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ADJUDICATIONS STAFF



# AIRCRAFT ACCIDENT INVESTIGATION

## F-16C #85-1490

MISAWA AB, JAPAN

14 APRIL 1992

*Lt Col David L. Hoglund  
Aircraft Accident Investigator*

NUCLEAR REGULATORY COMMISSION

Docket No. \_\_\_\_\_ Official Exh No. 211  
In the matter of PKS  
Staff \_\_\_\_\_ IDENTIFIED   
Applicant  RECEIVED   
Intervenor \_\_\_\_\_ REJECTED \_\_\_\_\_  
Cont'g Off'r \_\_\_\_\_  
Contractor \_\_\_\_\_ DATE 7/1/02  
Other \_\_\_\_\_ Witness \_\_\_\_\_  
Reporter EM



DEPARTMENT OF THE AIR FORCE  
PACIFIC AIR FORCES



FROM: CINCPACAF/CC  
25 E ST STE G214  
Hickam AFB, HI 96853-5420

28 DEC 1992

SUBJ: AFR 110-14 Report of Investigation, F-16C, 85-1490, Accident of 14  
April 1992

TO: 5 AF/CC

The subject report of investigation is approved.

  
JIMMIE V. ADAMS, General, USAF  
Commander-in-Chief

AIRCRAFT ACCIDENT INVESTIGATION UNDER AFR 110-14  
MISAWA AIR BASE, JAPAN

1. Statement of Authority and Purpose:

On 20 August 1992, by authority of Air Force Regulation 110-14, the Vice Commander-in Chief, Pacific Air Forces, appointed Lt Col David L. Hogle to investigate the aircraft accident which occurred on 14 April 1992 during which an F-16C (# 85-1490) assigned to Misawa AB, JA jettisoned two 370 gallon fuel tanks into Lake Ogawara while preparing for an emergency landing. By the same authority Captain John K. Weis is appointed as legal advisor for the investigation (TAB Y).

2. Summary of Facts:

a. History of Flight:

On 14 April 1992, four F-16C aircraft from the 432 Fighter Wing, 13th Fighter Squadron were scheduled to takeoff from Misawa AB at 0700I (local time is Zone I), drop practice bombs on Ripsaw range, practice surface attack tactics, and return to Misawa AB. The call signs of the aircraft were Voodoo 01-04. Several minutes after takeoff, 1Lt Clay W. Hall, the pilot of Voodoo 04, determined the need to perform an emergency landing. Voodoo 04 jettisoned fuel tanks and safely landed at Misawa AB.

Misawa AB and local media were involved in reporting the accident. Japanese media interest was high (TAB AA).

b. Mission:

Mission was a four aircraft simulated weapons delivery sortie to Ripsaw Range. Planned ordnance was six BDU-33, practice bombs, per aircraft.

c. Briefing and Preflight

The mission briefing was conducted by the flight leader and started at 0450I. Briefing covered all applicable items of the mission in accordance with AFR 55-116. Voodoo 04 stated he had 12 hours crew rest per AFR 60-1.

Pilot preflight inspections were normal, and all aircraft started at 0635I. Voodoo 04 shut down for a minor unrelated maintenance item. Voodoo 04 restarted and taxied for takeoff with all systems operating normally.

d. Flight Activity:

The flight tookoff at approximately 0715I, with 15 second spacing between aircraft. Takeoff was to the east on runway 10 followed by a left turn to the west. Approximately 2 minutes after takeoff while closing to join the other aircraft, Voodoo 04 noted an Engine Lube Low warning. At the time, Voodoo 04 was 1500' above sea level and 2 miles north of the field. After informing the flight leader, he started a left turn toward Misawa AB. Anticipating imminent engine failure and a heavyweight landing on a damp runway, Voodoo 04 cleared below his flight path and jettisoned his two external fuel tanks into a lake. Voodoo 04 maneuvered for an emergency landing pattern and landed uneventfully. Following postflight ground checks, Voodoo 04 shut down the engine. The aircraft was impounded and a maintenance investigation was accomplished (TAB V-4-A).

e. Impact:

Two 370 gallon fuel tanks, approximately 75% full, were jettisoned into Lake Ogawara. Impact occurred approximately 3 miles northwest of Misawa (N 40° 45.0', E 141° 20.0').

f. Ejection Seats: Not Applicable.

g. Personal and Survival Equipment: Not Applicable.

h. Rescue: Not Applicable.

i. Crash Response:

The 432nd FW Command Post was notified of the mishap within minutes and reported details to higher headquarters within an hour. By 0900 on the day of the mishap Misawa AB search parties and clean up crews were on the scene near Kamikita Beach. Initial efforts focused on fuel clean up, followed by tank debris recovery. The first pieces of the tanks were recovered by divers from the 39th Air Rescue Squadron on Thursday, 16 April. Throughout the weekend, efforts to recover the tanks were not possible due to inclement weather. On 21 April boats from the Ogawara Fishery Union set out to search for the tanks. That day tank debris was recovered from two areas of the lake. Approximately 75% of the tank debris is estimated to have been recovered. Reports of the recovery efforts are at TAB BB-3,4.

j. Maintenance Documentation:

The aircraft maintenance records (AFTO Form 781) were not available nor deemed necessary for the investigation. However a three month Maintenance History Inquiry for the mishap aircraft revealed only routine maintenance and no history of engine oil problems (TAB U).

