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RULEMAKINGS AND  
ADJUDICATIONS STAFF

REPORT OF AIRCRAFT ACCIDENT INVESTIGATION

F-16B SN 81-0814

147 FIG, ELLINGTON ANGB, TX

8 JUNE 91

CONDUCTED IN ACCORDANCE WITH AFR 110-14

APPOINTING AUTHORITY: Adjutant General  
State of Texas

INVESTIGATING OFFICER: Richard F. Trigilio  
Lt Col, TxANG

PFS Exh. 129

57208

NUCLEAR REGULATORY COMMISSION

Docket No. \_\_\_\_\_ Official Exh. No. 129

In the matter of \_\_\_\_\_

Staff \_\_\_\_\_

Applicant \_\_\_\_\_ IDENTIFIED

Intervenor \_\_\_\_\_ RECEIVED

Owner \_\_\_\_\_ REJECTED \_\_\_\_\_

DATE 2/1/04 WITHDRAWN \_\_\_\_\_

Witness \_\_\_\_\_

### III. Summary of Facts

#### A. Introduction to Flight History

The accident aircraft (SN 81-0814) was part of a two-ship crew exchange mission in support of the 147th FIG alert detachment at Holloman AFB (HMN), New Mexico. The aircraft had left Ellington Field (EFD) earlier that day configured with a centerline fuel tank and a baggage pod. The flight from Ellington to Holloman was uneventful. The aircraft arrived in Code 1 status and was turned by the 147 FIG Maintenance Detachment for the return flight to Ellington.

The accident aircraft with [REDACTED] and aircraft SN 82-0969 with [REDACTED] as Flight Lead had a routine takeoff from Holloman at approximately 1640Z and proceeded uneventfully to the Ellington area. The pilots had previously considered performing practice intercepts at that point, but canceled due to unfavorable weather conditions. Shortly thereafter on approach to Ellington, the trailing aircraft 81-0814 suffered engine failure and ultimately crashed approximately 10 miles south of the field. The pilot safely ejected and was recovered from the vicinity of the crash with no apparent injuries.

#### B. Briefing and Preflight

A routine flight briefing was accomplished on the morning of 8 June 1991. [REDACTED] filed appropriate flight plans and conducted the briefing with [REDACTED]. Their call signs were Tex 21 and Tex 22, respectively. The AF Form 70 (Computer Generated Flight Plan) and a copy AWS Form 28 (Aircrew

Briefing Log) are included in Tab K. [REDACTED] also briefed that they would attempt to accomplish practice intercepts during the flight if weather permitted.

[REDACTED] performed a preflight inspection of SN 81-0814, including a review of the rear cockpit switch settings and equipment configuration. Takeoff from Holloman was accomplished at 1640Z on 8 June 91.

#### C. Weather

Thunderstorm activity has been forecast along the Texas coast and at portions of the planned routing through central Texas. The forecast included possible thunderstorm activity for the Ellington area starting at 1600Z. Rain shower activity was occurring upon arrival of the two-ship at Ellington. Weather information is included in Tab K.

#### D. Flight Activity

D1. The accident aircraft under call sign Tex 22 was scheduled to support a crew exchange mission for the 147 FIG. Takeoff from Holloman and subsequent flight to Ellington were routine. The filed flight plan called for 37,000 feet altitude through Wink Junction, San Antonio, Palacios, and finally the Pelican West area for possible practice intercepts. As they neared the Pelican area, Tex 21 determined that the weather had deteriorated sufficiently to warrant going directly into Ellington. Tex 22 planned to drag to a position 2 miles behind Tex 21. As they neared Ellington (approximately 20-30 miles out), they descended to 10,000 feet and again checked the weather to determine whether or not an overhead approach would be possible. Although 3,500 feet visibility with broken cloud formations was the official forecast, rain showers in the area precluded an overhead approach and the decision was made to perform an Instrument Landing System (ILS) approach. Tex 22 began S-turns for separation and was stabilizing at about 2 miles behind Tex 21. They were in the process of descending from 10,000 to 3,000 feet when the first signs of a problem occurred.

