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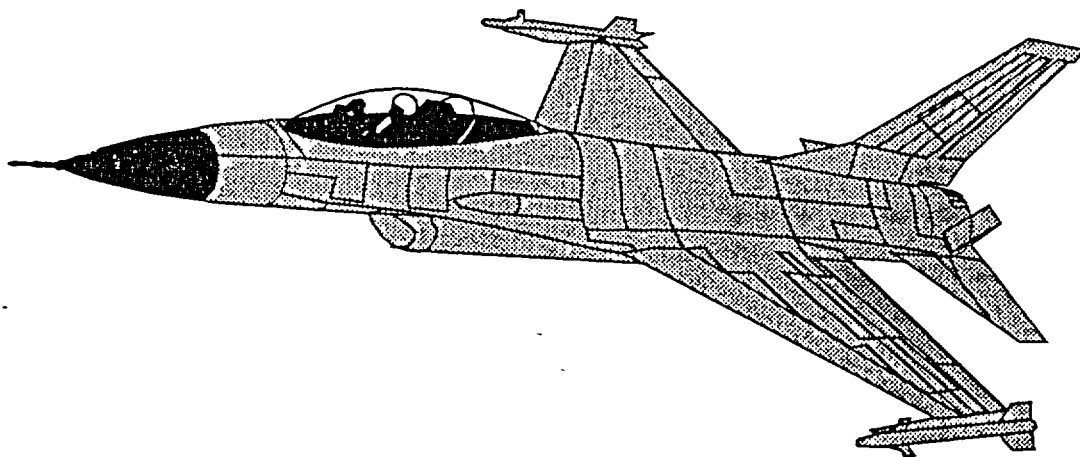
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OFFICE OF THE SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

# AIRCRAFT ACCIDENT INVESTIGATION REPORT

8 SEP 92



F-16C (SN85-1451)

86TH WING

RAMSTEIN AIR BASE, GERMANY

VOLUME I

PFS Exh. 142

UNCLASSIFIED

NUCLEAR REGULATORY COMMISSION

Order No. \_\_\_\_\_ Official Exh. No. 142

In the matter of PFS

Staff \_\_\_\_\_ IDENTIFIED ✓

Applicant ✓ RECEIVED ✓

Intervenor \_\_\_\_\_ REJECTED \_\_\_\_\_

Other \_\_\_\_\_ WITHDRAWN \_\_\_\_\_

DATE 7/1/02 Witness \_\_\_\_\_

By: [Signature]

AIRCRAFT ACCIDENT INVESTIGATION REEPORT

F-16C, SN-1451

RAMSTEIN AIR BASE, GERMANY

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## STATEMENT OF AUTHORITY AND PURPOSE

By order of the Commander, Headquarters Seventeenth Air Force, Lieutenant Colonel William F. Rake, 52nd Fighter Wing, Spangdahlem Air Base, Germany, was appointed by orders, dated 19 October 1992, to conduct an investigation into the crash of an F-16C aircraft which occurred on 8 September 1992, while flying from Incirlik Air Base, Turkey. Captain Kevin P. Koehler, 86th Wing, Office of the Staff Judge Advocate, Ramstein Air Base, Germany, was detailed by the same orders as the Legal Advisor to accompany Lt Colonel Rake throughout the course of the investigation. TSgt Robert A. Revis, 52nd Fighter Wing, Spangdahlem Air Base, Germany, was detailed as the Technical Advisor, by special order, effective 27 October 1992. (Tabs Y1 and Y2)

## MATTER INVESTIGATED

This was an investigation of a Class A aircraft accident involving F-16C (Serial Number 85-1451) assigned to the 86th Wing, Ramstein Air Base, Germany. The aircraft crashed at 0920 hours, local Turkish time, into a barren hillside in a sparsely populated farm area, near the village of Cakiruyuk, 120 nautical miles east-northeast of Incirlik Air Base, Turkey. The pilot successfully ejected and survived. The objective of the investigation was to obtain and preserve all available relevant facts and evidence pertaining to the accident, and to investigate the circumstances leading to the accident for use in claims adjudication and evaluation, litigation, disciplinary action, adverse administrative proceedings, or other purposes deemed appropriate by competent authority. Lieutenant Colonel Rake conducted the investigation under the authority of AFR 110-14, and was guided by the general procedures outlined in AFR 120-3.

NOTE: A glossary of abbreviations used in this Aircraft Accident Investigation Report follows the Summary of Facts. (See page 16)

## SUMMARY OF FACTS

### I. History of Flight

1. The 86th Wing, Ramstein Air Base, Germany, equipped with F-16C aircraft, was tasked to support Operation PROVIDE COMFORT flying from Incirlik Air Base (AB), Turkey (TU). Unit tasking was to provide flight operations in support of Combined Task Force (CTF) missions in the Turkish Area of Responsibility (TAOR) which extends down to the 36th degree of latitude in northern Iraq. The 86th Wing routinely cycled this tasking between its squadrons. During the squadron rotation on which this mishap occurred, the 526th Fighter Squadron (FS) had deployed to Incirlik AB, TU and had flown Operation PROVIDE COMFORT support sorties since 6 Aug 92.

