RAS 4825

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August 29, 2002

Administrative Judge Michael C. Farrar, Chairman
Administrative Judge Jerry R. Kline
Administrative Judge Peter S. Lam
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**Re: In the Matter of Private Fuel Storage, L.L.C., Docket No. 72-22-ISFSI, PFS Response to NRC Staff Letter of August 12, 2002**

Dear Administrative Judges:

Enclosed for the Board's information is a letter from John D. Parkyn, Chairman of Private Fuel Storage, to the U. S. Nuclear Regulatory Commission dated August 23, 2002. The letter responds to Mark Delligatti's letter of August 12, 2002 requesting PFS to review its aircraft crash hazard analysis and determine whether new information concerning the 1,000-ft restriction on low altitude flights in Skull Valley that PFS had used in its analysis would affect or require revisions to the aircraft crash analysis. Counsel for the NRC Staff has provided to the Board for its information a copy of the Staff's August 12, 2002 letter to PFS and the enclosed letter is PFS's response to that letter.

Sincerely,

Paul Gaukler

Paul A. Gaukler
Counsel for Applicant
Private Fuel Storage, L.L.C.

Enclosure

Template = SECY-043

cc: Office of Commission Appellate Adjudication (w/encl.)
Office of the Secretary (w/encl.)
Adjudicatory File (w/encl.)
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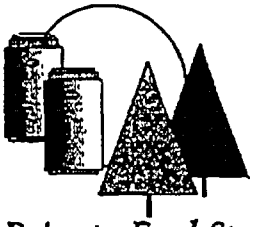

*Private Fuel Storage, LLC*

*P.O. Box C4010, La Crosse, WI 54602-4010*
*John D. Parkyn, Chairman of the Board*
*(608) 787-1236*

August 23, 2002

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

**PFS RESPONSE – NRC LETTER DATED AUGUST 12, 2002**
**DOCKET NO. 72-22 / TAC NO. L22462**
**PRIVATE FUEL STORAGE FACILITY**
**PRIVATE FUEL STORAGE L.L.C.**

References:

1. NRC August 12, 2002 letter
2. August 10, 2000 PFS Aircraft Crash Hazard Report, Rev. 4
3. July 2001 Revised Addendum to Aircraft Crash Hazard Report

Reference 1 refers to an apparent change made by the United State Air Force (USAF) concerning the lowest altitude at which F-16s are now permitted to fly through Skull Valley on their way to the Utah Test and Training Range (UTTR) and requests information on whether such a change affects the aircraft crash hazard calculated by Private Fuel Storage, LLC (PFS) for the Private Fuel Storage Facility (PFSF). PFS has been seeking additional information concerning this apparent change, and we will advise you promptly if we obtain further information.

In the meantime, PFS has reviewed its Aircraft Crash Report (Reference 2) and the Revised Addendum thereto (Reference 3) as requested. As set forth below, we have concluded that a change in the lowest altitude at which F-16s are permitted to transit Skull Valley en route to the (UTTR) would not change the calculated aircraft crash hazard for the PFSF.

In PFS's Aircraft Crash Report (Reference 2), PFS indicated that the lowest altitude north of English Village on Dugway Proving Ground at which F-16s were allowed to fly through Skull Valley was 1,000 ft AGL. This statement was based on various discussions that PFS's experts had with USAF officials at Hill Air Force Base (Hill AFB) and applicable instructions for the use of the UTTR provided to them. This prohibition on flights below 1,000 ft. AGL in Skull Valley was subsequently confirmed by Colonel Fly and Lt. Colonel Horstman. PFS understands, however, that revised instructions for "training" on the UTTR were issued in October 2000 which do not expressly include a prohibition on F-16s flying

below 1,000 ft. AGL in Skull Valley north of English Village. (The UTTR instructions for "testing" have not been changed and continue to include the 1,000 ft. AGL limitation.)

