

**UNITED STATES AIR FORCE
AIRCRAFT ACCIDENT INVESTIGATION
REPORT**

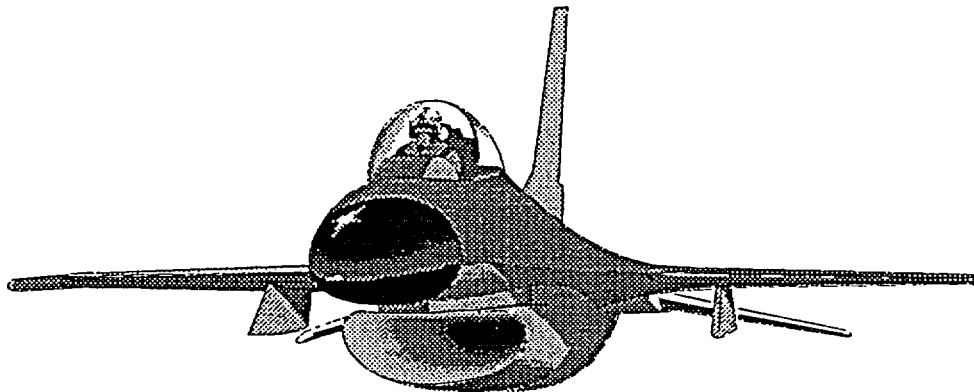
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OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

**F-16 C 88-0478
F-16 D 83-1185**

**56TH FIGHTER WING
LUKE AIR FORCE BASE, ARIZONA**



10 FEBRUARY 1995
CONDUCTED IAW AIR FORCE INSTRUCTION 51-503

58134

PFS Exh. 178

NUCLEAR REGULATORY COMMISSION

Docket No _____ Official Exh No 178
In the matter of _____ PE5
Staff _____ IDENTIFIED _____
Applicant _____ RECEIVED _____
Intervenor _____ REJECTED _____
Plant's Off'r _____ DATE 7/11/02
Contractor _____ Witness _____
Other _____ all
Reporter _____

AFI 51-503 ACCIDENT INVESTIGATION REPORT

AUTHORITY. In a letter dated 13 March 1995, Major General Nicholas B Kehoe, Commander, 19th Air Force, appointed Colonel Philip B. Straley, 12th Air Force Inspector General, Davis-Monthan Air Force Base (AFB), Tucson, Arizona (AZ), to conduct an investigation pursuant to AFI 51-503 into the circumstances surrounding an aircraft accident on 10 February 1995, involving an F-16C, serial number 88-0478 and an F-16D, serial number 83-1185 assigned to the 56th Fighter Wing (FW), Luke AFB, AZ. The appointing authority also appointed Major Lori T. Coleman, 56 FW/JA, Luke AFB, AZ, to act as legal advisor, Captain Andrew S. Giaconia, 56 EMS, Luke AFB, AZ, to act as maintenance advisor, Captain Kendall F. Ashley, 63 FS, Luke AFB AZ, to act as pilot technical advisor, Lieutenant Colonel (Dr) Isaac B. Shaw, 355 MG, Davis-Monthan AFB, AZ, to act as medical advisor, and Master Sergeant Donald G. Calhoun, 355 OG, Davis-Monthan AFB, AZ, to act as air traffic control advisor (Tab Y-2 - Y-4).

PURPOSE. To determine the facts surrounding the accident that occurred on 10 February 1995 at Luke AFB, AZ. Mishap pilot one (MP1), flying an F-16C, 88-0478, mishap aircraft one (MA1), successfully ejected and received injuries to both heels. MA1 was destroyed. Mishap pilot two (MP2), flying an F-16D, 83-1185, mishap aircraft two (MA2), landed MA2 from a straight-in formation approach. There was minimal collateral damage limited to Air Force property.

