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AFR 110-14

USAF AIRCRAFT
ACCIDENT INVESTIGATION
BOARD

14 NOVEMBER 1991
HILL AFB, UTAH

F-16B AIRCRAFT

419 FW

S/N 79-0419

466 FS

INVESTIGATING OFFICER

JAMES W. KIMMEL, LT COL, USAF
58 FIGHTER WING
LUKE AFB, ARIZONA

COPY NUMBER 10 OF 11

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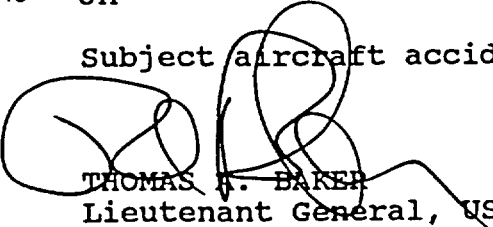
9 January 1992

OFFICE OF THE COMMANDER

SUBJECT Aircraft Accident Investigation: F-16B, SN 79-0419,
14 November 1991, 419 TFW (466 TFS), AFRES, Hill AFB UT

TO JA

Subject aircraft accident investigation is approved.


THOMAS H. BAKER
Lieutenant General, USAF
Commander

Readiness is our Profession

57288

AFR 110-14

AIRCRAFT ACCIDENT INVESTIGATION
FORMAL REPORT OF INVESTIGATION

1. AUTHORITY AND PURPOSE:

The Commander, Twelfth Air Force (TAC), appointed Lieutenant Colonel James W. Kimmel, under Air Force Regulation 110-14, to investigate and determine the facts and circumstances surrounding the aircraft accident involving F-16 aircraft S/N 79-0419, which occurred on 14 November 1991 near Wildcat Hills, Utah (TAB Y-1). Captain Steven S. Ferris, 421st Fighter Squadron, Hill AFB, Utah, provided operations technical advice (TAB Y-2); Captain Jeffrey M. Moody, 4th Fighter Squadron, Hill AFB, Utah, provided maintenance and life support technical advice (TAB Y-3); and Captain Frank J. Archer, 390th ECS, Mountain Home AFB, Idaho, provided medical technical advice (TAB Y-4). The purpose of the 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.

2. SUMMARY OF FACTS:

a. History of Flight. Four F-16A/B aircraft, call sign Thud 01-04 took off from Hill AFB, Utah, at 1447 local time on 14 November 1991. They were to conduct Surface Attack Tactics training on the Helicopter Air-to-Ground (HAG) Range located within R6404 with coordinated low altitude air-to-air training (LOWAT) support from Cyborg flight, a flight of two F-16A aircraft. Approximately 13 minutes after takeoff, the mishap aircraft, Thud 03, impacted a ridge destroying the aircraft and fatally injuring both pilots. There was no attempt initiated by either pilot to eject. News releases were provided to the public by the 419th Fighter Wing, Public Affairs Office, Hill AFB, Utah (TAB Z-1 to Z-3).

b. Mission. The mission was a tactical check ride for Thud 01. The flight had been given an Air Tasking Order (ATO) that included an ingress route, target, and egress route. Specific

simulated ordnance was included in the ATO along with a specific target located in the HAG Range. The ATO followed a Checkered Flag scenario, simulating operating out of the 466th Fighter Squadron's Checkered Flag Base. Thud 01 was flown by Lieutenant Colonel Danny W. Hamilton. Thud 02, the Standardization and Evaluation Flight Examiner (SEFE), was Captain Gary M. Batinich. Thud 03 was flown by Captain Arnold A. Clarke, with Captain Michael T. Sowell riding in the rear cockpit as an observer. Thud 04 was flown by Captain Douglas Lawton. Cyborg 01 was flown by Captain Thomas L. Wingo, and Cyborg 02 was flown by Brigadier General Forrest P. Winebarger.

c. Preflight and Briefing.

(1) Captain Clarke was a First Officer with Northwest Airlines. During the time period of 11 November to 14 November 1991, he had no conflicting duties with Northwest Airlines (TAB Z-8). Captain Clarke had flown a 4 versus 2 air intercept (AI) mission earlier that morning and arrived in the squadron at approximately 0730 hours local time on the day of the accident. Captain Clarke had not flown the day prior to the accident and crew rest was not a factor (TAB V-3-3, V-4-3).

