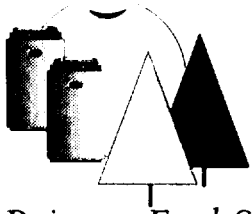
72-22



Private Fuel Storage, LLC

P.O. Box C4010, La Crosse, WI 54602-4010
John D. Parkyn, Chairman of the Board

December 22, 1998

Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Cask Storage System Site-Specific Seismic Analysis
Private Fuel Storage Facility
Docket No. 72-22 / TAC No. L22462
Private Fuel Storage L.L.C.

References:
1. NRC Letter, Delligatti to Parkyn, Second Request for Additional Information dated December 10, 1998
2. PFSLLC Letter, Parkyn to Director, Office of Material Safety and Safeguards, Safety Analysis Report, Revision 0, dated June 20, 1997
3. PFSLLC Letter, Parkyn to Delligatti, Office of Material Safety and Safeguards, Submittal of Calculation Package, dated July 14, 1997
4. Stone and Webster Letter, Donnell to Delligatti, "Docket 72-22 Calculation Package", dated 7/28/97
5. PFSLLC Letter, Parkyn to Director, Office of Material Safety and Safeguards, Response to Request for Additional Information, dated May 19, 1998 (included response to RAI 3-2 with enclosed J. D. Stevenson report for the Independent Cask Stability Analysis)
6. NRC Letter, Delligatti to Parkyn, First Request for Additional Information dated April 1, 1998

This letter is in response to the concern expressed in Reference 1 that the Private Fuel Storage, LLC (PFSLLC) has not provided plans for submitting the information necessary to determine that at least one of the cask systems referenced in the PFSLLC Safety Analysis Report (SAR) is compatible with the site-specific seismic design criteria.

As we have orally communicated to the NRC staff, this information has already been submitted for both cask systems and is contained within Revision 0 of the PFS SAR submitted with Reference 2 and the calculations and reports submitted with References 3, 4, and 5.

NF06 1 0

To ensure that we have completely addressed all of your concerns, each concern presented in your December 10, 1998 letter is repeated below followed by our response.

NRC Concern

"...the staff is concerned that PFS has not provided the staff with its plans for submitting the information necessary to determine that at least one of the cask systems referenced in the PFS SAR is compatible with the bounding site-specific parameters designated by the vendor."

Response

The information necessary to adequately demonstrate that both cask systems referenced in the PFS SAR are compatible with the site-specific seismic design criteria has already been submitted for both cask systems and is contained within Revision 0 of the PFS SAR, Section 8.2.1, submitted June 20, 1997 (Reference 2) and subsequent calculation package submittals (References 3 and 4). Additionally, information on the site-specific evaluation of overturning stability of loaded concrete casks including the J. D. Stevenson report, "Tipping Evaluation of Spent Fuel Storage Casks Subjected to Site Specific Earthquake Loading (ISFSI DE) for the Private Fuel Storage Facility", Revision 0, dated June 17, 1997, was provided in response to RAI question 3-2 (Reference 5).

For your convenience, the calculations provided in References 3 and 4 that are applicable to the cask stability analysis are listed below:

Development of Soil and Foundation Parameters in Support of Dynamic SSI Analysis
Geomatrix Calculation No. 05996.01-G(P05)-1, 3/31/97, QA Cat. I

Deterministic Ground Motion Calculations for Skull Valley, UT
Geomatrix Calculation No. 05996.01-G(P05)-2, 3/31/97, QA Cat. I

3-D Time Histories for Private Storage Facility
Holtec Calculation No. HI-961556, 11/8/96, QA Cat. I

Scoping Seismic Analysis of HI-STORM on a Western Area ISFSI
Holtec Calculation No. HI-961574, 11/25/96, QA Cat. I

Multi-Cask Seismic Response at the PFS ISFSI
Holtec Calculation No. HI-971631, 5/19/97, QA Cat. I

Soil-Structure Interaction Analysis for Evaluation of Transistor Storage Cask Seismic Stability
SNC Calculation No. PFS01.10.02.04, Rev 0, 7/24/97, QA Cat. 1

'TranStor Storage Cask Seismic Stability Analysis for PFS Site
SNC Calculation No. PFS01.10.02.05, Rev 0, 7/24/97, QA Cat. 1

NRC Concern

"...the design basis horizontal and vertical seismic acceleration levels for both the Holtec HI-STORM and Sierra Nuclear TranStor cask designs are far below the levels of .67g horizontal and .69g vertical accelerations reported for the PFS site."