SUMMARY OF FACTS

1. **HISTORY OF FLIGHT.** On 10 February 1995, First Lieutenant Charles A. Durfee, (MP1), was scheduled to be number four of a four ship formation (call sign Jayjay 4) in an F-16C surface attack training sortie. This profile included takeoff from Luke AFB at 1415 hours local, single ship chased low level to a first run delivery on Range 2 of the Barry M. Goldwater Range Complex, followed by nuclear events and strafe. Recovery was planned for tactical formation to the overhead pattern (Tabs K-9, V-5). Captain Barry W. Beckner, (MP2), was scheduled to lead a two ship (call sign Tundra 1) and instruct an F-16 intercept training sortie. The back seat of Tundra 1 was occupied by Captain Benjamin T. Culp, (MP3), flying as an observer in a non-syllabus status. Their profile included take-off from Luke AFB at 1431 hours local, departure to Gladden Bagdad air-to-air military operating area (MOA) for numerous intercepts. Recovery was planned for finger tip formation to a normal overhead pattern (Tabs K-5, V-7). The mishap occurred at 1534 hours local as a result of a midair collision between Jayjay 4 (MA1) and Tundra 1 (MA2) on short final at Luke AFB runway 21 Left (21L) (Tab A-1). Luke AFB was in the process of a runway change that resulted in only runway 21L being available for takeoffs and landings (Tab AA-48). Recovery sequence to Luke AFB runway 21L was Jayjay, flight of four (MA1 in a tactical box formation) followed by Tundra, flight of two (MA2 in the lead). Jayjay 1 and 2 element broke to downwind normally. Tower then cleared Radon, a flight of two F-16s on the go from a radar approach, for a closed pattern to follow Jayjay 1 and 2. Jayjay 3 and 4 element then

broke to downwind to follow Radon flight. Tundra 1 (MP2) called visual on the traffic to follow and broke to downwind to follow Jayjay 4 (MA1). Tundra 1 (MP2) followed Jayjay 4 (MP1) on downwind (Tabs AA-9 - AA-11). After the final turn as MA1 was approaching the threshold to land on 21L, MA2 overtook and collided with MA1. MA1 impacted the overrun of runway 21L. MA1 bounced into the air and MP1 initiated a successful ejection approximately 30 feet AGL at 142 KCAS. MA1 impacted the ground a second time, collided with a barrier housing, and was destroyed (Tabs A-1, AA-46). MA1 came to rest approximately 1700 feet down, 300 feet southeast of runway 21L (Tabs R-1, S-1). The Luke AFB Fire Department responded immediately to MA1 (Tab AA-34). MP1 was taken to the base hospital by ambulance (Tab X-3). MA2 sustained damage to the nose section and engine from the midair. After contact, MA2 pitched up and MP2 initiated a go around. MA2, without airspeed or angle of attack indications due to a damaged radome section, was led to a straight-in approach by Radon 1 and had an uneventful landing at 1542 hours local. Both pilots of MA2 successfully ground egressed at the end of runway 21R (Tabs A-1, K-5).

The 56 FW Public Affairs office sent out news releases of the mishap and responded to media inquiries (Tabs AA-53 - AA-57). A helicopter from Channel 10 News in Phoenix, AZ, flew over the mishap site prior to Albuquerque Center putting into effect a five mile radius, surface to 15,000 feet AGL flight restriction (Tab V-27). The mishap received coverage in the local, state, and national (Cable News Network) media.

2. **MISSION.** MP1's mission was a Surface Attack-8 ride of the F-16 B Course Syllabus F-16COBOOPL dated, June 1994. The mission purpose is to demonstrate proficiency in nuclear deliveries. The profile planned and conducted was normal for this type of mission. MP2's mission was to act as an instructor for his wingman (Tundra 2) in accomplishing Intercept-3 of the B Course Syllabus F-16COBOOPL, dated June 1994. This mission purpose is to build student proficiency in airborne intercepts. The profile planned and conducted was also normal for this type of mission (Tabs AA-58 - AA-60).

3. **BRIEFING AND PREFLIGHT.** MP1 had flown the night prior to the mishap (Tabs AA-51 - AA-52). He testified that he had 12 hours of crew rest and eight hours of sleep (Tabs V-5, V-6). MP2 had flown as an instructor the day prior to the mishap and was afforded the opportunity for 12 hours crew rest (Tabs AA-14, K-5). All pilots and crew chiefs from Jayjay and Tundra flights indicated the missions were well planned and thoroughly briefed, with normal preflights and ground operations (Tabs V-5 - V-8, V-29, V-30). In addition, the Air Traffic Control personnel interviewed who were working at the Luke AFB tower during the mishap, all stated that the briefings and shift changes were normal with no crew rest problems identified. (Tabs V-13 - V-14, V-19 - V-20, V-21 - V-22, V-23). The only activity out of the ordinary was a runway change commencing at 1500 hours local, which resulted in single runway operations (21L) at the time of the mishap (Tabs V-9 - V-10, AA-48).

