RAS. 5321 72-22-ISFSI — Applicant Exhibit 125 - Rec'd 7/1/02

AIRCRAFT ACCIDENT INVESTIGATION

Authority: Under the provisions of Air Force Regulation (AFR) 110-14, the Ninth Air Force Commander appointed Lieutenant Colonel Eugene A. Lutz to conduct an Aircraft Accident Investigation of the F-16C (SN 89-2061) accident which occurred 18 nautical miles southeast of Moody AFB, GA, on 4 April 1991. Technical advisors were Lieutenant Colonel Robert R. Kunkel (Medical), Captain Darrell M. Venture (Operations), Captain David A. Chapman (Maintenance), Captain Bernard A. Anderson (Legal), and Sergeant Robert D. Sentell (Administrative Support) (Y-2 to Y-7).

Purpose: An aircraft accident investigation is convened under AFR 110-14 to collect and preserve all relevant evidence for possible use in claims, litigation, disciplinary actions, adverse administrative proceedings, or for any other purpose deemed appropriate by competent authority. The investigation is to obtain factual information and is not intended to determine the cause of the accident. In addition, the aircraft accident investigation board cannot draw conclusions nor make recommendations. The report is available for public dissemination under the Freedom of Information Act (5 U.S.C. 552) and AFR 12-30.

## SUMMARY OF FACTS

1. History of Flight: On 4 April 1991, Captain William C. McGowan was scheduled as the pilot of the number four aircraft in a flight of four on two surface attack missions. Other members of the flight were Captain Vaylan L. Bradley (#1), Captain Christopher J. Walters (#2), and Captain Travis C. Byrom (#3). Filed under callsign Rally 11-14, the flight departed Moody AFB, GA at 1102 EST on their second sortie of the day to Lake George Range (A-1, K-3). Upon return from Lake George Range in a two-ship descent from 16,500 feet MSL, Rally 13/14 passed through a layer of clouds approximately 2,000-3,000 feet thick. When clear of the clouds, Rally 14 was told to assume a fighting wing formation position by his element leader (Rally 13). While assuming the formation position, Rally 14 perceived movement by Rally 13's aircraft toward him. During his resulting maneuvering to deconflict flight paths and to visually reacquire Rally 13, the mishap pilot believed the aircraft was not responding correctly or in response to his control inputs. He ejected safely and the aircraft crashed and was destroyed (V-3, V-5). The crash site was 18 nautical miles southeast of Moody AFB, coordinates 30 degrees 46.3 minutes north latitude, 82 degrees 56.6 minutes west longitude (A-1). The Moody AFB Public Affairs Office provided news releases (Z-2, Z-3).

2. Mission: The mission was scheduled and planned as surface attack continuation training for the flight members (K-3). The planned profile included single-ship takeoffs, rejoin into tactical formation, low-level navigation in single ship trail formation, a tactical attack at Lake George Range, additional range events, rejoin and flight to Grand Bay Range for strafe training and return to Moody AFB for landing (V-2).



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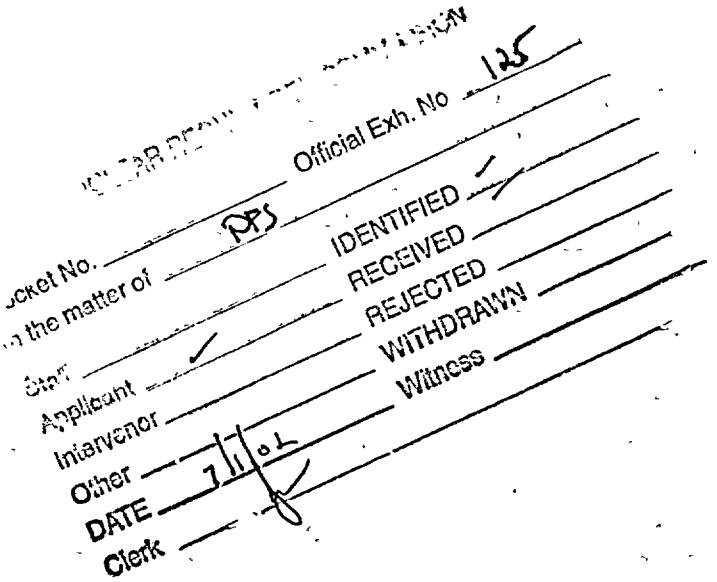
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3. Briefing and Preflight: Capt McGowan arrived for duty at approximately 0550. The other members of the flight all arrived at approximately 0600. All had adequate rest. The briefing commenced at approximately 0610. The briefing was comprehensive and flight members reported a clear understanding of planned events and their responsibilities (V-3, V-10). Three of the flight members, (#1, #2, #4) had flown together on a similar mission the day prior. Ground operations, taxi and pre-takeoff procedures were conducted without significant events on either the first or the second sortie (V-4, V-8, V-10).

