Private Fuel Storage, L.L.C.

7677 East Berry Ave., Englewood, CO 80111-2137
Phone 303-741-7009 Fax: 303-741-7806
John L. Donnell, P.E., Project Director

November 15, 2000

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

RESPONSES TO THIRD ROUND EIS
REQUEST FOR ADDITIONAL INFORMATION
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

References:
1. NRC Letter, Delligatti to Parkyn, Request for Additional Information for the Environmental Impact Statement, dated October 24, 2000
2. November 6, 2000 teleconference between S&W and the NRC
3. November 7, 2000 teleconference between S&W, PFS, and the NRC/ORNL
4. PFS Letter, Donnell to U.S. NRC, Responses to Third Round EIS Request for Additional Information, dated November 7, 2000
5. November 2, 2000 teleconference between S&W and the NRC

Reference 1 submitted the NRC's Third Round Environmental Impact Statement (EIS) Request for Additional Information (RAI). In the Reference 2 and 3 teleconferences, the NRC clarified the information needed to fully address the issues identified in the initial RAI. In Reference 4, Private Fuel Storage L.L.C. (PFS) provided information in response to question nos. 2, 3, 4, and 8 of Reference 1. The purpose of this letter is to respond to question nos. 1 and 5 of Reference 1. The response to question no. 5 summarizes the results of cost-benefit analyses for the Private Fuel Storage Facility (PFSF) which account for changes to the PFS membership and the date when it is anticipated that the Private Fuel Storage Facility (PFSF) will become operational (year 2003). Enclosed with this letter is a computer diskette which contains electronic files of the updated supplemental loading cost analyses associated with the response to question no. 5. The information contained in these enclosed electronic files is non-proprietary. The remainder of the cost-benefit analyses, performed by Energy Resources International, Inc. (ERI) to address question no. 5, is proprietary to ERI. Proprietary electronic files, which contain ERI's cost-benefit analysis developed to address question no. 5, are being submitted to the NRC under separate cover. The response to question no. 7 is also being submitted under separate cover since it contains financial information that is proprietary to PFS.

NMSS01 Public

As discussed in Reference 4, the information provided in response to question no. 5 in this letter is based on cost-benefit analyses which assume that spent fuel is received at the PFSF subsequent to 20 years of facility operation. A follow-up letter will be submitted to the NRC to further address question no. 5, providing the results of cost-benefit analyses which assume that no fuel is received at the PFSF subsequent to 20 years of facility operation. This follow-up letter will also address question no. 6 of Reference 1, estimating the "break-even" capacity of the PFSF using cost-benefit analyses which assume that no fuel is received at the PFSF subsequent to 20 years of facility operation. The follow-up letter is scheduled for submittal on November 22, 2000.

In the Reference 5 teleconference, Mr. Scott Flanders of the NRC requested that PFS perform a review to determine if the information contained in the PFSF Environmental Report (ER) Figure 2.5-2, "Water Wells Within 5 Miles (8 km) of PFSF Site", is up-to-date. PFS performed a review of the Utah Division of Water Rights database concerning those points of diversion in the four townships that include territory within the 5 mile radius as shown on ER Figure 2.5-2. The results of this review are included in the enclosure to this letter that addresses the third round EIS requests for additional information.

If you have any questions regarding this submittal, please contact me at 303-741-7009.

Sincerely

John L. Donnell

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

Enclosures

Copy to (with enclosures):

Mark Delligatti
Scott Flanders
John Parkyn
Jay Silberg
John Paul Kennedy
Sherwin Turk
Greg Zimmerman
Scott Northard
Denise Chancellor
Richard E. Condit
Joro Walker

ENCLOSURE CONTAINING RESPONSES TO QUESTION Nos. 1 and 5 of the NRC's THIRD ROUND EIS REQUEST FOR ADDITIONAL INFORMATION

ENVIRONMENTAL IMPACT STATEMENT

1. Provide updated information for Table 1.1 of the Draft Environmental Impact Statement (DEIS). Specifically, include storage capacities and projected dates for loss of full-core offload.
    - This information is requested as a result of changes in the PFS membership.

RESPONSE

The following information is being provided to update Table 1.1 of the DEIS to reflect the utilities, and associated nuclear power plants, that are currently members of the Private Fuel Storage Limited Liability Corporation (PFS).

In May 2000, Florida Power & Light Company acquired the interests of Illinois Power Company in the PFS. Information from DEIS Table 1.1 associated with Illinois Power Company (Clinton nuclear power plant) should be removed, and the information on the remaining fuel storage capacity and projected date of loss of full-core offload capability for Florida Power & Light Company's Turkey Point and St Lucie nuclear power plants, identified in the following table, should be added.

GPU Nuclear Corporation has sold the Oyster Creek nuclear power plant to AmerGen. Since AmerGen is not a member of the PFS, these two nuclear power plants should be removed from DEIS Table 1.1. GPU Nuclear Corporation retains its PFS membership as an investor in PFS, but presently owns no nuclear power plants whose fuel will be shipped to the PFSF. The table which follows reflects these changes in membership, as well as updated information (current for November 2000) regarding the remaining fuel storage capacity and projected date of loss of full-core offload capability for each of the PFS member reactors. The information in this table should be used to update DEIS Table 1.1.

