

RAS 5347

AAS 72-22-ISFSI - Applicant Exhibit 154

57

# AIRCRAFT ACCIDENT INVESTIGATION REPORT PART I

Rec'd 7/1/02



DOCKETED  
USNRC

2003 JAN 17 PM 1:36

OFFICE OF THE SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

**F-16C SN 86-0275  
AND  
F-16C SN 87-0335**

**ASSIGNED TO**

**8TH FIGHTER WING (PACAF)  
KUNSAN AIR BASE, REPUBLIC OF KOREA  
27 JULY 1993**

**CONDUCTED IN ACCORDANCE WITH AFR 110-14**

**APPOINTING AUTHORITY:  
ROBERT L. RUTHERFORD  
GENERAL, USAF  
COMMANDER, PACAF  
HICKAM AFB, HI 96853-5420**

**SUBMITTED BY:  
THOMAS A. ORAM  
LIEUTENANT COLONEL, USAF  
DEPUTY COMMANDER  
354TH OPERATIONS GROUP  
EIELSON AFB, AK 99702-1805**

PFS Exh. 154

57754





DEPARTMENT OF THE AIR FORCE  
PACIFIC AIR FORCES



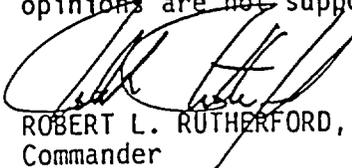
26 NOV 1993

FROM: PACAF/CC  
25 E Street, Ste G214  
Hickam AFB, HI 96853-5420

SUBJ: AFR 110-14 Report of Investigation, F-16C, SN 86-0275 and SN 87-0335

TO: 7 AF/CC

The subject report of investigation is approved except for the Investigating Officer's opinions that the pilot of Slap 02 violated the approach procedures contained in Air Force Regulation 60-16 and that the control tower watch supervisor failed to maintain situational awareness since these opinions are not supported by clear and convincing evidence.

  
ROBERT L. RUTHERFORD, General, USAF  
Commander

57755

AIRCRAFT ACCIDENT INVESTIGATION  
CONDUCTED IN ACCORDANCE WITH AFR 110-14

F-16C S/N 86-0275 AND F-16C S/N 87-0335  
8TH FIGHTER WING  
KUNSAN AIR BASE, REPUBLIC OF KOREA

INVESTIGATING OFFICER  
LIEUTENANT COLONEL THOMAS A. ORAM

1. STATEMENT OF AUTHORITY AND PURPOSE

a. Lieutenant Colonel Thomas A. Oram was appointed Investigating Officer by General Robert L. Rutherford, Pacific Air Forces Commander on 18 Aug 93 under the authority of Air Force Regulation (AFR) 110-14, Investigations of Aircraft, Missile, and Nuclear and Space Accidents, dated 15 Dec 89, for investigation of an aircraft accident that occurred on Tuesday, 27 Jul 93, on the approach end of Runway 36 at Kunsan Air Base (AB), Republic of Korea (ROK), involving F-16C, Serial Number 86-0275 and F-16C, Serial Number 87-0335. Five technical advisors were also appointed to assist in the investigation: Major Douglas W. Freeman, 8 OG/QA, Maintenance Advisor; Major Jay A. Clemens, 31 SOS/SGP, Flight Surgeon and Medical Advisor; Captain Douglas J. Fogle, 80 FS/SELO, Pilot Advisor; Captain Deborah L. Collins, 51 WG/JA, Legal Advisor; and Captain Ricky L. Smith, 3 OSS/DOFC, Air Traffic Control Advisor.

b. The documents appointing the investigating officer and technical advisors are at Tab Y. The investigation officially began 30 Aug 93.

c. The purpose of this accident investigation, according to AFR 110-14, is to obtain and preserve all available evidence for use in claims, litigation, disciplinary action, adverse administrative proceedings, and for all other purposes deemed appropriate by competent authority. This accident report is not privileged and is releasable in accordance with AFR 110-14, paragraph 12.

d. The times addressed in this report of investigation are Korean local times unless otherwise stated.

e. A glossary of acronyms and abbreviations is provided at Tab FF.