2. On 8 Sep 92, Lucky 01 and 02, a flight of two F-16Cs, took off from Incirlik AB, TU on an Operation PROVIDE COMFORT mission (Tabs A-1, K-1, V-1.4, V-2.3, and FF-1). Enroute to the TAOR, the mishap F-16 pilot, callsign Lucky 01, unfastened his lap belt to relieve himself into a piddle-pack (a dehydrated sponge in a disposable, soft plastic container used by pilots in cockpits without other provisions). In the process, the lap belt slid down between the side-stick controller (stick) and the ejection seat and became wedged when the pilot raised his seat (Tab V-1.12). The aircraft entered a nose low uncontrollable roll to the right (clockwise). The pilot successfully initiated ejection (Tab A, B, C, N, V-1.15 to V-1.16, V-2.9, DD-1, EE-1, and EE-2) and the aircraft, F-16C SN 85-1451 was destroyed upon impact (Tabs A, C, N, and V-2.9). Crash site was an isolated and sparsely populated area of south-central Turkey (Tabs A, S, V-1.17, V-2.10, and EE). Property damage was minimal. (Tabs P and GG)

3. At the time of this mishap, general information concerning the hazards of stick interference existed in the "F-16C/D Flight Manual" (Tab FF-3). Additionally, Headquarters, United States Air Forces in Europe (Hq USAFE), Standardization and Evaluation and Life Support offices had issued supplementary data on the subject which directly addressed the possibility of stick interference problems in conjunction with the use of piddle-packs. (Tabs CC-5.1, CC-6, CC-7, and FF-10)

a. Stick interference was discussed in the "F-16 C/D Flight Manual" under "F-16D Aircraft" (two seat model), "Cockpit Interior Check", and again in Section III, "Emergency Procedures" (Tab FF-3). With the exception of Section III, references in the flight manual did not address inflight operations and were confined to F-16D or ground operation discussions. The flight manual did not address interference while using a piddle-pack.

b. Hq USAFE Deputy Commander for Operations, Standardization and Evaluation Branch (DOV), in response to an ongoing Class-A Safety Investigation Board and a previous Class-C mishap, disseminated information on 20 Dec 90 which specifically addressed stick interference with an unfastened lap belt during a piddle-pack use inflight (Tab FF-

10). This information was in the form of a Flight Crew Information File (FCIF) message to all USAFE F-16 units and was to remain an active FCIF item for 90 days, at which time it was to be rescinded. By making it part of the FCIF, the item was required reading for all F-16 pilots prior to their next flight.

(1) It could not be ascertained if this item was entered into the 86th Wing's FCIF because the item had been rescinded and was no longer on file. The item did not appear on 86th Wing current or rescinded FCIF indexes. (Tab FF-12)

(2) Lt Col Snelgrove arrived at the 86th Wing in Sep 91 (Tabs T-2.1, V-1.1, and BB-3.8) and had not seen the FCIF item, but was familiar with the accidents which prompted the FCIF to be published. (Tab V-1.1)

c. Hq USAFE Deputy Commander for Operations, Current Operations Branch (DOOT), Life Support Section, had also published information specifically addressing stick interference and piddle-pack usage. In a 4 May 92 "Life Support Current Interest Letter" distributed to all USAFE wing and squadron life support sections, units were authorized to include instruction on the use of piddle-packs into unit-created training plans (Tabs V-6, CC-4, and CC-5.1). Similarly, a joint life support and safety working group held 2-4 Jun 92 at Hq USAFE emphasized these same problem areas (Tabs CC-6 and CC-7.2). At this meeting, unit representatives were informed of an impending change to USAFER 55-44 which would direct the inclusion of training on the hazards of piddle-pack use into their lesson plans. Unit representatives were encouraged to include this training prior to actually receiving the regulation change

(1) The term "unit" in the AFR 55-44 discussion of responsibility to maintain current lesson plans was defined as a "Wing" not a "Squadron." (Tabs V-2.14, V-5.3, V-6.3, and CC-3)

(2) Unit lesson plans were under revision at the time of the mishap and did not include piddle-pack interference topics. (Tabs V-2.15, V-5.3, to V-5.4, V-6.3 to V-6.4, CC-8, CC-9, and CC-10)

(3) The 526 FS had received the 4 May 92 letter but was unaware of the information discussed at the 2-4 Jun 92 Working Group. (Tabs V-2.16 and V-6.5)

(4) Lt Col Snelgrove accomplished semi-annual egress training 27 Apr 92, and was current the day of the mishap. (Tab CC-1)

4. News media interest and coverage of the accident was light. Newspaper articles appeared in Stars and Stripes, the Air Force Times, and four Turkish daily papers (Tabs EE-1, EE-3, EE-4, and EE-5). Queries were received from the Associated Press and the British Broadcasting Company, both in Ankara, TU (Tab EE-2). Media inquiries were directed to the 39th Tactical Group (TACG) Public Affairs offices, Incirlik AB, TU.