D2. At approximately 4,000 feet altitude and 200 knots airspeed, Tex 22 experienced a loud bang from the engine and severe vibration or chugging in the aircraft. The pilot initially thought it was jet wash from Tex 21 but discounted this quickly based on the relative position of the two aircraft. He reduced power immediately and the anomaly subsided. Pushing the power up to 75-80% again produced the chugging and a "rattle feeling" in the throttle. During this process, all instrumentation looked normal. [REDACTED] was surprised because the anomaly appeared to be engine related but instrumentation was

in the acceptable range and not fluctuating. [REDACTED] then informed Tex 21 that [REDACTED] had a major engine problem, declared an inflight emergency (IFE), and planned a straight-in flame-out approach.

[REDACTED] reduced power to the threshold just below the problem area which [REDACTED] believed was at 75% throttle and attempted to reach Ellington. Shortly thereafter, [REDACTED] experienced another loud bang and the engine began spooling down. Tex 21 had noticed and pointed out several possible impact areas for the aircraft and called this to [REDACTED] attention. At this time the external (centerline) fuel tank was jettisoned.

D3. [REDACTED] then attempted to restart the engine using the jet fuel start system. Air speed was 200 knots and throttle setting was 22%. As [REDACTED] was considering where to point the aircraft, [REDACTED] noticed restart had been successful and the throttle was increased to idle thrust range (approximately 65%). Instrumentation was again normal and the engine stabilized. [REDACTED] then attempted to increase power to usable thrust but immediately experienced another bang and the engine spooled down again. The altimeter indicated 900 feet and [REDACTED] initiated the ejections sequence.

D4. Ejection from the aircraft was normal and the canopy deployed. However, several of the risers were twisted. [REDACTED] was concerned with two sets of high tension wires below and made several attempts to clear the risers to allow better control of his descent. The risers eventually cleared and he was able to land in a brushy area a few hundred yards south of the aircraft impact point.

#### E. Aircraft Impact

The aircraft impacted a point approximately 10 miles due south of Ellington Field into an undeveloped, partially wooded tract. The aircraft was totally destroyed.

The wreckage has been retrieved and is in custody at Ellington at this time. Soil and water samples were taken by the 147 FIG for further processing to determine the existence of any possible environmental contamination in the area. Visual inspection indicates slight damage to trees and brush but no remaining debris of any kind.

The jettisoned fuel tank fell into a similar area several hundred yards south of the main impact point. It was also retrieved and left no visible impact damage.

#### F. Rescue Operation

[REDACTED] ejected from the aircraft with minimal difficulty and landed apparently unhurt several hundred yards south of the aircraft impact point. [REDACTED] communicated immediately with [REDACTED] on [REDACTED] Search and Rescue (SAR) radio and then walked to a service road approximately 100 yards away.

[REDACTED] observed the ejection sequence as [REDACTED] ejected from the aircraft. [REDACTED] immediately contacted the Ellington Control Tower and requested SAR support from the Ellington-based Coast Guard SAR unit.

The tower notified the 147 FIG Fire Protection Branch which had responded to the IFE and now prepared to respond to the crash area. The Aircraft Rescue Fire Fighters from the 147 FIG arrived at approximately 1845Z.

[REDACTED] had walked towards the impact point thinking it as possibly a firing range of some kind since [REDACTED] heard the sound of what turned out to be 20MM shells going off in the fire surrounding the wreckage. [REDACTED] was picked up and attended to by local emergency response personnel as [REDACTED] approached the crash area.

Shortly thereafter, a Coast Guard SAR helicopter arrived and transported [REDACTED] to Ellington Field. [REDACTED] went on to St John's Hospital in Houston, Texas, by ANG ambulance where he was treated and released.

#### G. Crash Response

The 147 FIG Fire Protection Unit had dispatched two vehicles from Ellington to the crash site within a very few minutes of learning the coordinates of the point where the pilot had landed. Local emergency units has also responded from League City, Arcola, and Friendswood, three communities in the southeast Houston area. The aircraft had caught fire and burned upon impact but the fire was essentially out by the time the 147 FIG personnel had arrived.