## 2. SUMMARY OF FACTS

### a. HISTORY OF FLIGHT

(1) On 27 Jul 93 at 3:31 PM, a United States Air Force F-16C, Block 30, Serial Number 86-0275, call sign "Slap 02," collided with a United States Air Force F-16C, Block 30, Serial Number 87-0335, call sign "Stingray 01," at 35 degrees 53 minutes 30 seconds north latitude, 126 degrees 37 minutes 5 seconds east longitude on the approach end of Runway 36, Kunsan AB, ROK, fatally injuring the pilot of Stingray 01. Lieutenant Colonel Ralph E. Gardner, a United States Air Force pilot assigned as the Chief of Safety, 8th Fighter Wing, Kunsan AB, ROK, was the pilot of Stingray 01. Slap 02 was flown by Captain Richard D. LeBlanc, a United States Air Force pilot assigned to the 35th Fighter Squadron, 8th Operations Group, 8th Fighter Wing, Kunsan AB, ROK. (Tabs A-1, C-1, and 2) Slap 02 was returning from his second flight of the day, a training mission that originated at Kunsan AB at 2:34 PM. Stingray 01 was just beginning the takeoff roll for his second flight of the day, a single-ship training mission, when the mishap occurred. (Tabs V-1, 2, 3, and EE-26)

(2) Stingray 01's intended route of flight was an Instrument Flight Rules (IFR) departure to the northeast to Visual Meteorological Conditions (VMC), then direct to Osan AB, ROK, for practice instrument approaches followed by an instrument recovery back at Kunsan AB (Tabs V-7, 74, and AA-2).

(3) The route flown by Slap 01 flight on the mishap sortie was from Kunsan AB to approximately 50 miles southeast of the base, then direct to Military Operating Area (MOA) 15 and MOA 16. Recovery from the operating areas was direct to Julop, the Initial Approach Fix (IAF), for the Aircraft Surge Launch And Recovery (ASLAR), Instrument Landing System (ILS) for Runway 36, the active runway at Kunsan AB. Captain LeBlanc was the pilot of the number two aircraft in Slap 01 flight, a formation of two F-16s. (Tabs O-14, 37, 38, V-1, 2, AA-1, and EE-26)

(4) Stingray 01 was configured with one 300 gallon and two 370 gallon external fuel tanks, a captive AIM-9 air-to-air training missile, an acceleration monitor assembly pod, two TER-9/A triple ejector bomb racks, 30 RR-170 chaff bundles, and 387 rounds of 20 millimeter target practice ammunition. Gross weight at takeoff was 34,439 pounds. (Tab L-1)

(5) Ground operations to include engine start and taxi for Stingray 01 were normal. After receiving takeoff clearance from the control tower, Stingray 01 taxied onto Runway 36, accomplished an engine run-up check, selected afterburner, and began his takeoff

roll. Shortly after brake release on takeoff roll, Slap 02 while attempting to land, collided with Stingray 01, fatally injuring the pilot of Stingray 01. (Tabs A-1, V-4, 46, 47, X, BB-3, and EE-37)

(6) Slap 02 was configured with one 300 gallon external fuel tank, a captive AIM-9 air-to-air training missile, an acceleration monitor assembly pod, two empty LAU-129 air-to-air missile launchers, two CATM-88/A captive air-to-ground training missiles, 30 M-206 flares, 30 RR-170 chaff bundles, and 511 rounds of 20 millimeter target practice ammunition. Gross weight at takeoff was 30,760 pounds. (Tab L-2)

(7) Engine start, taxi, and takeoff were uneventful for Slap 01 flight. The flight departed Kunsan AB and proceeded at medium altitude to practice High-speed Anti-Radiation Missile (HARM) employment tactics against a surface-to-air missile site located approximately 50 miles southeast of Kunsan AB. Weather conditions in the briefed training area were not suitable for the primary mission. Slap 01 coordinated with Airedale, the military radar control agency, for MOAs 15 and 16 to accomplish an approved alternate training mission. Slap 01 flight proceeded at medium altitude to their assigned MOAs. Upon entering the airspace, multiple intercepts were accomplished between Slap 01 and Slap 02 with both aircraft exchanging roles as the target aircraft and the interceptor aircraft. Departing the training airspace, Slap 01 passed the flight lead responsibilities to Slap 02, who led the flight back through Julop, the IAF, for an ASLAR ILS approach and landing at Kunsan AB. During the landing portion of the approach, Slap 02 collided with Stingray 01. Following the collision, the pilot of Slap 02 successfully ejected from his aircraft. (Tabs A-1, V-1, 2, 64, and O-30)

(8) Both aircraft skidded down the runway following the collision and came to rest approximately 1600 feet apart. Stingray 01 was totally engulfed in flames just off the runway surface to the west while Slap 02 was just east of the runway with a small fire at the tail of the aircraft. (Tabs R-1, S-1, V-36, and 37)

(9) Immediately following the collision, the flight data controller in the control tower activated the primary crash net, initiating the response of base crash, fire, and rescue personnel (Tab V-4).