## II. Mission

1. The mission of Lucky 01 and 02 was to perform Operation PROVIDE COMFORT presence, air superiority, and reconnaissance roles along with other coalition aircraft in the TAOR which extends down to 36 degrees of north latitude in northern Iraq (Tabs K-1 and FF-1). The majority of Operation PROVIDE COMFORT sorties were approximately three hours long and included takeoff from Incirlik AB, TU high altitude cruise, air-to-air refueling, air patrol of TAOR airspace, and return via high altitude. Some missions were tasked for a second air-to-air refueling and air patrol period prior to returning which increased flying time to about four hours. Lucky 01 and 02 were tasked for the longer mission. (Tab K, V-1.5, V-2.4, and FF-1)

2. Specifically, Lucky 01 was to perform flight lead duties for the mission and Lucky 02 as the wingman. (Tabs K, V-1.4, V-2.2, and FF-2)

## III. Briefing and Preflight

1. Lt Col Snelgrove, the mishap pilot, had previous experience flying Operation PROVIDE COMFORT missions. He had been deployed to Incirlik AB, TU since 19 Aug 92 and in that time, had flown five Operation PROVIDE COMFORT sorties prior to the mishap sortie. (Tab V-1.3)

2. On 8 Sep 92, the morning of the mishap, Lt Col Snelgrove was mentally and physically prepared to lead the sortie. He had pilot rest required by AFR 60-1, and had eaten breakfast prior to departing his quarters (Tab V-1.4). He arrived at the squadron with his wingman in sufficient time prior to their scheduled briefing time to gather all pre-mission briefing information, i.e., weather, Notices to Airmen (NOTAMS), intelligence update briefings, and flight planning data. No mass pilot briefing was given. The flight was filed for along prescribed routing to the TAOR (Tabs V-1.9 and V-2.7). With the exception of not signing off two Safety Information File (SIF) items and one Interim Message Change (IMC) to the "F-16C/D Flight Manual", Lt Col Snelgrove was prepared to fly (Tabs T-1.1, V-1.3 to V-1.4, V-1.6 to V-1.7, V-1. , V-2.3 to V-2.4, AA-1, AA-2, AA-3, BB, and FF-11). The missed items were not "Go/No-Go" or safety of flight items.

3. The flight briefing was accomplished by Lt Col Snelgrove with reference to USAFER 55-116 briefing guides and personal notes. It started on time and covered all applicable items and special subjects, as well as current Operation PROVIDE COMFORT emphasis items. The wingman, Capt Carlisle, had no questions at the conclusion of the briefing. Due to high outside air temperatures, attendant dehydration problems, and the anticipated length of the tasked sortie, Lt Col Snelgrove drank a container of water during the briefing. Both pilots had ample time to don flight gear and otherwise prepare to go to their aircraft. (Tabs V-1.7 and V-2.3)

4. The mishap aircraft was located on the concrete apron in front of a protective shelter and was properly prepared for flight in a timely

manner. Lt Col Snelgrove departed the squadron, arrived at the aircraft, and performed a preflight inspection in daylight conditions at the scheduled times. Aircraft configuration was as directed by the CTF and as expected by the pilot: AIM-9 missiles on wingtip stations number 1 and 9, wingtanks on underwing stations number 3 and 6, empty MAU-12 pylons on underwing stations 4 and 6, ALQ-131 Electronic Counter-Measure (ECM) pod on centerline station number 5, as well as 510 rounds of 20 millimeter (mm) cannon shells, 30 chaff bundles, and 15 flares carried internally. Start, taxi, and end of runway checks were normal and performed IAW applicable directives. (Tabs V-1.8 and V-2.7)

#### IV. Flight Activity

1. Lt Col Snelgrove and his wingman took off at 0903 Incirlik Local Time (ILT), three minutes later than planned (Tab K and FF-1) but well within the time allowed by Turkish air traffic controllers and Operation PROVIDE COMFORT directives. Because of prevailing good weather at Incirlik AB, TU and forecast good weather along the entire route, Lt Col Snelgrove elected to accomplish a visual flight rules (VFR) departure instead of the SID which was filed (Tabs V-1.9, V-2.7, and W). The entire mission, up to the time of the mishap, complied with Turkish, Operation PROVIDE COMFORT, and local Incirlik AB, TU directives. Both aircraft climbed to 33,000 feet mean sea level (MSL) and proceeded on course as cleared by Incirlik departure radar monitoring service. Leaving Incirlik's airspace, Lucky 01 and 02 contacted the Airborne Warning and Control System (AWACS) aircraft, callsign "Cougar", for flight following service and advisories. (Tabs V-1.10 and V-2.8)

2. The flight plan at this point was for approximately 30 minutes of virtually straight-line routing to the northwest corner of Iraq for air-to-air refueling. During this phase of flight the pilot decided to relieve himself into a piddle-pack. This decision was based on the length of time spent flying in straight and level flight well away from the ground and the fact that these conditions lend themselves to the use of the auto-pilot. Additionally, if not accomplished enroute to the air-to-air refueling rendezvous point, work load and flight conditions would not normally permit the pilot to use a piddle-pack for approximately the next three hours. (Tab V-1.11)

3. Use of a piddle-pack in the F-16 was difficult and there were no other provisions in the aircraft which allow a pilot to relieve himself. The F-16 was a single seat aircraft with a small cockpit which restricted pilot movement laterally as well as forward and aft. The rearward 30 degree incline of the ejection seat and the close proximity of the ejection seat to other instruments and controls further complicated successful use of the piddle-pack in the cockpit. The greatest range of motion for the pilot was vertically in the ejection seat which took the pilot out of optimum position to control the aircraft. The use of the aircraft auto-pilot was generally required to enable the pilot to maintain controlled flight conditions for the length of time required to use the piddle-pack.

