regulations, and evaluate the adverse environmental consequences, such as increased radiation doses to workers and increased vulnerability of transportation casks to sabotage.

HEALTH AND COST IMPACT OF A SEVERE TRANSPORTATION ACCIDENT IN SALT LAKE CITY, UTAH ARE SIGNIFICANT

RWMA has prepared an assessment of the health impacts and economic costs of a severe accident involving transportation of spent nuclear fuel to the proposed PFS facility in Skull Valley, Utah. The evaluation shows that the consequences of a potential accident or sabotage event are significant, and should be fully evaluated in an EIS.

This work was performed using the RADTRAN 4 and RADTRAN 5 computer codes developed by Sandia National Laboratories. After an initial discussion of the computer models, this report will detail the inputs and assumptions used in our analysis, comparing our methodology with that used for the DEIS. The results of our analysis will be reported, followed by a discussion of the impacts. This is followed by a section on the probability of such an accident. Finally, we discuss the health and cost impact of a sabotage event.

RADTRAN

RADTRAN is a computer model developed by Sandia National Laboratories to estimate population risks associated with the transportation of radioactive material. The first version of RADTRAN was issued in the late 1970s. In the context that it was used for the DEIS, the term "risk" has special meaning. It refers to the product of the probability of a given event and its likely consequences, summed up over the entire range of possible events. That is, the RADTRAN 4 computer code was used in the DEIS to calculate an expected risk to populations over the duration of the transportation campaign. RADTRAN was not used by the NRC to estimate the consequences of individual events.

We consider this to be a deficiency of the DEIS for the PFS facility. In this section, we perform a consequence assessment of a severe rail accident.

RADTRAN 4 also includes an economic model designed to provide order of magnitude estimates for the financial impact of transportation accidents involving a release of radioactive material. It estimates, based on the calculated concentration of radioactive material following an accident, the cost of emergency response, surveying, evacuation, and cleanup. The assumptions and methodology are contained in the technical manual²⁰ for RADTRAN 4.

RADTRAN 5, the latest version of the code, introduces a new, stand-alone economic model. This model was initially developed to estimate the economic consequences of plutonium-dispersal accidents. It is documented in a 1996 report by David Chanin and Walter Murfin²¹, and both the model and its documentation are available on the RADTRAN web site hosted by Sandia National Laboratories (<http://ttd.sandia.gov/risk/rt.htm>). The economic consequences estimated using the RADTRAN 5 spreadsheet companion are based on the "costs of compensation for damaged property and lost income, site characterization, demolition, transportation, waste disposal, and ecological restoration" (SAND96-0957, xi). A comparison of the costs included in the RADTRAN 5 economic model with those included in the RADTRAN 4 economic model show that the more recent model provides a much more detailed estimate of the costs of a radioactive release in the course of irradiated fuel transportation. It considers many more expenses likely to be incurred in the event of a release of radioactive material, resulting in a superior estimate of the likely economic consequences. Because we feel the RADTRAN 5 economic model to be an improvement on the RADTRAN 4 model, we perform an economic consequence assessment using this model in addition to the one obtained using the RADTRAN 4 program.

INPUTS

In order to correlate this consequence assessment with the risk assessment detailed in the DEIS, data was taken from that document wherever possible. We emphasize that much of these data cannot be found in PFS's Environmental Report.

Spent Fuel Inventory

In Appendix D, Table D.5 of the DEIS, the assumed radioactive inventory of the fuel used for the analysis is shown. All fuel shipped to the site is assumed to have a burnup of 40,000 MWD/MTU and be cooled for 5 years, the minimum cooling time required before transport. The HI-STAR 100 transportation cask, the only transportation cask currently under consideration for the proposed PFS facility, can hold 24 PWR fuel assemblies.

²¹ SAND96-0957. Chanin, D.I. and Murfin, W.B. "Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents." May 1996.