(10) Weather conditions at the time of the collision were poor. Forecast weather indicated a scattered deck of clouds at 500 feet above the ground with a 1500 foot ceiling and 1 1/2 miles visibility with rain showers. An observation taken by base weather personnel within five minutes of the mishap generally confirm the

forecast with a slightly higher ceiling of 1800 feet. (Tab O-25) Statements by personnel witnessing the mishap estimated the ceiling at 300 to 500 feet and visibility at 1 mile (Tabs V-1, 3, 4, 10, and 46).

(11) The collision occurred on the approach end of Runway 36 at Kunsan AB, which is Korean government land utilized by United States Air Force personnel pursuant to an agreement between the United States and the Republic of Korea. Both aircraft were assigned to the 35th Fighter Squadron (35 FS), 8th Operations Group (8 OG), 8th Fighter Wing (8 FW), 7th Air Force (7 AF), Pacific Air Forces (PACAF). (Tab A-1)

(12) The 8th Fighter Wing Public Affairs Office at Kunsan AB was notified of the mishap at 3:35 PM, via the secondary crash net. They, in turn, notified 7th Air Force Public Affairs at 4:00 PM. At 4:24 PM, United States Forces Korea (USFK) directed all inquiries be handled through 7th Air Force. A total of four news releases were made by 7th Air Force. The third release, dated 28 Jul 93, identified Lieutenant Colonel Gardner as a fatality in the mishap. (Tab EE-39)

b. MISSION

(1) Stingray 01 was scheduled as the flight lead of a two-ship formation of F-16 aircraft. The purpose of Stingray 01's scheduled mission was to train and maintain pilot proficiency in performing Close Air Support (CAS). (Tab K-4) However, prior to taxiing, the weather deteriorated below Stingray 02's weather minimums causing his sortie to be cancelled. Now a single F-16, Stingray 01's mission changed to his planned alternate instrument proficiency sortie (Tabs O-30 and V-74). Stingray 01's alternate mission was to train and maintain proficiency in instrument flying to include departure, enroute, arrival, and approach procedures, and to accomplish flying training requirements in accordance with Multi-Command Regulation (MCR) 51-50. (Tabs O-30, V-74, and EE-18)

(2) Slap 02 was the wingman of a two-ship formation of F-16s. The purpose of Slap 02's mission was to train and maintain pilot proficiency in performing Suppression of Enemy Air Defenses (SEAD). (Tabs K-4 and EE-29) Slap 01 flight was to accomplish this by practicing HARM employment tactics against a surface-to-air missile site southeast of Kunsan AB. Weather in the area of the missile site prevented the planned training and the flight reverted to its alternate intercept mission. The alternate mission's purpose was to accomplish radar and infrared missile defensive tactics and was accomplished in accordance with local directives. (Tabs O-30, V-1, and 2)

c. BRIEFING AND PREFLIGHT

(1) Lieutenant Colonel Gardner's activities in the days prior to the mishap were uneventful with no disruptions to his normal work-rest cycle. On 26 Jul 93, the day prior to the mishap, he reported for duty at approximately 7:00 AM and had a typical workday with his last official duty accomplished at 4:00 PM, when he attended a wing staff meeting. Following the staff meeting he attended an awards ceremony at the Officers Club where he consumed one beer with friends and then departed at 7:00 PM. On the day of the mishap, Lieutenant Colonel Gardner reported to the squadron at 7:30 AM in preparation for his two missions that day. (Tabs V-9 and 74)

(2) Captain LeBlanc's activities were typical of his normal lifestyle with no disruptions to his regular work-rest cycle. On the day prior to the mishap he departed the squadron at approximately 5:30 PM, arriving at the Officers Club a short time later. Prior to departing the Officers Club at 9:30 PM, Captain LeBlanc consumed two beers with dinner. On the day of the mishap, Captain LeBlanc reported for duty at the 35th Fighter Squadron around 7:15 AM to assist his flight leader with final preparation for the two sorties they were scheduled to fly together. (Tabs V-1, 2, and 13)