ACTION

Section 1.2 of the PFSF Environmental Report (ER) will be updated to include the above information.

Utility	Reactor	Remaining storage capacity (no. spaces)	Projected date of loss of full-core offload capability
Consolidated Edison Company of New York	Indian Point Unit 1	Shutdown; fuel onsite	N/A (shutdown)
	Indian Point Unit 2	385	2004
Southern California Edison Co.	San Onofre Unit 1	Shutdown; fuel onsite [a]	N/A (shutdown)
	San Onofre Unit 2	480	2006
	San Onofre Unit 3	524	2006
Genoa FuelTech Inc.	La Crosse Boiling Water Reactor	Shutdown; fuel onsite	N/A (shutdown)
Indiana-Michigan Company (American Electric Power)	D. C. Cook Units 1 and 2	1553 (shared)	2010 (both units)
Florida Power and Light Company	St. Lucie Unit 1	483	2005
	St. Lucie Unit 2	528	2007
	Turkey Point Unit 3	520	2010
	Turkey Point Unit 4	501	2011
GPU Nuclear Corporation	No Reactors	N/A	N/A
Northern States Power Company	Monticello	971	2006
	Prairie Island Units 1 and 2	140 (shared)	2007 (both units)
Southern Nuclear Operating Co.	Farley Unit 1	376	2006
	Farley Unit 2	560	2008
	Hatch Units 1 and 2	859 (shared)	[b]
	Vogtle Units 1 and 2	2,066 (shared)	2014 (both units)

a Pool is full; additional Unit 1 assemblies are being stored on an interim basis in Units 2 and 3 pools and in space leased at the General Electric Morris Facility through 2002.

b Southern Nuclear Operating Co. has obtained a license for an ISFSI to store spent fuel from Hatch Units 1 and 2, and has transferred some spent fuel from the Hatch reactors' fuel pool out to the dry storage facility where the fuel is stored in storage casks. As a result of this on-site dry storage capability, full-core offload capability is planned to be maintained at all times for Hatch Units 1 and 2, so there is no projected date for loss of full-core offload capability.

5. Revise and update the costs and benefits of the proposed PFSF. All previous cases should be revised to reflect:

   a) The current date that the PFSF would become operational.

   b) Any revisions required or implied by changes in PFS membership (e.g. Florida Power, GPU and Illinois Power). At a minimum, this should reflect the alteration in the members-only case and/or the small-throughput case.

   - The previous analyses were based on 2002 as the date the facility would begin to accept spent nuclear fuel. Current information indicates that this date should be revised to 2003.

RESPONSE

As requested by NRC, the costs and benefits of the proposed PFSF have been revised to reflect a facility start date of 2003 and to reflect the changes in PFS membership.

The small throughput case now includes Florida Power and Light Company's (FP&L) St. Lucie and Turkey Point reactors, and the Clinton and Oyster Creek reactors have been removed. These same changes were made in the medium throughput case. TMI-1 spent fuel was not part of GPU Nuclear Corporation's fuel storage plan, and therefore was not originally included in these two cases. Since all reactors were included in the large throughput case, no changes were necessary due to the changes in PFS membership.

Other Changes From April 2000 Analyses

In addition to the change in the facility start date to 2003 and the change in reactors in the small and medium cases, several other changes were made in this analysis that should be noted.

- The pool capacities for two member reactors have been updated to reflect recent changes in capacity. St. Lucie 2 pool capacity has been increased to 1360 and Vogtle 1 pool has been increased to 1475. These capacity changes will result in less spent fuel requiring dry storage in all cases.
- H.B. Robinson's loss of full core reserve date was changed to 1986 to reflect the fact that Robinson added dry storage at that time. This results in the elimination of the upfront costs for dry storage for Robinson for all cases.
- The amount of spent fuel accepted in the first year of operation (2003) for medium throughput cases (Cases 1 and 9) and the large throughput cases (Cases 7 and 13) was reduced from 2,000 MTU to 1,000 MTU. This was done to reflect that the facility may not be able to accept the entire 2,000 MTU annual capacity in the first year of operation depending upon the actual start date.

Results of Updated Analyses

The parameters for the spent fuel acceptance scenarios analyzed are provided in

Table 1. Table 1 also contains a summary of the amount of spent fuel projected to be loaded into dual purpose canisters for at-reactor dry storage and the amounts shipped directly from the spent fuel storage pool. The estimates of spent fuel shipped directly from the storage pools were used to calculate the additional loading costs for shipment offsite.

The results of the at-reactor spent fuel storage cost projection for the cases are summarized in Table 2a and Table 2b in constant 1999 dollars along with the associated costs to operate the PFSF. The Net Benefit (the cost savings associated with PFSF At-Reactor Storage Benefit minus the costs to operate the PFSF) for each case is also presented. NRC required that a discounted cash flow analysis be included assuming a 7.0% real interest rate. In addition, this analysis also examines the results based on a real interest rate of 3.8%. Table 3a and Table 3b provide the costs as net present value 1999 dollars using a 3.8% real discount rate (3.8% NPV). Table 4a and Table 4b provides the costs as net present value 1999 dollars using a 7.0% real discount rate (7.0% NPV). Table 5 presents a summary of the net benefits for all cases presented in this response.

