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OFFICE OF THE SECRETARY  
RULEMAKING AND  
REGULATIONS STAFF

# AFR 110-14 USAF AIRCRAFT ACCIDENT INVESTIGATION BOARD

17 DECEMBER 92  
DIXIE GUNNERY RANGE, TX

F-16A  
AIRCRAFT  
S/N  
83-1078

924 FG  
704 FS

INVESTIGATION OFFICER  
JOHN M. STEWARD, LT COL, USAF

388 FIGHTER WING  
HILL AFB, UTAH

PFS Exh. 145

COPY NUMBER 11 OF 11

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NUCLEAR REGULATORY COMMISSION

Decree No. \_\_\_\_\_ Official Exh. No. 145  
In the matter of PFS  
Staff \_\_\_\_\_ IDENTIFIED   
Applicant  RECEIVED   
Intervenor \_\_\_\_\_ REJECTED \_\_\_\_\_  
Other \_\_\_\_\_ WITHDRAWN \_\_\_\_\_  
DATE 7/1/02 Witness \_\_\_\_\_  
Clerk [Signature]



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS TWELFTH AIR FORCE (ACC)  
BERGSTROM AIR FORCE BASE TEXAS

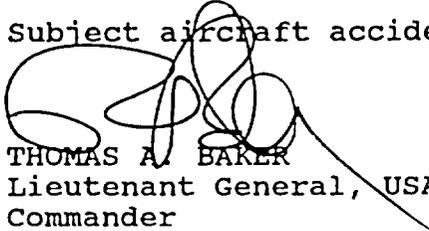
FROM: CC

15 March 1993

SUBJ: Aircraft Accident Investigation: F-16A, SN 83-1078,  
17 December 1992, 924 FG (704 FS), Bergstrom AFB TX

TO: JA

Subject aircraft accident investigation is approved.

  
THOMAS A. BAKER  
Lieutenant General, USAF  
Commander

CERTIFICATION

I certify the documents contained in this Accident Investigation Report for F-16A S/N 83-1078 are true copies of the originals.

A handwritten signature in black ink, reading "John M. Steward". The signature is written in a cursive style with a large initial "J" and a long horizontal stroke.

JOHN M. STEWARD, Lt Col, USAF  
Investigating Officer

AIRCRAFT ACCIDENT INVESTIGATION

FORMAL REPORT OF INVESTIGATION

1. AUTHORITY AND PURPOSE:

a. The Commander, Twelfth Air Force (ACC), appointed Lieutenant Colonel John M. Steward, under Air Force Regulation 110-14, to investigate and determine the facts and circumstances surrounding the aircraft accident involving an F-16A aircraft, S/N 83-1078. Major Conley B. Gainer, 67th Medical Group, Bergstrom AFB, TX, provided medical technical advice; Captain Robert L. Wilson, 314th Fighter Squadron, Luke AFB, AZ, provided operations technical advice; Technical Sergeant James W. Thomas, 58 FW Logistics Group, Luke AFB, AZ, provided maintenance and life support technical advice. Letters of appointment are located at TAB Y.

b. The purpose of this investigation is to obtain and preserve available evidence for claims, litigation, disciplinary, and administrative actions, and for all other purposes deemed appropriate by competent authority. This report is available for public dissemination under the Freedom of Information Act and AFR 12-30. This report covers the accident which occurred at 1442 hours, Central Standard Time, on 17 December 1992. The aircraft impacted just outside the Dixie Gunnery Range, Texas, and was destroyed. The pilot, Lieutenant Colonel Jimmie G. Mills, USAFR, successfully ejected and received only minor injuries.

