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NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	Docket No. 72-22-ISFSI	OFFICE OF SECRETARY RULEMAKINGS AND ADJUDICATIONS STAFF
PRIVATE FUEL STORAGE, LLC)	ASLBP No. 97-732-02-ISFSI	
(Independent Spent Fuel)		
Storage Installation))	May 15, 2001	

**STATE OF UTAH'S RESPONSE TO APPLICANT'S MOTION FOR
SUMMARY DISPOSITION OF UTAH CONTENTION V**

Pursuant to the Board's Order of April 20, 2001 and 10 CFR § 2.749(a), the State files this Response to the Applicant's April 16, 2001, Motion for Summary Disposition of Utah Contention V-- Inadequate Consideration of Transportation-Related Radiological Environmental Impacts ("Motion"). The State opposes the Applicant's Motion on the grounds that there are genuine disputes of material facts and, therefore, pursuant to 10 CFR § 2.749, the Applicant is not entitled to summary disposition as a matter of law. The State's opposition is supported by a Statement of Disputed and Relevant Material Facts ("Utah Facts"), and by the attached Declaration of Dr. Marvin Resnikoff (May 10, 2001).

I. BACKGROUND

PFS seeks NRC permission to create the largest interim storage facility in the country that would accommodate the storage of the nation's current inventory of spent nuclear fuel. If licensed, PFS could store up to 4,000 casks containing 40,000 metric tons of uranium of spent nuclear power plant fuel. Operation of the facility would require the unprecedented shipment of massive quantities of spent nuclear fuel through numerous communities across the United States, primarily by rail but also by heavy haul truck or barge.

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SECY-02

The shipment of spent nuclear fuel to the PFS facility would involve occupational and public radiation exposures during normal operation, and would pose accident risks. The State, concerned that these factors constitute significant environmental impacts, filed Contention Utah V, which raised valid concerns under the National Environmental Policy Act ("NEPA") that the environmental analysis for the PFS facility does not contain an adequate discussion of the transportation-related radiological environmental impacts.

At the time PFS filed its license application in 1997, the only environmental document supporting the PFS license application was the Applicant's Environmental Report ("ER"). In Contention Utah V the State challenged the adequacy of the ER's discussion of the transportation-related environmental impacts of the proposed ISFSI under the National Environmental Policy Act. As admitted by the Board, the contention states:

The Environmental Report ("ER") fails to give adequate consideration to the transportation-related environmental impacts of the proposed ISFSI in that PFS does not satisfy the threshold condition for weight specified in 10 C.F.R. s 51.52(a) for use of Summary Table S-4, so that the PFS must provide "a full description and detailed analysis of the environmental effects of transportation of fuel and wastes to and from the reactor" in accordance with 10 C.F.R. s 51.52(b).

LBP-98-7, 47 NRC 142, 201, 256, *aff'd on other grounds*, CLI-98-13, 48 NRC 26 (1998) (*emphasis added*); *see also* State's Contentions on the Construction and Operating License Application by Private Fuel Storage, LLC for an Independent Spent Fuel Storage Facility (November 23, 1997) at 147-149 ("Utah V"). The Board further clarified that Contention Utah V included "the potentially extra-regional impacts." LBP-98-10, 47 NRC 288, 296.

In June 2000, the NRC Staff issued the Draft Environmental Impact Statement ("DEIS") for the PFS facility. PFS filed for summary disposition on April 16, 2001.

II. STANDARD OF REVIEW

Pursuant to 10 CFR § 2.749(d), a party is entitled to summary disposition if "there is no genuine issue as to any material fact" and the party "is entitled to a decision as a matter of law." The burden of proving entitlement to summary disposition is on the movant.¹ Because the burden of proof is on the proponent, "the evidence submitted must be construed in favor of the party in opposition thereto, who receives the benefit of any favorable inferences that can be drawn."² Furthermore, if there is any possibility that a litigable issue of fact exists or any doubt as to whether the parties should be permitted or required to proceed further, the motion must be denied.³ Summary judgment may also be denied or continued if the opposing party demonstrates in its affidavits that it cannot present facts essential to justify its opposition.⁴

III. ARGUMENT

¹ Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102 (1993).

² Sequoyah Fuels Corp. and General Atomics Corp. (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-17, 39 NRC 359, 361, *aff'd* CLI-94-11, 40 NRC 55 (1994).

³ General Electric Co. (GE Morris Operation Spent Fuel Storage Facility), LBP-82-14, 15 NRC 530, 532 (1982).

⁴ 10 C.F.R. § 27.49(c); Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-86-11, 23 NRC 577 (1986). *See also* Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 and 2) ALAB-443, 6 NRC 741, 755 (1977): "[S]ummary disposition is a harsh remedy. It deprives the opposing litigant of the right to cross-examine the witness, which is perhaps at the very essence of an adjudicatory hearing. In such circumstances -- even in administrative proceedings where the rules of evidence may be relaxed -- it is important that a movant for summary disposition be required to hew strictly to the line set out by our Rules of Practice."

Although PFS's analysis of transportation impacts in the Environmental Report is woefully inadequate, the State agrees that issues raised in Contention Utah V should focus on the adequacy of the most recent transportation impact discussion in the DEIS.⁵ See Motion at 6. Contrary to PFS's claims, however, the DEIS discussion on transportation impacts of shipping spent nuclear fuel to and from the proposed PFS facility is still deficient notwithstanding that the DEIS contains more information on those impacts than did the ER.

In its Environmental Report, PFS relied solely on 10 CFR § 51.52(a), Table S-4, as a substitute for a transportation impact analysis. See Utah V at 146-48. However, the HI-STAR 100 shipping cask proposed by PFS exceeds the threshold condition for weight encompassed by Table S-4. *Id.* Thus, the substitution by PFS of the Table S-4 analysis for a "full description and detailed analysis" of transportation impacts was wholly inappropriate. In the DEIS, the NRC Staff essentially agreed with the State in that the DEIS did not rely on Table S-4. Resnikoff Dec. ¶ 7; Motion at 7.

PFS now claims that Contention Utah V is moot because the DEIS does not rely on Table S-4. Motion at 10. PFS's myopic reading of Utah V ignores the plain language of the contention. Utah V states that the ER

fails to give adequate consideration to the transportation-related environmental impacts of the proposed ISFSI in that PFS does not satisfy the threshold condition for weight specified in 10 C.F.R. s 51.52(a) for use of Summary Table S-4, so that the PFS must provide "a full description and detailed analysis of the environmental effects of transportation of fuel and

⁵ A contention based on the Applicant's Environmental Report may also be considered a challenge to the analysis in the DEIS; thus Utah V challenges not only the ER but also the DEIS. Louisiana Energy Services, L.P. (Claiborne Enrichment Center), CLI-98-03, 47 NRC77, 84 (1998).

wastes to and from the reactor . . .”