Therefore, the fuel inventory given in Table D.5 is for 24 PWR fuel assemblies, each with a burnup of 40,000 MWD/MTU and cooled for 5 years.

Table D.5 in Appendix D also identifies the "physical/chemical group" and "dispersibility category" for each isotope listed. These columns are used as inputs into the RADTRAN 4 computer program. Listed in Table D.5 are three physical/chemical groups (particulates, gas, and volatiles) and four dispersibility categories, listed as numbers. The physical/chemical groups are used to differentiate between the amount of material of different types that can be released from a container under a given accident scenario, while the dispersibility categories are used to estimate how much of this released material is in aerosol form and is respirable.

CRUD Release Fraction

Of particular note in Table D.5 are the properties given to Cobalt-60. As has been previously discussed, this isotope is considered in the DEIS to behave like a spent fuel particulate in the event of an accident. According to Table D.3 of the DEIS, the assumed particulate release fraction in the event of the severe accident (category 6) is 2.0×10^{-5} . As discussed above, this release fraction is inappropriately low.

RWMA's analysis is based on the technical literature and differs from the DEIS. The NRC does not provide a basis for the release fraction assumed in the DEIS. Tables A.1 and A.2 of this document, attached as an appendix, present the radionuclide inventory and release fractions used in RWMA's analyses and a comparison of the inputs used by RWMA with those assumed by NRC for the DEIS.

In order to determine the sensitivity of the differences shown in Table A.2, a RADTRAN 4 run was performed assuming an identical release scenario to that given for a severe (category 6) accident in the DEIS. It was found that using the release fractions assumed in the DEIS resulted in health consequence estimates of approximately 20% lower than those obtained assuming 100% CRUD release and 100% dispersal of released material. The economic cost estimates were roughly equivalent between the two runs. Table A.3 of this document, attached as an appendix, compares the results of these two runs.

Population Density

This analysis considers the potential impacts on human health and economics of a severe rail accident carrying spent fuel en route to the proposed PFS facility. We consider the effects of an accident in an environment having a population density similar to Salt Lake City Utah. According to a data sheet included as part of the RADTRAN 5 economic model, Salt Lake City has a population density of approximately 567 persons/km². We perform an additional analysis using the average urban population density of the 180 largest cities in the continental U.S., the method used in the RADTRAN 5 economic model.

Accident Scenario

The accident analyzed in this report is a severe rail accident in which one of the 4 casks carried by a typical rail shipment of spent nuclear fuel is damaged sufficiently to cause the release of a fraction of its contents. Specifically, it is assumed that 63% of the radioactive gas inventory is released, along with 0.2% of volatile solids and 0.002% of particulates (values obtained from Table D.4 of the DEIS) and 100% of the CRUD inventory.

Results

Table 5, given below, presents the results of our RADTRAN 4 analysis. The two variables in the runs are the atmospheric stability and the assumed evacuation time. In general, the more stable the atmosphere is in the event of an accident (stability class F is the most stable), the more concentrated the effects of the accident. However, the economic impacts will be greatest for accidents occurring under more neutral conditions, where released material is dispersed a greater distance.

Table 5: RADTRAN 4 Calculations: Impact of Severe (Category 6) Rail Accident in Salt Lake City, Utah

utaha1.in4	A	1	6.04E+04	30.2	\$590,000,000
utaha7.in4	A	7	6.10E+04	30.5	\$590,000,000
utahb1.in4	B	1	6.27E+04	31.35	\$2,580,000,000
utahb7.in4	B	7	6.40E+04	32	\$2,580,000,000
utahc1.in4	C	1	1.24E+05	62	\$10,400,000,000
utahc7.in4	C	7	1.29E+05	64.5	\$10,400,000,000
utahd1.in4	D	1	2.17E+05	108.5	\$20,900,000,000
utahd7.in4	D	7	2.24E+05	112	\$20,900,000,000
utahel.in4	E	1	2.64E+05	132	\$23,900,000,000
utahel7.in4	E	7	2.66E+05	133	\$23,900,000,000
utahf1.in4	F	1	3.52E+05	176	\$1,100,000,000
utahf7.in4	F	7	3.54E+05	177	\$1,100,000,000
utahavg1.in4	averaged over all	1	2.29E+05	114.5	\$14,300,000,000
utahavg7.in4	averaged over all	7	2.34E+05	117	\$14,300,000,000