2. SUMMARY OF FACTS:

a. History of Flight: Outlaw 12, Lt Col Jimmie G. Mills, was number two of a two-ship flight of F-16As which departed Bergstrom AFB, at 1421 hours on 17 December 1992. The flight leader of this two-ship, was Lt Col Henry L. Graves, using the call sign Outlaw 11. This particular flight was one of a series of training flights designed to transition Lt Col Mills from F-16C models to F-16A models. Lt Col Mills had flown F-16Cs at his previous base; reassignment to Bergstrom necessitated his transition to F-16As. The mission was planned as a practice bombing sortie. The two F-16As took off and flew southwest from Austin and passed over San Antonio at 21,000 feet. From there, the two-ship proceeded south and descended to enter the Dixie

Gunnery Range located 77 miles south of San Antonio. (TAB V-4, V-5) As Lt Col Mills passed over the target to enter the bombing pattern, he struck a bird and felt his engine shudder. (TAB V-4) The bird, a Red Tailed Hawk (Genus and Species: Buteo Jamaicensis), weighed approximately 2.5 pounds and was ingested by the engine. (TAB A-2, J-9, V-4) Subsequently, a nearly instantaneous and catastrophic engine failure and fire occurred. During this timeframe, the pilot reacted to multiple warning and caution lights in his cockpit as well as directions from his flight leader. He turned 20 degrees right to avoid a hunting lodge off his nose and to head directly toward the nearest landing field, 40 miles east-southeast. Cockpit fire warnings were visually confirmed as Outlaw 11 and Outlaw 12 both observed smoke and flames coming from Outlaw 12's aircraft. Following this 30 to 45 second period, which included a climb and several radio calls, Outlaw 11 directed, "Outlaw 12, you are still on fire. Recommend you get out [eject]." Lt Col Mills then ejected. (TAB J-4, V-4, V-5) The still-burning aircraft turned about 72 degrees further right, rolled beyond inverted, and impacted at approximately 25 degrees nose low. (TAB J-2, R-1 and R-2) Impact position was five statute miles east-southeast of the Dixie Range bombing circle and one-half statute mile south-southwest of the hunting lodge.

b. Mission: The mission was a "Top-Off" sortie for Lt Col Mills, Outlaw 12. Outlaw 12 was undergoing an F-16C to F-16A conversion since he had been reassigned to fly with the 704th Fighter Squadron (FS) at Bergstrom AFB, TX. The sortie was an extra flight beyond those required by the syllabus. It was added to improve Lt Col Mills' flying continuity between syllabus sorties and to increase his cockpit avionics proficiency. The mission was a Basic Surface Attack profile intended to emphasize switchology for Inertial Navigation System updates, bombing, and strafing. Planned bombing events included 10 degree, 20 degree, and 30 degree dive bombing followed by strafe. All events were to utilize basic bombing patterns. The flight leader, Lt Col Graves, was a qualified and current squadron supervisor. (TAB V-4, V-5)

c. Briefing and Preflight:

(1) Both pilots had adequate crew rest. (TAB K-2, V-4, V-5)

(2) Mission planning began at approximately 1045 hours on the morning of the mishap. Outlaw 11, Lt Col Graves, guided Outlaw 12, Lt Col Mills, through the mission planning. During this session, emphasis was placed on how to use the mission planning computer work station, which is called the Mission Support System II. After planning was complete, both

pilots took a 15-minute lunch break prior to the flight briefing. The briefing began two hours prior to takeoff and Lt Col Graves used the 704 FS briefing guides. The briefing covered all applicable items required by existing regulations, including emergency procedures, training rules, and divert airfields for their planned route of flight. Special emphasis was given to airborne engine start procedures, strafe techniques, bombing techniques, and heads-up-display altitude calibration procedures. (TAB V-4, V-5) The briefing ended 5 to 10 minutes prior to when the pilots stepped out to the aircraft. Pilot evaluation of maintenance documents, and visual aircraft inspections indicated both F-16s were properly prepared for flight. (TAB U, V-4, V-5)

(3) Ground operations were normal with two exceptions. First, before taxiing, Outlaw 12 had a problem with a fuel boost pump light which was not properly illuminating. After cycling the cockpit fuel feed knob and changing the bulbs, all six pump lights illuminated, confirming proper function. (TAB V-6) Second, Outlaw 11 had an Inertial Navigation System problem requiring a second alignment which was performed just prior to takeoff. (TAB V-4, V-5, V-6)

d. Flight Activity:

