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2003 FEB 25 PM 2: 31

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

SUMMARY OF FACTS

PART 1 - KUNSAN AIR BASE

Packet No. _____	Official Exh. No. <u>1</u>
In the matter of <u>PFS</u>	
Staff _____	IDENTIFIED <input checked="" type="checkbox"/>
Applicant _____	RECEIVED <input checked="" type="checkbox"/>
Intervenor _____	REJECTED _____
Other <u>Joint</u>	WITHDRAWN _____
DATE <u>4-11-02</u>	Witness _____
Clerk <u>L. Shindlering</u>	

1. HISTORY OF FLIGHT

a. Overview: On 26 December 1989, Tank 11 flight from the 35th Tactical Fighter Squadron was scheduled for continuation training as a two-ship formation with Tank 11 as the flight leader and Tank 12 as the wingman (accident aircraft). Takeoff was scheduled for 1300 hours local time (L), and Tank 11's actual takeoff time was 1259L with Tank 12 following 20 seconds in trail. After departing runway 36 at Kunsan Air Base, Tank 11 flew the Yoke Standard Instrument Departure and exited the airport traffic area on a southerly heading. At 1304L Tank 12's engine failed, and the pilot's attempts to regain thrust were unsuccessful. The pilot, Captain Jeffrey Sturmthal, successfully ejected from his aircraft at 1306L and landed in an open field 23 miles south of Kunsan Air Base. The aircraft was destroyed when it impacted a rice field approximately 20 seconds after the pilot ejected.

b. Mission: Tank 11 flight's mission was to accomplish continuation training in low altitude tactical navigation, surface attack tactics, and weapons delivery at the Koon-ni range complex¹. The configuration of the accident aircraft was two 370-gallon external fuel tanks, one SUU 20 dispenser, one triple ejector rack, nine BDU-33 practice bombs, one electronic countermeasures pod, one captive Aim 9M missile, one acceleration monitoring device, and 511 rounds of 20 mm target cannon ammunition²

c. Pre-mission Activity: Captain Sturmthal was well rested and within aircrew rest requirements for his mission. Nutritionally, he had eaten well with an occasional drink of beer in the holiday preceding the accident. He arrived at the squadron to mission plan at 0800L and did the bulk of the planning since his flight lead was assigned Supervisor of Flying duties for one hour that morning. At 1000L the flight lead returned to review and modify the mission planning materials. Captain Sturmthal left to eat lunch at 1030L and returned at 1100L for the flight briefing.³

The flight lead conducted the briefing in accordance with the MCM 55-116 briefing guides. All required topics were briefed including specifically: Abnormal Procedures, Low Altitude Engine Failure, and Rescue Combat Air Patrol. Upon completion of the briefing there were no questions or doubts concerning the mission plan.⁴

The weather was observed scattered at 4000 ft with winds from the North for 16 knots. No other weather or NOTAMS affected the mission.⁵

Upon arrival at the aircraft, Captain Sturmthal performed his preflight inspection of aircraft 86-0300. He was met and launched by Senior Airman Joseph M. Richard.⁶ Start and taxi were uneventful with four exceptions. While strapping into his cockpit the pilot inadvertently left his chin strap unsnapped. During the start of the Jet Fuel Starter (JFS), the pilot discovered that the JFS run light did not illuminate. He observed rpm indications of a JFS run, decided to take the aircraft, and planned to writeup the discrepancy post flight.⁷ At the end of runway quick check, the crew chief observed an engine oil level in a cross-hatched area of the gage and he consulted with Sergeant Blair D. Finney, the chief of end-of-runway operations. Sergeant Finney saw that the oil level was in the oil expansion range and released the aircraft in accordance with Technical Order (T.O.) 1F-16C-2-12JG-00-1.⁸ Prior

to taking the runway for takeoff, the flight lead detected birds in the vicinity of the runway and opted to make single-ship takeoff with 20 second spacing.⁹

d. Flight Activity: Using afterburners, Tank 11 departed the runway at 1259L¹⁰ followed 20 seconds later by Tank 12. Tank 11 made a climbing right turn and flew the Yoke Standard Instrument Departure to a rollout heading of 170 degrees direct to their low level start point. From his trail position Tank 12 accomplished an avionics systems check as he rejoined Tank 11. Tank 11 directed a change of lead and dropped behind Tank 12 to accomplish his own systems check. After rejoining with Tank 12, Tank 11 assumed the lead and porpoised his wingman to a line-abreast tactical formation. The flight was now southbound with Tank 12 on the right (West) side of the formation.¹¹