(3) The morning of the mishap, a large force employment (LFE) exercise was scheduled that would include not only Lieutenant Colonel Gardner's and Captain LeBlanc's flights but all of the scheduled sorties in the 35th Fighter Squadron that morning. The LFE would afford squadron pilots the opportunity to train in a large force scenario, practice coordination between multiple formations, and employ assets such as F-16s configured with HARMS. (Tabs V-1, 7, 14, 15, and 16)

(4) The LFE mass briefing was attended by all participants and began on time, at 8:00 AM, a little more than three hours prior to Stingray 11's and Slap 22's scheduled takeoffs. The briefing combined the 35th Fighter Squadron's mission commander briefing slides and a personal briefing guide. Included items were ground operations to include engine start and taxi timing, takeoff times/flow, weather, NOTAMS (Notices to Airmen), Rules of Engagement (ROE), special interest items, abnormal procedures, and coordination of attacks in the target area. There were no questions at the conclusion of the mass briefing and the participants were released to conduct their individual flight briefings. (Tabs K-3, V-1, 2, 14, 15, and EE-27)

(5) The mission profile for the exercise included trail departures, proceeding to the "Wedding" refueling track where the flights would conduct individual air refueling with a KC-135R (military version of the Boeing 707). Following refueling, the flights were to reform in an area approximately 80 miles southwest of Kunsan AB and depart as a package (a large group of aircraft maintaining position within the group by visual, radar, or timing references) for the target area. The package was to head north from the rejoin area to Chik-Do Range, an island bombing complex approximately 25 miles due west of Kunsan AB. (Tabs V-1, 2, 14, and 15)

(6) In the LFE, Lieutenant Colonel Gardner was the flight lead of a formation of four F-16s, call sign Stingray 11. The flight's aircraft were configured with inert (cement filled) MK-82 500 pound bombs. This configuration allowed the pilots to experience the performance of the F-16 with a realistic combat load while reducing the training restrictions associated with live munitions. (Tabs V-14, 74, and EE-27)

(7) Lieutenant Colonel Gardner conducted the individual briefing for Stingray 11 flight using a squadron briefing guide. The briefing lasted approximately 30 to 35 minutes. Nothing unusual was noted about his briefing or mannerisms. His briefing was thorough and included all required items as defined in MCR 55-116. At the conclusion of the briefing, Lieutenant Colonel Gardner and the other flight members donned their required flying and life support equipment and stepped to the aircraft on time. (Tabs V-14 and 74)

(8) Preflight inspection as well as engine start, taxi, and takeoff were all normal and without incident for Stingray 11 flight. Takeoff was at 11:20 AM as planned, fifteen minutes later than the printed schedule. (Tabs K-4, V-74, EE-26, and 27) Departure and package rejoin were as briefed. Due to timing, the planned inflight refueling was not accomplished. As the package proceeded north to Chik-Do Range, the mission commander determined that the weather had deteriorated and was not sufficient to accomplish the remainder of the planned mission. The flights were subsequently cleared to return to Kunsan AB by the mission commander. With Lieutenant Colonel Gardner in the lead, Stingray 11 returned to Kunsan AB as a four-ship formation landing out of straight-in approaches at 1:12 PM. Lieutenant Colonel Gardner and his wingman were unable to attend the mass debrief, because of limited time between sorties, and planned to debrief with the mission commander following their second mission. (Tabs K-4, V-14, 15, 74, and EE-26)

(9) Lieutenant Colonel Gardner was scheduled to fly as Stingray 01 on his second sortie of the day. This sortie was a formation of two F-16s that would accomplish a CAS mission. His wingman from the morning mission would again fly with him on the second sortie. It was scheduled to be flown in P-518, training airspace in the northern part of the Republic of Korea. This mission was identical to one Lieutenant Colonel Gardner flew with this same wingman the day prior. The mission was briefed in accordance with MCR 55-116 by Lieutenant Colonel Gardner utilizing a squadron briefing guide and adequately addressed all required subjects. The wingman had no questions at the conclusion of the briefing and the flight departed the squadron for the aircraft on time. (Tabs K-4 and V-74)

(10) The weather had deteriorated since their first sortie that day and after engine start, while accomplishing ground operations prior to taxiing, the supervisor of flying determined that "C" weather category pilots would not fly (Tabs V-7, 34, and EE-33). Since his wingman was now weather cancelled, Lieutenant Colonel Gardner obtained squadron approval to fly his prebriefed alternate mission of instruments (Tab V-7). The remainder of his ground operations and taxi were normal and in accordance with local directives. Neither the aircraft crew chiefs nor the end of runway inspection crew members noted any difficulties or deficiencies with the aircraft. (Tabs V-46, 47, 60, and 74) At 3:30+12 PM, Stingray 01 was cleared on the runway for takeoff (Tab EE-37).