4. Flight:

a. The first sortie for Rally flight was basically routine for all members of the flight. The mishap pilot reported the aircraft Code 2 after flight for an INS MFL 003 which was experienced on the ground after landing. The malfunction was not worked between flights due to the surge schedule and the mishap pilot reported normal alignment and operation of the INS on the second sortie (V-4). Therefore, further discussion of the first sortie will not be included in the remainder of this summary.

b. On the second sortie, Rally 11 flight took off at approximately 1102 EST. They rejoined on departure into tactical formation followed by a climb to enter a low-level route to Lake George Range. The flight encountered a scattered-to-thin, broken cloud deck from 2,000 to 3,000 MSL on departure. The flight descended, entered the low-level route and maintained visual meteorological conditions (VMC). After the low-level route, the flight performed a tactical attack at Lake George Range followed by individual range events. The flight rejoined into two elements of two aircraft for a battle damage check and then climbed to 16,500 feet MSL enroute to Grand Bay Range for strafe training. The flight lead obtained clearance for a descent through instrument meteorological conditions (IMC) from Moody RAPCON. Rally 12 and 14 rejoined with their leaders into close formation for the descent through IMC conditions which began at approximately 10,000 feet. When the aircraft were clear of the weather at approximately 7,000-8,000 feet MSL, the wingmen (Rally 12/14) were each instructed to maintain fighting wing formation position by their respective leaders (V-8, V-10). Rally 14 began a slow clearing turn to the right, away from Rally 13. At a distance estimated as 200-300 feet from his leader, Rally 14 perceived movement by Rally 13's aircraft towards him. Rally 14 began a hard turn away from Rally 13, unloaded the aircraft and performed a rolling 120 degree turn to the left in order to visually reacquire Rally 13 (V-2). The nose of Rally 14's aircraft dropped to a position approximately 40 degrees nose low. Rally 14 interpreted the nose drop as an abnormal condition and not commanded by himself. Rally 14 unloaded the aircraft, rolled to what he believed to be an upright condition and attempted to pull to straight and level flight. There was no nose movement as he anticipated (V-2). He unloaded the aircraft and pulled again on the stick with the same result. The flight path marker (FPM) in the heads up display (HUD) fell to approximately 65 degrees nose low. The pilot set the throttle to idle, extended the speed brakes and again pulled back on the stick. The pilot experienced roll-ratcheting by the aircraft. The FPM remained at a position 60-65 degrees nose low. Rally 14 believed ground impact was inevitable and ejected at approximately 1212 EST (V-2, V-6).

Using flight data obtained from the Crash Survivable Memory Unit (CSMU), graphs and HUD displays were developed by the AFR 110-14 board to pictorially represent that data (O-2 to O-5). CSMU data showed that after Rally 14 rolled 120 degrees to the left, he maintained positive G force on the aircraft and the nose moved to approximately 40 degrees nose low (O-2 to O-5). At that point, CSMU data showed Rally 14 unloaded the aircraft, rolled left to a near inverted position and exerted positive force on the stick with the nose falling to a near vertical position. Data showed Rally 14's flight path continuing as a vertical descending left spiral until ground impact (O-2 to O-5).

After ejection, Rally 14 landed in a tree and was able to climb down and contact Rally 11. He was guided to a road and clearing. Approximately two hours later, he was picked up by Georgia County Sheriffs and taken to a Moody AFB ambulance for transport back to Moody AFB (V-3).

5. Impact: The aircraft impacted in an unpopulated area approximately 18 nautical miles southeast of Moody AFB (P-1). The aircraft was destroyed upon impact (M-1, M-2).

6. Ejection Seat: The ejection seat functioned normally (V-3), but was not recovered (V-14).

7. Personal and Survival Equipment: All inspections of the mishap pilot's personal and survival equipment were current (U-3). The red lanyards for the parachute four-line-jettison were not extended far enough for the pilot to perform a four-line-jettison. Locator beacon and survival radio functioned normally. The mishap pilot used a day flare, compass, and survival mirror to aid in his location and recovery. All functioned normally (U-3).