(1) Outlaw 11 flight filed and was cleared for the Outlaw 20-40F routing. This was a high altitude instrument flight rules (IFR) departure to the southwest. The routing included a letdown to the Dixie Gunnery Range, which is within Restricted Airspace (R-6312). This same clearance included a high altitude IFR return to Bergstrom AFB. (TAB V-4, V-5)

(2) The sortie began 1421 hours, six minutes after the scheduled takeoff time. Actual weather for the entire route of flight was as briefed; there were no clouds and visibility was 7 miles or greater. (TAB K-3, V-4, W-2) During the departure, an operations (OPS) check and weapons system checks were performed. As they climbed, Outlaw 11 directed Outlaw 12 to a standard, 6000 feet line abreast, formation. This formation was flown for the remainder of the sortie until the birdstrike. (TAB V-4, V-5)

(3) Range entry began from the northwest. A descent-OPS check was performed which confirmed fuel consumption, aircraft performance, and all cockpit indications were normal. The range entry performed was typical for entering the basic bombing pattern on Dixie Gunnery Range. This entry was at 1000 feet

above ground level and 400 knots. Approaching the manned portion of the gunnery range, Outlaw 11 maneuvered the flight to fly over the bombing circle on an easterly heading. (TAB V-4, V-5, V-7)

(4) Just prior to flying over the bomb circle, Outlaw 12 was looking at his flight leader, to his left. When he subsequently looked forward, he saw a bird and immediately felt a birdstrike. He felt the engine shudder and began a subtle climb. (TAB V-4) While Dixie Gunnery Range does not have recording devices, testimonies indicate Outlaw 12's radio call was: "I took a bird; it's in the engine," or words to that effect. Outlaw 11 had just started a left pull up to the bombing pattern when Outlaw 12 made this call. Outlaw 11, hearing the birdstrike call, maneuvered his aircraft to an observation position by flying in an "S" pattern above and behind Outlaw 12. (TAB V-4, V-5)

(5) Aside from the engine shudder, initial engine indications were normal. However, within the next 5 to 10 seconds, the "overheat," "engine," and "fire" warning lights illuminated which triggered audio warnings in Outlaw 12's cockpit. Outlaw 12 started a climb and turned right about 20 degrees to avoid a building off his nose and to fly directly toward the Naval Orange Grove Airfield. (TAB V-4) Outlaw 12 turned on his video tape recorder (VTR) but the tape was found burned in the wreckage and unusable. (TAB N-1) During the early stages of the remaining climb, Outlaw 12 was analyzing potential causes for the "overheat" light, the first warning light he observed. His thought processes were punctuated and altered as additional cockpit lights illuminated and additional radio calls were exchanged. Throughout this sequence he weighed which critical procedures might apply or take precedence. Outlaw 12 noted the fan turbine inlet temperature (FTIT) was about one thousand degrees and transmitted, "My FTIT is over 900." After the high FTIT call, Outlaw 11 directed, "Shut it down." By maneuvering in "chase" formation, Outlaw 11 was able to observe and confirm fire from the engine access doors on both sides of Outlaw 12's aircraft. Outlaw 11 relayed this visual confirmation of fire on the radio. (TAB V-4, V-5)

(6) Following Outlaw 11's "shut down" call, Lt Col Mills then moved the throttle to the off position. Up to this point, Lt Col Mills was not committed to ejecting from this aircraft. Rather, he began executing emergency action procedures thinking the aircraft might still be recoverable. He started the Jet Fuel Starter and increased his climb, both early steps of an attempt to re-start the engine. (TAB V-4) Shutting down the engine had triggered the start of the Emergency Power Unit (EPU), which provides backup electric and hydraulic power. The