LBP-98-7, 47 NRC at 201, 256. The heart and soul of Utah V challenges the adequacy of impacts from the transportation of spent nuclear fuel to and from the proposed PFS facility. PFS recognizes this in its Material Facts, thereby contradicting the arguments in its Motion. See PFS Statement of Material Facts (“PFS Facts”) at ¶ 3 (*stating* Utah V “challeng[es] the adequacy of the analysis of transportation-related radiological environmental impacts”).

Contention Utah V is not limited to whether or not the transportation impact analysis relies on Table S-4. The fact that PFS inappropriately relied on Table S-4 is merely proof that PFS’s analysis of transportation impacts is inadequate and that a “full description and detailed analysis of the environmental effects of transportation of fuel and wastes to and from the reactor” is warranted.

Unlike the ER, the DEIS does not rely on Table S-4 but utilizes the methodology suggested by the State. Regardless of the methodology used to analyze transportation impacts, there must be a “full description and detailed analysis” of those impacts. Here the DEIS comes up short. The DEIS does not contain a full description and detailed analysis of transportation impacts because the DEIS’s simplified assumptions ignore many relevant and material factual issues that create significant occupational and public exposures that are not addressed in the DEIS.

Although the DEIS analysis is an improvement from the Applicant’s inappropriate use of Table S-4, it is still significantly incomplete and inadequate in the following respects. First, the DEIS does not analyze the increased occupational exposures from additional transfers of spent nuclear fuel during cask loading at reactor sites without the capability to

lift the 145 ton HI-STAR 100 shipping cask proposed by PFS. See Utah Facts ¶¶ 3-4. This is relevant and material because a significant number of fuel shipments to PFS will likely come from reactors without the capability to directly load a HI-STAR 100 cask. In fact, seventeen reactors owned by PFS members cannot directly load the HI-STAR 100 shipping cask because they either have no rail access or are restricted by the reactor bay or crane loading capacity. Resnikoff Dec. ¶ 8.

Second, the DEIS does not analyze the increased occupational and public exposures from heavy haul truck or barge transport to a railhead for shipments originating at a reactor site without direct rail access. See Utah Fact ¶ 5. When there is no direct rail access at the reactor, numerous transfers are involved in transporting the spent nuclear fuel to the nearest railhead, thereby increasing occupational exposure to workers with each transfer. Resnikoff Dec. ¶ 8.

Third, the DEIS does not analyze the increased occupational exposures from additional transfers of spent nuclear fuel during cask loading at reactor sites without the capability to accommodate the increased height of a steerable trolley railcar from a standard railcar. See Utah Fact at ¶ 6. While PFS has not disclosed the exact railcar design it intends to use to ship casks to Utah, PFS must use a steerable trolley and a three or four axle trolley to distribute the weight of the approximate 211 ton HI-STAR 100 cask and railcar. Resnikoff Dec. ¶ 10. The steerable trolley PFS intends to use will be higher than a fixed trolley and it may not fit into reactor loading bays. Consequently, having to load the fuel onto the steerable trolley may lead to more transfer operations, just as lack of direct rail access requires, thus leading to increased occupational exposure to workers. The DEIS is

incomplete because it does not address the inability of the reactor to directly load onto a steerable trolley in the reactor bay.

Fourth, the DEIS does not analyze the increased occupational and public exposures that result from using steerable trolleys that must negotiate turns and cross bridges at slow speeds. See Utah Fact ¶¶ 7-8. Because of the high center of gravity of a three or four axle steerable trolley, trains must compensate for this fact by traveling at slower speeds around turns and over bridges than the speeds considered in the DEIS. Resnikoff Dec. ¶ 11.

Fifth, the DEIS does not analyze the increased occupational exposure that may occur in the transfer of spent nuclear fuel from the HI-STORM or other dry cask storage system to the HI-STAR 100 or other transportation cask. See Utah Fact ¶ 9. Such a situation could occur where the reactor and storage pool are entirely dismantled. Resnikoff Dec. ¶ 12.

Sixth, the DEIS does not analyze the increased accident rate due to the instability of the heavy railcars with high centers of gravity that PFS intends to use. See Utah Fact ¶ 10. An increased accident rate is expected with the type of railcar PFS intends to use because high lateral forces combined with a high center of gravity make the PFS-type railcars less stable. *Id.* The DEIS does not account for such potential increases in transportation accidents.

Once again in a rush to dismiss the State's legitimate concerns, PFS overlooks the substance and significance of the inadequacies in the DEIS. PFS argues that, whether adequate or not, the transportation impacts in the DEIS are wholly independent of Table S-4 and that should suffice to satisfy Contention Utah V. Motion at 7. PFS's position ignores

the fact that the underpinning of Utah V is the adequacy of the transportation analysis. The Board should reject PFS's argument because to find that an inadequate analysis meets the intent of NEPA would render NEPA a meaningless charade.

A "full description and detailed analysis" of the environmental impacts from transportation of the spent nuclear fuel to and from the PFS facility must be provided. 10 CFR § 51.52(b). Moreover, NEPA requires the Staff in the DEIS to take a "hard look" at environmental impacts. Claiborne, CLI-98-03, 47 NRC at 88. A number of public and occupational impacts have not been evaluated. Consequently, the DEIS does not take the "rigorous" or "hard look" at environmental impacts required by NEPA.

PFS claims that the Staff's analysis in the DEIS is a "full description and detailed analysis" because the analysis utilized RADTRAN4 to calculate dose to the public along a route originating at Maine Yankee. Motion at 8. The mere pronouncement by PFS that there is a full description and detailed analysis does not make it so. Moreover, the analysis in the DEIS is misleading and not representative of many of the anticipated shipments to PFS because Maine Yankee has direct rail access, while numerous reactors do not - an important fact the DEIS failed to address. Resnikoff Dec. ¶ 9.

The DEIS does not satisfy 10 CFR § 51.52(b) or NEPA, nor does it render the issues in Utah V moot. It is evident that there are substantive disputes of relevant material fact, and in this summary disposition proceeding the proponents of the motion have not proven they are entitled to a decision as a matter of law. The benefit of all favorable

inferences that can be drawn from the evidence must be construed in favor of the State.⁶

The State requests the Board to deny the motion and set this matter for hearing.

V. CONCLUSION

For the reasons stated above, the DEIS does not address the concerns raised by the State in Contention Utah V and there remain genuine and material disputed issues of fact between the State of Utah and PFS. Accordingly, PFS is not entitled to summary disposition and the matter should be set for hearing.

DATED this 15th day of May, 2001.

Respectfully submitted,



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⁶ Sequoyah Fuels Corp. and General Atomics Corp. (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-17, 39 NRC 359, 361, *aff'd* CLI-94-11, 40 NRC 55 (1994).

CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S RESPONSE TO
APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF CONTENTION UTAH
V was served on the persons listed below by electronic mail (unless otherwise noted) with
conforming copies by United States mail first class, this May 15, 2001:

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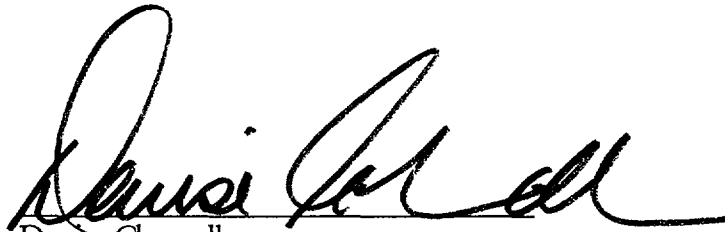
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A handwritten signature in black ink, appearing to read "Denise Chancellor", written over a horizontal line.

Denise Chancellor
Assistant Attorney General
State of Utah

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

May 15, 2001

1. The State disputes Private Fuel Storage (“PFS”) Material Facts ¶¶ 6 and 7. 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,” NUREG-1714 (“DEIS”) fails to provide “a full description and detailed analysis of the environmental effects of fuel and wastes to and from the reactor” as required by 10 CFR § 51.52(b). *See* Resnikoff Dec. ¶¶ 7-13.
2. In the DEIS, the NRC Staff attempted to analyze some of the impacts from transporting spent nuclear fuel to and from the proposed PFS facility. The Staff failed to provide a full description and perform a thorough and detailed analysis of the environmental effects of transporting spent nuclear fuel to and from the PFS facility. *See* ¶ 1, *supra*; *see also*, Resnikoff Dec. ¶¶ 7-13.
3. The HI-STAR 100 shipping cask proposed by PFS weighs approximately 145 tons. *See* Resnikoff Dec. ¶ 8. Reactor sites that do not have the ability to lift the 145 ton HI-STAR shipping cask or to accommodate the railcar and HI-STAR 100 shipping cask must perform more spent nuclear fuel transfers with a smaller transfer cask. Id.
4. The DEIS fails to analyze the increased occupational exposure that will occur due to additional transfers of spent nuclear fuel at reactor sites which

do not have the capability to lift the HI-STAR 100 shipping casks proposed by PFS. Id.

5. Reactor sites without direct rail access must transport the loaded HI-STAR 100 casks by heavy haul or barge transport to a railhead. Id. ¶¶ 8-9. The DEIS fails to analyze additional public and occupational exposure at reactor sites where there are no existing rail lines into the reactor loading bay. Id.
6. A 3-axle or 4-axle steerable trolley railcar must be used to transport the 145 ton HI-STAR 100 cask. Id. ¶ 10. Some reactor loading bays may not be capable of accommodating a steerable trolley railcar due to the increased height. Id. The DEIS fails to analyze additional occupational exposure at reactor loading bay sites which cannot accommodate a steerable trolley railcar. Id.
7. The higher height steerable trolley railcar also has a higher center of gravity which requires slower speeds to negotiate turns and cross bridges. Id. ¶ 11. Slower speeds increase occupational and public exposure times. Id.
8. The DEIS fails to analyze the increase in public and occupational exposure that will occur due to the slower speeds that the PFS railcars must travel. Id.
9. The DEIS fails to analyze the additional occupational exposure that may occur in the transfer of spent nuclear fuel from another dry cask storage system. Id. ¶ 12.
10. The accident rate for heavy railcars with higher centers of gravity is greater than for standard railcars. Id. ¶ 13. The DEIS fails to analyze the higher accident rate due to the heavier weight and higher center of gravity of the railcars to be used to transport spent nuclear fuel to the PFS facility. Id.

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
)
) May 10, 2001

**DECLARATION OF DR. MARVIN RESNIKOFF REGARDING MATERIAL
FACTS IN DISPUTE WITH RESPECT TO CONTENTION UTAH V**

I, Dr. Marvin Resnikoff, hereby declare under penalty of perjury and pursuant to 28 USC § 1746, as follows:

1. I am a physicist with a Ph.D. in high-energy theoretical physics from the University of Michigan and also the Senior Associate of Radioactive Waste Management Associates (RWMA), a private technical consulting firm based in New York City. I have researched radioactive waste issues for the past 27 years and have extensive experience and training in the field of nuclear waste management, storage, and disposal. Our work at RWMA is about equally divided among three issues related to the matters covered in this deposition: (i) transportation and storage of irradiated fuel, (ii) personal injury law suits involving radiation in which we calculate radiation exposures, and (iii) remediation of radioactive landfills and contaminated sites. A copy of my resume has already been filed in this proceeding. See, Exhibit A attached to my declaration in support of the "State of Utah's Responses to Applicant's Motion for Summary Disposition of Utah Contention K/Confederated Tribes Contention B," dated January 30, 2001.
2. I have considerable expertise and experience in the field of nuclear waste storage and transportation, including reviewing and analyzing cask designs, and evaluating transportation risks. Since 1975 I have worked on spent fuel transportation issues, including cask safety, for the States of Utah, Nevada (including Clark and White Pine Counties), Idaho, New Mexico and Alaska. This work began with work for the New York Attorney General's office on the safety of transporting plutonium by plane out of John F. Kennedy International Airport. My role in the case was to determine whether the plutonium shipping container could be punctured and the amount of plutonium that could be released. I was an invited speaker at the 1976 Canadian meeting of the American Nuclear Society to discuss the risk of transporting plutonium by air. On behalf of the State of New York, I also reviewed and provided

comments on NUREG-170, "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes." On behalf of the State of Nevada and Clark County, Nevada, I provided comments on the transportation cask safety studies and transportation risk assessments, such as the Modal Study and references, and more recently NUREG/CR-6672. I have conducted transportation risk assessments for the State of Nevada and have employed various computer codes and formulas to estimate the amount of radioactivity released in and the health and economic consequences of a severe accident, including the computer models RADTRAN, RISKIND, RESRAD, and HOTSPOT. In addition, in hearings before state commissions and in federal court, I investigated proposed dry storage facilities at the Point Beach (WI), Prairie Island (MN) and Palisades (MI) reactors. These are matters that are also addressed in this declaration. For the Council on Economic Priorities, I have written a book on the transportation and storage of irradiated fuel. In June 2000, I was appointed to a Blue Ribbon Panel on Alternatives to Incineration by former DOE Secretary Bill Richardson.