8. Crash Response: Moody AFB tower activated the crash net at 1217 EST. Visual contact with Capt McGowan was maintained by Rally 11 and by two additional F-16 aircraft. The mishap pilot was picked up by Georgia County Sheriffs approximately two hours after the mishap and delivered to a Moody AFB ambulance for transport back to Moody AFB. The Disaster Control Group was activated at 1232 EST and the Disaster Response Force (DRF) was formed. The DRF initially had difficulty locating the exact crash site due to site inaccessibility. Private landowner earth moving equipment cut a fire break at the crash site and the crash fire extinguished itself. The impact site was initially secured by local law enforcement agencies and then turned over to the 347th Security Police. Lieutenant Colonel James P. Blanco, 347 CSG/CD was the on-scene commander (V-15).

9. MAINTENANCE DOCUMENTATION: A thorough review of maintenance records for aircraft 89-2061 revealed no discrepancies related to the mishap (H-1 to H-4). There were no overdue time compliance technical orders (TCTO) or time change items (TCI) found for the aircraft or engine (H-6). All scheduled inspections

were completed with no discrepancies identified (U-2). The equipment review report identified no overdue inspections (U-2). Oil analysis reports were reviewed and revealed no abnormalities.

10 MAINTENANCE PERSONNEL AND SUPERVISION: Preflight and servicing were reviewed with no discrepancies noted. Individual training records were reviewed with no discrepancies noted. Training records for the individual performing the servicing and quick turn on the aircraft prior to the mishap flight were not available due to PCS (H-7).

11. FLUID SAMPLE ANALYSIS: A review of the oil analysis revealed no abnormalities. Fuel and liquid oxygen testing revealed samples were satisfactory for use. The tested nitrogen sample failed to meet specifications for use. This failure was questioned due to the use of an oxygen sampler to perform the test (O-6 to O-11).

12. AIRFRAME AND AIRCRAFT SYSTEMS:

a. Flight Control System: The mishap pilot reported unanticipated stick response and abnormal flight control indications during the mishap sequence. The mishap pilot reported no abnormal flight control response prior to the sequence and reported no flight control warning or caution lights prior to or during the mishap sequence (V-6). Analysis of the mechanical actuation system of the flight control surfaces indicated no abnormalities in the flight control system (J-2).

b. Hydraulic System: Analysis of the hydraulic system indicated there were no abnormalities during the flight (J-2).

c. Engine: The mishap pilot reported no engine abnormalities during the flight (V-4). Analysis of the engine components and the CSMU engine data revealed that the engine was operating at slightly above idle at the time of impact (J-2).

d. Fuel System: The mishap pilot reported no abnormalities with the fuel system during the flight (V-4).

13. OPERATIONS PERSONNEL AND SUPERVISION: The mission was conducted under the authority of the 347 TFW and 68 TFS (K-3). The briefing was conducted by Captain Bradley using the 347 TFW Briefing Guide and was thorough and complete (V-3, V-10).

14. PILOT QUALIFICATIONS: Capt McGowan was current and qualified to conduct the mission (G-2, G-4). His flying experience is as follows:

| Aircraft | Hours |
|---|---|
| F-16 | 257.8 |
| AT-38 | 38.8 |

| 30/60/90 Day Summary | Sorties/Hours |
|---|---|
| 30 Day | 19/25.9 |
| 60 Day | 39/55.1 |
| 90 Day | 49/68.0 |

15. MEDICAL: Capt McGowan was medically qualified to fly the mission (T-4).

16. NAVIGATION AIDS AND FACILITIES: All applicable navigation aids were operational.

17. WEATHER: The Moody AFB weather forecast for the time period from takeoff until the mishap was 1500 feet scattered, 8000 feet scattered and 25000 feet scattered, 7 miles visibility, and winds from the northeast at 7 knots. Light turbulence was forecast from the surface to 5000 feet with rainstorms in the vicinity (W-2). A weather observation taken approximately 20 minutes after the mishap reported a measured 3500 broken, 5000 broken, 9000 broken and visibility 7 miles. The wind was southeast at 10 knots and no rainstorms were in the vicinity (W-3).

18. DIRECTIVES AND PUBLICATIONS:

a. Directives and publications applicable to the mishap were:

(1) AFR 60-16, General Flight Rules.

(2) AFM 51-37, Instrument Flying.

(3) TACR 55-116, F-16 Pilot Operational Procedures.

(4) TACR 55-116/MAFB Sup 1, Local Operational Procedures.

(5) TACM 3-3, Mission Employment Tactics, Fighter Fundamentals.

(6) T.O. 1F-16CG-1, Flight Manual.

(7) T.O. 1F-16C-CL-1, Flight Manual Checklist.

(8) 347 TFW Briefing Guide.

