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RULEMAKINGS AND
ADJUDICATIONS STAFF

AFR 110-14 USAF AIRCRAFT ACCIDENT INVESTIGATION

23 JUNE 1993
PEORIA ANG, PEORIA ILLINOIS

F-16A
82-0916

F-16B
82-1042

169 FS

169 FS

INVESTIGATING OFFICER
COL DENNIS B. SWANSTROM

COPY NUMBER 7 OF 9

57745

NUCLEAR REGULATORY COMMISSION

Decree No. _____ Official Exh. No. 153
In the matter of PPS

Staff _____ IDENTIFIED
Applicant RECEIVED
Intervenor _____ REJECTED _____

Owner _____ WITHDRAWN _____
DATE 7/1/02 Witness _____

Block _____

2. SUMMARY OF FACTS

a. History of Flight

(1) A flight of two F-16's (one F-16A and one F-16B), call sign of "Tonto" departed Greater Peoria Airport, Illinois at 0900 Central Daylight Time (CDT) on 23 June 1993. The purpose of the flight was to conduct a Basic Fighter Maneuver (BFM) training mission in the Howard Military Operating Area (MOA) located southwest of Peoria, Illinois. (TAB K). (Basic Fighter Maneuvers consist of training which stresses maneuvering one airplane against another emphasizing employment necessary to kill the adversary).

(2) Tonto 1, the two seat F-16B aircraft, had [REDACTED] in the front cockpit and [REDACTED] in the rear cockpit. [REDACTED] was flying as an Instructor Pilot (IP) for the flight and [REDACTED] was flying as a Mission Pilot (MP). Tonto 2, the single seat F-16A aircraft was flown by [REDACTED] as a

Mission Pilot (MP). [REDACTED] and [REDACTED] were assigned to the 169th Fighter Squadron, 182nd Fighter Group, Illinois Air National Guard. [REDACTED] was assigned to the 182nd Fighter Group, Illinois Air National Guard.

(3) Tonto 1 was conducting a BFM (Basic Fighter Maneuvers) mission to upgrade Tonto 2's proficiency. According to all testimony and video recordings, a highly professional mission had been executed by both aircrews. At the conclusion of the maneuvering portion of the BFM mission in the Howard MOA, Tonto 1 called for Tonto 2 to rejoin to "loose route" for return to the Greater Peoria Airport, Illinois. (Loose route is a position where the airplanes are approximately 300-500 feet apart). During the rejoin, Tonto 2 impacted Tonto 1 (F-16B S/N 82-1042) causing the aircraft to become uncontrollable. Both aircrew successfully ejected. Tonto 2 recovered F-16A (S/N 82-0916) at Greater Peoria Airport, Illinois. [REDACTED] and [REDACTED] received minor injuries. A news response was provided to the media by the Illinois Department of Military Affairs (Tab AA-1).

b. Mission:

The mission was planned as a Basic Fighter Maneuvers (BFM) Mission to the Howard Military Operating Area (MOA) originating and recovering at Greater Peoria Airport, Illinois. The mission was approved in accordance with Air National Guard Regulation 55-010 and was flown in accordance with applicable directives.

c. Briefing and Preflight:

Testimony of the witnesses indicated the pilots were mentally and physically prepared for the mission. The briefing started two hours (0700) prior to takeoff (0900). The briefing was conducted by [REDACTED]. [REDACTED] indicated [REDACTED] tailored the briefing to the training needs of [REDACTED]. Testimony and available evidence indicates the flight, up to the final rejoin, was briefed and flown in accordance with all directives (Tab V).

d. Flight Activity:

Tonto flight was filed and cleared to Howard Military Operating Area. Individual takeoffs were accomplished at 0900 hours (Tab E-12, E-13). Basic Fighter Maneuver engagements were accomplished in the Military Operating Area. Following the last engagement, Tonto 1 cleared Tonto 2 to "loose route" (Tab N-3). During the rejoin, Tonto 2 self-initiated a fence-out check approximately sixteen seconds prior to impact. (A fence-out check in the context of a peacetime Basic Fighter Maneuver Mission would insure that the aircraft flares are turned off). Tonto 2 is "on the line" (40 degrees down Tonto 1's right wing) at 1,200 feet away, accomplishing what appears to be a normal rejoin. ("On the line" is a term that means an aircraft is in the correct position and executing the correct rejoin). At this point, Tonto 2 is in a 25 degree right bank with a closure on Tonto 1 of