Comparison of Results

Case 1: 2003 PFSF, 20,000 MTU Capacity, 2015 Repository
Case 3: 2015 Repository, No Action Alternative

Case 1 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate of 1,000 MTU in 2003, 2,000 MTU per year from 2004 through 2011, and at varying rates thereafter depending upon the availability of spent fuel for shipment from the reactors assumed to utilize the PFSF for this case. The maximum capacity for the PFSF is 20,000 MTU for this scenario. Case 1 assumes that a total of 51 reactors ship spent nuclear fuel to the PFSF. Total spent nuclear fuel throughput for this case is approximately 29,100 MTU.

Case 1 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 1 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2015 on an oldest-fuel-first (OFF) basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2015 and 2016, 2,000 MTU in 2017 and 2018, 2,700 MTU in 2019, and 3,000 MTU thereafter.

Case 3 provides a comparative analysis of the reactor storage costs for a 2015 No Action Alternative for the 51 reactors analyzed in Case 1. Case 3 assumes that spent fuel acceptance begins in 2015 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 1, presented in Table 2a, was calculated to be $4.964 billion. This is the difference between the Total Utility At-

Reactor Storage Costs for Case 1 of $3.786 billion and Case 3 of $8.750 billion. PFSF Costs for Case 1 are $1.863 billion for a Net Benefit of $3.101 billion (Constant 1999$). Table 3a presents the results of the 3.8% NPV calculation for Case 1 and Case 3, resulting in Net Benefits of $921 million. Table 4a presents the results of the 7% NPV calculation, resulting in Net Benefits of $305.6 million.

Case 5: 2003 PFSF Members Only, 8800 MTU Capacity, 2015 Repository
Case 6: 2015 Repository, No Action Alternative

Case 5 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate of 1,000 MTU per year from 2003 through 2008, 500 MTU from 2009 through 2012, and at varying rates thereafter depending upon the availability of spent fuel for shipment from the reactors assumed to utilize the PFSF for this case. Only those reactors that are operated by PFS members were assumed to ship spent fuel to the PFSF in this scenario. This scenario now includes the FP&L reactors and no longer includes the Oyster Creek and Clinton reactors. The maximum capacity for the PFSF for this member-only scenario was calculated to be approximately 8,800 MTU. Case 5 assumes that a total of 19 reactors ship spent nuclear fuel to the PFSF. Total throughput for the facility is approximately 13,900 MTU.

Case 5 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 5 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2015 on an OFF basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2015 and 2016, 2,000 MTU in 2017 and 2018, 2,700 MTU in 2019, and 3,000 MTU thereafter.

Case 6 provides a comparative analysis of the reactor storage costs for a 2015 No Action Alternative for the 19 reactors analyzed in Case 5. Case 6 assumes that spent fuel acceptance begins in 2015 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 5, presented in Table 2a, was calculated to be $1.487 billion. This is the difference between the Total Utility At-Reactor Storage Costs for Case 5 of $1.178 billion and Case 6 of $2.665 billion. PFSF Costs for Case 5 are $1.065 billion for a Net Benefit of $422.1 million (Constant 1999$). Table 3a presents the results of the 3.8% NPV calculation for Case 5 and Case 6, resulting in Net Benefits of ($64) million. Table 4a presents the results of the 7% NPV calculation, resulting in Net Benefits of ($154.6) million.

Case 7: 2003 PFSF, 38,000 MTU Capacity, 2015 Repository
Case 8: 2015 Repository, No Action Alternative

Case 7 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate of 1,000 MTU in 2003 and 2022, and 2,000 MTU per year from 2004 through 2021. In order for there to be a sufficient inventory of spent fuel available for shipment to the PFSF, Case 7 assumed that spent fuel would be accepted from all reactors in the U.S The maximum capacity for the PFSF for this scenario was calculated to be approximately 38,000 MTU.

Case 7 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 7 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2015 on an OFF basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2015 and 2016, 2,000 MTU in 2017 and 2018, 2,700 MTU in 2019, and 3,000 MTU thereafter.

Case 8 provides a comparative analysis of the reactor storage costs for a 2015 No Action Alternative for all reactors analyzed in Case 7. Case 8 assumes that spent fuel acceptance begins in 2015 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 7, presented in Table 2a, was calculated to be $8.101 billion. This is the difference between the Total Utility At-Reactor Storage Costs for Case 7 of $9.205 billion and Case 8 of $17.306 billion. PFSF Costs for Case 7 are $2.367 billion for a Net Benefit of $5.734 billion (Constant 1999$). Table 3a presents the results of the 3.8% NPV calculation for Case 7 and Case 8, resulting in Net Benefits of $1.987 billion. Table 4a presents the results of the 7% NPV calculation, resulting in Net Benefits of $916.9 million.