4. The pilot prepared the cockpit prior to using the piddle-pack. He



disarmed the ejection seat, turned on the auto-pilot, unfastened the lap belt, draped each half of the lap belt over the inside of his thighs, and was removing his flight gloves when he dropped one glove to the cockpit floor. The pilot reached forward and down with his right hand and retrieved his glove. While pulling his arm back, he knocked the right lap belt off his thigh and the metal buckle came to rest between the ejection seat and the stick controller. (Tab V-1.12)

5. The pilot then moved his right hand to the seat height adjustment switch on the right wall of the cockpit and raised the ejection seat to create more room between the seat and the instrument panel located between the pilot's knees. The lap belt became wedged between the upward moving ejection seat and the stick which was attached to the instrument console on the right side of the cockpit. (Tab V-1.12)

a. The stick was a force-sensing unit containing transducers in both pitch and roll axes and moved approximately one quarter inch in both axes. (Tab FF-6)

b. The ejection seat height adjustment switch controlled upward and downward movement of the ejection seat and was spring-loaded to a center "off" position (Tab FF-5). Upward seat movement was perceived to stop coincident with the pilot releasing the switch. (Tab V-1.14)

6. The resultant stick movement to the right overrode the auto-pilot and commanded the aircraft into a nose low, rapid righthand (clockwise) roll of approximately two to three seconds per revolution. (Tabs O-1.2 and V-1.12, and V-2.8)

7. The cause of the aircraft roll was immediately apparent to the mishap pilot who saw the wedged lap belt as the aircraft began its right hand roll (Tab V-1.12). He made multiple unsuccessful attempts to regain control of the aircraft. (Tab V-1.12 to V-1.15)

a. He unsuccessfully tried moving the stick with full force to the left. (Tab V-1.12)

b. He attempted to lower the ejection seat by reversing the the ejection seat height adjustment switch. The seat would not lower and the lap belt remained wedged. (Tab V-1.12 to V-1.14)

(1) The seat actuator motor (seat actuator) was protected by a thermal relay which interrupted electrical power if overheated. (Tab FF-5)

(2) The seat actuator was protected by a circuit breaker designed to pop (open) if the circuit breaker sensed more amperage than it was designed to allow (Tab FF-8) and disable the seat actuator. The seat actuator circuit breaker was recovered from the aircraft wreckage and found to be in the popped (open) position (Tab J-1.3). This may have occurred at impact or could have been the result of running the seat actuator while the seat was not movable. (Tabs J-1.3 and FF-8)

c. He attempted to pull the lap belt free with his left hand while trying to fly the aircraft with his right. (Tab V-1.13)

d. He tried to interrupt the auto-pilot, using the "paddle" switch on the stick. (Tabs V-1.13 and FF-7)

8. During the rapid rolls, the flight path of the aircraft dropped to approximately 30 degrees below the horizon and the aircraft rapidly lost altitude (Tabs V-1.12 to V-1.13, and V-2.8). At an estimated 10,000 feet Above Ground Level (AGL), the mishap pilot perceived he may be able to control the aircraft and, passing about 4000 feet AGL, he was able to stop the roll momentarily by holding the stick with full force to the left. The aircraft continued in a nose low descent and at approximately 2000 feet AGL, the aircraft again entered a righthand roll as he pulled back on the stick to recover from the dive. (Tab V-1.14 to V-1.15)

9. The pilot re-armed his ejection seat and initiated ejection despite concern he would not survive the ejection without his lap belt fastened to hold him in the seat. He initiated ejection with his left hand while attempting to counter the roll by stick inputs with his right. (Tab V-1.15)

10. Lucky 02, initially attempted to follow the mishap aircraft, thinking he was executing an avoidance maneuver for some unknown reason. No radio transmissions were made by Lucky 01. After Lucky 01 started into a second roll, it became apparent to the wingman, that Lucky 01 had a problem. Lucky 02 turned on his video tape recorder (VTR) and his intercom to record what transpired. He instructed the mishap pilot to perform the Critical Action Procedures (CAPs) for aircraft departure from controlled flight and informed him of his altitude above the ground. He directed him to eject at approximately 10,000 feet AGL. (Tab N and V-2.9)

11. At the time of the ejection, no aircraft malfunctions were noticed by the pilot or detected by the mishap aircraft flight data recorder (Tabs J, O-1, and V-1.9). Flight data recorder analysis results were consistent with the aircraft flightpath described by the pilot (Tabs J-1.1, O-1, and V-1.12). Additionally, analysis of recovered instruments revealed no instrument or instrumentation failures. The engine seemed to be operating normally. Only one of the two hydraulic gauges was recovered, but it was found to indicate in the normal pressure range and the flight data recorder indicated that both hydraulic systems were under sufficient pressure to operate the flight controls. No electrical power supply or interruption problems were evident. (Tab O-1)

## V. Impact

1. The aircraft crashed on 8 Sep 92 at 0920 ILT in an isolated, sparsely populated area of south-central Turkey, approx .5 nm southwest of a small farm community called Cakiruyuk. Specifically, the crash site was the base of a barren, rocky hillside near a harvested wheat field located 070 degrees and 120 nm from Incirlik Air Base TU (Tabs S and Z). Coordinates were north 37 degrees, 33.8 minutes latitude and east 37 degrees, 49.55

minutes longitude (Tabs A and N). F-16C SN 85-1451 was destroyed on impact. (Tab M)

2. Flight conditions at the time of impact were: an easterly heading (heading indicator destroyed), 290 knots airspeed, 22 degrees nose low, and 47 degrees left wing down with a right (clockwise) rolling motion. (Tab J-1.1)

3. Analysis of the altimeter revealed an altimeter setting of 29.81 inches of mercury (in. Hg) was entered at the time of impact (Tab J-1.1). This was the local altimeter setting at Incirlik AB, TU at the time the mishap aircraft took off (Tab W-2). AFM 51-37 directs a standard setting of 29.92 in. Hg be entered flying at or climbing through specified transition altitude (Tab FF-13). The resultant 110 foot indicated altitude error while at cruising altitude should have had no affect on this mishap.