(2) Mission preparation for the sortie was thorough. All of the material required by local directives was provided to the flight. Lieutenant Colonel Hamilton was the primary mission planner since this was a tactical check ride for him (TAB V-8-4).

(3) The briefing started on time and was normal. The briefing included all applicable items required by existing regulations. All members of the flight clearly understood the plan and objectives for the mission. Cyborg 01 was briefed by LTC Hamilton on all applicable portions of the mission to include altitude blocks and aircraft deconfliction procedures, LOWAT training rules, and termination criteria prior to Thud's brief. The briefing was concluded approximately 10 minutes prior to the briefed pilot step time (TABS V-2, V-4, V-7).

d. Flight.

(1) Ground operations for Thud flight were normal and the four-ship started engines at 1415 hours local time. Preflight checks were normal and the flight taxied to Runway 14 at 1430 hours local. The end of runway checks were accomplished in

accordance with local directives and the flight received clearance for an Island 418 Standard Instrument Departure and Flight Plan from Hill Clearance Delivery.

(2) Thud flight was cleared for takeoff at 1447 hours. The flight accomplished single ship afterburner takeoffs with 20 second spacing between aircraft and flew a radar trail departure due to the existing weather conditions at Hill AFB. Thud flight flew the Island 418 Departure in radar trail formation until approximately 15 miles prior to the start point of Visual Route (VR) 1422/23 where the flight encountered visual meteorological conditions (VMC) and descended out of 7500 feet Mean Sea Level (MSL) for 300 feet Above Ground Level (AGL). Thud 01 and 02 rejoined to tactical formation followed by Thud 03 and 04. A G-awareness exercise was performed at the start point of VR 1423 and the flight proceeded north along the low level route towards Cedar Hill, the next steerpoint (TABS Z-4, V-2-5, V-4-7).

(3) Cyborg flight departed Hill AFB approximately five minutes before Thud and flew an Island 04 departure into the Lucin Military Operating Area (MOA) where they set up a north/south oriented Combat Air Patrol (CAP) on the southeast corner of the Hog Up Mountain Range located in the Lucin B MOA (TAB Z-9). Cyborg's mission was to intercept Thud flight at different points along Thud's route of flight to validate Thud flight's radar and visual lookout. For the first intercept, Cyborg's game plan was to run a beam intercept on Thud flight just as they entered the northeast corner of the Lucin MOA (TAB V-7-5).

(4) Approximately eight miles south of Cedar Hill, UT, Thud 04 reported Radar Warning Receiver (RWR) indications coming from his eight o'clock position, and Thud 01 replied that he also had RWR indications coming from his seven o'clock position. Thud 03 made a left hand turn of approximately 135 degrees and reported that he would check southbound in an attempt to acquire the bandits. Thud 04 was instructed to continue to the next steerpoint and then turn west at which point they would regain mutual support (TABS V-2-7, V-4-12).

(5) Thud 01 and 02 continued to Cedar Hill, then turned left to west toward the next steerpoint. Thud 03 turned right to north and asked Thud 04 what his position was. Thud 04 indicated he was northwest of Cedar Hill, and Thud 03 instructed him to come back south. Thud 03 and 04 passed head on, on approximately a north/south heading. After passing Thud 04, the impact point and

heading indicates Thud 03 turned left to west. After passing Thud 03, Thud 04, because of RWR indications, executed a right-hand missile defense turn also to the west when he called Tally (visual contact with bandits) two aircraft at left nine-thirty high. Unsure of the LOWAT training rule airspeed restrictions, Thud 04 did not engage the bandits but asked Thud 03 if he was in a position to engage the bandits. At this time, Cyborg 01 saw a fireball at his 1 to 2 o'clock position and called "knock it off" (directive to discontinue maneuvering). A "knock it off" roll call was initiated to determine for certain which aircraft was the mishap aircraft (TABS V-2-7, V-4-11, V-7-7).