Case 9: 2003 PFSF, 17,000 MTU Capacity, 2010 Repository
Case 10: 2010 Repository, No Action Alternative

Case 9 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate of 1,000 MTU in 2003, 2,000 MTU from 2004 through 2011, and at varying rates thereafter depending upon the availability of spent fuel for shipment from the reactors assumed to utilize the PFSF for this case. The same reactors assumed to ship spent fuel to the PFSF in Case 1 were assumed for Case 9. A maximum capacity for the PFSF was calculated to be 17,000 MTU for this scenario. Case 9 assumes that a total of 51 reactors ship spent nuclear fuel to the PFSF. Total spent nuclear fuel throughput for this case is approximately 29,100 MTU.

Case 9 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 9 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2010 on an OFF basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2010 and 2011, 2,000 MTU in 2012 and 2013, 2,700 MTU in 2014, and 3,000

MTU thereafter.

Case 10 provides a comparative analysis of the reactor storage costs for a 2010 No Action Alternative for the 51 reactors analyzed in Case 9. Case 10 assumes that spent fuel acceptance begins in 2010 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 9, presented in Table 2b, was calculated to be $3.358 billion. This is the difference between the Total Utility At-Reactor Storage Costs for Case 9 of $3.795 billion and Case 10 of $7.152 billion. PFSF Costs for Case 9 are $1.863 billion for a Net Benefit of $1.495 billion (Constant 1999$). Table 3b presents the results of the 3.8% NPV calculation for Case 9 and Case 10, resulting in Net Benefits of $403.8 million. Table 4b presents the results of the 7% NPV calculation, resulting in Net Benefits of $83.8 million.

Case 11: 2003 PFSF Members Only, 7,400 MTU Capacity, 2010 Repository
Case 12: 2010 Repository, No Action Alternative

Case 11 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate of 1,000 MTU per year from 2003 through 2008, 500 MTU from 2009 through 2012, and at varying rates thereafter depending upon the availability of spent fuel for shipment from the reactors assumed to utilize the PFSF for this case. Only those reactors that are operated by PFS members were assumed to ship spent fuel to the PFSF in this scenario. The maximum capacity for the PFSF for this member-only scenario was calculated to be approximately 7,400 MTU. Case 11 assumes that a total of 19 reactors ship spent nuclear fuel to the PFSF. Total throughput for the facility is approximately 13,900 MTU.

Case 11 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 11 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2010 on an OFF basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2010 and 2011, 2,000 MTU in 2012 and 2013, 2,700 MTU in 2014, and 3,000 MTU thereafter.

Case 12 provides a comparative analysis of the reactor storage costs for a 2010 No Action Alternative for the 19 reactors analyzed in Case 11. Case 12 assumes that spent fuel acceptance begins in 2010 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 11, presented in Table 2b, was calculated to be $897.7 million. This is the difference between the Total Utility At-Reactor Storage Costs for Case 11 of $1.186 billion and Case 12 of $2.084 billion. PFSF Costs for Case 11 are $1.065 billion for a Net Benefit of ($167.3) million (Constant 1999$). Table 3b presents the results of the 3.8% NPV calculation for Case 11 and Case 12, resulting in Net Benefits of ($253.5) million. Table 4b presents the results of the 7% NPV calculation, resulting in Net Benefits of ($239.7) million.

It should be noted that the net benefit calculated for the 7% NPV case is actually larger than the net benefit calculated for the 3.8% NPV case. Generally speaking, one would expect the net benefits for the 7% NPV to be lower than those calculated using a 3.8% NPV. Since there are several different cost categories, each will be affected by discounting to different degrees depending upon the timing of the actual cash flows for each cost category. Thus, while each individual cost component is lower in the 7% NPV case than in the 3.8% NPV case, the sum of the cost components results in the 7% NPV being slightly higher than the 3.8% NPV.

Case 13: 2003 PFSF, 38,000 MTU Capacity, 2010 Repository
Case 14: 2010 Repository, No Action Alternative

Case 13 assumes that the PFSF operates for a period of 40 years. This assumes that the PFSF begins operation in 2003 and accepts spent fuel at a rate 1,000 MTU in 2003 and 2022, and 2,000 MTU per year from 2004 through 2021. In order for there to be a sufficient inventory of spent fuel available for shipment to the PFSF, Case 13 assumed that spent fuel would be accepted from all reactors in the U.S. The maximum capacity for the PFSF for this scenario was calculated to be approximately 38,000 MTU.

Case 13 assumes that spent fuel is shipped to the PFSF based on an "optimized" shipping schedule that takes into account the needs of the reactors that are assumed to store spent fuel at the facility. Case 13 assumes that spent fuel is shipped from the PFSF to a DOE repository beginning in 2010 on an OFF basis. It is assumed that DOE accepts SNF on a system-wide basis at a rate of 1,200 MTU in 2010 and 2011, 2,000 MTU in 2012 and 2013, 2,700 MTU in 2014, and 3,000 MTU thereafter.

Case 14 provides a comparative analysis of the reactor storage costs for a 2010 No Action Alternative for the reactors analyzed in Case 13. Case 14 assumes that spent fuel acceptance begins in 2010 at a DOE repository.