4. **FLIGHT ACTIVITY.** To best describe the flight plans, communication, and sequence of events that led to the mishap, we will look at the major components/players that impact this mishap: Jayjay 4 (MP1); Tundra 1 (MP2); Luke AFB Control Tower

a. Jayjay 4 (MP1): Jayjay, flight of four, with MP1 as Jayjay 4, took off from Luke AFB, AZ on runway 3R at 1415 hours local (Tab K-9). Rejoin by elements to route formation was accomplished. MP1 was given the lead of the element for cruise to the entry point for a low level on visual route (VR) 1219. Communications between Jayjay flight and Luke departure, flight service, range control, and Range Two were all standard. MP1 flew VR 1219 with Jayjay 3 in a chase position. MP1 entered Range 2 and accomplished a radar loft delivery with a BDU-33 inert practice bomb followed by four more nuclear deliveries and low angle strafe. After the range events, MP1 safed his arming switches and rejoined for a battle damage check with Jayjay 3. Jayjay flight then assumed a four ship tactical box formation for their return to Luke AFB. All communications during recovery with range control, Albuquerque Center, and Luke AFB approach were standard. During the mission, the flight was made aware of a runway change to runway 21 at Luke AFB over guard frequency. Jayjay flight contacted Luke AFB tower and was cleared for a standard entry in tactical formation. Jayjay 1 and 2 broke to downwind over the approach end for runway 21L. Jayjay 3 and 4 (MP1) had to delay their break to downwind to follow Radon, flight of two, that was cleared closed from an instrument approach to follow Jayjay 1 and 2. Jayjay 3 and 4 (MP1) broke to downwind over the departure end of 21R to follow Radon flight. MP1 followed Jayjay 3 on downwind and turned base at what he estimated was the proper point for runway 21L. MP1 maintained approximately 185 to 195 KCAS during his final turn and rolled out at approximately 300 feet AGL and one mile from the end of 21L. MP1 picked up a 2 to 2.5 degree glide path, slowed to 11 degrees AOA, approximately 152 KCAS, for the final approach phase. At between 20 to 40 feet AGL above the 21L overrun, MP1 felt a collision and felt himself being driven into the overrun. MP1 believed the gear would not sustain the impact and pulled the ejection handles to initiate a successful ejection (Tabs V-5 - V-6, V-17, AA-9 - AA-11).

b. Tundra 1 (MP2): Tundra, flight of two, with MP2 as Tundra 1, took off from runway 3R at Luke AFB at 1451 hours local (Tabs K-5, V-7). Tundra flight rejoined, accomplished a weapons system check, and cruised in tactical formation to its assigned Gladden Bagdad MOA. Area work encompassed numerous intercepts in accordance with the briefing and syllabus. The flight was rejoined to a route formation for recovery to Luke AFB. While in the area, Tundra flight also received a call that Luke AFB was in the process of a runway change to 21. Recovery was accomplished in route formation to runway 21L. During recovery, Tundra 2 stated he had radar contact on a group ahead in tactical formation (Jayjay flight). Tundra flight accomplished the standard entry to 21L at Luke AFB (Tabs V-7 - V-8, V-15 - V-16). Tundra 1 (MP2) transmitted the required radio calls to Luke AFB tower as he entered initial. Luke AFB tower directed Tundra flight to break so as to follow an F-16 abeam the departure end. MP2 acknowledged with a "tally ho" (Tab AA-9). MP2 entered downwind sequenced behind Jayjay 4 (MA1)

and turned base 3000 feet short of a normal base turn position for runway 21L. During the final turn, MP2 stated over the intercom, "halfway around halfway down" to MP3. MP2 rolled out on final at approximately one half to three quarters of a mile from the runway at approximately 350 to 400 feet AGL (Tabs V-7 - V-8, Z-2). MP2 did not have visual contact with MA1 throughout the entire base turn and final approach. MP2 continued on final with a 3.5 to 4.5 degree glide path, unaware that MA1 was under the nose of his aircraft (Tabs V-7 - V-8, Z-2). Impact occurred with MA2's radome striking MA1's tail, driving MA1 into the overrun of 21L (Tabs A-1, S-5). The midair collision pitched MA2 up from which MP2 initiated a go around. MP2 requested immediate landing due to unknown structural damage. MA2 was rejoined by Radon 1 who led him to a landing on runway 21R (Tabs A-1, V-7 - V-8, V-11 - V-12).