+26 knots. At approximately seven seconds later (nine seconds to impact), Tonto 2 was 39 degrees down Tonto 1's right wing line at approximately 700 feet away. At this point, Tonto 2 is in a 20 degree right bank and has a closure on Tonto 1 of +63 knots. Tonto 1 is now expecting Tonto 2 to execute a normal overshoot (low and behind Tonto 1). One second later, Tonto 2 is 36 degrees down Tonto 1's right wing line at 600 feet away. Tonto 2 is in a 60 degree right bank and has a closure on Tonto 1 of +73 knots. Three seconds later (five seconds prior to impact), Tonto 2 is 30 degrees down Tonto 1's right wing line at 400 feet away. Tonto 2 is in a 40 degree right bank and has a closure on Tonto 1 of +68 knots. At this time, Tonto 2 reduces power from 80-85% to idle and remains in idle until impact. (With the power remaining in idle, the jet was not accelerating as it approached Tonto 1. At four seconds prior to impact, information from Tonto's 2's radar is no longer available since the system only records every 5 seconds). Therefore, the remaining data was extracted from Tonto 2's Heads Up Display (HUD) tape recording. At four seconds prior to impact, Tonto 2 is in a 60 degree right bank and has an estimated closure on Tonto 1 of approximately +63 knots. At this point, Tonto 2 increases his G onset to 2.4 G's. Up to this point, Tonto 2 had maintained a relatively constant G loading of .8 to 1.2 G's. (The importance of monitoring Tonto 2's Gs is the G force would indicate any evasive action he was taking). At some point during the last four seconds prior to impact, Tonto 2 lost sight of Tonto 1. The last HUD video frame came one second prior to impact and indicated Tonto 2 was in a 60 degree right bank and at 1.8 G's. Tonto 1 lost sight of Tonto 2 when Tonto 2 crossed under Tonto 1. When Tonto 1 observed Tonto 2, collision was unavoidable. The aircrew in F-16B (S/N 82-1042)(Tonto 1) could no longer control the aircraft because of damage incurred upon impact and they initiated the ejection sequence.

e. Impact:

Aircraft 82-1042 impacted the ground shortly after a mid-air collision that occurred at 0928 CDT on 23 June 1993. The crash site was four miles (4) east of Ipava, Illinois. (Tab J-6). The aircraft was inverted at a flat pitch angle with low forward velocity and with a slight right yaw (when viewed from above the inverted wreckage) indicating an inverted right spin. The nose radome attached to the avionics section (forward and lower equipment bays) included the front cockpit rudder pedals was found 1,800 feet away from the main aircraft structure. (Tab J-1)

f. Ejection:

(1) The ejection sequence was initiated by the front seat pilot of aircraft 82-1042. The ejection was within the envelope of the system.

(2) There were no deficiencies in the ejection seat system. Both front and rear seats operated in accordance with their design specification.

g. Personal and Survival Equipment:

(1) Personal and survival equipment inspections were current.

(2) Both pilots stated that all ejection and survival equipment operated normally. Neither pilot elected to use the Four Line Jettison System that was available. Four Line Jettison consists of two cables which may be pulled to allow enhanced steering while descending in the parachute. Their decision not to use this system had no bearing in this mishap. The front seat pilot landed in a tree and subsequently fell approximately 30-35 feet. [REDACTED] suffered minor back injuries as a result of the fall from the tree.

h. Rescue:

(1) The crash occurred at 0928 CDT.

(2) Two different local citizens called 911 within three minutes of the aircraft striking the ground.

(3) Due to the proximity of the crash to the 182nd, they were the responding military unit to this mishap. In addition, the first people to respond were a group of four local people who located the pilots within minutes of their parachutes landing. County Sheriffs and State Highway Patrol were on-scene within 15 minutes of the accident. The main wreckage was secured at approximately 1000 by local law enforcement.

i. Crash Response:

(1) Volunteer fire departments from Lewistown and Fulton County in conjunction with County Sherrifs and Highway Patrol responded to the 911 call. They were first on-scene and provided security and minor first aid. The 182nd responded by sending initial action personnel on a UH1 helicopter flown from Army Aviation Support Facility #3. All necessary response equipment to include vehicles, light-all, etc were convoyed to the crash site and were on-scene within two hours of the mishap.