The results show that, under average atmospheric conditions, a severe accident resulting in a release of a small fraction of the radioactive contents of a rail cask carrying 5-year cooled fuel will result in 115-117 additional latent cancer fatalities to the population of exposed individuals. The economic impacts associated with evacuation, interdiction, and restoration are calculated by RADTRAN 4 to be on the order of \$14.3 billion dollars, ranging up to \$23.9 billion. This is for a population density of 567 persons/km², corresponding to a low-density urban area such as Salt Lake City. Population doses will scale with population density.

RADTRAN 5 Economic Analysis

The RADTRAN 5 economic model has been previously discussed. For an accident in an urban area, remediation activities are broken into three categories: remediation of lightly, moderately, and heavily contaminated areas. These groups are segmented based on the amount of remediation required to meet a given cleanup criteria. For our analysis, we will assume a cleanup criteria of 0.2 uCi/m^2 , a level suggested by the EPA as a cleanup criteria for transuranics (see Appendix B, SAND96-0957).

Different remediation schemes are then employed for areas having contamination levels exceeding the cleanup criteria by certain amounts. Chapter 5 of the SAND96-0957 document outlines the approach used to designate the cleanup categories. For contamination levels of $0.2\text{-}0.4 \text{ uCi/m}^2$, the area is designated as "lightly contaminated," and remediation costs are associated with non-destructive decontamination activities such as washing and scrubbing, removing topsoil, and other "surface" decontamination activities. For contamination levels of $0.4\text{-}2 \text{ uCi/m}^2$, the area is designated as "moderately contaminated," and remediation costs are associated with destructive decontamination, such as replacement of roofing, furniture, flooring, and all landscaping. For contamination levels above 2 uCi/m^2 , the approach is to assume that decontamination is impractical, and the costs incurred are due to condemnation, acquisition, demolition, disposal, and restoration of property.

To perform this analysis, it is essential to estimate which areas are deemed lightly, moderately, and heavily contaminated in order to segment the cost estimate into these three categories. We utilized the output from the RADTRAN 4 runs estimating the consequences of severe accidents in urban areas as input into an economic analysis using the RADTRAN 5 economic model, having in previous studies determined that RADTRAN 4 and RADTRAN 5 yield similar contamination level estimates.

The cost estimates obtained from this model estimate cleanup impact for a release of radioactive material in an urban area with a population density of $1344 \text{ persons/km}^2$. This value was obtained by summing the populations and areas contained by the 180 largest cities in the continental U.S., then dividing the cumulative population by the cumulative area. It does not appear that changing the assumed population density has an impact on the calculated cost estimates obtained from the model. Rather, it appears that this average population density has been internalized into the program. Therefore, we calculate the economic impact of a category 6 accident in an urban area having a population density of $1344 \text{ persons/km}^2$ using the RADTRAN 5 model.

The results of this analysis, for average meteorological conditions, are presented below, assuming average weather conditions. For comparison, we also present the results of an economic analysis using the RADTRAN 4 code and assuming $1344 \text{ persons/km}^2$.

**Table 6: Comparison of RADTRAN 4 and RADTRAN 5 Economic Models:
Severe Rail Accident, 5 year cooled fuel, 1344 persons/km²**

RADTRAN Version	Economic Cost, \$2000
Radtran 4	\$31,900,000,000
Radtran 5	313,000,000,000

This comparison shows that there is an order of magnitude difference in economic impact estimates between the two models. Much of this is due to the significantly more detailed cost assessments employed in the RADTRAN 5 economic model, which takes into account replacement costs for contaminated personal items and property as well as compensation for lost income, among other factors. Regardless of which model is used, the result is clear: the economic impacts of a severe transportation accident resulting in a small release of radioactive material would be devastating.