c. Luke AFB Control Tower: Luke AFB control tower was manned in accordance with all applicable regulations and instructions with the crew assuming duty at 1430 hours local (Tab AA-48). The local controller position was manned with a local controller one trainer (LC1) and a local controller two trainee (LC2) (Tab A-1). The supervisor of flying (SOF) was in position and continuing a runway change from 03 to 21 that started at approximately 1500 hours local. This action requires single runway operations (21 Left open) until the BAK-12 cable is appropriately set on the departure end of 21R (Tabs V-9 - V-10). As previously stated, the pattern at Luke AFB at 1528 hours local had Jayjay flight on 5 nautical mile initial in a tactical formation, Radon flight on a radar approach, and Tundra flight at approximately 15 miles, maneuvering for initial. Jayjay 1 and 2 broke to downwind, followed by Radon flight who had been cleared for a closed from his radar approach. Jayjay 3 and 4 are directed by tower to follow the F-16 pulling closed at 21L departure end. Jayjay 3 acknowledged and broke to follow Radon flight. Tundra 1 (MP2) checked in on 5 mile initial and was directed to follow F-16 departure end. Tundra 1 (MP2) acknowledged with a "tally ho" call. Tundra 1 and 2 broke departure end to follow. During base turn gear checks, Radon 2 (misidentifying himself as Radon 1) called "gear down on the right". LC2 misstated "Radon 1 runway 3 left" and was immediately corrected by LC1. The watch supervisor (WS) observed Radon 2 setup for the right and LC1 issued a go around. Jayjay 3 and 4 (MP1) made normal gear down calls to the left runway and were cleared to land. Tundra 1 (MP2) called "base gear down, low approach left". Tower cleared Tundra 1 (MP2) for low approach 21L and gave the winds. Tundra 2 called "base gear down, full stop left..right", which was very similar to Radon 2's call. This misstatement drew the attention of local control. LC1 corrected Tundra 2 by stating, "Tundra 2, runway 21 left, say again, 21 left, cleared to land". Three seconds later, LC1 transmitted, "Attention all aircraft, we're still single runway 21 left, vehicles on the outside runway". This was the last transmission from the tower until after the midair collision between Jayjay 4 and Tundra 1. The elapsed time from when Tundra 2 drew the attention of the tower with his misstated radio transmission, to the midair collision was approximately 25 seconds. The only conversation in the tower was a muffled statement by the WS, "This second guy is eat'em...", approximately six seconds prior to the midair collision (Tabs AA-9 - AA-10).

5. **IMPACT.** At approximately 20 to 40 feet above runway 21L's overrun, MA2's radome collided with MA1's aft tail section driving MA1 downward. MA1 initially impacted the overrun of runway 21L at 1534 hours local, approximately 50 feet prior to the threshold on the centerline (Tabs A-1, R-1, S-1). The flight parameters at the time of initial ground impact were estimated to be -2.5 degrees AOA and 146 KCAS (Tab AA-46). MA1 bounced back into the air and impacted the ground a second time colliding with, and destroying the approach barrier housing building (BAK 14) approximately 1500 feet down and 250 feet southeast of the centerline of runway 21L (Tabs A-1, R-1, S-1). Due to the initial impact, secondary impact, collision with the barrier housing, and ensuing fire, MA1 was destroyed (Tabs A-1, D-4). MA1 came to rest approximately 1700 feet down and 300 feet southeast of the centerline of runway 21L, sitting upright, and facing to the northeast (Tabs R-1, S-1). There were no property damage claims filed as of 28 March 1995 (Tab AA-3).

6. **EGRESS SYSTEM.** MP1 initiated his ejection system approximately 30 feet AGL after the first impact (Tab AA-46). No deficiencies or malfunctions were noted with any of the sequencing components of the ejection system (Tabs AA-16 - AA-24). The flight parameters at the time of ejection were estimated to be 30 feet AGL, at 142 KCAS, and 15.9 degrees AOA (Tabs O-17 - O-25, AA-46). These parameters placed the ejection sequence within the envelope of Mode 1 operation (Tabs AA-16 - AA-24). MP1 landed on the concrete approximately 1150 feet from the wreckage, 550 feet down and 50 feet from center of the approach end of runway 21L. MP1 testified that his parachute landing fall (PLF) technique was less than optimum due to minimum time in the parachute. MP1 received injuries to both his heels (Tabs R-1, V-5, X-3).