The PFSF At-Reactor Storage Benefit for Case 13, presented in Table 2b, was calculated to be $6.855 billion. This is the difference between the Total Utility At-Reactor Storage Costs for Case 13 of $6.860 billion and Case 14 of $13.715 billion. PFSF Costs for Case 13 are $2.366 billion for a Net Benefit of $4.489 billion (Constant 1999$). Table 3b presents the results of the 3.8% NPV calculation for Case 13 and Case 14, resulting in Net Benefits of $1.539 billion. Table 4b presents the results of the 7% NPV calculation, resulting in Net Benefits of $690.7 million.

Oldest Fuel First Priority Assumption for Shipments to DOE Repository

The NRC requested that PFS address its assumption that spent fuel would be shipped to DOE on the basis of an oldest-fuel-first (OFF) acceptance priority ranking. As stated in *Utility At-Reactor Spent Fuel Storage Costs for the Private Fuel Storage Facility, Cost Benefit Analysis, Revision 2*, ERI-2025-0001, April 2000 (ERI 2000), the PFS base case repository assumption is that a geologic repository will not be operational until 2015. The assumption that shipments of spent fuel to the DOE repository will be based on an OFF acceptance priority ranking is appropriate for several reasons.

The use of an OFF acceptance priority ranking for shipments to the DOE repository is consistent with the acceptance methodology outlined in the *Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste* (Contract*)*, Title 10, U.S. Code of Federal Regulations, Part 961.

Each Contract Holder may select from among the spent fuel covered by its Contract the specific fuel assemblies, subject to specified delivery criteria, that it will deliver to DOE for a particular delivery allocation. While exchanges of delivery allocations between Contract Holders are allowed by the Contract, they are subject to approval or disapproval by DOE on a case by case basis. There is no guarantee that DOE will approve any specific exchange.

Of greater significance to the matter of exchanges of delivery allocations, is the fact that if a repository is not operational until 2010 or 2015, the majority of sites with operating nuclear power plants will have added initial increments of additional storage capacity; the ability to ship spent fuel to DOE could prevent the need for additional storage capacity at these sites. In addition, many nuclear power plants will begin to reach the end of their 40 year operating licenses during the 2010 to 2015 time frame and will want to ensure that spent fuel can be shipped offsite as quickly as possible to facilitate timely decommissioning of the site. Under an OFF acceptance priority ranking, the majority of spent fuel that would be shipped for scenarios in which a DOE repository begins operation in either 2010 or 2015 will come from nuclear power plants that have been shutdown for decommissioning. Therefore, it is highly unlikely that any such Contract Holder would exchange acceptance rights under a scenario in which the DOE repository does not begin operation until 2010 or 2015.

NRC also requested that PFS explain why the analysis did not consider exchanges of acceptance rights within individual nuclear power plant operating companies. The ownership of nuclear power plants has changed dramatically during the past year and is expected to change even further in the future. Accordingly, it would be difficult to forecast which companies would own which nuclear power plants by 2010 or 2015.

As stated earlier, Contract Holders have the right under the Contract to specify which spent fuel is shipped to DOE. However, some Contract Holders have multiple Contracts that cover different nuclear power plant sites. It is unknown what, if any, flexibility DOE will allow such Contract Holders to utilize delivery allocations from one Contract for spent fuel in another of its Contracts, possibly in two different states. Also, Contract Holders will have to be responsive to the requirements of local communities as part of its internal consideration of whether spent fuel should be shipped to DOE from site A or site B. For example, while it may be advantages for the Contract Holder to ship fuel from site B instead of site A, local requirements may preclude it from doing so.

Summary

The results of this analysis are based on conservative assumptions regarding the costs for at-reactor spent fuel storage and conservative cooling times for shipment of spent fuel to the PFSF. PFS continues to believe that it is not realistic to assume that a repository will begin operation in 2010 and that its base case assumption that a repository will begin operation in 2015 is valid.

The analyses contained herein continue to demonstrate that there is a need to provide centralized, interim storage of spent nuclear fuel for some operating nuclear plants; to allow for the complete dismantlement and decommissioning of other nuclear plants; and to allow for the standardized packaging and staging of spent fuel in a uniform manner prior to its shipment to a federal facility. In addition, the availability of the PFSF, to both members and non-member plants, would provide benefits to those plants which may be unable to increase at-reactor spent fuel storage or where at-reactor storage would not be economically advantageous.

In addition to the at-reactor storage benefits calculated in this analysis, there are other unquantified benefits associated with the operation of the PFSF that should be considered to fully account for the facility benefits. These additional benefits include, but are not limited to:

- Avoidance of the potential effects of premature nuclear plant shutdowns due to insufficient at-reactor spent fuel storage capacity, including the cost of replacement power, replacement generating capacity, and the increase in air emissions associated with the loss of a non-emitting generator.
- Avoidance of delays in the final dismantlement and decommissioning of shutdown plants, which could prohibit the potential reuse of those sites for other purposes.