(11) In the LFE, Captain LeBlanc was flying as the wingman, call sign Slap 22, in a flight of two F-16s configured with a 300 gallon external fuel tank on station five; two CATM-88A, captive air-to-ground training missiles on stations three and seven; two captive AIM-120, air-to-air training missiles on stations two and eight; and a captive AIM-9, air-to-air training missile and an AMA, acceleration monitor assembly pod on stations one and nine. All of these missiles were inert and contained neither a rocket motor nor explosive charge. As with the MK-82s that Stingray flight was carrying, these training missiles replicate the weight of actual missiles and affect the performance of the F-16, simulating a realistic combat load. (Tabs V-1, 2, and EE-27)

(12) Captain LeBlanc's flight lead, Slap 21, conducted the individual flight briefing using a personal briefing guide. Since the flight was scheduled to fly two back-to-back SEAD missions and not scheduled to return to the squadron between flights, both sorties were briefed at this time. The briefing lasted approximately 40 minutes and included all required briefing items. There were no questions at the conclusion of the briefing with the flight stepping to the aircraft on time. (Tabs V-1 and 2)

(13) Slap 22's preflight inspection, engine start, taxi, and takeoff were all normal with no difficulties noted. Airborne on time at 11:14 AM, Slap 21 flight proceeded to the air refueling area without incident. Following air refueling, enroute to the rejoin area, Slap 21 flight was directed by their squadron to return to Kunsan AB due to an unauthorized configuration on their aircraft. (Tabs V-2, 7, and EE-19) Slap 21 flight proceeded to a point just east of Kunsan AB to burn down fuel prior to landing. Once accomplished, the flight returned to Kunsan AB and landed at 12:48 PM out of an ASLAR ILS approach, the same approach later flown on the mishap sortie. (Tabs K-4, V-1, 2, and EE-26)

(14) Slap 21 flight was scheduled to refuel immediately following their landing from the first sortie with the aircraft's engine running (i.e. hot pit refuel) and then taxi back to the runway for takeoff on their second sortie. Because of the configuration problem, the aircraft refueled, then taxied back to their parking locations to have squadron maintenance personnel properly configure the aircraft in accordance with technical order directives. At this time Captain LeBlanc, unsure of the impact reconfiguring the aircraft would have on his second sortie, went to the squadron's maintenance debriefing section to confirm which aircraft he would fly on the second sortie. While there, he consumed a package of cookies and drank water from his flask before returning to the aircraft. Arriving back at aircraft 86-0275, Captain LeBlanc noted the deteriorating weather and called squadron operations twice to confirm their approval of his second sortie. Approval was given with directions to land by 3:30 PM. During the period between sorties, Captain LeBlanc and his flight lead only saw each other for a short time and did not conduct any debriefing of their first mission or further briefing of their second sortie. (Tabs V-1, 2, and 64)

(15) As with his first sortie that day, Captain LeBlanc's preflight, engine start, and taxi were without difficulties or abnormalities. Testimony by the crew chief who launched Slap 02 and the end of runway crew who inspected his aircraft prior to takeoff noted nothing unusual or out of the ordinary. (Tabs V-1, 46, 64, and 66) Slap 01 flight was cleared for takeoff and was airborne at 14:38 PM (Tab EE-26).

d. FLIGHT ACTIVITY

(1) Slap 01 flight executed single-ship takeoffs with a radar assisted trail departure. This type of departure requires all flight members to fly a prebriefed engine power setting and airspeed, turn at the same navigation reference points, and use on-board air-to-air radar to monitor all preceding aircraft. Once safely airborne, the flight turned right to a heading of 180 degrees and subsequently rejoined to route formation (aircraft

laterally spaced 75-500 feet apart). The weather on departure consisted of a 500 foot ceiling with layers of clouds extending upwards to approximately 19,000 feet above Mean Sea Level (MSL). (Tabs V-1, 2, and AA-1)