Approximately 20 miles south of Kunsan Air Base, Tank 11 directed an in-place 90 degree right turn as part of a briefed "g" awareness maneuver before starting their tactical low level route. Upon his leader's command, Captain Sturmthal selected military power, rolled right 60 degrees, and began a three to four "g" turn at 400 Knots Indicated Airspeed (KIAS) and an altitude of 4000 feet Mean Sea Level (MSL). Reaching 30-45 degrees of turn, the pilot experienced a violent explosion that banged his head off the canopy and jolted his hands from the throttle and control stick. Simultaneously, he experienced severe vibrations that frustrated attempts to interpret his gages and caution lights.¹²

Sensing a loss of thrust, he focused on his engine rpm gage and observed a rollback through 60 per cent. At this point the pilot zoomed the aircraft and began to apply emergency procedures for low altitude engine failure.¹³ The pilot's observations are indicative of an engine failure according to T.O. 1F-16C-1.¹⁴

As Captain Sturmthal zoomed his aircraft, he jettisoned his two external wing tanks. He started the JFS using START 2 after seeing the engine rpm at 5 per cent. Although the run light was known to be inoperative during his ground start, he noticed that the rpm recovered to 25-28 per cent. The aircraft apexed at approximately 5800 feet MSL as the pilot began a transition to a glide profile, and he maintained 240-250 KIAS for the remainder of the glide. For the aircraft's configuration and fuel weight, maximum range airspeed was approximately 230 KIAS and maximum endurance airspeed was 190 KIAS.¹⁵ After cycling the throttle off and back to mid-range, the pilot saw that the Secondary Engine Control (SEC) light was illuminated on the caution light panel indicating that the engine had automatically transferred into SEC. He observed the rpm unchanged at 25-28 per cent and a stabilized FTIT reading between 200 to 300 degrees centigrade. During his testimony, Captain Sturmthal was unsure if he completed the emergency procedure requiring the engine control switch to be switched to the SEC position, or if he deliberately turned the control switch back to Primary as a last-ditch effort to start the engine. Critical action procedures require the pilot to switch the engine control switch to SEC even if the engine has already transferred to SEC and the SEC caution light is illuminated.¹⁶ He cycled the throttle a second time from off to idle range without result. Throughout the emergency the aircraft continued to vibrate.¹⁷

During his zoom and resulting glide, the pilot made frequent corrections to his flight path to avoid populated areas while Tank 11 provided assistance with checklist support and additional clearing of the projected impact area of the jet. Early in his zoom, Tank 12 made a right turn to a northwesterly heading to a relatively unoccupied area on the ground¹⁸. The pilot intentionally delayed ejection below minimums recommended in T.O. 1F-16C-1¹⁹ to further avoid populated areas in his flight path. At 1400 feet MSL, the pilot successfully ejected.²⁰

Approximately twenty seconds following ejection, the aircraft was destroyed when it impacted a rice field 7000 feet north-northwest of where the pilot landed.²¹ The pilot observed the fireball and fire following the impact.

e. Post Ejection: After ejection Captain Sturmthal looked for and witnessed the impact and resulting fireball of his aircraft. He then realized that his helmet had rotated forward on his head as a result of his chin strap being unstrapped. His first action was to refasten the chin strap after getting a good check of his parachute's integrity. He completed his post ejection procedures in accordance with life support training guidance²² with two exceptions. Instead of discarding his oxygen mask by disconnecting the CRU-60/P from his harness, he chose to drop only one side of the mask and retain the mask in the descent.²³ When he reached for the four-line lanyard pull loops to accomplish the four-line modification of his parachute for stability and steerability, he discovered the loops inaccessible.²⁴ Photos of this malfunction are at Tab Z-2.