EPU functioned for two seconds and then failed. (TAB J-4) By the time he increased his climb angle, the rear half of Outlaw 12's aircraft was spewing flames and trailing heavy smoke. (TAB V-4, V-5, V-7) Outlaw 11 then transmitted, "You're still on fire--recommend you get out." Outlaw 12 also visually confirmed the fire by checking over his right and left shoulders. On one side he observed fire, sparks, and trailing smoke; over the other heavy trailing smoke. This confirmed for Lt Col Mills that he needed to eject. The aircraft was at approximately 142 knots and at 3534 feet Mean Sea Level when Lt Col Mills transmitted, "I'm outta here," and ejected. (TAB J-5, V-4, V-5) After ejection, the aircraft turned right, began a slow roll to beyond an inverted attitude, and impacted the ground. The aircraft impact and the explosion was witnessed by the range control officer and his crew as well as two hunters in separate positions east of the bombing range. The large resultant aircraft and fuel fire burned for approximately 10 to 15 minutes. This was followed by small surrounding brush fires. Dixie Gunnery Range fire fighters extinguished these fires. (TAB V-7, V-9)

f. Ejection: The ejection seat in aircraft 83-1078 sequenced normally and within the ejection envelope. Lt Col Mills' parachute opened normally and he accomplished a four-line parachute descent. (TAB V-4)

g. Personal and Survival Equipment: During the parachute landing Lt Col Mills, the raft, the seat kit, and the parachute created a "hammock effect" in the brush and trees which cushioned Lt Col Mills' landing. The emergency radio locator beacon, included in the ejection seat, failed to operate. Testimony indicates this resulted from improper installation of the beacon which drained the battery. (TAB V-4, V-5) The life raft also failed to inflate during the ejection sequence. Once safely on the ground, Lt Col Mills waved to Outlaw 11 signaling that he was okay. Lt Col Mills did not elect to use the emergency radio in the ejection seat kit. Rather, he walked alone to a hunting lodge he had observed before ejection and during his parachute descent. From there he phoned home base. (TAB V-4)

h. Rescue:

(1) After the ejection, Outlaw 11 took control as the Search and Rescue (SAR) On-Scene Commander and coordinated rescue with Major Dick Hahn, the Range Control Officer. Outlaw 11 flew over Outlaw 12, after his parachute landing, to confirm Outlaw 12 was physically okay. Then Outlaw 11 set up an orbit over the crash site. (TAB V-4, V-5)

(2) The Range Control Officer called Corpus Christi Naval Air Station (NAS) via telephone to request a SAR helicopter. An HH-1 helicopter out of Corpus Christi NAS arrived approximately 30 minutes after the ejection. (TAB V-4, V-5, V-7) Subsequently the next two-ship scheduled for Dixie Gunnery Range checked in on the range frequency for their planned range period. Outlaw 11 informed them of the downed aircraft and directed them to hold at 10,000 feet above the range. Outlaw 11 then went down to a lower altitude to make another pass over Outlaw 12. On this second attempt, Outlaw 11 was unable to see Outlaw 12 because of the thick brush. (TAB V-5)

(3) After calling for the SAR helicopter, Major Hahn departed the range control tower, with all but one of his crew, and drove to the crash site. They were traveling in three vehicles, one of which was UHF radio-equipped. (TAB V-4, V-5, V-7) At this point Outlaw 11 radioed Houston Center on UHF 322.5 that an aircraft was down and directed them to vector airplanes away from the area. (TAB V-5) About 15 minutes after the ejection the Dixie Range complex fire truck arrived at the crash site. By this time, their efforts served mainly to put out brush fires since the crash and resultant fuel fire had largely burned out. (TAB V-7, V-9)

(4) Major Hahn arrived at the hunting lodge about the time the rescue chopper was checking in on the range radio frequency. Shortly thereafter, Major Hahn radioed to Outlaw 11, "Don't worry about it. Jimmie is in the house over there and he is fine." (TAB V-5, V-7)