3. I have considerable training and experience in the field of risk assessment involving nuclear and hazardous facilities, serving as an expert witness in numerous personal injury cases in which I estimated radiation doses and the likelihood these exposures caused cancer. These cases involved uranium mining and milling, oil pipe cleaning, X-rays, thorium contamination and other issues. This work involved the use of computer codes, such as MILDOS, to estimate radiation doses and spreadsheets employing dose conversion factors.
4. I am the State of Utah's expert witnesses on Contention Utah V, which relates to the environmental impacts of transportation of spent nuclear fuel to and from the proposed Private Fuel Storage facility. I participated in the drafting of the contention and the development of the State's position regarding the contention, including the preparation of discovery against the Applicant and the NRC Staff.
5. I am familiar with Private Fuel Storage, L.L.C.'s ("PFS's") license application ("LA"), Environmental Report ("ER") and Safety Analysis Report ("SAR") in this proceeding, as well as the applications for the storage and transportation casks (HI-STORM and HI-STAR) PFS plans to use. I am also familiar with NRC regulations, guidance documents, and environmental studies relating to the storage and transportation of spent nuclear power plant fuel, including NUREG-0800, 10 CFR Part 100, EPA's Protective Action Guide, and Federal Register Notice December 4, 1996 (61 Fed. Reg. 64257). I am also familiar with applicable PFS responses to NRC's Requests for Additional Information ("RAIs").
6. I have carefully reviewed the Applicant's April 16, 2001 Motion for Summary Disposition of Utah Contention V - Inadequate Consideration of Transportation-Related Radiological Environmental Impacts, as well the Statement of Material Facts

on Which No Genuine Dispute Exists; other relevant PFS documents; the NRC Staff's *Safety Evaluation Report* ("SER") dated September 29, 2000; and 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*, NUREG-1714 ("DEIS") dated June 2000.

7. This declaration is written in support of the State's Statement of Disputed and Relevant Material Facts. I will discuss my view that the discussion in the DEIS does not adequately address environmental effects of the transportation of spent nuclear fuel to and from the proposed Private Fuel Storage facility as required by 10 CFR § 51.52(b). While I acknowledge that the discussion in the DEIS is an improvement over the grossly inadequate use of Table S-4 in the ER, the DEIS still does not adequately address the environmental impact of the weight of cask-carrying railroad cars. The DEIS has not provided "a full description and detailed analysis of the environmental effects of transportation of fuel and wastes to and from the reactor," as alleged in Contention Utah V.
8. PFS plans to transport spent nuclear fuel in a 145 ton HI-STAR 100 shipping cask. See, emailed memo from John Donnell to Stan Gurule dated March 30, 1999, attached hereto as Exhibit 1 (PFS bates no. 32858-9). Many reactor sites do not currently have the capability to lift the 145 ton HI-STAR 100 shipping cask. Among the 22 reactors¹ claimed to be owned by PFS members, five have rail access and sufficient crane capacity.² The remaining seventeen reactors cannot directly load the HI-STAR 100 shipping cask because they either have no rail access or are restricted

¹ The Indian Point Unit 2 reactor listed in the DEIS as owned by a PFS member is currently awaiting NRC approval to transfer the ownership and license to a non-PFS member. See news article titled *Entergy Nuclear adds Indian Point plants to its Northeast Fleet*, dated November 9, 2000, attached hereto as Exhibit 2. Following completion of the sale of Indian Point Unit 2, PFS members will own 21 reactors.

² The DEIS incorrectly lists Illinois Power Company as a PFS member. Florida Power and Light Company replaced Illinois Power as a PFS member prior to the DEIS issuance. See letter from John Parkyn, PFS, dated June 2, 2000, to NRC, advising that Florida Power and Light has secured the membership of Illinois Power in the PFS, LLC, attached hereto as Exhibit 3. Florida Power and Light's three reactors do not have direct rail access. Additionally, the Oyster Creek and Three Mile Island Unit 1 reactors are no longer owned by PFS members. See news releases from GPU's internet site titled *GPU, Amergen Complete Sale of Oyster Creek Facility* (August 9, 2000) and *This Month's News GPU and AmerGen Close Sale of Three Mile Island Unit 1* (December 21, 1999), both attached hereto as Exhibit 4.

by the size of the reactor bay or crane loading capacity. The reactor accessibility is shown in a table I prepared entitled "Reactor Accessibility," attached hereto as Exhibit 5. See additionally, *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. For PFS reactor sites without direct rail access, as well as additional reactors owned by any non-PFS member customers, spent nuclear fuel must be transported by heavy-haul truck or barge to the nearest railhead. A crane capable of lifting the 145 ton cask must be installed at each reactor site or the HI-STAR 100 shipping cask must be loaded using smaller transfer casks which will increase the number of transfers. The occupational exposure to workers will increase with the number of transfers. However, the discussion in the DEIS did not account for the increased occupational exposure that will occur at reactor sites which do not have the capability to lift the 145 ton HI-STAR 100 shipping casks proposed by PFS.

9. Based on standard assumptions for the Maine Yankee shipment, the DEIS estimated incident-free radiological consequences of 10.4 person-rems/year if shipments are completely by rail from reactor sites to the PFS facility, and 23 person-rems/year if fuel is transferred to the PFS facility via an intermodal transfer facility at Rowley Junction. DEIS at 5-37. But the DEIS fails to consider that Maine Yankee has direct rail access. Thus, the analysis did not account for the additional public and occupational exposures that would occur at sites where intermodal transfer and heavy-haul or barge transport are necessary.
10. The HI-STAR 100 cask and the rail car combined weigh 211 tons or more. Letter from Peter Conlon, Director of Railway Technology and Training for the Transportation Technology Center, to John Donnell, Stone & Webster (June 16, 1998) attached hereto as Exhibit 6.³ A 3-axle or 4-axle trolley is necessary to distribute the weight of the cask and railcar. However, PFS has not disclosed the exact railcar design.⁴ Thus, the environmental impacts related to transporting spent nuclear fuel to and from the proposed PFS facility cannot be determined. A steerable trolley, that PFS intends to utilize, will increase the height of the rail car compared to a fixed trolley. Due to the increased height, a railcar with a steerable

³ While marked "PFS Confidential Information," PFS has informed the NRC Staff and State that Mr. Conlon's letter need not be treated as proprietary. See NRC Staff's Response to State of Utah's Request for Admission of Late-filed Contentions Utah LL Through OO (August 30, 2000) at n. 22.

⁴ PFS shows a rail car with a 3-axle trolley in the SAR, Figure 4.5-5. However, the figure has a fixed, not steerable, trolley.

trolley may not fit into reactor loading bays. If the railcar does not fit in the reactor loading bay, smaller spent nuclear fuel transfer casks must be used to load the HI-STAR 100 transportation cask outside of the reactor loading bay. The additional transfers from using a smaller transfer cask will increase occupational exposure. The discussion in the DEIS did not account for the steerable trolley railcars or subsequent consequences, such as increased occupational exposure from using smaller transfer casks.