(2) As the flight continued to the south, it became apparent to Slap 01 that the primary mission of practicing HARM employment tactics would not be possible due to the weather in the planned training area. Slap 01 coordinated with Airedale for alternate training airspace in MOAs 15 and 16, just east of Kunsan AB, to accomplish the briefed alternate mission of intercepts. During this process Slap 01 flight turned north and proceeded in the general direction of the requested MOAs. After receiving approval from Airedale, Slap 01 flight entered the airspace and maneuvered to begin their prebriefed intercept mission. (Tabs V-1, 2, and AA-1)

(3) The objective of Slap 01 flight's intercept training was to practice defensive maneuvering as a single F-16 against another aircraft which was employing radar and infrared guided air-to-air missiles at medium to high altitudes (15,000 to 30,000 feet MSL). To accomplish this, Slap 01 split-up the flight and sent Slap 02 to the western portion of the airspace as Slap 01 maneuvered to the east. Prior to the intercept, one of the aircraft would be designated by the flight lead as the fighter (the aircraft simulating the employment of air-to-air missiles) and the other would be the target (the aircraft defending against air-to-air missiles). When both aircraft were ready to start the intercept training, they would turn towards each other and use the aircraft's air-to-air radar and other on-board systems to locate the opposing aircraft and maneuver to simulate employing air-to-air missiles or maneuver defensively against the attack. The flight accomplished several intercepts with Slap 01 and Slap 02 alternating roles between fighter and target aircraft. (Tabs V-1 and 2)

(4) After Slap 01 reconfirmed, via radio, the requirement to land by 3:30 PM, Slap 02 rejoined with his flight leader, Slap 01, for the return to Kunsan AB. Once rejoined, a battle damage check (a visual inspection of each aircraft in a flight normally accomplished at the completion of tactical maneuvering) was accomplished. During this check, Slap 01 passed the lead of the formation to Slap 02 who maintained it for the remainder of the flight. (Tabs V-1 and 2)

(5) Slap 02, now in the lead of the flight, began a descent in anticipation of an instrument recovery back to Kunsan AB. During the recovery, the flight accomplished a descent check and entered the weather. The flight continuing its descent, proceeded towards Julop, the IAF for the ASLAR ILS approach to

Runway 36 at Kunsan AB. Slap 02 established radio contact with Kunsan approach control at 3:22+30 PM and requested the ASLAR ILS to Runway 36 at Kunsan AB. (Tabs V-1, 2, and EE-37).

(6) Radar contact with Slap 01 flight was established approximately fifteen miles to the east of Kunsan AB by Kunsan approach control at 3:22+42 PM. On initial contact, approach control advised Slap 01 flight of the current weather, altimeter setting, active runway, and runway conditions at Kunsan AB. The flight was then cleared to descend to 5000 feet MSL and proceed direct to Julop. Once Slap 02 acknowledged the radio call from approach control, Slap 01 flight was cleared to contact Kunsan arrival on another frequency. Slap 02 directed the flight to the new frequency and checked in with Kunsan arrival advising them of his request for the ASLAR ILS. Kunsan arrival cleared Slap 01 flight for the ASLAR ILS to Runway 36 at 3:24+38 PM. At 3:26+45 PM, Slap 02 reported Julop and advised Kunsan arrival that he was inbound for the approach. Continuing inbound on the approach, Slap 02 was contacted by Kunsan radar final control at 3:28+54 PM who made an advisory gear check radio call. It was at this point that Slap 02 advised the controlling agency that "Slap 02 was out in front." Prior to this time, Slap 02 answered all radio calls as Slap 01. At 3:29+35 PM, the control tower local controller advised the radar final controller, who was in radio contact with Slap 02, that he was cleared to land. The radar final controller then passed the landing clearance to Slap 02 at 3:29+40 PM. As Slap 02 continued the final portions of his approach, the control tower local controller, at 3:30+12 PM, cleared Stingray 01 for takeoff. At 330 feet MSL, Slap 02 broke out of the clouds on final and radioed Slap 01 with the altitude of the cloud bases on his VHF radio. Shortly thereafter, at 3:31+00 PM, Slap 02 collided with Stingray 01 on the approach end of the runway. Moments after the collision, the pilot of Slap 02 successfully ejected from his aircraft. (Tabs A-1, V-1, 2, 3, and EE-37)