7. **PERSONAL AND SURVIVAL EQUIPMENT.** All personal equipment inspections were up to date (Tabs AA-25 - AA-26). MP1 could not confirm if he had a full chute due to his limited time until PLF (Tab V-5). The seat kit deployed as designed and all components were accounted for (Tab AA-26). The only noteworthy item is that the one-man life raft failed to inflate. After investigation by life support, it was determined that the minimal time and altitude between seat-man separation and PLF was not sufficient enough to allow for the required inch-pounds to be applied to the life raft inflation lanyard. Life support testing of the life raft lanyard after the mishap showed it to function normally under prescribed conditions (Tabs AA-27 - AA-29).

8. **RESCUE.** End of runway (EOR) personnel and a security policewoman were the first to MP1 and they directed MP1 to lay down to await emergency personnel (Tab V-5). Luke Fire Department emergency vehicles received the initial call at 1535 hours local from the primary crash net telephone and dispatched to the scene in 1 minute and 3 seconds, arriving at the scene at 1541 hours local. Rescue Vehicle 3 (vehicle number A1532-D-10) attended to MP1's injuries (Tab AA-34). MP1 was approximately 1150 feet north of the crash site. MP1 sustained injuries to both his heels. MP1 was taken to the base hospital by the Flight Surgeon's ambulance, treated, remained overnight, and released (Tab X-3).

9. **CRASH RESPONSE.** Crash response began at 1535 hours local when the call was received over the primary crash net telephone. The crash occurred at the north end of runway 21L, over Luke AFB property. As a result of the crash, a fire erupted destroying the BAK-14 barrier facility and MA1. Chief 2, Rescue 3, SCAT 9, Tanker 8, Engine 4, Engine 6, and Crash Firefighting Vehicles 11, 14, and 15 responded to the mishap scene and barrier facility fire, extinguishing the fires approximately 10 minutes after arrival. The subsequent Class III fuel spill of 740 gallons of JP-8 was contained. The tail of MA1 was moistened and MA1 covered with plastic to contain carbon fiber exposure (Tabs AA-34, AA-36, AA-38). The response effort did not appear to be hampered by weather and was performed without further incident or delay.

10. **MAINTENANCE DOCUMENTATION.** All AFTO Form 781 series forms for MA1 and MA2 were reviewed and there were no significant discrepancies or any overdue inspections on the airframe, engines, or accessories (Tabs H-2 - H-7, AA-40 - AA-41). There were no time compliance technical orders (TCTOs) or time change items (TCIs) shown overdue in either MA1 or MA2. A review of oil analysis, fuel, and liquid oxygen samples showed no discrepancies (Tabs U-2 - U-11). There was no oil or hydraulic samples taken from MA1 after the mishap due to the ensuing fire and destruction of that aircraft. A review of automated maintenance records showed no trends or notable malfunctions related to this mishap for either MA1 or MA2 (Tabs H-2 - H-7).

11. **MAINTENANCE PERSONNEL AND SUPERVISION.** Both MA1 and MA2 received proper basic preflight and postflight inspections and were serviced by qualified maintenance personnel. Testimony from both dedicated crew chiefs, performing launch duties for the mishap sorties, indicated normal preflights, walk arounds, engine starts, pre-launch checks, and taxi for both aircraft (Tabs V-29, V-30). A review of maintenance training records revealed qualified personnel in both maintenance units (Tabs AA-40 - AA-41).

12. **ENGINE, FUEL, HYDRAULIC, AND OIL INSPECTION ANALYSIS.** A thorough review of previous and post mishap analysis of the aircraft and engine oil samples, fuel truck samples, LOX equipment and respective storage tank samples revealed no noteworthy trends (Tabs U-2 - U-11).