(5) The SAR chopper first called Outlaw 11, Lt Col Graves, about 45 miles out from the crash site. Outlaw 11 then directed the helicopter to the hunting lodge for the pickup. By this time Outlaw 11 was low on fuel and informed Major Hahn he was returning to base. Outlaw 11 turned over the On-Scene Commander duties to the next two-ship on the range, Spur 31, and left the area. (TAB V-5, V-7)

(6) Major Hahn and his assistants were at the hunting lodge when the chopper arrived. One of Major Hahn's assistants vectored the SAR chopper for a single approach and landing. The chopper landed in a corner of the hunting lodge's parking area, away from vehicles and the hunting lodge. (TAB V-7) Outlaw 12 walked to the chopper, got in, and requested they take him to Randolph AFB, TX. (TAB V-4, V-7)

(7) Lt Col Mills spent 3 to 4 hours at Randolph AFB undergoing medical examinations and tests. He gave blood, had x-rays taken, and gave a 72-hour history report to the doctor. (TAB V-4) A staff car, with a medic, then picked up Lt Col Mills and took him to Bergstrom AFB for further evaluations. Lt Col Mills was released at approximately 2230 hours on 17 December 1992 and was driven home. (TAB V-4)

(8) The aircraft impacted on privately owned land which is leased for hunting. On the following day, 18 December 1992, one additional helicopter sortie was flown into the crash area. This sortie involved about 30 to 40 minutes of flying in the accident area to deliver Safety Board Investigators and to find and recover the ejection seat. (TAB V-7)

j. Maintenance Documentation:

(1) Air Force Technical Order (AFTO) 781A, engine records, CORE Automated Maintenance System (CAMS) computer and life support records were reviewed. AFTO 781 discrepancies noted for the period 24 hours prior to the accident were as follows: An erroneous symbol was entered in Block 7 of the AFTO 781H dated 17 December 1992. This ambiguous entry was not discovered or corrected by the production superintendent. (TAB U-2, U-6) In addition, the AFTO 781Hs did not include documentation of a Basic Post Flight inspection following flying on 16 December 1992, the day prior to the mishap flight. TAB U-5)

(2) No time compliance [scheduled] maintenance items were overdue. (TAB U-3) One red diagonal write-up was open on the back side of the AFTO 781K, the Delayed Discrepancy Document, for a door modification. (TAB U-11) This posed no safety-of-flight problem.

(3) Scheduled and periodic inspections were reviewed; none were overdue. The hydrazine indicator disk was due to be changed on the date of the mishap.

(4) The pre-mishap Joint Oil Analysis Program (JOAP) records for the engine were reviewed. (TAB U-7) All readings were within normal limits and no adverse trends were noted.

(5) The aircraft and engine time change records were reviewed. No time change items were overdue. However, some engine items went in the 10 percent "over fly." This is authorized by the Air Logistics Center engine logistics manager and is outlined in T.O. 2JF 100-14, Section Five. (TAB U-2)

(6) No items were overdue in the Aircraft's Events Listing (EVL). (TAB U-2)

(7) The last scheduled inspection performed was a "50-hour Special Inspection" on 23 November 1992. (TAB U-8) Unscheduled maintenance performed after that date was on 25 November 1992, for a chaff and flare problem (TAB U-9), and replacement of a cracked main landing gear, tire heat shield on 9 December 1992. (TAB U-10) Additionally, there was one open red diagonal write-up in the active AFTO 781A concerning a digit in the Horizontal Situation Indicator-mileage window. (TAB U-10) Finally, there was an open red diagonal write-up in the AFTO 781K, the Delayed Discrepancy Document, for a caution panel light "spare" which was inoperative. (TAB U-11) None of these posed a safety-of-flight problem.

(8) All maintenance procedures, practices, and performances were within prescribed standards.

k. Maintenance Personnel and Supervision:

(1) The aircraft forms indicate a Basic Post Flight Inspection was not accomplished on A/C 83-1078 on 16 December 1992. Aircraft forms indicate a thru-flight inspection, a less detailed inspection, was accomplished on that date. (TAB U-5)

(2) A review of training records revealed the flight line personnel associated with F-16 S/N 83-1078 were qualified for their assigned duties.