Assuming that the prohibition on flights below 1,000 ft. AGL through Skull Valley has been dropped, PFS's calculated hazard probability for the PFSF would not change. PFS was informed by the Air Force that the F-16s typically transit the valley at altitudes between 3,000 to 4,000 ft. AGL, and therefore lowering the permissible altitude at which F-16s may transit Skull Valley from 1,000 ft AGL to some lower altitude would not affect the altitude at which aircraft would typically transit Skull Valley. Further, although the Sevier B MOA extends down to 100 ft. AGL, the Air Force as a general matter rarely flies fighters below 500 ft. AGL. An F-16 pilot must be specially trained and qualified to fly below 500 ft. AGL. In a recent discussion, the Commander of the 388th Fighter Wing at Hill AFB stated that no 388th FW pilots are qualified for low-level flight below 500 ft. AGL and there are no plans to qualify any of them for low-level flight below 500 ft. AGL. PFS has also confirmed that no pilots of the 419th Reserve Wing at Hill AFB are qualified for low-level flight below 500 ft. AGL, nor are there plans to do so. Conceivably, other pilots using the UTTR might be qualified for flight below 500 ft. AGL, but almost all F-16 fighter sorties through Skull Valley are flown by the F-16s stationed at Hill AFB. Further, as noted by the Commander of the 388th FW, the current trend is away from low-level flight. This trend is the result of the increased technological capability of the Air Force (e.g., use of high accuracy precision guided munitions) and the Air Force's recent ability to immediately establish total air supremacy, beginning with the Gulf War. Therefore, it is unlikely that Hill AFB pilots will be qualified to fly below 500 ft. AGL in the future.

In accordance with the parameters set forth in the Aircraft Crash Report, flying through Skull Valley at 500 ft. AGL or higher would be categorized as "Normal flight," for which PFS has already analyzed the potential hazard to the PFS facility. In this respect, the Chief of Safety of Air Combat Command has stated (in the memorandum included at Tab F to the Aircraft Report) that flight down to 500 ft. AGL is not high risk.

PFS has reviewed its Aircraft Crash Report and has confirmed, for the following reasons, that changing the lowest altitude at which F-16s could transit Skull Valley in Normal flight from 1,000 ft. to 500 ft. AGL would not change the probability hazard calculated for the PFSF.

- First, because flight at 500 ft. AGL or higher through Skull Valley would be in the Normal phase of flight, the Normal crash rate that PFS used for assessing the crash hazard for F-16s transiting Skull Valley (i.e., $2.736 \times 10^{-8}$ per mile) would remain applicable.

- Second, in its assessment of the F-16 accident reports set forth in Tab H of the Aircraft Crash Report, from which PFS determined that 90 percent of the accidents would leave the pilot in control of the aircraft and potentially able to avoid the PFSF, PFS did not exclude any accident because the aircraft was flying at an altitude below 1,000 ft. AGL. Nor did PFS categorize any of the accidents in its database as a non-Skull Valley-type event because it occurred at an altitude below 1,000 ft. AGL. For example, the accident of May 25, 1990 (discussed in Tab H to the Aircraft Crash Report), which occurred as the pilot was descending to make a low-level flight below 1,000 ft., was still included as a Skull-Valley type event. The accident of May 13, 1998 (also discussed in Tab H to the Report), which occurred when the aircraft struck a flock of pelicans at 830 ft. AGL, was not excluded because of the altitude at which the bird strike had occurred. Rather, it was considered and excluded from the set of Skull Valley-type events because there are no known flocks of large birds (over 12 lbs) present in Skull Valley and because the Air Force bird strike data base (which has records of bird strikes dating back approximately 15 years) shows no bird strikes of any type in Skull Valley over that time period.

- Third, the only change that would occur in PFS's categorization of flights if one were to assume that F-16s transit Skull Valley at altitudes down to 500 ft. AGL is that two additional F-16 accidents would fall within the Sevier B category in PFS's analysis of "able to avoid" accidents in Tab H of the Aircraft Crash Report. (The Sevier B category was one of two subsets of Skull Valley-type events that PFS evaluated as a sensitivity analysis in arriving at an applicable "able to avoid" percentage for its hazard calculation.) The two accidents are the 3 Sep 90 accident in which the engine failed while the pilot was descending to 500 ft. AGL at 480 knots for low level cruise flight and the 23 Oct 90 accident in which the engine failed while the pilot was at 500 ft. AGL at 480 knots in low level cruise flight. Both pilots remained in control of the aircraft and undertook the zoom maneuver for low-level engine failure specified in the F-16-1 Manual. Both accidents were therefore categorized as "Able to Avoid" and their inclusion in the Sevier B analysis in Tab H would increase the population of that category from 9 to 11 with 10 of the 11 accidents resulting in the pilot remaining in control. This would increase the percentage of "Able to Avoid" accidents for the Sevier B subset from 89% to 91%, which further substantiates PFS's position.