#### VI. Ejection Seat

The Advanced Concept Ejection System (ACES) II seat has three modes of operation which determine the speed with which the pilot's main parachute deploys. Ejection was initiated and occurred within the ejection seat's designed operating envelope Mode-2 (Tab FF-4). The ejection was successful despite the fact the pilot was forced to eject without a fastened lap belt. All components involved in the ejection sequence appeared to have functioned properly. (Tabs V-1.16, and V-2.9)

#### VII. Personnel and Survival Equipment

1. The pilot landed on a rocky hillside which was predominately covered with boulders. The pilot encountered no difficulties in the operation or use of survival equipment. The only survival equipment used was the PRC-112 radio which was used to talk to aircraft involved in the rescue operation. (Tab V-1.18 to V-1.19)

#### VIII. Rescue

1. At the time of the mishap, both Lucky 01 and 02 were in radio contact with the AWACS who maintained continual radio contact with the Incirlik Command Post. Therefore, at 0920 ILT, when Lucky 02 informed the AWACS that Lucky 01 had ejected, AWACS was immediately able to notify Incirlik's Command Post to initiate rescue and recovery efforts (Tabs N-1.2, V-2.9 to V-2.10, DD-2, DD-3.1, DD-4, and DD5.1). Because Operation PROVIDE COMFORT involves a coalition of countries including Turkey and because of Status of Forces Agreement (SOFA) provisions, the Turkish military was also soon notified of the crash.

2. Lucky 02 established an orbit over the crash site, passed coordinates to AWACS, contacted the mishap pilot via radio and ascertained that the pilot was not injured (Tabs V-2.9 to 2.10). While waiting for helicopter response to the crash site for pilot pickup, air coverage was provided by the mishap pilot's wingman, Lucky 02, a flight of two A-10s, callsign Vulture, a flight of two F-111's, callsign Ratch, and three more flights

of two A-10s each, callsigns Condor, Puma, and Sawtuth. (Tab DD-1.2)

3. A number of inhabitants from the nearby village of Cakiruyuk responded to the crash site within five minutes. They were friendly and willing to help but could not speak English. The pilot was able to communicate using German and instructed them to stay away from the crash site. They recovered a number of personal items located near where the pilot landed and delivered them to him. (Tab V-1.18 to V-1.19)

4. Turkish military personnel responded from a local garrison and were the first to cordon the crash site. (Tab V1.19)

5. CTF, helicopter rescue and crash recovery responses were delayed by bi-lateral (US-TU) coordination and treaty interpretation problems centered predominately around jurisdictional issues.

a. HH-53 helicopters located at Incirlik AB, TU 120nm west of the crash site were primarily responsible for Operation PROVIDE COMFORT search and rescue (SAR) operations and were the first to be notified. However, due to problems coordinating engine start and take off clearances, their launch was delayed. At 1220 ILT, an HH-53, callsign Pave 11, launched from Incirlik AB, TU to deliver a small ground party to secure and begin clearing the crash site. By this time, pilot pickup was already in progress by UH-60 helicopters from Diyarbakir AB, TU. The HH-53 arrived at 1317 ILT and returned to Incirlik AB, TU at 2019 ILT. (Tab DD-1.2)

b. At 0950 ILT, because of delays in launching the HH-53 helicopters, UH-60 helicopters located at Diyarbakir AB, TU 114 nm east of the crash site were alerted. Flight crews were recalled and aircraft made ready. At 1124 ILT, UH-60 helicopters, callsign Eagle 13, launched. They arrived at the crash site for pilot pickup at 1225 ILT and transported the pilot to Incirlik AB, TU where the pilot was taken to a flight surgeon. Arrival time was 1329 ILT. (Tabs V-1.21, AA-4, and DD-4)

c. Prior to the arrival of Eagle 13 for pilot pickup, two Turkish helicopters arrived on scene. The first one had been operating in the vicinity, located the pilot, and offered to transport him to a local hospital. The second Turkish helicopter was dispatched to the crash site from Diyarbakir AB and was directed to pick up the pilot and transport him back to Diyarbakir AB, TU. (Tab V-1.20 to V-1.21)

d. Both offers were declined by the pilot who did not seem injured and desired to return to Incirlik AB, TU. AWACS had contact with the aircraft orbiting overhead the crash site as well as intermittent radio contact with the pilot. They relayed the pilot's intentions to the CTF which agreed to the decision. (Tabs V-1.21, DD-1.2)

e. Crash response was also delayed. After initial notification at 0945 ILT, an initial response team was prepared to travel via helicopter to the crash site and a follow-on Disaster Response Force (DRF) was preparing to depart via military vehicle convoy. The initial response

team departed on an HH-53 helicopter, callsign Pave 11, at 1120 (1130 in Explosive Ordinance Disposal report). The follow-on DRF convoy was scheduled to depart at 1300 ILT, but was delayed until 1730 ILT due to the requirement to have a Turkish military escort. The DRF convoy arrived at the crash site at 0130 ILT on 9 Sep 92. (Tabs O-2.2, DD-3.1)