e. Impact. Thud 03 impacted a ridge approximately six feet from its crest at N 4151.2 W 11300.4 (TAB A-1). The elevation of the impact point was 4,988 feet MSL (TAB R-2). Flight data indicates the aircraft was heading 232.06 degrees magnetic heading (TAB R-2) at approximately 400 knots indicated airspeed (TAB J-25) when it impacted the ridge. The aircraft was in a five degree nose high, ten degree right wing down attitude at the point of impact (TAB J-14).

f. Ejection. Firing of the seat-mounted initiators on the front seat were the result of impact forces bending the linkage and initiator sears. Firing of the rear seat-mounted initiators were the result of impact forces rotating the bellcrank. No evidence was discovered that would indicate an ejection sequence was initiated by either crew member (TAB J-9).

g. Personal and Survival Equipment. Detailed review of life support equipment revealed no evidence which would indicate equipment failure or maintenance problems prior to impact (TAB J-19).

h. Rescue.

(1) The crash occurred at 1500 local on 14 November 1991.

(2) Immediately after the crash, Cyborg 01 made the "knock it off" call and then made the first rescue call to Clover Control on UHF 298.6 (TAB V-7-9). At 1503 local, Clover notified Lieutenant Colonel Conroy, 466 FS/DO and the Hill AFB Command Post. At 1504 local, the Box Elder County Sheriff's Department was notified (TAB Z-11).

(3) A rescue helicopter from the 6514th Test Squadron was requested by the Hill AFB Command Post. A CH-53 helicopter from the 6514th was airborne at 1540 local with a flight surgeon, an aeromedical technician, and a pararescue specialist on board. They arrived at the accident site at 1624 local. The wreckage and remains were encountered at 1626 local and both pilots were pronounced dead by Doctor Albano of Hill AFB at 1630 local (TAB V-10).

i. Crash Response.

(1) Hill AFB Command Post received notification from Clover at 1503 local and shortly after that the helicopter support from the 6514th Test Squadron was requested. The base Disaster Control Group was activated with Colonel Emory, the Base Commander, in charge. Once it was determined that there were no survivors, no further immediate crash response was undertaken. A convoy led by the Deputy Base Commander, Lieutenant Colonel Sutton, and including security police, medical personnel, and other personnel was sent to the crash site to secure the site and begin the mishap investigation (TABS V-9, V-10).

(2) There was no significant delay from the time of discovery of the accident until rescue personnel arrived on scene, which was approximately one hour and twenty-four minutes (TAB V-10).

(3) Although the accident occurred approximately 65 miles from Hill AFB, in poorly accessible terrain, there were no significant difficulties encountered in the rescue effort since helicopter support was readily available..

j. Maintenance Documentation.

(1) Air Force Technical Order (AFTO) Forms 781 and Core Automated Maintenance System (CAMS) computer records were reviewed. Discrepancies that were open at the time of the mishap are accurately listed in TAB H-9. Captain Clarke signed the 781H for the second sortie (TAB U-2).

(2) No Time Compliance Technical Orders (TCTOs) were overdue. Tabs H-9 and H-10 accurately itemize TCTOs not complied with and their grounding date.

(3) AFTO Forms 781 and CAMS records for scheduled inspections were reviewed. None were overdue (TAB H-9).

(4) The pre-accident Jet Oil Analysis Program (JOAP) records were reviewed. All parameters were within limits and no adverse trends existed (TAB U-3 to U-5).

(5) The aircraft time change records were reviewed. No time change items were overdue (TAB H-9).

(6) No items were overdue in the Equipment Review Report.

(7) There were three open RED DIAGONAL write-ups in the 781As (TAB H-9). The write-ups were normal aircraft system discrepancies and were unrelated to the accident. The delayed discrepancies are accurately detailed in TAB H-9. There were no safety of flight issues with any of the write-ups. All unscheduled maintenance accomplished on the aircraft since its overhaul completion on 23 May 1991 was reviewed. There is no indication of any relationship between the unscheduled maintenance performed and the accident.

(8) Review of aircraft records shows no indication of maintenance procedure, practice or performance, including civilian contractors, related to the accident.

k. Maintenance Personnel and Supervision.