13. **AIRFRAME AND AIRCRAFT SYSTEMS.** A review of all airframe and aircraft system maintenance data since their last scheduled inspection revealed no significant findings (Tabs H-2 - H-7, AA-40 - AA-41). A review of the flight control computer data and crash survivable flight data for both MA1 and MA2 revealed normal parameters prior to the mishap (Tabs O-4 - O-47, AA-46). An analysis of both aircraft hydraulic, flight control, and engine systems prior to this mishap revealed no significant events (Tabs H-2 - H-7, AA-40 - AA-41). MA2's engine was downloaded prior to shipment to San Antonio Air Logistics Center and revealed no faults or significant events (Tabs AA-42 - AA-44). This engine is still being broken down and analyzed, but preliminary data show no damage prior to this mishap (Tabs J-3, AA-45).

14. **OPERATIONS PERSONNEL AND SUPERVISION.** The missions involved were authorized by AFI 11-206 and 19th Air Force Syllabus F-16COBOOPL (Tabs AA-58 - AA-60). All go/no go items were signed off in accordance with wing standards (Tabs K-9 - K-11). Both missions were briefed by experienced, fully qualified instructor pilots who were familiar with local area procedures and pattern operations (Tabs V-5, V-15). MP1 was proficient in the F-16 and was in the surface attack phase of training. MP2 was acting as an instructor pilot for an intercept demonstration proficiency ride for his student (Tab AA-12). Both preflight briefings were thorough and in accordance with wing standard briefing guides (Tabs V-5, V-15). No supervisors were present during either flight's briefing.

15. **CREW QUALIFICATIONS.** The following is a brief summary of MP1, MP2, and tower personnel qualifications.

a. MP1 was qualified and cleared solo in the F-16. No lapses in currency were noted. MP1 had flown both days prior to the mishap (Tab AA-12). MP1 was in the surface attack phase of training in the syllabus and had accumulated 301.4 total flying hours with 65.4 hours of F-16 time. The 30/60/90 day look-back is as follows (Tabs AA-12, G-5 - G-6): 30 days: 21.3 hours 60 days: 31.7 hours 90 days: 41.9 hours. MP1's training showed no deficiencies or lapses in currency. His overall performance throughout the program was slightly above average with typical student errors and no adverse trends in relation to pattern operations. No sorties were graded non-effective due to student non-progression. MP1 was approximately two-thirds of the way through the syllabus (Tab AA-12).

b. MP2 was a qualified F-16 instructor pilot and arrived at Luke AFB as a highly qualified F-18 pilot. He was a Marine exchange pilot and has been at Luke AFB for ten months (Tab AA-12). His experience included a total of 1450.7 flying hours, 193.7 hours being in the F-16. The rest of his flight experience was from various Marine aircraft, primarily the F-18 (Tabs G-9 - G-10). No deficiencies were noted in his performance in the F-16 transition course, instructor course, or current duties as an instructor pilot (Tabs V-24, AA-12). His 30/60/90 day look-back is as follows (Tabs G-11 - G-12): 30 days: 23.9 hours 60 days: 35.1 hours 90 days: 51.4 hours. His performance in the F-16 transition course was above average with the only discrepancies being having to adjust his habit patterns from the F-18 to the F-16. MP2's performance in the instructor upgrade course was above average with no deficiencies noted and all rides graded average or better. His training culminated with an exceptionally qualified rating on his instructor check ride. He had been performing F-16 instructor duties for eight months prior to the mishap (Tab AA-12).

c. The Control Tower's B Crew was on duty during the mishap (Tab AA-48). They were working the last day of this round of shifts, which included, two day shifts and two swing shifts. As indicated by crew members statements, all interviewed stated they had the required crew rest prior to assuming duties in the control tower (Tabs V-13 - V-14, V-19 - V-20, V-21 - V-22, V-23). Control tower crew qualifications, are as follows:

SSgt Gregory D. Davis, Control Tower Operator (CTO), Tower Watch Supervisor, 8 years, 10 months, total air traffic control (ATC) experience, 1 year, 7 months Luke AFB experience. Sgt Christopher F. Miller, CTO, Ground Controller, 3 years, total ATC experience, 1 year 9 months Luke AFB experience. SrA Henry A. Bailey, (LC1), CTO, Local Controller, 6 years total ATC experience, 5 years Luke AFB experience. SrA Gregory B. Owen, CTO, Coordinator (Tower), 5 years, 6 months, total ATC experience, 9 months Luke AFB experience. SrA Charlene M. Collin, CTO, Flight Data, 3 years, 3 months total ATC experience, 2 years 3 months Luke AFB experience. AIC Jenny L. D'Amico, (LC2) 3-Level, Local Control Trainee, 11 months total ATC and Luke AFB experience (Tab AA-4).