6. EOD and bioenvironmental operations were accomplished by US military personnel following which, a search of the wreckage was performed with the assistance of the local populous. DRF duties were completed on 14 Sep 92 and the DFR returned to Incirlik AB, TU on 15 Sep 92. (Tabs O-2.4 and DD-5)

#### IX. Maintenance Documentation

1. The current aircraft Air Force Technical Order (AFTO) Forms 781A as well as previous 781A forms dated 30 Apr 92 to 8 Sept 92 were reviewed. Only minor non-related documentation discrepancies were found. (Tabs U-1, U-3, and U-4)

2. A review of Time Compliance Technical Orders (TCTO) revealed no overdue TCTOs. (Tabs U-6, U-10, and U-11)

3. Aircraft scheduled inspections were satisfactorily completed. No discrepancies were found. (Tabs U-1 and U-5)

4. Oil analysis records were reviewed and found to be within limits. (Tab U-13)

5. A review of automated history products revealed time change requirements were complete with no discrepancies. (Tab U-1)

6. No unscheduled maintenance was performed on the aircraft after the postflight/preflight and walk-around inspections on 8 Sep 92. The mishap sortie was the first flight of the day. (Tabs U-3 and U-4)

7. A review of maintenance documents and testimony revealed no maintenance procedures or practices that appear related to the mishap. (Tabs U-1, U-4, V-3, and V-4)

#### X. Maintenance Personnel and Supervision

1. All maintenance personnel and supervisors performed duties IAW technical data. (Tabs U-1, V-3, and V-4)

2. Preflight/Postflight and walk-around inspections were completed with no discrepancies noted. (Tabs U-2, U-3, U-4, V-3.3, and V-4.4)

3. On-the-job training records (AF Forms 623) were reviewed. All training and certifications were completed satisfactorily. (Tab U-1)

#### XI. Engine Oil, Fuel and Hydraulic Inspection Analysis

All engine oil records were within standards (Tab U-13). Due to the nature of this mishap and the testimonies given (Tab V), fuel and hydraulic analysis were deemed unnecessary and therefore not completed.

#### XII. Airframe and Aircraft Systems

1. All aircraft systems appeared to be operating normally. (Tabs J, O-1, and V1.9)
2. The technical analysis of recovered instruments revealed nothing that indicated the aircraft was operating abnormally prior to or at the time of impact. (Tab J)

#### XIII. Operations Personnel and Supervision

The mishap sortie was tasked by CTF Operation PROVIDE COMFORT (Tab FF-1) and properly authorized on USAFE Form 406, Consolidated Flight Authorization/Approval (Tab K). Capt Peterson, 526 FS, Assistant Deputy Commander for Operations approved the flight. Lt Col Snelgrove was the only pilot onboard and was the pilot in command of the aircraft. All supervisory personnel were considered qualified and capable of the required decisions and duties related to the tasking, launch, and flight of the mishap aircraft and pilot.

#### XIV. Pilot Qualifications

1. Lt Col Snelgrove was highly qualified and experienced with an extensive background in tactical fighter aircraft. He was previously an instructor pilot and a graduate of the USAF Fighter Weapons Instructor Course (FWIC) in the F-4. He was also an instructor in the FWIC in the F-4 and the F-16A/B aircraft (Tabs G, T-2, V-1.1, BB-2.9 to 2.14, and BB-2.17 to 2.36). Due to his experience and demonstrated abilities, he was given an abbreviated upgrade to instructor pilot while at Ramstein Air Base, Germany (Tab BB-3.54). He was Deputy Commander for Operations of the 526 FS at the time of the mishap. (Tab V-1.1)
2. At the time of the mishap he had been rated for over 15 years, was a command pilot with a grand total of 2,298.5 hours of flying time, and had 2,092.9 total hours as first pilot or instructor. He had a total of 552.7 hours in the F-16 of which 316.6 were as an instructor. The sum of his flying experience in the last 30/60/90 days were 14 sorties and 27.1 hours, 20 sorties and 40.0 hours, and 36 sorties and 63.8 hours respectively. (Tabs G, T-2.2 to 2.3, and BB-1.3)
3. A complete review of Lt Col Snelgrove's training and flight evaluation records revealed no significant training or performance problems (Tabs BB-2 and BB-3). He was current in all required recurring training (Tabs BB-1, BB-5, CC-1, and FF-11). With the exception of not signing off two SIF items and an IMC to the flight manual, neither of which were critical flight items, Lt Col Snelgrove was

prepared to fly (Tabs C-1.1, V-1.3 to V-1.4, V-1.6 to V-1.7, V-2.3 to V-2.4, AA-1, AA-2, AA-3, and FF-11). No unfavorable information was contained in his personnel records.

