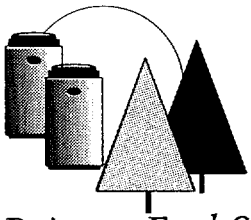

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May 15, 2001

REQUEST FOR ADDITIONAL INFORMATION ON AIRCRAFT HAZARDS—CLARIFICATION
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE FACILITY
PRIVATE FUEL STORAGE L.L.C.

Reference 1: NRC Letter, Delligatti to Parkyn, Request for Additional Information, dated March 9, 2001.
Reference 2: PFS Letter, Donnell to Delligatti, Request for Additional Information on Aircraft Hazards—Partial Response, dated March 30, 2001.
Reference 3: April 25, 2001 teleconference between PFS and the NRC.

In Reference 1 the NRC submitted a request for additional information regarding the supplements to PFS's license application that PFS submitted under letters dated January 19 and 25, 2001 and other documents related to aircraft hazards. PFS answered the questions for which it had the information to do so on March 30, as submitted with Reference 2.

On April 25, 2001, PFS and the NRC participated in a teleconference (Reference 3), in which the NRC requested clarification of some of the information PFS had provided to the NRC in Reference 2. The attached submittal documents the answers to the NRC's questions that PFS provided in the teleconference.

NMSS01Public

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

Sincerely

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

Copy to:
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PFS Answers to NRC Questions Regarding Aircraft Hazards to the PFSF, April 25, 2001

1. If the engine of an F-16 fails, will the aircraft's navigation systems (e.g., INS, GPS, TACAN) still function?

The INS and the TACAN will still function if the engine fails. The INS provides bearing and distance to the selected steer point; the TACAN provides bearing and distance to the selected ground-based navigation aid (TACAN).[1] The Global Positioning System will be inoperative. In the event of an engine failure, the main and standby generators will no longer operate and the emergency generator will be the main source of power to the aircraft systems. As a general rule, the emergency generator only provides a "get home" capability. Systems such as navigation and communications that are necessary to fly the airplane safely to base are in this category. Systems required for combat employment of weapons such as the radar, LANTIRN and others will not operate on the emergency generator.

2. Is the F-16 aerodynamically stable if the pilot ejects?

Yes, the F-16 is stable if the pilot ejects. The plane will go in the direction it was pointed prior to the pilot ejecting. The flight control computers will also tend to seek level flight as the airplane decelerates until a preprogrammed angle of attack is reached. A more detailed discussion may be found on page 21 of the Aircraft Crash Impact Hazard at the Private Fuel Storage Facility (Rev 4).

3. Considering both day and night flight, when would F-16 pilots fly through Skull Valley using visual flight rules (VFR) and instrument flight rules (IFR)?

Pilots normally transit Skull Valley using Visual Flight Rules (VFR); this is true both during the day and at night. As shown by the Air Weather Service historic cloud cover and visibility charts in the March 30, 2001 PFS response to the NRC Staff Request for Additional Information (RAI), the weather in Skull Valley is conducive for VFR operations the large majority of the time. In addition, most simulated combat training, both air-to-surface and air-to-air, requires the pilot to be flying clear of clouds. Thus, there is little utility to flying in the weather for the tactical (simulated combat) portion of training missions. The squadrons will normally start to reduce or cancel the number of sorties to be flown as the weather in the UTTR becomes unusable.

In order to fly under Instrument Flight Rules (IFR), it is necessary to have an IFR clearance with the appropriate air traffic control agency. This is normally done prior to takeoff by filing an IFR flight plan, although it is possible to obtain an IFR clearance while airborne.

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[1] RAI Response, March 30, 2001, pages 7, 28.

IFR flight is normally conducted on established airways. However, pilots have the option of flying from point to point outside of the established airways if approved by air traffic control. These points are normally defined by bearing and distance to a ground based navigation aid or by latitude and longitude coordinates. The route of flight is delineated on the flight plan filed with air traffic control. Changes to the route of flight may be requested from air traffic control while airborne.

IFR flight must be at or above an established minimum area altitude to ensure clearance from the terrain. This minimum altitude is based upon the terrain elevation and the proximity of rising terrain. As noted in the report, the Stansbury Mountains on the eastern portion of the Sevier B MOA extend through the vertical limit of the MOA and the Cedar Mountains on the west rise to 7,700' MSL. This high terrain would preclude IFR flight through a significant portion, if not all, of the Sevier B MOA.

The 388th FW aircraft are equipped with the LANTIRN system, which is composed of a targeting and a navigation pod. During night operations, the pilots will use the Imaging Infrared (IIR) capability of the navigation pod to assist them. The navigation pod projects an image of what is in front of the aircraft on the pilot's head up display[2] thereby increasing his positional and situational awareness.