The pilot immediately took survival and recovery actions by stopping his emergency beacon and establishing radio contact with Tank 11 who was now holding overhead to coordinate rescue operations. Captain Sturmthal used his survival gear to facilitate his recovery to include: radio, flares, and parachute and thermal blanket as signaling devices. Additionally, he improved his visibility to the supporting aircraft by improving his ground position.²⁵

Within moments of his landing, Captain Sturmthal was met by Korean civilians, and they provided substantial support and assistance until rescue forces arrived at the site.²⁶

When examined in the emergency room at Kunsan Air Base, Captain Sturmthal complained of mild calf pain bilaterally. His physical exam was normal. He was admitted overnight for observation and released the next day.²⁷

f. Impact: The aircraft impacted trees prior to ground impact and was stripped of some external stores. At ground impact the debris covered an area of approximately 900 feet long by 300 feet wide. The impact site is located at the 179 degree radial for 23 nautical miles from Kunsan Air Base.²⁸ The map at Tab AA depicts both the burn and debris areas at North 3532.6 South 12641.5. Photo of impact is at Tab S-1.

2. LIFE SUPPORT EQUIPMENT

No discrepancies were found in the operation and maintenance of the survival kit and components.²⁹

No discrepancies were found in the maintenance of the personnel parachute. However, the four-line lanyard pull loops, normally held in place between the parachute risers by hand tackings were drawn into the four-line release lanyard storage tunnels. This made the pull loops inaccessible to the pilot.³⁰ This malfunction has occurred in other ACES II four-line release assemblies. The Directorate of Material Management at Kelly AFB is projecting corrections to current technical order procedures which prevent aircrews from performing the four-line release by March 1990.³¹

The ejection seat had up-to-date maintenance, but the quick disconnect on the left side of the seat didn't separate as designed. Instead there was a tension failure of the ballistic hose at a point ten inches from the design quick disconnect to the pressure operated initiator. The quick disconnect was safety wired with 0.041 wire in accordance with technical order guidance.³² (Photos at Tab Z-1 and Z-2). This malfunction has occurred in other ACES II ejection sequences. A statement by the F-16 Life Support

is unusable fleet-wide for CSFDR download only because associated adaptor cables to the CSFDR have not yet been fielded. The adaptors will be fielded with the Enhanced Data Transfer Terminal (EDTT) in July 1990. In the interim, maintenance uses Alternate Ground Readout Equipment (AGRE) to produce a computer floppy disc of a CSFDR's memory to forward to General Dynamics. There is no formalized technical data or training programs for the AGRE. Formal training requirements for the EDTT and the CSFDR have been forwarded to Air Training Command. Until programs are instituted, General Dynamics field teams will conduct training for PACAF F-16 units in July 1990.⁷⁰

6. MAINTENANCE PERSONNEL AND SUPERVISION

No training discrepancies occurred, and all involved 8th Tactical Fighter Wing maintenance personnel were qualified to accomplish their respective maintenance actions on aircraft 86-0300 and engine 509521.⁷¹

No discrepancies were noted with 8th Tactical Fighter Wing maintenance supervision.

7. PILOT QUALIFICATIONS AND SUPERVISION

The accident pilot was qualified⁷² and current for the planned mission events. He was a mission ready pilot in the 35th Tactical Fighter Squadron with 167 hours of F-16 experience, 1,309 hours of fighter aircraft experience, and 1,470 hours total flying time.⁷³ In the time preceding the accident, he experienced a 34 day layoff from flying due to leave, DNIF⁷⁴, and TDY. As a work-up from the layoff he accomplished three low-demand sorties, two emergency simulators, two EPRs with mission ready pilots, and a critical action emergency procedure test prior to the accident sortie.⁷⁵ Although not documented and coordinated as required by local wing training directives⁷⁶, the program was programmed and monitored by Captain Sturmthal's flight commander. No other supervisory discrepancies were noted.