Sabotage Analysis

In this section, we perform a consequence assessment of the effects of a successful sabotage attack on a rail cask shipment in Salt Lake City, Utah. We present the methodology and results of our consequence assessment of the effects of a successful sabotage attack on a rail cask containing spent nuclear fuel. We use the RADTRAN 4 and RADTRAN 5 programs to estimate the health and economic consequences of the sabotage event described in the Luna report, assuming a population density of 567 persons/km² for the RADTRAN 4 economic analysis and 1344 persons/km² for the RADTRAN 5 economic analysis. To provide a range of potential consequences, we use the minimum, average, and maximum release fractions obtained from the computer analyses documented in the Luna report.

Because of the relative scarcity of experiments estimating the true consequences of a credible sabotage attack on a rail cask, we have decided to use release fractions from the Luna simulation for a rail cask as our lower bound estimate of the consequences of a sabotage event on a rail cask. In addition, we believe that a sabotage event resulting in either the full penetration of a rail cask, or multiple penetration due to multiple missile strikes, is credible. In order to make an estimate of this more severe event, we apply the release fractions obtained in the Luna report for a truck cask to the rail cask inventory. These release fractions are 1-2 orders of magnitude greater than those obtained from the rail cask simulation. We have previously shown how a full penetration event is postulated to result in an order of magnitude increase in the respirable release rate over a one-hole event. In this sense, our use of the truck cask release fractions can be seen as a proxy to estimate the consequences of a complete rail cask penetration event.

It must be stressed that the consequence estimates presented here are lower bound estimates of the consequences of a terrorist strike on a rail cask containing spent nuclear fuel. This is the case for a number of reasons, the most important of which are (1) the failure of the Luna report to consider modern anti-tank missiles, capable of fully penetrating a rail cask, (2) failure of the Luna report to consider a multiple-missile strike sabotage event, which would result in a much greater release fraction than that calculated in the Sandia computer simulation, and (3) failure of the Luna study to physically test newer, more susceptible casks for resistance to sabotage attack. Because of these factors, we have performed a consequence assessment assuming the release fractions obtained in the Luna report for a truck cask sabotage scenario, using this as a proxy for a more severe, multiple-hole attack or an attack in which complete penetration of a cask occurs. This is explained later in this section.

Tables 3 and 4, below, reproduce the release fractions assumed for each of our consequence assessments. All of the values were taken from data contained in the Luna report. We use the rail cask release fractions, listed in Table 7, to estimate the consequences of a single hole penetration event like the one described in the Luna report. As a proxy for estimating the consequences of a complete penetrations event, or a multiple-missile strike, we use the release fractions obtained from the Luna report for a truck cask.

Table 7: Release Fractions Used in Sabotage Analysis: Single Hole Penetration Event*

	Minimum Release Fractions	Average Release Fractions	Maximum Release Fractions
CRUD	4.50E-07	1.30E-06	3.00E-06
Noble Gas	2.30E-04	4.10E-04	6.70E-04
Cesium	6.20E-06	1.70E-05	4.00E-05
Particulates	1.10E-06	3.10E-06	1.00E-05

*release fractions are those obtained in the Luna report for a HEDD1 detonation on a rail cask

Table 8: Release Fractions used in sabotage analysis: Complete (Multiple-Hole) Penetration Event*

	Minimum Release Fractions	Average Release Fractions	Maximum Release Fractions
CRUD	3.1E-5	7.5E-5	1.4E-4
Noble Gas	1.2E-2	2.0E-2	2.6E-2
Cesium	4.2E-4	1.0E-3	2.0E-3

Particulates	4.7E-5	1.2E-4	3.9E-4
--------------	--------	--------	--------

*release fractions are those obtained in the Luna report for a HEDD1 detonation on a truck cask. We have noted earlier how a complete (2-hole) penetration is likely to increase release fractions by a factor of 10. The use of these fractions serves as a proxy with which to estimate the consequences of a sabotage attack more severe than the one assumed for the Luna report.