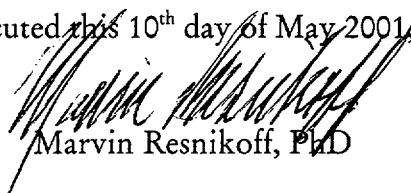
11. The 3-axle or 4-axle steerable trolleys railcars have a higher height and a higher center of gravity. To compensate for the higher center of gravity, the trains must travel at slower speeds around turns and over bridges than considered in the DEIS. Slower speeds will increase the radiation exposures to the public and escort crews. These increased public and occupational exposures were not considered in the DEIS.
12. The discussion in the DEIS did not account for the occupational exposures from transferring spent nuclear fuel from HI-STORM or other dry storage casks to HI-STAR100 or other transportation casks. This may occur at sites where the reactor and storage pool are entirely dismantled.
13. The discussion in the DEIS did not account for the potential increase in transportation accidents due to the use of heavy railcars with high centers of gravity. High lateral forces combined with a higher center of gravity makes the heavy railcars less stable. As such, the accident rate for heavy railcars increases. According to the Peter Conlon, Director of Railway Technology and Training for the Transportation Technology Center, 3-axle fixed freight cars "have a higher probability of derailment," due to the "relatively rigid nature of the assemblies." Mr. Conlon 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 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.

See Conlon letter, Exh. 6 at 1. Additionally, mixing heavy and lighter railcars in one train may cause derailment in the event of sudden stops.

Executed this 10th day of May 2001,

By


Marvin Resnikoff, PhD



John Donnell
03/30/99 03:54 PM

To: Stan_Gurule@aar.com
cc:
Subject: Re: Request for Info

Attached is some info which I believe answers your question.

J Donnell



raillc

SPENT FUEL SHIPMENT WEIGHT

A shipment consists of either a HI-STAR or TranStor shipping cask loaded with a spent fuel canister, two impact limiters, shipping cradle, personnel barrier, and shipment tie downs.

HI-STAR shipping cask

Max. weight of loaded canister	= 88,857 lb.	(Reference 1, Table 2.2.1)
Weight of HI-STAR shipping cask	= 153,080 lb.	(Reference 1, Table 2.2.1)
Weight of impact limiters	= 33,309 lb.	(Reference 1, Table 2.2.1)
Weight of shipping cradle	= 6700 lb.	(Reference 1, Table 7.1.1)
Weight of tie downs	= 1100 lb.	(Reference 1, Table 7.1.1)
Weight of personnel barrier	= <u>710 lb.</u>	(Reference 1, Table 7.1.1)

Total weight of HI-STAR shipment = 283,756 lb. = 141.9 \approx 142 tons

TranStor shipping cask

Max. weight of loaded canister	= 83,200 lb.	(Reference 2, Table 2.2-1)
Weight of shipping cask	= 160,900 lb.	(Reference 2, Table 2.2-1)
Weight of impact limiters	= 20,900 lb.	(Reference 2, Table 2.2-1)
Weight of shipping cradle	= 15,600 lb.	(Reference 3, Sheet 1)
Weight of tie downs (incl w/ cradle)		
Weight of personnel barrier	= <u>1300 lb.</u>	(Reference 4)

Total weight of HI-STAR shipment = 281,900 lb. = 141 tons

Since the heaviest shipment weight = 142 tons, select a Heavy Duty Flat Car or Heavy Duty Depressed Deck Car with a minimum load capacity of 145 tons (290,000 lb.).

Current designs for heavy duty rail cars consist of either two 3-axle trucks supporting the bed or two sets of 2-axle trucks attached to span bolsters, which support the bed.

The light weight (weight of car) for a two 3-axle heavy duty flat car is 98,300 lb. (Ref. 5)

The light weight for a four 2-axle heavy duty depressed center car is 132,500 lb. (Ref. 6)

Since the heaviest is 132,500 lb, then the maximum rail load is $132,500 + 290,000 =$ 422,500 lb.



Date: 11/9/00
 For Release: Immediate
 Contact: Nancy Morovich (Investor Relations) Carl Crawford (Media)
 Entergy Entergy
 (504) 576-5506 (601) 368-5658
 (888) 925-8406 (pager) (800) 844-8084, ID 1708515 (pager)
nmorovi@entergy.com ccrawfo@entergy.com

Entergy Nuclear adds Indian Point nuclear plants to its Northeast Fleet

NEW YORK, NY – Consolidated Edison (NYSE: ED) and Entergy Corporation (NYSE: ETR) have agreed to the purchase by Entergy of Con Edison's Indian Point 1 and 2 nuclear power plants in Westchester County, N.Y. Indian Point unit 1 has been shut down and in safe storage since the early 1970s. The sale will place all three units at the Indian Point site under a single owner for the first time in their 25-year operating history.

Entergy previously agreed to buy Indian Point unit 3 along with the James A. FitzPatrick plant in Oswego County, N.Y., from the New York Power Authority and is preparing to close that transaction.

The agreement calls for Entergy to pay Con Edison \$502 million for the two nuclear units, three natural gas-fired turbines, and other assets. Entergy also agreed to pay book value for nuclear fuel, which is estimated to be about \$100 million at the time of closing. The companies also entered into a power purchase agreement to sell the full output of Indian Point 2 to Con Edison through the end of 2004.

"The key point is both Indian Point operating units will be managed by a single organization with more than 25 years of proven operating experience – and that will benefit New York's consumers and economy," said J. Wayne Leonard, chief executive officer of Entergy.

"With this purchase, Entergy's growth strategy in the Northeast is coming together. Pilgrim, our first purchase last year, is making a strong contribution to our 2000 earnings, significantly exceeding our forecast. These clean-air nuclear units also demonstrate our commitment to environmental leadership."

The addition of Indian Point 2 will give Entergy four operating nuclear units in the Northeast. The company purchased the Pilgrim Station in Plymouth, Mass., in 1999. Entergy is also managing decommissioning activities at the Maine Yankee plant in Wiscasset, Maine, and at the Millstone Unit 1 plant in Waterford, Conn.

Entergy's fleet of nuclear plants in the Northeast "will be a stabilizing force in the competitive power market of New York and the Northeast," Jerry Yelverton, chief executive officer of Entergy Nuclear, said.

"With four plants in the Northeast, we expect to create savings through sharing resources in best safety practices, performance management, purchasing, training, licensing and environmental areas – all of which should make these plants more productive and competitive. Our commitment to New York is to provide a safe, low cost power supply and a brighter future of new career opportunities for Con Edison's nuclear employees," the Entergy Nuclear CEO said.

The 680 nuclear employees of Con Edison will be transferred to Entergy Nuclear at their present salaries with comparable benefits.