8. DIRECTIVES AND REGULATIONS

The following directives were germane to the investigation at Kunsan Air Base:

Technical Orders

- (1) T.O. 1F-16C-1, F-16C/D Flight Manual
- (2) T.O. 2J-F110-6-4 WP 054 00
- (3) T.O. 2J-F110-4

Air Force and PACAF Regulations

- (1) MCR 55-116, F-16 Pilot Operational Procedures, 24 August 1987
- (2) MCR 55-116, PACAF Chapter 9, PACAF Operating Procedures, 7 October 1988
- (3) AFR 60-1, Flight Management, 28 May 1985
- (4) PACAFR 55-116, 8 TFW Operating Procedures, 1 March 1989

8 Tactical Fighter Wing Directives

- (1) 8 TFW Operations Plan 127-4, Mishap Response, 23 October 1989
- (2) 8 TFW Safety Mishap Quick Reaction Checklist
- (3) 35 TFS Squadron Employment Standards

Accident Investigation Guidance

- (1) AFR 110-14, Investigations of Aircraft and Missile Accidents, 4 May 1984
- (2) PACAF Pamphlet 110-14, Accident Investigator's Handbook, 14 March 1988

A pilot is also trained to jettison all stores, (eg, fuel tanks, ordnance) before ejecting to reduce the aerodynamic drag on the aircraft to aid in the pilot's control. This also prevents their detonation if they remain onboard and crash as a result of crashing with the aircraft. A pilot may have other high priority tasks, such as trying to restart a malfunctioning engine which could prevent the crash and the need to eject.

The pilot's focus on survival will limit or entirely prevent the pilot from evaluating where the aircraft will impact or trying to locate a specific site and maneuvering the crashing aircraft away from it. The only training an Air Force pilot receives with respect to avoiding ground sites, is contained in a flight manual which instructs a pilot to avoid populated or built-up areas. The PFS facility occupies an area of only 0.13 square miles and neither appears to be a populated area nor a built-up area with commercial or residential buildings. Therefore, a pilot may not even make a conscious decision to maneuver a crashing F-16 away from the PFS site.

Q. 46: Explain your basis for concluding that the pilot's focus on survival may prevent any effort to locate and steer the crashing aircraft away from a ground site such as the proposed PFS facility.

A. 46: I have discussed specific mishap circumstances with four active duty F-16 pilots who have ejected from aircraft. Three of the pilots ejected from F-16s and one pilot ejected from an F-111, a two engine fighter aircraft.² All four pilots said their thoughts were focused on their own survival and all of the pilots said they did not even consider where the aircraft would impact and did not consider where the jettisoned stores would impact. All four pilots stated that if they were required to eject in the future, they would again not consider where their aircraft or ordnance would impact.

²The four pilots are: 1) Major Tom Smith, whose January 13, 1995 F-16 crash is the subject of an accident report reviewed in the PFS Crash Report; 2) Captain Pietrykowski, currently assigned to the 388th Fighter Wing at Hill AFB, who ejected from an F-16 on June 21, 2000, near Cold Lake, Canada; his F-16 was flying at 1,700 feet AGL at 540 KIAS on a straight and level course when it encountered a bird strike; 3) Lt. Tidgewell, currently assigned to the 388th Fighter Wing at Hill AFB, who ejected from an F-16 on October 17, 2001, at Hill AFB; his F-16 was on the runway traveling at 150 KIAS when it encountered a tire separation; and 4) Colonel Couter, currently assigned to the 388th Fighter Wing at Hill AFB, who ejected from an F-111 on September 16, 1982, in the United Kingdom; his F-111 was on a final approach flying at 150 feet AGL at 150 KIAS when it encountered hydraulic failure.