Results

Tables 9 and 10 presents the results of our RADTRAN 4 consequence assessments of the sabotage events described above.

Table 9: RADTRAN 4 CALCULATIONS: Consequences of Luna Report Sabotage Scenario: Single Hole Penetration Event (567 persons/km², average meteorological conditions)

Release Fractions Used	Evacuation Time Days	Population Dose Person-rem	Expected LCFs	Economic Cost \$2000
Average	1	8.64E+03	4.3	123,000,000
Average	7	8.81E+03	4.4	123,000,000
Minimum	1	3.14E+03	1.6	39,400,000
Minimum	7	3.21E+03	1.6	39,400,000
Maximum	1	2.57E+04	12.9	340,000,000
Maximum	7	2.60E+04	13	340,000,000

Table 10: RADTRAN 4 CALCULATIONS: Consequences of Luna Report Sabotage Scenario: Complete (Multiple-Hole) Penetration Event (567 persons/km², average meteorological conditions)

Release Fractions Used	Evacuation Time Days	Population Dose Person-rem	Expected LCFs	Economic Cost \$2000
Average	1	3.43E+05	171.6	8,120,000,000
Average	7	3.48E+05	174	8,120,000,000
Minimum	1	1.41E+05	70.5	2,490,000,000
Minimum	7	1.43E+05	71.5	2,490,000,000
Maximum	1	9.90E+05	495	14,300,000,000
Maximum	7	9.94E+05	497	14,300,000,000

As can be readily seen from these tables, the consequences of a sabotage accident would be severe. The DEIS should acknowledge and evaluate this.

Appendix: Spent Fuel Inventory and Assume Release Fractions: Severe Accident Analysis

Table A.1: Radionuclide Inventory Used In Accident Analysis*

Isotope	Ci/shipping Canister	Physical/Chemical Group
Cobalt-60	5.23E+02	CRUD
Krypton-85	9.07E+04	Gas
Strontium-90	8.86E+05	volatile
Ruthenium-106	1.84E+05	volatile
Cesium-134	4.20E+05	volatile
Cesium-137	1.23E+06	volatile
Promethium-147	4.06E+05	particulates
Samarium-151	5.35E+03	particulates
Europium-154	8.76E+04	particulates
Plutonium-238	4.37E+04	particulates
Plutonium-239	4.34E+03	particulates
Plutonium-240	6.19E+03	particulates
Plutonium-241	1.25E+06	particulates
Americium-241	1.34E+04	particulates
Americium-243	2.35E+02	particulates
Curium-242	4.54E+02	particulates
Curium-244	2.74E+04	particulates

Total Activity 4.66E+06

* source: DEIS, Table D.5

Table A.2: Release Fractions Used in Consequence Assessment of Severe Rail Accident Carrying Spent Nuclear Fuel

Particle Type		Release Fractions Used In RADTRAN Calculations	
		Our Analysis	NRC Analysis for DEIS
CRUD	release	1	0.00002
	aerosol	1	1
	respirable	1	0.05
Volatile Solids	release	0.002	0.002
	aerosol	1	1
	respirable	1	1
Particulates	release	0.00002	0.00002
	aerosol	1	0.000001
	respirable	1	0.05
Gas	release	0.63	0.63
	aerosol	1	1
	respirable	1	1

Table A.3: Comparison of RADTRAN 4 Results: Release Fractions used in DEIS vs. Release Fractions Assumed in This Analysis

File description	Population Dose person-rem	Expected LCFs	Economic Cost 2000\$
release fractions assumed for this analysis	229000	114.5	\$14,300,000,000
release fractions assumed in PFS dEIS	180000	90	\$13,900,000,000