4. If there were cloud cover in Skull Valley, how would the pilot maintain awareness of the location of the PFSF site, including the use of aircraft instruments such as the INS to do so?

As noted in answer 9(h) in the March 30, 2001 PFS RAI, pilots are trained to maintain situational awareness as to their location and the surrounding environment. As part of their mission preparation, pilots will select and annotate a route of flight on their map. Typically, the map will have heading, distance and time between turn points; location of emergency fields; any flight restrictions such as areas with a minimum altitude, no fly areas, etc.; location of simulated "enemy positions"; and other information as appropriate. These are discussed during the flight briefing prior to the mission as well.

Once airborne, pilots will use outside references, landmarks, roads, etc. and their onboard systems while referencing their maps to maintain their positional awareness. As a general rule, pilots will rely on outside references and reinforce them with onboard systems when cloud coverage and visibility allow. As weather or darkness begins to limit visual contact with outside references, pilots will begin to rely more on their onboard systems and less on external features. It is possible for pilots to fly in the clouds without any external references available. In this case, the pilot uses onboard systems to maintain basic aircraft control (altitude, attitude, heading, speed) and an combination of the onboard INS and external navigation aids such as TACAN and GPS to maintain positional awareness.

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[2] RAI Response, March 30, 2001, page 8

One of the onboard instruments the pilot would use is the Horizontal Situation Indicator (HSI, see attached example).[3] This displays bearing and distance to the selected navigation or steering point and can be used to fly an exact course to the point. In the attached example, the selected navigation point is bearing 090^0 for 3 miles. Further, it shows that the airplane is to the right of the 103^0 course selected by the pilot. If the pilot wanted to correct back to the course, he would need to turn left. If the pilot were on course, then the large bar marked "Deviation from Selected Course" (in the drawing) would be centered and it would form a straight line with the "arrow point and tail" in the center of the display. Thus, pilots can maintain a precise course (also referred to as ground track) to the desired point.

5. If an F-16 experiences an problem or failure and the pilot determines that he must jettison the aircraft's stores, at what point does the pilot actually jettison them and would he ever consider the point at which the stores might hit the ground before jettisoning them?

The pilot's specific actions in the event of an engine problem or failure would depend in part on the circumstances under which the incident occurred. If the pilot was operating in the 3,000'-4000' AGL regime indicated by the 388th FW Vice Commander[4], and experienced an engine anomaly, the pilot could be reasonably expected to climb while trying to determine if in fact the engine was operating normally. If the pilot was concerned about the engine he would turn toward the nearest suitable airfield while carefully monitoring the situation and taking appropriate actions. Depending on the nature of the problem, the pilot may elect to jettison the external stores. Should the engine subsequently fail, the pilot would jettison the external stores if he had not already done so. In this case, because pilots maintain situational awareness, the pilot should already be aware of populated areas or significant structures such English Village or the PFSF.

Conversely, if the pilot was at the same 3,000-4,000' AGL and the engine suddenly failed with little or no warning, the pilot would execute the low altitude engine failure and airstart procedures described in the Report[5]. In the event of a low altitude engine failure, there is no written requirement in the pilot procedures to look for a clear area prior to jettisoning the external stores. However, during discussions of emergency procedures and in simulator training when low altitude engine failure procedures are practiced, many pilots indicate they will at least consider what's in the immediate area before jettisoning the stores. As has been noted in previous PFS submittals, pilots are taught to maintain general situation and positional awareness.

6. Why would F-16 pilots transiting Skull Valley through Sevier B MOA avoid entering the restricted air space adjacent to the MOA to the west while transiting the valley?

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[3] The HSI is powered by the emergency generator..

[4] Aircraft Crash Impact Hazard at the Private Fuel Storage Facility (Rev 4), page 5.

[5] Ibid, Tab E

Pilots transiting Skull Valley through Sevier B MOA would avoid entering the restricted air space adjacent to the MOA for several reasons. First, flights must be cleared into the restricted airspace by Clover Control. If they haven't received clearance, they won't enter the airspace. Second, the flight transiting Skull Valley may be scheduled for range space in the western portion of the South UTTR not the airspace adjacent to Skull Valley. Third, even if the flight transiting Skull Valley is scheduled for the airspace next to Skull Valley, their range time may not have started yet and another flight may be using the airspace.

7. When F-16s fly down Skull Valley in a formation and the formation was to use a turning point in the valley, how many of the aircraft in the formation would actually fly directly over the turning point?