(2) There were no delays in any response to this mishap. All agencies responded in a timely manner and professional attitude.

(3) There were no noteworthy difficulties during the rescue effort. The only item of note was a delay in finding the nose section of the mishap aircraft. After an extensive 20-hour search, it was located approximately 1/4 mile from the main wreckage site.

j. Maintenance Documentation:

(1) Review of a Air Force Technical (AFTO) Forms 781 and Core

automated System (CAMS) records of aircraft F-16B, 82-1042 and F-16A 82-0916, revealed no discrepancies that contributed to the mishap.

(2) Review of all Time Compliance Technical Orders (TCTOs) revealed no discrepancies that related to the mishap.

(3) All scheduled inspections were satisfactorily complied with. There were none overdue. No discrepancies were noted.

(4) Review of the Oil Analysis Records revealed no discrepancies. All pre-mishap samples were within standards. No adverse trends were noted.

(5) Review of the aircraft Time Change Requirements revealed all requirements were completed with none overdue.

(6) Review of the Equipment Review Report was accomplished with no noted discrepancies.

(7) The history of the unscheduled maintenance and the work performed on the aircraft reveal no correlation between the maintenance performed and the mishap.

(8) All maintenance procedures, practices, and performances were found to be normal and in order, bearing no relationship to the mishap.

(9) 30 Day Flight/Maintenance History:

(a) 30 day flight/maintenance history of aircraft 82-1042 revealed that the aircraft flew 14 missions within the 30 days immediately prior to the mishap. Of these 14 missions, 10 were completed with the aircraft returning without any maintenance discrepancies (Code 1). Three of the missions were completed with the aircraft returning with minor maintenance discrepancies that would not impose any safety of flight issues but could limit mission capability to some degree. (Code 2). One mission returned with maintenance required prior to the next flight (Code 3). All discrepancies had been corrected and it was determined that these discrepancies could not have contributed to the mishap.

(b) 30 day flight/maintenance history of aircraft 82-0916 revealed that the aircraft flew 17 missions within the 30 days immediately prior to the mishap. Of these 17 missions, 10 of these missions were completed with the aircraft returning without any maintenance discrepancies (Code 1). Six of the missions 30 days prior to the mishap were completed with the aircraft returning with minor maintenance discrepancies that would not impose any safety of flight issues but could limit mission capability to some degree. (Code 2). One mission returned with maintenance required prior to the next flight (Code 3). All discrepancies had been corrected and it was determined that these

discrepances could not have contributed to the mishap.

k. Maintenance Personnel and Supervision:

(1) Preflight, servicing, launch, and end of runway (last chance to check the aircraft prior to flight) were all accomplished within accepted standards.

(2) Review of training records found involved personnel were adequately trained to perform tasks assigned.

(3) There was no indication of any maintenance practice or procedures that could have contributed to the mishap.

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

(1) Engine inspection data indicated normal performance.

(2) Results of the fuel test report data were normal.

(3) Results of the hydraulic fluid test report data were normal.

(4) Results of the oil test report were normal.

(5) Tests results are on file with the aircraft records at 182 FG/ Peoria IL 61607.

m. Airframe and Aircraft System:

(1) No operational testing of components or accessory systems took place nor did any teardown take place.

(2) There were no suspected component or accessory system failures.

n. Operations Personnel and Supervision: The mission was authorized by [REDACTED] on a 182 Fighter Group Form 25, order number 174 (Tab K). [REDACTED] briefed the mission using Air Combat Command Regulation (ACCR) 55-116 briefing guides. Squadron supervisory personnel were in the squadron building but did not attend the flight briefing, which is normal. The mission was thoroughly and adequately briefed (TAB V).

o. Crew Qualification:

(1) Pilot records indicated MP1A to be a highly qualified Instructor Pilot. MP2 was accomplishing a Mission Qualification Training (MQT) Program (This is a training program to insure that the individual is mission qualified in this aircraft). Both pilots were qualified to fly the mission.