PFS believes that the calculation of a negative net benefit for any scenario does not imply that the operation of the PFSF would not be beneficial for that scenario. Taking into consideration the additional benefits discussed above, PFS believes that all scenarios analyzed demonstrate that there is a need for the proposed PFSF.

Table 1 Parameters for Spent Fuel Acceptance Scenarios

Assumptions	Case 1	Case 3	Case 5	Case 6	Case 7	Case 8
PFSF Operation Date	2003 PFSF	No PFSF	2003 PFSF	No PFSF	2003 PFSF	No PFSF
Repository Operation Date	2015	2015	2015	2015	2015	2015
Peak PFSF Capacity (MTU)	20,000	0	8,800	0	38,000	0
Reactors in Comparison	51	51	21	21	all	All
License Duration (Years)	40		40		40	
Parameters for Calculation of Loading Costs for Shipment Offsite						
MTU In DP Canisters	423	4,561	96	2,318	2,051	17,771
MTU From Pools	28,689	24,551	13,760	11,538	83,048	67,328
Total MTU	29,112	29,112	13,856	13,856	85,099	85,099

Assumptions	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14
PFSF Operation Date	2003 PFSF	No PFSF	2003 PFSF	No PFSF	2003 PFSF	No PFSF
Repository Operation Date	2010	2010	2010	2010	2010	2010
Peak PFSF Capacity (MTU)	17,000	0	7,400	0	38,000	0
Reactors in Comparison	51	51	21	21	All	All
License Duration (Years)	40		40		40	
Parameters for Calculation of Loading Costs for Shipment Offsite						
MTU in DP Canisters	423	3,059	96	1,284	2,051	12,025
MTU From Pools	28,689	26,053	13,760	12,572	83,048	73,074
Total MTU	29,112	29,112	13,856	13,856	85,099	85,099

Table 2a At-Reactor Spent Fuel Storage Cost Summary (Millions Constant 1999$)

	Comparisons of Costs for PFSF versus 2015 No Action Alternative Scenarios					
Cost Category	**Case 1 vs. Case 3**		**Case 5 vs. Case 6**		**Case 7 vs. Case 8**	
PFSF Operation Date	Case 1 2003 PFSF 20,000 MTU	Case 3 No PFSF	Case 5 2003 PFSF 8,800 MTU	Case 6 No PFSF	Case 7 2003 PFSF 38,000 MTU	Case 8 No PFSF
Operating Reactor Storage	$ 344.8	$ 1,045.1	$ 77.4	$ 448.7	$ 973.6	$ 3,193.2
Shutdown Reactor Storage	$ 3,066.0	$ 7,419.8	$ 952.0	$ 2,108.4	$ 7,552.2	$ 13,587.8
Loading Costs for Shipment Offsite	$ 375.4	$ 285.2	$ 148.5	$ 107.9	$ 679.2	$ 525.0
Total Utility At-Reactor Storage Cost	$ 3,786.2	$ 8,750.1	$ 1,177.9	$ 2,665.0	$ 9,205.0	$ 17,306.0
PFSF At-Reactor Storage Benefit	$ 4,963.9		$ 1,487.1		$ 8,101.0	
PFS Facility Cost	$ 1,862.7		$ 1,065.0		$ 2,367.0	
Net Benefit	$ 3,101.2		$ 422.1		$ 5,734.0	

Table 2b At-Reactor Spent Fuel Storage Cost Summary (Millions Constant 1999$)

	Comparisons of Costs for PFSF versus 2010 No Action Alternative Scenarios					
Cost Category	**Case 9 vs. Case 10**		**Case 11 vs. Case 12**		**Case 13 vs. Case 14**	
PFSF Operation Date	Case 9 2003 PFSF 17,000 MTU	Case 10 No PFSF	Case 11 2003 PFSF 7,400 MTU	Case 12 No PFSF	Case 13 2003 PFSF 38,000 MTU	Case 14 No PFSF
Operating Reactor Storage	$ 345.3	$ 836.0	$ 77.4	$ 306.4	$ 972.2	$ 2,560.9
Shutdown Reactor Storage	$3,074.0	$ 6,010.8	$ 960.0	$ 1,662.4	$ 5,208.2	$ 10,586.8
Loading Costs for Shipment Offsite	$ 375.4	$ 305.5	$ 148.5	$ 114.8	$ 679.2	$ 567.2
Total Utility At-Reactor Storage Cost	$ 3,794.7	$ 7,152.3	$ 1,185.9	$ 2,083.6	$ 6,859.6	$ 13,714.9
PFSF At-Reactor Storage Benefit	$ 3,357.6		$ 897.7		$ 6,855.3	
PFS Facility Cost	$ 1,862.7		$ 1,065.0		$ 2,366.0	
Net Benefit	$ 1,494.9		$ (167.3)		$ 4,489.3	

Table 3a At-Reactor Spent Fuel Storage Cost Summary (Millions NPV 1999$ - 3.8% Real Interest Rate)