Con Edison is currently replacing the steam generators of Indian Point 2 and expects to return the unit to service by the end of the year.

Under the sale agreement, Con Edison must complete the steam generator replacement, refueling work and bring unit 2 to full power before the sale transaction is closed.

To provide Con Edison customers with a power supply at a stable price, Entergy has agreed to sell Indian Point 2's energy output back to Con Edison through the end of 2004.

Con Edison will also transfer to Entergy both units' decommissioning trust funds, which meet the amount required by the U.S. Nuclear Regulatory Commission.

Entergy was selected as the successful bidder in an auction process managed for Con Edison by Morgan Stanley Dean Witter. The proposed sale must be approved by the NRC, the Federal Energy Regulatory Commission, the New York Public Service Commission and other regulatory authorities. The companies said they expected to close the transaction in mid-2001.

The nuclear businesses of Entergy Corporation are headquartered in Jackson, Miss. Entergy, a global energy company based in New Orleans, is one of the largest power generators in the nation with more than 30,000 megawatts of generating capacity, about \$11 billion in annual revenue and over 2.5 million customers. Entergy's nuclear businesses encompass five power reactors at four locations in Arkansas, Mississippi and Louisiana under regulatory jurisdictions, and the Corporation is expanding into the competitive power market nationally by purchasing additional nuclear plants.

Indian Point 1 and 2 purchase will be Entergy's third purchase in the Northeast. The company's purchase of Pilgrim was the first nuclear plant sale in a competitive bidding process. Entergy Nuclear Northeast is headquartered in White Plains, NY.

Con Edison is a subsidiary of Consolidated Edison, Inc., one of the nation's largest investor-owned energy companies, with more than \$8 billion in annual revenues and \$16 billion in assets. The utility provides electric, gas and steam service to more than three million customers in New York City and Westchester County, New York. For additional financial, operations and customer service information, visit Con Edison's web site at www.coned.com.

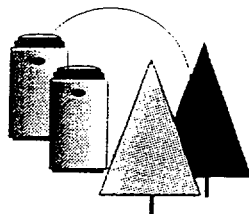
Entergy's on-line address is: www.entergy.com.

The following constitutes a "Safe Harbor" statement under the Private Securities Litigation Reform Act of 1995: Investors are cautioned that forward-looking statements contained in the foregoing release with respect to the revenues, earnings, performance, strategies, prospects and other aspects of the business of Entergy Corporation may involve risks and uncertainties. Actual events and results may, for a variety of reasons, prove to be materially different from those indicated in these forward-looking statements, estimates and projections. Factors that could influence actual future outcomes include regulatory decisions, the effects of changes in law, the evolution of markets and competition, changes in accounting, weather, the performance of generating units, fuel prices and availability, financial markets, risks associated with businesses conducted in foreign countries, changes in business plan, the presence of competitors with greater financial resources and the impact of competitive products and pricing; the effect of the Entergy Corporation's policies, including the amount and rate of growth of Entergy Corporation's expenses; the continued availability to Entergy Corporation of adequate funding sources and changes in interest rates; delays or difficulties in the production, delivery or installation of products and the provision of services; and various legal, regulatory and litigation risks. Entergy Corporation undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. For a more detailed discussion of some of the foregoing risks and uncertainties, see Entergy Corporation's filings with the Securities and Exchange Commission.



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Private Fuel Storage, LLC

ATTORNEY
GENERAL

JUN 12 2000

ENVIRONMENT

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

John D. Parkyn, Chairman of the Board

June 2, 2000

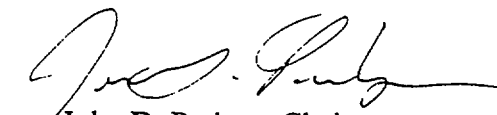
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

NEW PFSLLC MEMBER
DOCKET NO. 72-22/TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

The purpose of this letter is to advise you that Florida Power and Light has secured the membership of Illinois Power in the Private Fuel Storage L.L.C.

If you have any questions regarding this matter, please contact me at 608-787-1236 or Mr. J. L. Donnell, Project Director, at 303-741-7009.

Sincerely,



John D. Parkyn, Chairman
Private Fuel Storage L.L.C.

June 2, 2000

Page 2

Copy to:

Mark Delligatti

John Donnell

Jay Silberg

Sherwin Turk

Asadul Chowdhury

Greg Zimmerman

Scott Northard

Denise Chancellor

Richard E. Condit

John Paul Kennedy

Joro Walker

News

GPU

Contact
Home Page[Customer Service](#) | [Investor](#) | [News](#) | [Community](#) | [Employment](#) | [About GPU](#)[Media Contacts](#)[Latest Release](#)**GPU, Amergen Complete Sale of Oyster Creek Facility***Posted 2000-08-09 08:35:14***CONTACT:**

GPU, Ned Raynolds, (973) 455-8294
 PECO Energy, Bill Jones, (215) 841-4129, Ralph DeSantis (610) 765-5530
 British Energy, Doug McRoberts, (011) 131-44-527-2020

Morristown, NJ – August 8, 2000 – GPU, Inc. and AmerGen Energy Company today announced they have completed the sale of GPU's Oyster Creek nuclear generating facility in Lacey Township, NJ, to AmerGen for \$10 million.

The sale includes the 619-megawatt, single unit boiling water reactor and adjacent former farm property.

AmerGen, a joint venture between PECO Energy Company, of Philadelphia, and British Energy, of Edinburgh, Scotland, now holds the license for Oyster Creek's operation and has full responsibility and authority over the nuclear station.

An agreement on the sale was reached in September, 1999. The U.S. Nuclear Regulatory Commission approved transfer of the operating license to AmerGen on June 6, 2000. The New Jersey Board of Public Utilities approved the sale on July 20, 2000.

"The sale of Oyster Creek is the final significant step in GPU's exiting the merchant generation business," said Fred D. Hafer, chairman, president and chief executive officer of GPU. "We are now sharply focused on the transmission and distribution of electricity, as well as new, non-regulated businesses, which we believe hold the key to our future growth."

The sale will provide the Oyster Creek employees with an opportunity to join an organization that is becoming a major operator and owner of nuclear generating facilities.

The purchase of Oyster Creek marks another acquisition in AmerGen's business plan to become one of the nation's leading nuclear power generators. In 1999, the company purchased the Clinton Power Station in Illinois and Three Mile Island Unit 1 in Pennsylvania. It also has signed an asset purchase agreement for the Vermont Yankee Nuclear Power Station in Vermont.

Jerry Rainey, AmerGen CEO, said, "We are pleased to be acquiring another quality

nuclear plant, and at the same time maintaining electric reliability, jobs and economic benefits for New Jersey. Oyster Creek is a good fit for our growing generation portfolio."