16. MEDICAL.

a. MP1 was medically cleared for flying duty at the time of the mishap (Tab T-4). MP1 suffered fractures of both heels and bruises to both legs. Toxicological studies were normal and medical records review did not reveal medical conditions or problems that could have contributed to this mishap (Tabs X-3, X-7)

b. MP2 was medically cleared for flying duty at the time of the mishap (Tab T-5). However, MP2 had seen the Ophthalmologist for irritation and redness of his right eye two days prior to the mishap. This was not a referral from a flight surgeon and a determination for flying status should have been made by a flight surgeon following this visit. MP2 was seen again for evaluation and treatment by the Ophthalmologist on the morning of the mishap. MP2 was continued on medication and flying status without a flight surgeon's validation entry being placed in the medical record. MP2's medical records were kept in the Ophthalmologist's office for a future follow up visit. MP2's eyes were checked after the mishap and found to be better than 20/20. MP2 did not suffer injuries from this mishap (Tab X-4). Toxicological studies were normal (Tab X-8).

c. MP3 was medically cleared and qualified for flying duty at the time of the mishap (Tab T-6). MP3 did not suffer injuries from this mishap. Toxicological studies were normal and a medical record review did not reveal medical conditions or problems that could have contributed to this mishap (Tabs X-5, X-9).

d. Tower Watch Supervisor's (WS) medical records were not impounded. A physical examination was present in his medical records after they were retrieved on 22 March 1995. However, a discrepancy was noted between the 1042, signed on 29 January 1995, which stated he was qualified after periodic medical examination and the date the physical was accomplished (the day of the mishap) 10 February 1995 (Tabs T-7, X-5). The Watch Supervisor's medical record review did not reveal medical conditions or problems that may have contributed to this mishap. Toxicological studies were normal (Tab X-10).

e. Local Controller 1 (trainer, LC1) was medically cleared and qualified for controlling duty at the time of the mishap (Tab T-8). Although, his urine ethanol test was positive, the blood alcohol was negative. All Toxicological studies were normal and a medical record review did not reveal medical conditions or problems that could have contributed to this mishap (Tabs X-6, X-11).

f. Local Controller 2 (trainee, LC2) was medically cleared and qualified for flying duty at the time of the mishap (Tab T-9). Toxicological studies were normal and a medical record review did not reveal medical conditions or problems that could have contributed to this mishap (Tabs X-6, X-12).

17. **NAVAIDS AND FACILITIES.** All navigational aids (NAVAIDS) and facilities were functioning normal. Luke AFB control tower had initiated a runway change from runways 03L and 03R, to runways 21L and 21R beginning at approximately 1500 local. Runway 21R was closed during the accident due to personnel and vehicles on the runway resetting the barrier cable (Tabs V-9 - V-10, AA-48).

18. **WEATHER.** Weather was not a factor in the mishap. The Luke AFB weather observation on 10 February 1995, taken one minute after the mishap, was 6,000 feet scattered, 20,000 feet scattered, 20 miles visibility, surface winds were 220 degrees at 10 knots. This wind component is what caused the change to runway 21 (Tabs W-2 - W-6).

19. GOVERNING DIRECTIVES AND PUBLICATIONS.

AFI 13-203	Air Traffic Control
FAAH 7110.65H	Federal Aviation Administration Handbook: Air Traffic Control
F-16C0B00PL	19th Air Force, Syllabus of Instruction, USAF Basic Operational Training Course, F-16C/D
AFI 11-206	General Flight Rules
T.O. 1F-16 C-1	Flight Manual, F-16 C/D

STATEMENT OF OPINION

1. Under 10 U.S.C. 2254(d), any opinion of the accident investigation as to the cause or causes of, or the factors contributing to, the accident set forth in the accident investigation report may not be considered as evidence in any civil or criminal proceeding arising from an aircraft accident, nor may such information be considered an admission of liability by the United States or by any person referred to in those conclusions or statements.