(1) Basic post-flight and preflight inspections were accomplished the night before the accident. Additionally, a thru-flight inspection was accomplished before the second sortie of the day for F-16B, S/N 79-0419.

(2) Review of training records revealed that the assigned dedicated crew chief and assistant dedicated crew chief for aircraft S/N 79-0419 were trained and qualified for their assigned tasks.

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

(1) Engine intake inspection was accomplished the night before and the day of the accident.

(2) No contaminant was found in the JP-4 fuel sample (TAB U-1).

(3) Hydraulic samples were taken from the rudder Integrated Servo Actuator (ISA) assembly and the B system hydraulic accumulator. Results of the analysis indicated the hydraulic fluid was Mil-H-5606 with a minimal amount of Mil-H-83282 hydraulic fluid as a contaminant. Per Mr. Daryl Anderson (lab technician from the Ogden Air Logistics Center), the minimal amount of contaminant would not cause any problems to the hydraulic system (TAB U-1).

(4) No engine oil sample was taken from the wreckage.

m. Airframe and Aircraft Systems.

Technical and engineering evaluations were accomplished on the flight controls, engine, egress system, and aircraft instruments. The following conclusions have been reached:

(1) Flight controls - Ogden Air Logistics Center, Mr. David McNeill (TAB J-1): No failures in the flight control system were indicated until two seconds after initial impact. Available flight data indicate no abnormalities in aircraft operation or flight profile that would lead to an uncontrolled flight. Expanded flight control computer data indicated a significant left roll rate and pitch up rate just prior to impact.

(2) Engine - San Antonio Air Logistics Center, Mr. Jeffrey D. Barnette (TAB J-5): All damage noted to the engine was caused by crash impact. The engine was accelerating through approximately 82 percent revolutions per minute (RPM) at impact.

(3) Egress System - San Antonio Air Logistics Center, Mr. W. M. Marshall (TAB J-9): No evidence was discovered that would indicate an ejection attempt by either crew member.

(4) Instrument Report - Ogden Air Logistics Center, Mr. William L. Mitchell (TAB J-14): Nothing was noted during instrument analysis that would indicate instrument or instrument system failure prior to aircraft impact or loss of input signal.

n. Operations Personnel and Supervisors. This mission was authorized by Lieutenant Colonel Wayne Conroy, on 419 TFW Form 3 (TAB K-1). Lieutenant Colonel Hamilton gave the briefing with the squadron's standardized Surface Attack Tactics (SAT) briefing guide derived from Tactical Air Command (TAC) Regulation 55-116. Squadron supervisory personnel were in the squadron, but were not present during Thud's flight brief. This is normal. Cyborg's flight lead

was prebriefed by Lieutenant Colonel Hamilton on the conduct of the LOWAT elements, aircraft separation, and termination criteria of the mission (TAB V-8-4).

o. Crew Qualifications.

(1) Examination of aircrew flight records revealed the mishap pilot was highly qualified and current, in accordance with current regulations and directives, to fly the mission with an aircrew member in the rear cockpit (TABS G-5, G-6, Z-5, 6).

(2) Captain Clarke was an experienced pilot with 1971.2 hours of flight time, with 1250.6 hours in the F-16A/B. He was proficient in all 466 FS missions and had flown sufficiently during the previous 30, 60, and 90-day periods, to stay current in the mission. Captain Clarke's flying time is typical of a part-time reservist maintaining mission ready (MR) status (TAB Z-7). In addition, Captain Clarke had flown three times during the week of the accident (TAB G-4); his first mission of the week being a Surface Attack Tactics sortie similar to the accident sortie (TAB Z-12). His mission qualification was valid through April 1992 (TAB G-7). His instrument qualification was valid through January 1992 (TAB G-8).

(3) Flying experience for Captain Clarke is as follows (TAB G-5, G-6):

<u>Total Time</u>	<u>F-16A/B</u>	<u>30/60/90 Days</u>
1971.2	1250.6	6.1/14.7/18.5

(4) Captain Michael Sowell was an experienced pilot. He had 1144.1 hours of total time. He had over 470 hours in the F-16C/D, and over 630 hours in the RF-4C (TAB G-27). He was qualified to fly in the back seat as an observer. This was his first flight after being assigned to the 466th FS.

p. Medical.