(2) MP1A was an experienced instructor pilot with 1909.4 total time and 1726.6 in the F-16. [REDACTED] had a 30/60/90 day flying log of 10.2/26.4/42.2 respectively (Tab E-1). MP2 was an experienced pilot with 4961.2 total time and 98.0 in the F-16. [REDACTED] had a 30/60/90 day flying log of 5.7/6.8/9.5 respectively (Tab E-3).

(3) MP1A was highly qualified. MP2 was inexperienced in the F-16. MP2 had failed to meet performance standards in the offensive portion of a previous Basic Fighter Maneuvers mission; however, his failure to achieve these performance standards did not impact the phase of flight where the mishap occurred. MP2's progress in the MQT program was normal given his level of experience and currency in the F-16.

p. Medical:

(1) All three pilots involved in the mishap were medically cleared for flying prior to the mishap. (Tab AA 2-4)

(2) [REDACTED] and [REDACTED] had normal toxicology results. (Tab AA 5-10). [REDACTED] results only showed the morphine [REDACTED] had been given prior to the specimen being drawn. (Tab AA 11-15)

(3) [REDACTED] suffered no injuries. [REDACTED] has not been returned to status pending further ophthalmological testing. (Tab AA 16-19). [REDACTED] suffered minor facial abrasions and lacerations. (Tab X). [REDACTED] returned to flying status 6 July 1993. (Tab AA 20-21). [REDACTED] suffered a compression fracture of the lower lumbar vertebrae and a slight superior inplate buckling of the second lumbar vertebrae. [REDACTED] was discharged from the hospital the day after the mishap. (Tab X) [REDACTED] has not returned to flying status pending waiver approval. (Tab AA-22)

q. Nav aids and Facilities:

All navigation aids and facilities were operational during the mission. They had no bearing on this mishap.

r. Weather:

(1) There was no significant weather during the mishap flight. Peoria was 25,000 scattered, 20 miles, light and variable winds. The MOA weather was forecast at 25,000 scattered and 20 miles visibility.

(2) Aircrew testimony concurs that the weather was as forecast.

s. Directives and Publications:

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

AFR 60-1	Flight Management
AFR 60-16	General Flight Rules
AACM 3-3 Vol V	Mission Employment Tactics - F-16
ACCR 51-50	Flying Training-Tactical Fighter
ACCR 51-50 Vol 6	F-16 Aircrew Training
ACCR 55-79	Aircrew/Weapons Controller
	Procedures for Air Operations
ACCR 55-116	F-16 Aircrew Operational Procedures
	Aircrew Standardization/Evaluation
	Procedures
ACCR 60-2	Aircrew Standardization/Evaluation
	Procedures
T.O. 1F-16C-1	Flight Manual F-16C
T.O. 1F-16C-6-WC-1	Inspection requirements for the F-16C aircraft

(2) There were no known or suspected deviations from the directives or publications by the pilot or others involved in the mission.

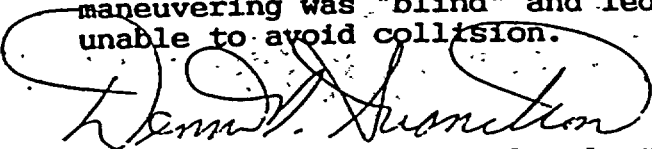
3. STATEMENT OF OPINION:

a. Disclosure:

"Under 10 U.S.C. 2254(D) any opinion of the accident investigators as to the cause 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".

b. Opinion:

Mishap Pilot 2 (MP2) was attempting a rejoin on Mishap Aircraft 1 (MA1). MP2 became disoriented following the accomplishment of a fence out check which required intense concentration in the cockpit. During the remainder of the rejoin attempt, MP2 developed a misperception of MA1's aircraft orientation. MP2's "disorientation" caused [redacted] to errantly maneuver [redacted] aircraft to a position directly under and within a few feet of MA1. MP2 lost sight and awareness of MA1's position. MP2 perceived [redacted] had overshot to the outside of MA1's turn. MP2's final maneuvering was "blind" and led to impact with MA1. The pilot of MA1 was unable to avoid collision.


DENNIS B. SWANSTROM, Colonel, IA ANG
Investigating Officer

1 September 1993