Though not confirmed, the investigation indicated no open discrepancies in the AFTO Form 781 or any unaccomplished Time Compliance Technical Orders changes on the aircraft that would have any bearing on the mishap.

k. Maintenance Personnel and Supervision:

The ground crew who launched the mishap aircraft was SSgt Roddrick L. Jackson, a 7 skill level, 45254B, fully qualified F-16 crew chief with five years of F-16 experience, assigned as the dedicated crew chief on the mishap aircraft. He stated (TAB V-4-A) he inspected the engine oil reservoir sight gauge on the right side of the engine before engine start and noted a reading of 37 half pints (the gauge reads from 32 to 44 half pints) and he noted approximately the same after start.

The maintenance investigator, MSgt Robert Pino (TAB V-4), and Mr Dan Bowman (TAB V-2), a technical representative for General Electric, the manufacture of the engine stated the oil sight gauge is not always an accurate reading of engine oil reservoir level. Prior to start, the reading may be high and after start the reading may drop depending on temperature and power setting. Also engine oil levels vary with engines because some engines draw and return oil to the reservoir at different rates. Both stated the best indication of oil level occurs 5 to 30 minutes after shutting down an engine that has run at least 10 minutes at or above 80% power. This procedure has been mandated by the 432 FW (TAB BB)

The maintenance investigator stated the last documented hot oil reading was 41 half pints and occurred on 4 Apr 92, ten days prior to the incident. During this time, the aircraft had an engine fuel component replaced and the aircraft had been used as a weapons load trainer. The engine had been run 2.3 hours but oil readings were not documented. It is possible an under servicing condition could have occurred during this period, but not have been noted by the crew chief or pilot on the morning of the mishap.

The maintenance investigator checked the aircraft after landing and the sight gauge read 32 half pints (the bottom of the gauge) and he noted no visible oil leakage. After running the engine for 20 minutes the investigator noted the oil level decreased below 32 half pints and then returned to approximately 32 half pints.

The mishap aircraft was then serviced with 9 half pints of oil and read 41 half pints on the sight gauge. Two one-hour engine runs were accomplished, with oil readings above 39 half pints at all power settings. Oil levels at each shut down were 41 half pints. The aircraft then flew a one hour operational check flight and had an oil level of 41 half pints on landing.

From this information the maintenance investigator concluded the aircraft was not leaking oil and that it was under serviced by 9 half pints of oil.

- l. Engine, Fuel, Hydraulic, and Oil inspection Analysis: Not Applicable
- m. Airframe and Aircraft Systems:

The F-16C engine has a system called the Engine Monitoring System (EMS) that records engine data. This "data save" occurs when initiated by the pilot, when the EMS detects an engine anomaly, or when initiated by the ground crew. This data can be printout out by a ground terminal and samples from the mishap aircraft are at TAB V-4-A.

An Engine Lube Low warning occurs when a sensor in the engine oil reservoir senses 1.1 gal or 17.6 half pints of oil for 15 seconds. This sensor also causes the EMS to record engine data when it activates the Engine Lube Low warning. Engine Lube Low warnings are not common, and the General Electric tech rep reported the only Engine Lube Low fault at Misawa AB from Sep 91 to Sep 92 occurred on the mishap aircraft.

The maintenance investigator found at engine start an unrelated fault initiated the EMS resulting in a reading of 1.24 gal or 19.8 half pints of oil. When the Engine Lube Low warning occurred on the day of the mishap, the EMS recorded readings of between .75 and .91 gal or 14.6 and 16 half pints of oil (TAB V-4-A).

When the maintenance investigator ran the engine immediately after the incident, the EMS recorded readings of 1.65 to 1.83 gal or 26.4 to 29.3 half pints depending on the power settings. After servicing 9 half pints of oil (41 half pints on the sight gauge) and doing two engine runs, the EMS recorded between 2.26 to 2.6 gal or 36.2 to 41.6 half pints depending on the power setting.