2. In presenting my opinion on this mishap, I will address separately, the major components/players that led to, or impacted, this midair collision.

a. 1Lt Durfee (MP1), was well prepared for the mishap mission. He is a motivated student in the F-16 making slightly above average progress. His performance that day showed good aircraft control throughout his surface attack mission. MP1's traffic pattern was well within prescribed procedures. MP1 received no warnings of the impending collision from his six o'clock position and stated all aircraft systems were normal. With his concentration correctly focused on the landing runway 21L, MP1 cannot be considered causal or contributing to this accident.

b. Capt Beckner (MP2), was well prepared to fly the mishap mission. He is an extremely motivated, professional, Marine exchange officer who has impressed his Air Force peers and supervisors. His "exceptional qualified" grade on his initial F-16 instructor pilot checkride exemplifies his commitment and capability. On the day of the mishap, his briefing and performance prior to the traffic pattern were uneventful. After calling "tally ho" on the traffic to follow and before starting base turn, Capt Beckner lost sight of Jayjay 4 and subsequently lost his situational awareness on the proper F-16 to follow. The drop in situational awareness and loss of visual contact was the cause of this accident. Without visual contact with Jayjay 4, Capt Beckner started his final turn approximately 3000 feet prior to the proper position. This base turn position put him on a collision course with Jayjay 4. In my estimation, had Capt Beckner delayed his base turn to the proper position, he would have regained visual contact with Jayjay 4 or, due to the spacing on downwind, would have had sufficient lateral displacement from Jayjay 4 to avoid this midair collision. The improperly flown pattern by Capt Beckner is a contributing factor to this mishap.

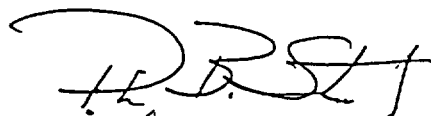
c. Prior to the mishap there were eight F-16s in the overhead pattern for a single runway (21L) operation. The controllers interviewed stated it was busy, yet not overpowering. Two F-16 students (Radon 2 and Tundra 2) made improper base turn radio calls, indicating an intent to land on the incorrect closed runway. In both instances, the local controller and watch supervisor perceived the error and issued corrective guidance. During the second misstated radio call (Tundra 2), the tower personnel became channelized on Tundra 2 for approximately 25 seconds. During this time, Tundra 1 was in the final turn on a collision course with Jayjay 4. This 25 seconds, which was extracted from the time Tundra 2 calls base to just prior to the midair, was excessive and contributes to this mishap. Six seconds prior to the midair, you can hear the watch

supervisor say "This second guy is eat'em...". With the traffic situation at that time (Jayjay 4 on final, Tundra 1 base to final, Tundra 2 base) it could be deduced that the watch supervisor was referring to Tundra 1. In this case, he had a responsibility to separate the aircraft and issue safety alerts. The lack of direction by the watch supervisor contributes to the accident. Finally, when Tundra 1 was given his low approach clearance, he was given the landing runway 21L and the winds. During my investigation, I have come across two schools of thought concerning interpretation of the FAA handbook. One says traffic information such as, "number three to land behind the F-16 base turn", should have been issued to Tundra 1 with his clearance for the low approach. The other interpretation says, sequence and traffic information was not required because Tundra 1 had previously called "tally ho" on the traffic to follow. Whatever the correct interpretation is, in all likelihood, had Tundra 1 been told how many aircraft were ahead of him in the base to final turn, it would have cued him that he did not have all aircraft in sight and subsequently encourage him to maneuver and possibly regain visual contact with on Jayjay 4 and avoid the midair collision.

d. Capt Beckner had been issued steroid eye drops in November 1994 for an eye problem and placed on Duties Not Including Flying (DNIF) status. Prior to the mishap, the same eye problem resurfaced and steroid eye drops were once again prescribed. In this instance, he was not placed on DNIF status. Capt Beckner's eyes were checked immediately after the mishap and found to be better than 20/20. While I believe that Capt Beckner should have been on DNIF status, I do not believe this to have been a contributing factor to this mishap because his visual acuity was above average. However, the inconsistency of the medical treatment found in his records requires attention.

3. CONCLUSION. Given the situation that 1Lt Durfee (MP1) was put in, he exercised his only option and wisely ejected from MA1. It is my opinion that the cause of this accident was Capt Beckner's loss of situation awareness in the traffic pattern. This mistake may not have elevated to an accident/midair had:

- a. Capt Beckner flown the base to final pattern in accordance with published guidance.
- b. the tower personnel monitored Tundra 1 in the final turn.
- c. the watch supervisor directed action in the six seconds prior to the midair.
- d. the tower personnel issued traffic information to Tundra 1.



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