- Fourth, flying at a minimum altitude of 500 ft. AGL would not affect PFS's assessment of the likelihood that a pilot in control of a crashing F-16 would avoid the PFSF. If a pilot experienced an engine failure (by far the most likely cause of an accident in Skull Valley) while flying at 500 ft. AGL, he would still zoom the airplane to trade energy for altitude in the same manner as if flying at a higher altitude through Skull Valley. As evidenced in the two accidents described in the paragraph above, when F-16 pilots fly at lower altitudes, such as 500 or 1,000 ft. AGL, they typically fly faster, thus giving themselves more energy to trade for altitude and time in the event of an emergency. In this respect, the Aircraft Crash Report states (page 19d) that pilots flying at lower altitudes, such as 500 or 1,000 ft. AGL, would most likely be traveling at a minimum speed of 420 knots as opposed to the 350 to 400 knots flown at higher altitudes. As reflected in Figure 3 of the Aircraft Crash Report (which appears after page 19c), F-16s traveling at altitudes of 500 to 1,000 ft. AGL and at speeds of 420 to 480 knots would have, after initiating the zoom and completing the airstart sequence, well over 45 seconds before descending to the minimum recommended ejection altitude of 2,000 ft. AGL.

  Specifically, as can be seen from Figure 3, aircraft flying within a box represented by these low altitude flight parameters (500 to 1,000 ft. AGL and speeds of 420 to 480 knots) would be roughly the same distance from the chart's green and yellow zone boundary as those in the box on the chart labeled "F-16s in Skull Valley," which represents typical flight in Skull Valley at 3,000 to 4,000 ft. AGL at speeds of 350 to 400 knots. The boundary between the green and the yellow zones on the chart represents those speed and altitude combinations that should provide the pilot with 45 seconds after completion of the airstart sequence, i.e., throttle advance to the midrange, before reaching 2,000 ft. AGL. At speed and altitude combinations above this boundary, the pilot would have more than 45 seconds before reaching 2,000 ft. AGL and at speed and altitude combinations below this boundary the pilot would have less than 45 seconds before reaching 2,000 ft. AGL. Thus, in practice, the higher speeds at which F-16 pilots would fly when transiting Skull Valley at 500 to 1,000 ft. AGL would give them roughly the same amount of time to respond to an emergency as those flying at higher altitudes but lower speeds, which PFS has calculated to be in the range of one to two minutes. See Aircraft Crash Report at 19e.

- Fifth, lowering the effective minimum altitude at which F-16s transit Skull Valley from 1,000 ft. AGL to 500 ft. AGL would increase somewhat the effective width of the Sevier B MOA at any given altitude because it would allow pilots to fly somewhat further to the east on the eastern side of the valley near the Stansbury Mountains. This effect can generally be discerned by visualizing a contour line at 500 ft. AGL on Figure 1 of the Aircraft Crash Report (which appears after page 6), "Sevier B MOA Cross Section at Latitude of PFSF," and would be equally applicable further up the valley where the initiating events for accidents that could affect the PFSF would be likely to occur. This slight increase in effective width would reduce somewhat the calculated hazard to the PFSF because, under the crash impact hazard formula in NUREG-0800, the calculated hazard is inversely proportional to the width of the airway, which here is the useable width of the MOA.

Thus, changing the effective minimum altitude at which F-16s may transit Skull Valley from 1,000 ft. AGL to 500 ft. AGL would not increase the calculated hazard probability for the PFSF. As already discussed above, the Air Force as a general matter rarely flies below 500 ft. AGL. Accordingly, there would be no, or at most very few, flights below 500 ft. AGL even assuming that there is no prohibition on flights below 1,000 ft AGL in Skull Valley. Therefore, the conclusions reached in PFS's Aircraft Crash Report would remain unchanged assuming that the prohibition on flights below 1,000 ft. AGL has been dropped.

Please call me at 608-787-1236 or John Donnell, PFS Project Director, at 303-741-7009 with any questions concerning this letter.

Sincerely,

John D. Parkyn
Chairman of the Board
Private Fuel Storage, LLC

cc: Mark Delligatti
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