Again, both the maintenance investigator and the General Electric tech rep stated the EMS data from the oil reservoir sensor, like the oil sight gauge can vary depending on aircraft maneuvers, oil temperature and circulation, and sensor inaccuracies. The pilot stated he was in approximately wings level, unaccelerated flight when the Engine Lube Low warning came on.

These inaccuracies are demonstrated by the four low and slightly different readings that triggered the Engine Lube Low warning at 0718:32. However after servicing 9 half pints of oil (41 half pints on the sight gauge) the EMS reading did approximate the reading on the sight gauge. This has led the investigators to believe the oil reservoir level sensor reads correctly at high reservoir levels. However at low reservoir levels the reservoir sensor and thus the Engine Lube Low warning may be reading lower than the sight gauge. However this supposition could have only been confirmed by bench testing the level sensor at the time of the incident.

In conclusion, evidence indicates the Engine Lube Low warning came on because of low servicing or sensor inaccuracies or both.

- n. Operations Personnel and Supervision: Not a factor.
- o. Crew Qualifications:

The pilot was fully qualified and mission ready for the flight with a current mission qualification certification (TAB G).

The pilot had approximately 290 hrs in the F-16 and 519 hours of total flying time. He had flown the F-16 for 22 months and had been assigned to Misawa for 16 months. In the previous 30, 60, and 90 days he had flown 19, 35, 46 sorties and 33.9, 62.3, 79.7 hours respectively. His senior supervisor, the operations officer for the 13th FS, stated he is a good pilot who was well qualified for the mission (TAB V-2).

- p. Medical:

The pilot was medically qualified to fly the mission. No postflight medical examination was accomplished.

- q. Navaids and Facilities:

All flight facilities and navigational aids affecting the flight were operating properly and did not contribute to this mishap.

- r. Weather:

The complete Misawa AB weather observations are at TAB W. The weather at the time of the mishap was 37 degrees F with scattered clouds at 1500' and 2500' and a broken ceiling at 3500', with visibility of 14 miles. Sunrise was 0458I. A rain shower had passed over the base before engine start.

- s. Directives and Publications:

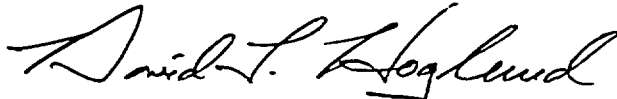
AFR 60-1	Flight Management
AFR 55-116	F-16 Pilot Operational Procedures
T. O. 1 F-16C-1	Flight Manual

The F-16 flight manual stresses the importance of monitoring the aircraft oil system. The pilot stated he checked the engine oil reservoir sight gauge on the right side of the engine before start and noted a normal reading. He also stated his habit before taxiing is to confirm with the ground crew chief that oil is reading normally in the sight gauge. Prior to takeoff, the pilot had no indication of engine oil system malfunctions. Approximately two minutes after takeoff the pilot saw an Engine Lube Low warning.

The flight manual and flight crew checklist states the warning light is an indication of less than normal oil quantity and possible engine failure. It further recommends immediate landing at the nearest suitable field and jettison of stores or fuel tanks in preparation for emergency landing. The operations officer of the 13th FS stated the pilot executed the proper procedures during the emergency situation.

No deviation from the directives occurred.

t. Signature:



DAVID L. HOGLUND, Lt Col, USAF  
Aircraft Accident Investigator



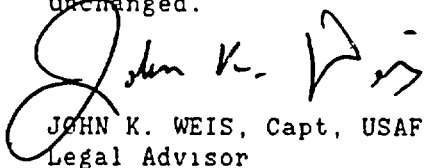
03 OCT 1992

SUPPLEMENTAL STATEMENT

1. Documents contained in Tabs A through BB were provided by the various witnesses and the officer who conducted the safety investigation which immediately followed this incident, with the following exceptions: all flight records at Tabs G and T, and the weather observations at Tab W, which were obtained by Capt Randy Lane, 14 FS, who assisted in this later investigation. The flight records were obtained from 13 FS, and the weather observations from 432 OSS. Mr Shoichi Ichisawa, 432 FW/JA compiled the extracts from the local media. Mr Ichisawa also translated the weather observations from the original Kanji. TSgt David Driskell, 432 OSS, provided additional explanations for individual headings and information on the weather observation charts.

2. Documents at Tabs A, G, T, and W are copies of original documents which have been retained by the custodians at the originating agency from which each was obtained. I have examined all copies and verify that they are true and accurate duplicates of original documents.

3. As required by AFR 110-14, Atch 1, para 3(e), all reference to social security numbers and 'For Official Use Only' have been deleted. Except for the required deletions noted above, these documents have been included unchanged.

  
JOHN K. WEIS, Capt, USAF  
Legal Advisor

57375

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