(9) Det 1, 4444 Ops Sq Replacement Training Unit (RTU) Manuals.

b. In light of the pilot's testimony concerning the mishap sequence (V-2, V-5, V-6), the board researched directives which deal directly with use of the HUD under such circumstances. The directives found to be pertinent to this investigation were as follows:

(1) AFM 51-37 which addresses the relationship between reliance on the HUD and situational awareness and pilot workload, as well as problems which may arise therefrom (O-12).

(2) A 4444 Operations Squadron RTU manual which addresses the use of the HUD during instances of spatial disorientation, unusual attitude recoveries, lost wingman maneuvers, and for large performance transients (O-13).

(3) A different 4444 Operations Squadron RTU manual which addresses the benefits of using the HUD with regard to pilot workload and precision, flight safety, and aircraft control, as well as purported drawbacks of its use (O-19).

(NOTE: Captain McGowan received RTU training with 4444 Operations Squadron manuals.)

EUGENE A. LUTZ, Lt Col, USAF
AFR 110-14 Aircraft Accident Investigation Officer

## GLOSSARY

NOTE: Acronyms, jargon and terms are explained in the context in which they appear in the report. The application of these definitions may not be universal and may be limited to this report.

AB - Afterburner.

ADI - Attitude Director Indicator.

AFB - Air Force Base.

AFM - Air Force Manual.

AFR - Air Force Regulation.

AFTO - Air Force Technical Order.

AGL - Above Ground Level.

AMD - Acceleration Measuring Device.

AMU - Aircraft Maintenance Unit.

AOA - Angle of attack; Angular difference between the longitudal axis of the aircraft and the flight path.

BDU - Bomb, Dummy Unit (Practice Bomb).

Beacon - Emergency locator transmitter.

Broken - A cloud layer covering more than 60 percent of the sky.

CAP - Captive Missile.

CART - Explosive cartridge, electrically fired to jettison.

CD - Deputy Commander.

Ceiling - A cloud deck broken or overcast.

Corner - Airspeed at which an aircraft can perform its tightest turn.

CSMU - Crash Survivable Memory Unit.

Curvilinear - A type of bombing pattern in which the flight path is continually changing.

Declutter - Remove unwanted flight information from the HUD using cockpit switches.

DRF - Disaster Response Force.

ECM - Electronic Counter Measures.

ELT - Emergency Locator Transmitter.

EOD - Explosive Ordnance Disposal.

EPU - Emergency Power Unit.

EST - Eastern Standard Time.

FDR - Flight Data Recorder.

Fighting Wing - A formation position allowing the wingman freedom to maneuver on his leader.

Fingertip Formation - Very close formation position.

FL - Flight Level.

FLCS - Flight Control System.

FPM - Flight Path Marker.

FWIC - Fighter Weapons Instructor Course.

G - Gravity; the acceleration forces imposed by maneuvering an aircraft.

Grunt - Muscle straining maneuver to combat G forces.

Guard - (Radio channel) Standard emergency radio frequency

HUD - Heads Up Display.

IFR - Instrument Flight Rules.

IMC - Instrument Meteorological Conditions (generally in clouds, fog or precipitation).

INS - Inertial Navigation System.

Knock It Off - A radio call used to stop maneuvering by all aircraft.

LANTIRN - Low Altitude Night Terrain Infrared Navigation.

Large Performance Transients - Large or abnormal changes to aircraft engine characteristics or parameters

MFL - Maintenance Fault List.

MOA - Military Operating Area.

MSL - Mean Sea Level.

NAV - Navigation.

NM - Nautical Mile.

RAPCON - The facility containing radar equipment and controllers.

Ratcheting - Jerky movement of the aircraft nose.

RESCAP - Rescue Combat Air Patrol; providing rescue functions while airborne.

Round(s) - Amount of 20mm gun ammunition.

Route Formation - Wide spaced formation.

RPM - Revolutions Per Minute.

RTB - Return to Base.

RTU - Replacement Training Unit; Unit instructing advanced flying training.

Scattered - A cloud layer covering less than half the sky.

SUU - Suspension Unit Utility (SUU)-20; Practice bomb dispenser.

TAC - Tactical Air Command.

TACM - Tactical Air Command Manual.

TACR - Tactical Air Command Regulation.

TCTO - Time Compliance Technical Order.

TER - Triple Ejection Rack.

Terminate - A radio call used to stop maneuvering by an individual or flight.

TFS - Tactical Fighter Squadron.

Trail - A formation flown at a specified distance behind other aircraft.

UHF - Ultra High Frequency.

Unload - Reduce G load on the aircraft and pilot.

VFR - Visual Flight Rules.

VHF - Very High Frequency.

VR - Visual Route.