	Comparisons of Costs for PFSF versus 2015 No Action Alternative Scenarios					
Cost Category	**Case 1 vs. Case 3**		**Case 5 vs. Case 6**		**Case 7 vs. Case 8**	
PFSF Operation Date	Case 1 2003 PFSF 20,000 MTU	Case 3 No PFSF	Case 5 2003 PFSF 8,800 MTU	Case 6 No PFSF	Case 7 2003 PFSF 38,000 MTU	Case 8 No PFSF
Operating Reactor Storage	$ 318.4	$ 799.3	$ 70.7	$ 312.5	$ 871.6	$ 2,277.0
Shutdown Reactor Storage	$ 1,932.0	$ 3,667.0	$ 490.2	$ 881.0	$ 3,383.5	$ 5,587.6
Loading Costs For Shipment Offsite	$ 262.1	$ 116.1	$ 100.7	$ 40.1	$ 378.7	$ 198.6
Total Utility At-Reactor Storage Cost	$ 2,512.5	$ 4,582.4	$ 661.6	$ 1,233.6	$ 4,633.8	$ 8,063.2
PFSF At-Reactor Storage Benefit	$ 2,069.9		$ 572.0		$ 3,429.4	
PFS Facility Cost	$ 1,148.9		$ 636.0		$ 1,442.0	
Net Benefit	$ 921.0		$ (64.0)		$ 1,987.4	

Table 3b At-Reactor Spent Fuel Storage Cost Summary (Millions NPV 1999$ - 3.8% Real Interest Rate)

	Comparisons of Costs for PFSF versus 2010 No Action Alternative Scenarios					
Cost Category	**Case 9 vs. Case 10**		**Case 11 vs. Case 12**		**Case 13 vs. Case 14**	
PFSF Operation Date	Case 9 2003 PFSF 17,000 MTU	Case 10 No PFSF	Case 11 2003 PFSF 7,400 MTU	Case 12 No PFSF	Case 13 2003 PFSF 38,000 MTU	Case 14 No PFSF
Operating Reactor Storage	$ 318.8	$ 679.9	$ 70.7	$ 233.6	$ 870.5	$ 1,946.1
Shutdown Reactor Storage	$ 1,935.0	$ 3,241.4	$ 492.4	$ 762.5	$ 2,749.1	$ 4,807.9
Loading Costs For Shipment Offsite	$ 262.3	$ 148.9	$ 100.7	$ 50.2	$ 407.1	$ 254.2
Total Utility At-Reactor Storage Cost	$ 2,516.1	$ 4,070.2	$ 663.8	$ 1,046.3	$ 4,026.7	$ 7,008.2
PFSF At-Reactor Storage Benefit	$ 1,554.1		$ 382.5		$ 2,981.5	
PFS Facility Cost	$ 1,150.3		$ 636		$ 1,442.0	
Net Benefit	$ 403.8		$ (253.5)		$ 1,539.5	

Table 4a At-Reactor Spent Fuel Storage Cost Summary (Millions NPV 1999$ - 7.0% Real Discount Rate)

	Comparisons of Costs for PFSF versus 2015 No Action Alternative Scenarios					
Cost Category	**Case 1 vs. Case 3**		**Case 5 vs. Case 6**		**Case 7 vs. Case 8**	
PFSF Operation Date	Case 1 2003 PFSF 20,000 MTU	Case 3 No PFSF	Case 5 2003 PFSF 8,800 MTU	Case 6 No PFSF	Case 7 2003 PFSF 38,000 MTU	Case 8 No PFSF
Operating Reactor Storage	$ 302.2	$ 663.9	$ 66.7	$ 241.5	$ 813.2	$ 1,811.0
Shutdown Reactor Storage	$ 1,465.8	$ 2,376.5	$ 324.1	$ 505.8	$2,090.5	$ 3,179.0
Loading Costs for Shipment Offsite	$ 205.2	$ 59.0	$ 78.1	$ 19.0	$ 260.8	$ 95.4
Total Utility At-Reactor Storage Cost	$ 1,973.2	$ 3,099.4	$ 468.9	$ 766.3	$ 3,164.5	$ 5.085.4
PFSF At-Reactor Storage Benefit	$ 1,126.2		$ 297.4		$ 1,920.9	
PFS Facility Cost	$ 820.6		$ 452.0		$ 1,004.0	
Net Benefit	$ 305.6		$ (154.6)		$ 916.9	

Table 4b At-Reactor Spent Fuel Storage Cost Summary (Millions NPV 1999$ - 7.0% Real Discount Rate)

	Comparisons of Costs for PFSF versus 2010 No Action Alternative Scenarios					
Cost Category	**Case 9 vs. Case 10**		**Case 11 vs. Case 12**		**Case 13 vs. Case 14**	
PFSF Operation Date	Case 9 2003 PFSF 17,000 MTU	Case 10 No PFSF	Case 11 2003 PFSF 7,400 MTU	Case 12 No PFSF	Case 13 2003 PFSF 38,000 MTU	Case 14 No PFSF
Operating Reactor Storage	$ 302.5	$ 587.4	$ 66.7	$ 192.0	$ 812.2	$ 1,613.0
Shutdown Reactor Storage	$ 1,467.1	$ 2,205.2	$ 324.9	$ 462.7	$ 1,863.9	$ 2,902.3
Loading Costs for Shipment Offsite	$ 205.4	$ 88.1	$ 78.1	$ 27.3	$ 285.7	$ 141.2
Total Utility At-Reactor Storage Cost	$ 1,975.0	$ 2,880.7	$ 469.7	$ 682.0	$ 2,961.8	$ 4,656.5
PFSF At-Reactor Storage Benefit	$ 905.7		$ 212.3		$ 1,694.7	
PFS Facility Cost	$ 821.9		$ 452.0		$ 1,004.0	
Net Benefit	$ 83.8		$ (239.7)		$ 690.7	