Dr. Robin Jeffrey, British Energy's executive director North America and president of AmerGen, said, "The Oyster Creek acquisition demonstrates AmerGen's ongoing commitment to developing a premier fleet of US nuclear plants. This transaction will help to secure the future of the facility and will provide staff with an opportunity to be part of a Company which has nuclear power generation as a central part of its strategy."

With the transfer of ownership, Ron DeGregorio, a veteran of PECO Nuclear operations who led the AmerGen Oyster Creek Transition Team, became the plant's site vice president. "This is an exciting day," he said. "We have a good plant, fine operating staff and the potential to be an excellent nuclear generator for the next decade. Safety and reliable power production are the foundation of AmerGen's operating principles."

The ownership transfer places Oyster Creek in a Mid-Atlantic Regional Operating Group (ROG) consisting of PECO Energy's Limerick and Peach Bottom nuclear stations, TMI Unit 1 and Oyster Creek, under the supervision of Joe Hagan, PECO Energy's senior vice president for Nuclear Operations.

The sale provides for AmerGen to assume full responsibility for the ultimate decommissioning of Oyster Creek. At the closing of the sale, GPU provided funding for the decommissioning trust of \$440 million. The transaction will reduce by more than \$150 million the costs GPU customers would bear for decommissioning and for other plant-related transitional costs if the plant were shut down rather than sold to AmerGen.

GPU will purchase the electricity generated by Oyster Creek at a fixed price through March, 2003. Also, GPU will fund outage costs, including the cost of re-load fuel, for a refueling outage scheduled for October, 2000. AmerGen will repay these costs to GPU in nine equal annual installments beginning in August, 2001.

GPU, Inc. (NYSE: GPU), headquartered in Morristown, NJ, is a registered public utility holding company providing utility and utility-related services to customers throughout the world. GPU serves 4.6 million customers directly through its electric companies -- GPU Energy in the US, GPU Power in the UK, and Emderca in Argentina. It serves an additional 1.4 million customers indirectly through GasNet, its gas transmission subsidiary in Australia. The company's independent power project business units own interests in and/or operate 14 projects in 5 countries including the US. GPU's 1999 revenues were \$4.8 billion and its total assets were \$21.7 billion. GPU's other subsidiaries include MYR Group, Inc., GPU Advanced Resources, Inc., GPU International, Inc., GPU Service, Inc. and GPU Telecom Services, Inc.

PECO Energy (NYSE:PE) is an electric and gas utility serving 1.5 million electric customers in the five-county Philadelphia area and 425,000 natural gas customers in four suburban counties. It is one of the nation's largest nuclear utilities, producing more than 36 billion kilowatt-hours of electricity in 1999 at its Limerick and Peach Bottom generating stations.

PECO Energy has set new nuclear performance standards in safety, availability and capacity factors, efficient refueling outages and low operating and maintenance costs. The company also owns and operates coal, natural gas, oil, landfill gas and hydro power plants, and its Power Team operates a 24-hour energy trading floor with transactions in 47 states and Canada.

British Energy provides more than 20 per cent of Britain's electricity and it the U.K's largest generator. It owns and operates 15 nuclear power reactors in the United Kingdom, with 9,600 megawatts of generation, including seven advanced gas-cooled nuclear stations and one pressurized water reactor station.

British Energy has also acquired the Eggborough coal-fired power station in Northern England. This is part of its long-term strategy of achieving vertical integration and purchasing more flexible generating plant in the UK.

In July 1996, British Energy was successfully privatized through a public offering of stock. The company has distinguished itself on nuclear operations through its outstanding safety record and by reducing costs and increasing output and profit following privatization. Headquartered in Edinburgh, Scotland, it has market capitalization of around £2bn and has 5,300 employees.

News

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This Month's News GPU and AmerGen Close Sale of Three Mile Island Unit 1**Contact: Ned Raynolds 973-455-8294**

Morristown, NJ – GPU, Inc. (NYSE: GPU) announced today that it has completed the sale of its Three Mile Island (TMI) Unit 1 nuclear generating facility near Harrisburg, Pa., to AmerGen Energy Company for \$100 million.

AmerGen is a joint venture of PECO Energy Company, of Philadelphia, Pa., and British Energy Company, of Edinburgh, Scotland, founded in 1997 to purchase and operate nuclear generation plants in the United States.

"This transaction is one of the final steps in our planned exiting of the domestic merchant generation business, which will enable us to focus on our strategy of transmitting and distributing electricity and providing utility services," said Fred D. Hafer, chairman, president and chief executive officer of GPU.

"The purchase of TMI Unit 1 marks another major acquisition in AmerGen's business plan to become the nation's leading power generator," said Jerry Rainey, PECO Nuclear president and chief nuclear officer, and chief executive officer of AmerGen. "TMI-1 has an excellent operating and safety record and a fine, experienced staff. It has the potential to remain as one of the nation's top nuclear plants for many years to come. We are pleased to add it to our growing portfolio of nuclear assets."

In addition to acquiring Clinton and TMI Unit 1, AmerGen has agreements to purchase three other nuclear stations in 2000, including GPU's Oyster Creek nuclear generating plant.

Under the purchase agreement and subject to certain adjustments, AmerGen paid \$23 million for TMI-1's reactor and will pay \$77 million over five years for the plant's nuclear fuel. The ownership of TMI Unit 2 will remain with GPU. AmerGen will assume full responsibility for the decommissioning of TMI Unit 1, which has been prefunded by GPU for an amount of \$320 million. GPU has agreed to purchase the energy and capacity from TMI Unit 1 from January 1, 2000 through December 31, 2002 at fixed prices.

GPU, Inc. (NYSE: GPU), headquartered in Morristown, NJ, is a registered public utility holding company providing utility and utility related services to customers throughout the world. GPU serves 4.6 million customers directly through its electric distribution subsidiaries -- GPU Energy in the United States, Midlands Electricity plc. in the United Kingdom and GPU Emdersa in Argentina. It serves another 1.4 million customers indirectly through its electric and gas transmission subsidiaries, GPU GasNet and GPU PowerNet in Australia. GPU's revenues were \$4.3 billion and its total assets were \$16.3 billion in 1998. Other GPU subsidiaries include GPU Advanced Resources, Inc., GPU International, Inc., GPU Nuclear, Inc., GPU Service, Inc. and GPU Telecom Services, Inc. (<http://www.gpu.com>)

PECO Energy is an electric and gas utility serving 1.5 million electric customers in the five-county Philadelphia area and more than 400,000 natural gas customers in four suburban counties. It is one of the nation's largest nuclear utilities, producing more than 33 billion kilowatt-hours of electricity in 1998 at its Limerick and Peach Bottom generating stations. PECO Energy has set new nuclear performance standards

in safety, availability and capacity factors, efficient refueling outages, and low operating and maintenance costs.