Response

The PFSLLC approach to licensing the facility and the use of associated cask storage systems is to reference the Topical Safety Analysis Report (TSAR) for the Sierra Nuclear TranStor and Holtec HI-STORM storage systems that were under NRC review at the time of the License Application submission (June 20, 1997) and supplement them for certain site-specific items. PFSLLC recognized early on that the seismic design basis contained within the vendors' TSARs did not envelop the PFSLLC site, and that a site-specific analysis for cask stability would be required.

The HI-STORM generic seismic cask stability analysis referenced in the PFSF license application was described in Section 3.4.7 of the HI-STORM SAR, Revision 1, January 1997. The revision 1 analysis had considered a seismic event characterized by Regulatory Guide 1.60 response spectra curves with a zero period acceleration (ZPA) of 0.8g in three orthogonal directions.

The TranStor generic cask stability analysis referenced in the PFSF license application was described in Section 11.2.5 of the TranStor SAR, Revision B, March 1997. The revision B analysis had considered a seismic event characterized by Regulatory Guide 1.60 response spectra curves with a ZPA of 0.75g in two horizontal directions and 0.5g in the vertical direction. The analysis was simplified to a two-dimensional analysis, and as such, used a resultant horizontal acceleration of 0.8g ZPA and a vertical acceleration of 0.5g ZPA. The horizontal acceleration of 0.8g is the resultant of both 0.75g horizontal accelerations as modified by the 100-40 rule allowed by NUREG/CR-0098.

The generic cask stability analysis performed by each vendor assumed a single cask resting on a rigid surface. Neither analyses considered soil-structure interaction, which will affect the dynamic properties and seismic response of the structural system. Therefore, in order to verify cask stability under site-specific conditions, PFSLLC had each cask vendor perform a site-specific seismic analysis (cask stability) based on the response spectra curves representing a ZPA of 0.67g horizontal and 0.69g vertical. Additionally, a separate and independent seismic analysis (cask stability) was then performed by PFSLLC (subcontracted to Dr. John Stevenson & Associates) to confirm the results of the cask vendor's analyses.

This approach is fully described in the PFSLLC SAR, Section 8.2.1, and detailed in the calculations and reports that have been provided to the NRC previously as discussed above. Section 8.2.1.2 of the PFSLLC SAR states the following:

"The HI-STORM and TranStor storage casks are analyzed for a generic DE as selected by each cask vendor and as described in their respective SARs. The HI-STORM and TranStor storage casks are also analyzed for a PFSF site specific DE, which is based on a seismological evaluation of the siting area. The site specific DE is discussed in Section 3.2.10 and is represented by response spectrum curves developed specifically for the site with a ZPA of 0.67g horizontal (two directions) and 0.69g vertical. Both the HI-STORM and TranStor storage casks are analyzed for these conditions by the vendors to assure structural strength of the cask and cask stability. Cask stability analyses provide assurance that the casks will not tip over or slide excessively in an earthquake.

In addition to the vendor's PFSF site-specific cask stability analyses, a separate and independent site-specific cask stability analysis was performed by a structural-mechanical engineering consultant specializing in seismic dynamic analysis of equipment and structures. The analysis was performed by J. D. Stevenson, Consulting Engineer, for the purpose of independently confirming the cask stability conclusions of the vendor's analyses. This bounding case analysis considered both the HI-STORM and TranStor storage casks. The analysis demonstrates the storage casks will not tip over or slide excessively in an earthquake and confirms the conclusions of the vendors."