Table 5 Summary of Net Benefits (Millions of $)

Net Benefits for the 2015 Repository Scenarios			
Net Benefits	**Case 1 vs. Case 3 2003 PFSF 20,000 MTU**	**Case 5 vs. Case 6 2003 PFSF Members Only 8,800 MTU**	**Case 7 vs. Case 8 2003 PFSF 38,000 MTU**
Constant 1999$	$3,101	$ 422	$ 5,734
NPV 3.8%	$ 921	$ (64)	$ 1,987
NPV 7.0%	$ 306	$ (155)	$ 917

Net Benefits for the 2010 Repository Scenarios			
Net Benefits	**Case 9 vs. Case 10 2003 PFSF 17,000 MTU**	**Case 11 vs. Case 12 2003 PFSF Members Only 7,400 MTU**	**Case 13 vs. Case 14 2003 PFSF 38,000 MTU**
Constant 1999$	$ 1,495	$ (167)	$ 4,489
NPV 3.8%	$ 404	$ (254)	$ 1,540
NPV 7.0%	$ 84	$ (240)	$ 691

RAI Regarding Figure 2.5-2 of the PFSF Environmental Report

In a teleconference dated November 2, 2000 between S&W and the NRC, Mr. Scott Flanders of the NRC requested that PFS perform a review to determine if the information contained in the PFSF Environmental Report (ER) Figure 2.5-2, "Water Wells Within 5 Miles (8 km) of PFSF Site" is up-to-date.

RESPONSE

PFS performed a review of the Utah Division of Water Rights database concerning those points of diversion in the four townships that include territory within the 5 mile radius as shown on Figure 2.5-2 (T4S, R9W; T4S, R8W; T5S, R8W; T5S, R9W). The review utilized a water right search program that identifies points of diversion(s) of water rights by township to determine whether the well information presented in Figure 2.5-2 was complete with respect to the number of wells listed, and accurate in content. The review determined that the 9 wells shown in ER Figure 2.5-2 are the only wells within 5 miles of the PFSF site, and the locations of the 9 wells are correctly plotted. Some of the information shown in tabular form concerning several of the 9 wells on ER Figure 2.5-2 (e.g. date drilled, depth to water, yield, etc.) differs from that presented in the Utah Division of Water Rights database. The following table includes revisions to the table extracted from ER Figure 2.5-2 so that the data are in agreement with that provided in the Utah Division of Water Rights database. Well numbers 7, 8, and 9 are on the Skull Valley Indian Reservation, and are owned by the Reservation. The Division's database does not contain any information about these wells, and the information pertaining to these wells in the following table is unchanged from that in ER Figure 2.5-2.

Well Map No.	Owner	Total Depth	Date Drilled	Use	Depth to Water Before Pumping	Yield When Well Drilling Was Completed	Priority/ Allowed Diversion
1	Skull Valley Co., Ltd.	340'	1967	Stockwatering	297'	No Data	0.015 cfs 1955
2	Island Ranching Co., Inc.	325'	1959	Irrigation, Stockwatering	No Data	765 gpm	2.18 cfs 1959
3	Island Ranching Co., Inc.	347'	1954	Irrigation, Stockwatering	168'	No Data	1.226 cfs 1954
4	Anschutz Land Company	408'	No Data	Irrigation, Stockwatering	No Data	No Data	0.7487 cfs 1960
5	Anschutz Land Company	209	1948	Stockwatering	150	20 gpm	0.015 cfs 1948
6	Anschutz Land Company	292'	1940	Stockwatering	280'	12 gpm	0.015 cfs 1940
7	Skull Valley Indian Reservation	401'	1975	Domestic, Industrial	77.5'	15 gpm	Not Required
8	Skull Valley Indian Reservation	651'	1976	Domestic	519.5'	60 gpm	Not Required
9	Skull Valley Indian Reservation	No Data	No Data	Domestic	No Data	No Data	Not Required

ACTION

ER Figure 2.5-2 will be revised in accordance with the above table in the next amendment of the PFSF License Application.

ENCLOSURE CONTAINING COMPUTER DISKETTE WITH NON-PROPRIETARY ELECTRONIC FILES OF THE UPDATED SUPPLEMENTAL LOADING COST ANALYSES ASSOCIATED WITH THE RESPONSE TO EIS RAI #3, QUESTION NO. 5

COPY
STONE & WEBSTER

JLDonnell-1/1
JLCooper-1/1
JRJohns-1/1
DWLewis-1/1
CFile R2.1.1
Jb Bk M1.1-1/1
S03323.doc