British Energy provides more than 20 percent of Britain's electricity and is the U.K.'s largest generator. It owns and operates 15 nuclear power reactors in the United Kingdom, with 9,600 megawatts of generation, including seven advanced gas-cooled nuclear stations and one pressurized water reactor station. In July 1996, British Energy was successfully privatized through a public offering of stock. The company has distinguished itself in nuclear operations through its outstanding safety record and by reducing costs and increasing output and profit following privatization.

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Exhibit 5

Reactor Accessibility

	DOE YM EIS ^f J-12 No Rail Access	DOE MPC study ^g No Large Casks
Indian Point 1, 2 ^a	X	X
Oyster Creek ^b	X	X
Turkey Point 3, 4 ^b	X	X
St. Lucie 1, 2 ^b	X	X
Prairie Island 1, 2 ^c		X
Monticello		X
Cook 1, 2 ^d		X
LaCrosse		X
San Onofre 1, 2, 3		
Farley 1, 2 ^d		X
Hatch 1, 2		
Vogtle 1, 2 ^e		X

^a Incorrectly omitted from Table by DOE.

^b Barge transfer to railroad.

^c Rail access, but reactor bay sizing a problem.

^d Heavy haul transfer to railhead.

^e Heavy haul transfer to railhead, but restricted by crane capacity.

^f 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-0250D, July 1999, Appendix J.

^g Concept of Operations for the Multi-Purpose Canister System, prepared for US DOE by TRW Environmental Safety Systems, Inc., September 30, 1993 (DOC ID: A00000000-01717-6700-00001), Appendix A, Table 1 (attached to this exhibit).



55500 DOT Road
P.O. Box 11130
Pueblo, Colorado 81001-0130

Peter C.L. Conlon
Director, Railway Technology Training
(719) 584-0554
Fax: (719) 584-0748
Email: peter_conlon@ttci.aar.com

June 16, 1998
MBS/98-188/PCLC

John Donnell, P.E.
Private Fuel Storage, L.L.C.
c/o Stone & Webster Engineering Corp.
P.O. Box 5406
Denver, CO 80217-5406

PFS
Confidential
Information

Dear Mr. Donnell:

As we understand your objective at this stage of the decision process, you would like to use a railcar design that has already been approved by the AAR and then add safety improvement technology such as improved suspension, braking, defect detection, and other appropriate risk reduction systems. This is to avoid the testing and AAR Equipment Engineering Committee approval process for railcars designed specifically for the SNF transportation system. While this approach may appear to have some advantages, we still recommend a careful, thorough examination of the pros and cons before making such a choice.

As agreed, before discussing a proposal to assist PFS, we've looked into some of the specifications of the existing heavy flat car fleet owned by TTX. We focused on depressed center cars since they give the most clearance for loading the canister and provide the lowest center of gravity. With the larger of the two shipping casks weighing in at about 284,000 pounds and the longer of the two at nearly 27 feet, the TTX car type that most closely fills the bill has a loading deck of 32 feet and an average load limit of 370,000 pounds with a deck height above railhead of 2 feet 8 inches. This car type has 8 axles, which are configured as two pair of 2-axle trucks connected by span bolsters. It weighs 155,000 pounds empty. These cars may be operated at speeds up to 55 mph. According to our research, they are not free interchange cars. No car of this type has been tested according to the Chapter XI performance specifications. It is also unlikely that these cars would meet the Chapter XI performance specifications as they are currently written.

6 axes wt 3 Ax.
385,000 4 Ax.
423,000

Gross vs Net?



The AAR Chapter XI performance specifications are not comprehensive enough for ensuring incident-free performance for sensitive cargoes such as spent nuclear fuel. To address this, the AAR is preparing to develop a performance specification for railcars and trains that will carry spent nuclear fuel.

New Spec

Our experience is that 4-axle span bolster and 3-axle freight car trucks have a higher probability of derailment. This is due to the relatively rigid nature of the assemblies. 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 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. The span bolster truck has approximately the same performance as two 2-axle trucks. The 2-axle trucks that do not have a curve steering feature tend to warp causing high lateral forces. If two 2-axle trucks in a span bolster both warp, the lateral forces would be extreme and could cause rail rollover. This would be exacerbated by the heavy loads of the SNF car. Further, any heavy car will exert significant lateral forces

4 axle
bolster?

TTCI is a subsidiary of the Association of American Railroads

Information on
a twisting of
the moment
dynamical

when operated slowly on a super-elevated track. In our opinion 3-axle or span bolster-equipped cars using conventional trucks are unlikely to meet the required performance specifications. ←

Recent testing of various advanced truck designs at TTC have illustrated benefits of new design approaches. Some further information on this is contained in the attached research digests.

Since the combined weight of the cask, appurtenances, and the railcar is so high, two 2-axle trucks of the most advanced design unfortunately do not appear to be an option. We think that 3-axle trucks that allow the front and rear axle to steer may be the next best approach. The only design that we know of at the moment are those used on the newer locomotives, though one manufacturer may be working on such a design for heavy-duty railcars. New steering locomotive truck examples have shown that a 3-axle truck can curve with moderate lateral forces when this is a design consideration before construction. Locomotives are not currently interchange vehicles and the steering trucks have not been tested per Chapter XI. We believe that their primary suspension and steering features make it likely that Chapter XI performance will be good. } why
←

If you take the approach of modifying existing cars to add safety improvements, you should test it thoroughly to ensure that it meets all of the dynamic performance expectations. Prior to testing, we recommend that the car be modeled to evaluate various suspension configurations at different speed regimes. Our NUCARS model is designed specifically for this purpose. We do not advocate modeling alone to gain Equipment Engineering Committee approval. To be certain that the improved design performs within the design specifications, you must demonstrate what you modeled. Approval by the Equipment Engineering Committee will likely be required after all of the changes to the original suspension system are made.

In summary, at a minimum we recommend that whatever design changes are proposed for the suspension be modeled before a final design is selected and that the prototype car be thoroughly tested to ensure that it performs to expectations. With the weight range of cask and existing cars, 4-axle span bolster or 3-axle truck assemblies will be required. We strongly recommend that you examine the possibilities for improving dynamic performance to reduce the probability of derailment.

I'd like to suggest that we have a face-to-face meeting with our vehicle dynamics experts to discuss this in detail before you make a decision on the path that PLS will take.

Sincerely,



Peter Conlon

**PFS
Confidential
Information**

cc: (without enclosures)
John A Vincent, Senior Engineer, GPU Nuclear, Inc.,
John D. Parkyn, Private Fuel Storage, LLC.
A.J. Reinschmidt, TTCI
R.E. Fronczak, AAR-DC

24625