Section 8.2.1.2 also includes a detailed description of the "HI-STORM Cask Stability Analysis", "TranStor Cask Stability Analysis", and the "Independent Cask Stability Analysis". The cask stability analyses provided in the PFSLLC SAR have been supplemented by calculations and reports which were provided to the NRC in References 3, 4, and 5.

As you are aware, PFSLLC field activities are being concluded which will augment the defining site geological characteristics in response to questions contained in the first round of RAIs issued by the NRC (Reference 6). We do not anticipate a change to the seismic design basis definition or the storage system stability analysis, contained within the existing PFSF License Application, as a result of this fieldwork. Therefore, this work does not affect the licensing strategy used by PFSLLC with regard to referencing vendor TSARs in review at the time of submission of the PFSLLC License Application and referencing of the TSAR.

Based on our monitoring of the NRC licensing review of the HI-STAR TSAR, PFSLLC is aware that Holtec has revised that application to delete, at the NRC's request, the "high seismic" cask stability evaluation. These revisions do not impact the PFSLLC license application or its reference to the vendor TSAR since our site-specific analysis, previously submitted as discussed above, fully addresses cask stability during a seismic event.

NRC Concern

"The staff expects that PFS will submit the information necessary to support use of at least one of the designated cask designs at the Skull Valley site in February, along with the responses to all outstanding RAIs."

Response

As discussed above, the information necessary to adequately demonstrate that both cask systems referenced in the PFSLLC SAR are compatible with the site-specific seismic design criteria has already been submitted and is contained within Revision 0 of the PFSLLC SAR and accompanying calculations and reports (References 2, 3, 4, and 5).

NRC Concern

Submittal of information on this issue... *"will ensure that review resources will be available and will allow the review of these analyses and information to be factored into our schedule."*

Response

As stated above, this information has been submitted to the NRC (References 2, 3, 4, and 5). Since the licensing basis and supporting calculations were in the possession of the NRC as early as June and July 1997 and the J. D. Stevenson report in May of 1998, we trust that review of the information is well underway and has already been factored into your schedule.

NRC Concern

.... *"If you do not intend to provide this information in February, we would like to meet with you at your convenience, but as soon as possible, to discuss this issue."*

Response

We are currently reviewing the second round of RAIs submitted with your December 10, 1998 letter (Reference 1) and anticipate providing responses in February 1999 as requested. There are no questions in this RAI concerning the site-specific analysis for cask stability and since this information has been previously submitted to the NRC we are not planning any additional submittal on this topic.

We believe that the above referenced information, previously submitted to the NRC, adequately demonstrates that both cask systems referenced in the PFSLLC SAR are compatible with the aforementioned site-specific seismic design criteria. We trust that this resolves your concerns on this matter. Please contact us if you have any further questions or require additional information regarding this subject.

Sincerely,

John Parkyn
Chairman of the Board
Private Fuel Storage L.L.C.

JDP:cls

cc: Ms. Denise Chancellor, Esq. - State of Utah
Mr. Richard Condit - Land and Water Fund of the Rockies
Ms. Diane Curran, Esq. - Harmon, Curran, & Spielberg
Mr. Mark Delligatti - U.S. NRC
Mr. John Donnell - Stone & Webster
Mr. John Paul Kennedy, Esq. - Confederated Tribes of the Goshute Reservation
Mr. Clayton Parr, Esq. - Castle Rock, et al. (Parr, Waddoups, Brown, Gee & Loveless)
Mr. Danny Quintana, Esq. - Skull Valley Band of Goshute Indians
Mr. Jay Silberg, Esq. - Shaw, Pittman, Potts & Trowbridge
Mr. Sherwin Turk - U.S. NRC
Mr. Joro Walker, Esq. - Land and Water Fund of the Rockies

H:\SHARED\PFS\LETTERS\1222.DOC