(1) Both pilots were medically qualified for flight at the time of the accident (TAB X). The toxicological reports for both Captain Clarke and Captain Sowell were negative.

(2) Both pilots died of multiple blunt injuries resulting from ground impact (TAB X).

q. Navigational Aids and Facilities. Navigational aids and facilities were operational during this mission.

r. Weather.

(1) Weather was not a factor in this accident. Weather observations from stations near the crash site were as follows (TAB W-1 to W-4):

(a) Hill AFB (1458L) - 1,000 feet scattered, 2,000 feet scattered, measured 5,000 feet overcast, 20 mile visibility with light drizzle, winds 320 degrees at 08 knots, temperature 38 degrees Fahrenheit, dew point 31 degrees Fahrenheit, altimeter setting 29.64 inches.

(b) North Range (Valid 1300L-2000L) - 2,000 feet scattered, 4,000 feet scattered, 8,000 feet broken, 12,000 feet overcast, 6 miles visibility with light rain showers and light snow showers, winds 340 degrees at 10 gusting to 15 knots, altimeter setting 29.50 inches.

(2) Weather warnings and advisories

(a) Hill AFB - Ice Foreign Object Damage Alert/Wet Runway.

(3) Pilots in Thud and Cyborg flight indicated obtaining VMC approximately 15 miles prior to the start point of VR 1422/1423. Pilots indicated that the weather at the crash site appeared to be an 8,000 foot overcast deck with excellent visibility and discernible horizon (TABS V-2-5, V-4-7, 8).

s. Directives and Publications.

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

AFR 60-1	Flight Management
AFR 60-16	General Flight Rules
TACM 3-3, Vol V	Mission Employment Tactics - F-16
TACR 51-50	Flying Training - Tactical Fighter
TACR 51-50 Vol 6	F-16 Aircrew Training
TACR 55-79	Aircrew/Weapons Controller Procedures for Air Operation

TACR 55-116
TACR 60-2

419 TFW 51-1
FLIP AP-1B

F-16 Aircrew Operational Procedures
Aircrew Standardization/Evaluation
Procedures
Local Supplement to TACR 51-1
U.S. Military Training Routes

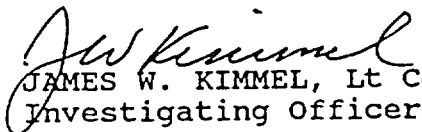
(2) With the following exception, all directives and publications were followed:

Regulation

TACR 55-79, Air-to-Air Training, paragraph 5-2b(1). Training will be conducted within designated airspace. Designated areas include Military Operating Areas, low level routes approved for air-to-air operations, ATC-assigned airspace, restricted/warning areas, and airspace authorized by letters of agreement with appropriate ATC agencies.

Mishap Actions

Cyborg flight departed the Lucin B MOA while intercepting Thud flight which was operating on VR 1422/23 (TABS R-1, V-7, Z-9, Z-10). LOWAT was conducted in and along VR 1422/23 outside of the MOA.


JAMES W. KIMMEL, Lt Col, USAF
Investigating Officer

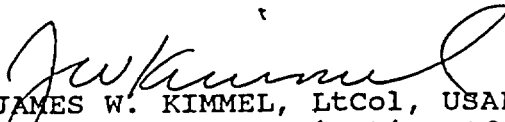
Reply to

Attn of: LtCol Kimmel
Investigating Officer

Subject: Release of Wreckage, F-16B, S/N 79-0419

To: OO-ALC/JA

The accident investigation board convened to investigate the 14 November 1991 crash of F-16B, S/N 79-0419, flown by Captain Arnold A. Clarke, has completed its investigation. The wreckage is hereby released to OO-ALC/JA for disposition.



JAMES W. KIMMEL, LtCol, USAF
AFR 110-14 Investigating Officer

1st Ind

OO-ALC/JAD

To: LtCol Kimmel

Receipt acknowledged.


LESLIE D. LONG, Captain, USAF
Assistant Staff Judge Advocate