The Explosive Ordnance Disposal (EOD) team and a hydrazine response team from Ellington also responded to deal with potential hazards in their respective areas. The area is now clear of any explosive ordnance, hydrazine, or other debris. The hydrazine tank had not ruptured and is currently scheduled for disposal by the 147 FIG through normal procedures.

#### H. Maintenance Documentation

Maintenance documentation is available for aircraft SN 81-0814, including the AFTO Forms 781A, J, F, H and G which were recovered from the Crash site. Tab H contains a complete listing of records available and reviewed as part of this investigation. Tab U contains additional maintenance records used in compiling this report.

#### I. Maintenance Status

Aircraft SN 81-0814 had entered 150-hour phase inspection on 7 May 91 and was released 1 June 91 after completion of the Functional Check Flight (FCF). The aircraft maintained Code 1 status for the eight flights completed since being released from phase.

Examination of the wreckage and subsequent testing revealed a number of facts concerning the aircraft maintenance status at the time of impact.

**Engine:** Although engine failure was the specific problem encountered in flight, no evidence was obtained to indicate that engine hardware failure had contributed to the anomaly experienced by the pilot. A review of the retrieved engine components has been included in Tab J.

**Instrumentation:** A review of the cockpit instrumentation revealed no indication of instrument or instrument system failure.

**Fuel Quantity:** The pilot indicated [redacted] had approximately 2900 pounds of fuel remaining at the time [redacted] first experienced engine failure. This is consistent with the reconstructed reading on the fuel quantity indicator. Furthermore, analysis of the wreckage site indicated that a considerable quantity of fuel remained in the aircraft at the time of impact.

**Fuel Supply System:** The main fuel shutoff valve (MFSOV), part of the fuel supply system, was found still connected to the aircraft. The actuator had broken free of the valve, but was recovered. An Analysis of the MFSOV and actuator, conducted by Ogden ALC and other DOD personnel, indicated the following (see analysis in Tab J and photographs in Tab S):

- 1) The MFSOV was found to be approximately 14 degrees from fully closed (see photograph).

- 2) Analysis of the actuator indicated the valve was likely to be in this configuration prior to impact.
- 3) Analysis also indicated a deterioration of the Teflon seal surrounding the butterfly.

Maintenance documentation revealed that the Time Compliance Technical Order (TCTO) 1F-16-1798 which required safety wire of the master fuel switch guard to maintain the switch in the master (open) position had not yet been complied with. Subsequent analysis of the switch indicated it was in the open position prior to impact. Parts are currently back-ordered, thus preventing completion of this TCTO. Expiration date of the TCTO is 11 Feb 92.

Previous failures of the MFSOV had prompted Tactical Air Command (TAC) and Pacific Air Force (PacAF) to direct safety wiring of the valve in the open position. On 10 May 91 National Guard Bureau published guidance that instead of applying safety wire to the valve, the switch guard should be safety wired such that the switch is locked in the open position.

This MFSOV had received a visual inspection in accordance with Technical Order 1F-16-6WC-1 by the aircraft crew chief during the through-flight inspection at Holloman AFB on 8 June 91 between the two cross-country missions. The valve was observed to be in the full open position at the time.

#### J. Medical

Medical examination of the pilot at St John's Hospital in Houston, TX, indicated no apparent injury from his ejection and landing. Blood and urine analysis testing conducted by the Armed Forces Institute of Pathology (accession #2327470) on 19 June 91 were negative.

#### K. Aircrew Qualification

[REDACTED] is a member of the 111th Fighter Interceptor Squadron of the 147 FIG. [REDACTED] is currently qualified as an F-16 pilot. [REDACTED] duty Air Force Specialty Code (AFSC) is 11150. [REDACTED] most recent flight physical was accomplished on 31 Mar 91. [REDACTED] received a proficiency check in May 91. [REDACTED] has 566.8 total flying hours of which 339.2 hours have been in the F-16. Detailed data is included in Tab G.

IV. Following are Tabs with supplemental data for this investigation. Tabs A through S were provided by the President of the Safety Investigation Board and were used to develop some of the information presented in the above summary. Additional data is presented in Tabs T through Z. An index of Tabbed data follows.

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