1. Engine, Fuel, Hydraulic and Oil Inspection Analysis:

(1) Engine inspection data was normal. (J-7)

(2) Fuel test data was normal. (TAB J-6)

(3) Analyses of engine oil and hydraulic fluid drawn following the mishap were inconclusive. (TAB U-2, Z-3)

m. Component and Accessory Systems Review: All aircraft component and accessory systems were operating normally until the birdstrike. (TAB J-4) The post-mishap engine tear down and evaluation was conducted by the San Antonio Air Logistics Center, F-100 Propulsion Division/LPFE, Kelly AFB, TX 78241-5000.

n. Operations Personnel and Supervision:

(1) This sortie was conducted under the authority of the 704 FS/CC.

(2) The briefing officer was Lt Col Henry L. Graves, Jr. He used the briefing guide from AFRESR 55-116. Supervision was thorough and adequate as Lt Col Graves was the squadron commander.

o. Crew Qualifications: The mishap pilot, Lt Col Mills, was highly experienced, with 4283.5 total flying hours in seven different operational jet aircraft. This includes experience in F-16Cs and A-10s. He was undergoing "Top-off" training to transition from the F-16C models to the F-16As. No training deficiencies or discrepancies were noted. (TAB G-7, T-2, V-4, V-5)

p. Medical:

(1) Lt Col Mills was medically qualified for flying duties at the time of the aircraft mishap. The Toxicological Report was negative for illegal substances, unauthorized drugs, and alcohol. (TAB X)

(2) Lt Col Mills did not sustain any significant injuries due to the mishap or his subsequent ejection. (TAB X) He did not require hospitalization and was returned to flying status after ten days of medical grounding.

(3) A complete and thorough review of Lt Col Mills' medical and dental records revealed he had a past medical history of slightly elevated lipids that had not been completely followed up (i.e., still needed to be repeated). This was an administrative oversight and non-contributory to the mishap. Lt Col Mills has a history of defective distal and near visual acuity, which corrects to 20/20 in both eyes with lens. He was wearing his glasses at the time of the birdstrike and ejection, which was also non-contributory to the mishap. (TAB X)

q. Nav aids and Facilities: These were not factors affecting this mission. (TAB Z)

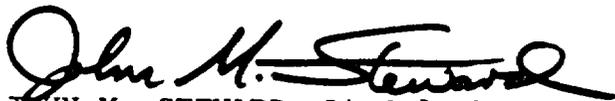
r. Weather: Forecast weather and actual weather from take-off all the way to the Dixie Gunnery Range was clear of clouds and visibility was seven miles or greater. (TAB F-4, K-3, V-5, V-7, W-2)

s. Directives and Publications

(1) The following publications were applicable to the mission:

AFR 50-46/AFRES Sup 1	Weapons Ranges
924 TFG 55-46	Dixie Range Procedures
AFR 60-1/ACC Sup 1/ AFRES Sup 1/BAFB Sup 1	Flight Management
AFR 60-16/ACC Sup 1/ AFRES Sup 1	General Flight Rules
ACCM 3-3, Vol V	Mission Employment Tactics - F-16
AFRESR 51-50 AFRESR 51-50, Vol VII	Flying Training - Tactical Fighter
ACCR 55-79	Aircrew/Weapons Controller Procedures for Air Operations
AFRESR 55-116/924 TFG Sup 1	F-16 Aircrew Operations Procedures
AFRESR 60-2/924 TFG Sup 1	Aircrew Standardization/ Evaluation Procedures
T.O. IF-16A-1	Flight Manual F-16A
Outlaw Guide	Pilot Aide

(2) With the exception of documentation omissions in the aircraft maintenance records, shown in Section j(1) of this report, there were no known or suspected deviations from the directives or publications by the pilot or others involved in the mission.



JOHN M. STEWARD, Lt Col, USAF  
Investigating Officer