#### XV. Medical

1. Lt Col Snelgrove was medically qualified for the mishap flight on 8 Sep 92. He had a current flight physical and was not on Duty-not-to-Include-Flying (DNIF) status. (Tabs AA-1, AA-2, and AA-3)

2. After the helicopter delivered him to Incirlik AB, TU, Lt Col Snelgrove was immediately taken to the 39 TACG Flight Medicine Clinic where an examination was performed. He was found to have minor bruises on the right and left sides of his neck as well as one in the lower portion of his spine above the tail bone. He also complained of tenderness in the middle of his back. (Tab AA-6)

3. The findings of the post mishap flight surgeon exam and toxicology report revealed nothing that would have adversely affected his performance as a pilot. (Tabs AA-4 and AA-5)

4. The pilot was subsequently put on DNIF status until 20 Oct 92 due to muscular stiffness in the neck and chest which required physical therapy. (Tab AA-6)

#### XVI. Nav aids and Facilities

The status of Incirlik facilities and NOTAMS were reviewed and would not appear to affect this mishap. (Tab FF-9)

#### XVII. Weather

The forecast weather condition at Incirlik Air Base, TU for the time period in which the mishap aircraft was to takeoff was three eights cumulus cloud cover at 3,000 feet AGL, unrestricted visibility outside of clouds and winds out of the northeast at 5 knots. Enroute weather was forecast to be only slightly different with three eights cumulus cloud cover at 4,000 AGL four eights alto-cumulus cloud cover at 10,000 feet AGL, which constituted a ceiling, unrestricted visibility outside of clouds and winds out of the southwest at 12 knots (Tabs W-1 and W-3). Actual observed weather condition at the time the mishap aircraft took off was one eight cumulus cloud coverage at 3,000 feet AGL and unrestricted visibility outside of clouds. Airfield operations under visual flight rules (VFR) were permitted. Enroute weather was better than forecast with no ceiling observed. (Tab W-2)

#### XVIII. Directives and Publications

The following directives, publications and technical orders were applicable to the operation of the mission and the maintenance performed on the mishap aircraft.

1. Regulations and Manuals:

- a. AFR 60-1, Flight Management
- b. AFR 60-2, Aircrew Standardization/Evaluation Program
- c. AFR 60-16, General Flight Rules
- d. AFM 51-37, Flying Training Instrument Flying
- e. USAFER 51-1, Aircrew Ground Training
- f. USAFEM 51-50, Vols I and VIII, Tactical Fighter and F-16 Aircrew

Training

- g. USAFER 55-44, Life Support Program
- h. USAFER 55-27, Air Force Life Support Systems Program
- i. USAFER 55-116, F-16 Pilot Operational Procedures; Ramstein AB

Chapter 8 to USAFER 55-116

- j. USAFER 66-5, Combat Oriented Maintenance Organization
- k. DoD Flight Information Publication, General Planning
- l. DoD Flight Information Publication, Area Planning, Special Use

Airspace, Europe-Africa-Middle East

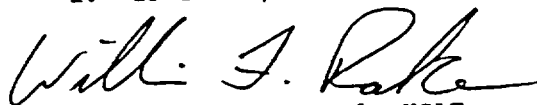
- m. 86 TFW In-flight Guide
- n. Operation PROVIDE COMFORT In-flight Guide

2. Technical Orders (T.O.):

- a. 1F-16C-1, F-16C/D Flight Manual
- b. 1F-16C-1CL-1, F-16C/D Checklist
- c. 1F-16C-6WC-1-11, Basic Postflight/Preflight, Launch, Recovery, and End of Runway Inspection
- d. 1F-16C-2-10JG-00-1, Aircraft Ground Safety Guide
- e. 1F-16C-12JG-00-1, Aircraft Ground Servicing Guide
- f. 1F-16C-34-1-1, Avionics and Non-nuclear Weapons Delivery Flight

Manual

- g. 1F-16C-34-1-1CL-1, Checklist Avionics and Non-nuclear Weapons Delivery Flight Crew Procedures
- h. 1F-16C-70FI-0011, Power Fault Isolation
- i. 1F-16C-6, Scheduled Inspections and Maintenance Requirements.



WILLIAM F. RAKE, Lt Col, USAF  
Accident Investigating Officer



### CERTIFICATION

As the investigation officer appointed to conduct this aircraft accident investigation, I certify that I have conducted a complete investigation of the facts of this accident under AFR 110-14.

The following originals were not included in the accident investigation report.

1. The originals of Tabs A through S were not forwarded to the Accident Investigation officer. Instead they were reportedly sent to Hq AFSA/SER Norton Air Force Base, California. Copies were provided to the Accident Investigation Officer.

2. Lt Colonel Snelgrove's Flight Records may be obtained by contacting the following offices:


a. Flight Data Records and History - 86th Wing, Flight Records Management Office, Ramstein Air Base, Germany

b. Flight Evaluation Folder - 526th Fighter Squadron, Standardization and Evaluation Section, Ramstein Air Base, Germany

c. Flying Training Records - 526th Fighter Squadron, Training Office, Ramstein Air Base, Germany

3. Lt Colonel Snelgrove's medical and dental records can be located at the 86th Medical Group, Flight Medicine and Dental Clinics respectively, Ramstein Air Base, Germany.

4. All maintenance documents of aircraft (F-16C, SN 85-1451) not included in the original copy of this report, all photo negatives provided to the investigating officer, and all other photocopied original documents can be located at the Office of the Staff Judge Advocate, 86th Wing Ramstein Air Base, Germany.



WILLIAM L. RAKE, Lt Col, USAF  
Accident Investigating Officer


I have reviewed the above referenced originals and certify that the copies contained herein are true and correct copies of the originals.



KEVIN P. KOEHLER, Capt, USAF  
Legal Advisor

LEGAL SUFFICIENCY REVIEW

I have observed and reviewed all aspects of this investigation and find it was conducted in a legally sufficient manner in accordance with AFR 110-14, AFR 120-4, and other applicable directives. Any information from the documents included in this report which would not be appropriate for release under the provisions of the Privacy Act has been deleted.