As noted in the March 30, 2001 RAI response to question 4e, a typical formation for a two ship formation would be for the wingman to be approximately 9,000' line abreast from his leader. Thus, while both aircraft in the flight would be heading in the general direction of the turning point, only one (and possibly neither) would be pointed directly at the turning point. A typical four ship formation will be flown as an "off-set box". This is essentially two flights of two aircraft, with each flight in the line abreast formation. The second, or trailing, second flight (also known as an element) is normally a few miles behind the first flight and offset left or right. Thus, depending on the actual relative position of the aircraft in the flight, and where exactly the flight lead is pointed, there could be one or two aircraft in the flight pointed directly at the proposed PFSF even though everyone in the flight would be pointed in the general direction of the proposed PFSF. It is conceivable, although not likely, that none of the four aircraft would be pointed directly at the PFSF if it were selected as a turn point.

There is no "set" turn point in Skull Valley. There are some buildings and road intersections that can be used if desired. Many flights, however, do not have a turn point in Skull Valley itself; they will use their time in the Valley for administrative procedures, G awareness turns, etc. As such, when entering Skull Valley from the north, they'll use the mountain ranges for the lateral confines and visually point toward the narrow neck or gap at the southern end of the valley.[6] Their first turn point would be either in the neck of the valley or south of it.

8. How big is the S-shaped path (two adjacent 90 degree turns) flown by F-16 pilots doing G-awareness turns?

The G-awareness maneuver is not a precise maneuver and the airspace required will vary depending upon variables such as speed and G loading. As a rough estimate, the turning radius for G awareness turns at 400KCAS and 4-5 G's would be approximately 1nm. A typical delay from the end of the first turn until the beginning of the second turn would 5-10 seconds, although no minimum or maximum amount of delay is required by regulation.

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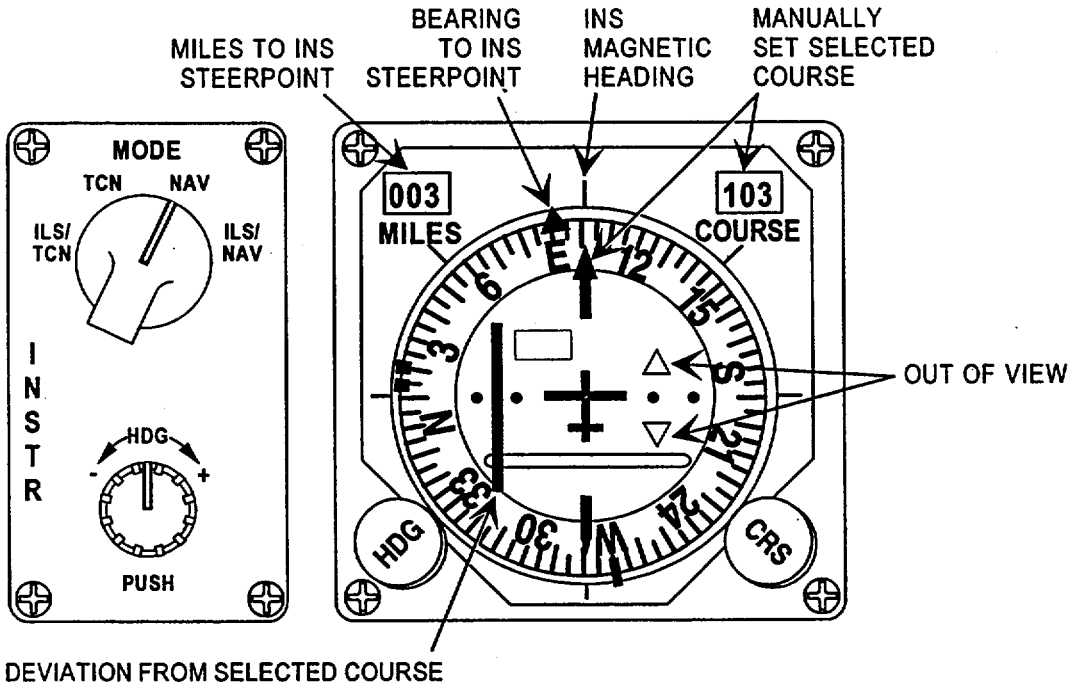
[6] RAI Response, March 30, 2001, page 11.

NAV Selected

When NAV is selected on the instrument mode select knob the following data displays on the HSI: INS magnetic heading, bearing to INS steerpoint, miles-to-go, course deviation, and course set from the selected INS steerpoint (Figure 17). The NAV mode does not change HUD symbology from the standard navigation displays.



NAV Mode HSI Display.