  
KEVIN P. KOEHLER, Captain, USAF  
Legal Advisor

## GLOSSARY OF TERMS

|                 |   |
|-----------------|---|
| AB              | Air Base  |
| ACES            | Advanced Concept Ejection System                                      |
| ADO             | Assistant Operations Officer  |
| AFM             | Air Force Manual  |
| AFSC            | Air Force Specialty Code  |
| AFTO            | Air Force Technical Order   |
| AGL             | Above Ground Level  |
| AOR             | (Turkish) Area of responsibility                                      |
| APC             | Armored Personnel Carrier   |
| AWACS           | Airborne Warning and Control System                                   |
| Bail Out        | The command to eject  |
| Beacon          | Emergency Locator Transmitter (ELT)                                   |
| BOOM            | Device used to transfer fuel from a tanker to another aircraft        |
| BPO             | Basic Postflight (Inspection)   |
| C-Model         | Single seat version of the F-16                                       |
| CAMS            | Core Automated Maintenance System                                     |
| CAP             | Combat Air Patrol   |
| CAPS            | Critical Action Procedures  |
| Capt            | Captain   |
| Combat Descent  | A rapid descent to lower altitude                                     |
| CPT             | Cockpit Procedural Trainer  |
| CTF             | Combined Task Force   |
| DNIF            | Duty Not to Include Flying  |
| DO              | Deputy Commander (Operations Officer)                                 |
| DOOT            | Deputy Commander for Operations, Life Support                         |
| Branch          |   |
| DOOV            | Deputy Commander for Operations Standardization and Evaluation Branch |
| DRF             | Disaster Response Force   |
| DTC             | Data Transfer Cartridge   |
| EOD             | Explosive Ordnance Disposal   |
| EPU             | Emergency Power Unit  |
| EOR             | End of Runway   |
| FCIF            | Flight Crew Information File  |
| FRAG            | Fragmentary order   |
| FS              | Fighter Squadron  |
| FTIT            | Fan Turbine Inlet Temperature   |
| Guard           | Universal distress frequency  |
| Hanging Harness | Parachute harness trainer   |
| HAS             | Hardened Aircraft Shelter   |
| Hit A Tanker    | Refuel  |
| HEI             | High Explosive Incendiary   |
| HUD             | Heads Up Display  |
| Hq              | Headquarters  |
| IAW             | In Accordance With  |
| IFR             | Instrument Flight Rules   |
| ILT             | Incirlik Local Time   |
| IMC             | Interim Message Change  |
| In.Hg           | Inches of mercury   |

|                           |  |
|---------------------------|--|
| IP                        | Instructor Pilot   |
| JFS                       | Jet Fuel Starter   |
| JINK                      | A small turn   |
| Knots                     | Nautical miles per hour  |
| K-Town                    | Turn point on standard PROVIDE COMFORT routing                           |
| Lt Col                    | Lieutenant Colonel   |
| Marked the Position       | Command to the inertial navigation system to remember a current position |
| MQT                       | Mission Qualification Training   |
| MR                        | Mission Ready  |
| MS                        | Mission Support  |
| NCOIC                     | Noncommissioned Officer in Charge  |
| NM                        | Nautical Miles   |
| NOTAM                     | Notice to Airmen   |
| O'Clock                   | Position expressed in relation to the face of a clock                    |
| OJT                       | On the Job Training  |
| OPS                       | Operations   |
| PAS                       | Protective Aircraft Shelter  |
| PAR                       | Precision Approach Radar   |
| Phase                     | Aircraft inspections accomplished after a certain amount of flying time  |
| Down to the Area          | A sortie into the TAOR   |
| Red Ball                  | Rapid maintenance response to repair an aircraft                         |
| RAPCON                    | Radar Approach Control   |
| RECCE                     | Reconnaissance   |
| RTB                       | Return to base   |
| RTU                       | Replacement Training Unit  |
| SA                        | Situational Awareness  |
| SAR                       | Search and Rescue  |
| SIF                       | Safety Information File  |
| SN                        | Serial Number  |
| SOF                       | Supervision of Flying  |
| SOFA                      | Status of Forces Agreement   |
| STEP                      | A time set to depart the squadron to fly                                 |
| STICK                     | Side-stick controller  |
| TACG                      | Tactical Group   |
| TAOR                      | Turkish Area of Responsibility   |
| TCTO                      | Time Compliance Technical Order  |
| Temporal Distortion       | Recollection as if in slow motion  |
| TU                        | Turkey   |
| Twenty-eight Twenty-eight | Frequency 282.8  |
| UPT                       | Undergraduate Pilot Training   |
| USAFE                     | United States Air Forces in Europe                                       |
| USAFER                    | United States Air Forces in Europe Regulation                            |
| USAFEM                    | United States Air Forces in Europe Manual                                |
| VFR                       | Visual Flight Rules  |
| VMC                       | Visual Meteorological Conditions   |
| VTR                       | Video Tape Recorder  |
| VUL Time                  | Vulnerability time   |
| Walk Around Inspection    | A cursory check of aircraft condition                                    |
| WG                        | Wing   |

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451  
ZULU

Flight management specialists  
Aircraft Serial Number 85-1451  
A time referencing Greenwich Meridian Time (GMT)