(7) Stingray 01 coordinated a flight plan with ground control to include an instrument departure to Visual Meteorological Conditions (VMC) and then direct to Osan AB, ROK, to practice instrument approaches (Tabs V-74 and AA-2). He was cleared for takeoff at 3:30+12 PM (Tab EE-37). Stingray 01 taxied onto the runway and accomplished his engine run-up checks prior to brake release. As he released brakes, Stingray 01 selected afterburner and began his takeoff roll. Shortly after brake release, Slap 02 collided with Stingray 01 approximately 800 feet down the runway. (Tabs A-1, V-3, 46, 47, and BB-3)

(8) The forecast weather for 3:31 PM called for a ceiling of 1500 feet and visibility of 1 1/2 miles (Tab O-25). A flight of F-16s that had departed Kunsan approximately two to three minutes prior to the mishap described the weather as being worse to the

south and improving to the north (Tab V-10). Witnesses in the area described the weather at the time of the mishap to be a 300-500 foot ceiling with approximately 1 mile visibility. (Tabs V-1, 10, and 18)

(9) Data from the Crash Survivable Flight Data Recorder (CSFDR) from Slap 02's aircraft indicates a fairly constant 11 degree Angle of Attack (AOA) approach until impact. The last readings show an AOA of 10.72 degrees, airspeed of 160.0 knots, one "G" flight, 8 degrees nose up, 0 degrees of bank, and an altitude of 0 feet. (Tab BB-2)

(10) The CSFDR data taken from Stingray 01's aircraft shows the aircraft to be in full afterburner, rolling down the runway at 88 kts, when the collision occurred. (Tab BB-3)

(11) In testimony given by individuals who observed Slap 02 on final approach prior to impact, and who observed the collision, stated that it appeared as though Slap 02 did not attempt to maneuver to avoid Stingray 01. (Tabs V-1, 3, 46, and 48)

(12) The following is a transcript of communications between Slap 01 flight, Radar Approach Control (RAPCON), Stingray 01, and Kunsan Tower. Times in this transcript are derived from the RAPCON time announcer. Dates and times are inclusive of, 27 Jul 93, 1522.20 (3:22+20 PM) thru 1531.40 (3:31+40 PM). (Tab EE-37)

CALL SIGN

AGENCY

SLAP 01

FLIGHT OF TWO KUNSAN F-16s

SLAP 02

MISHAP AIRCRAFT 86-0275

APPROACH

KUNSAN APPROACH CONTROL (RAPCON)

APP CONTROLLER (APP)

APPROACH CONTROLLER (RAPCON)

ARR CONTROLLER (ARR)

ARRIVAL CONTROLLER (RAPCON)

RFC CONTROLLER (RFC)

RADAR FINAL CONTROLLER (RAPCON)

LCL CONTROLLER (LCL)

KUNSAN TOWER LOCAL CONTROLLER

VEGAS 21

FLIGHT OF TWO KUNSAN F-16s

VENOM 31

FLIGHT OF TWO KUNSAN F-16s

VENOM 32

VENOM 31's WINGMAN

STINGRAY 01

MISHAP AIRCRAFT 87-0335

SOURCE	TIME	TRANSMISSION
SLAP 02	1522.20	SLAP check
SLAP 01	1522.21	Two
SLAP 02	1522.22	Approach, SLAP zero one uh with you enroute to Julop for the ASLAR for an IFR pickup
APP	1522.30	SLAP zero one, Kunsan approach, Ident
APP	1522.42	SLAP zero one, radar contact one five miles east of Kunsan, verify information Juliet
SLAP 02	1522.50	SLAP zero one, uh negative ATIS
APP	1522.51	SLAP zero one roger, runway three six in use, wind two niner zero at five, visibility one and one half miles, rain showers, sky conditions five hundred scattered, one thousand eight hundred broken, ceiling measured one thousand eight hundred, overcast three thousand altimeter two niner six five, approach ceiling one thousand eight hundred, visibility one mile, and runway condition is wet
SLAP 02	1523.15	SLAP zero one copies all, two niner six five enroute Julop, like ASLAR drag, full stop
APP	1523.21	SLAP zero one roger, descend and maintain five thousand, proceed direct Julop
SLAP 02	1523.26	SLAP in a descent to five thousand direct Julop
APP	1524.06	SLAP zero one, contact Kunsan arrival local channel one one
SLAP 02	1524.09	SLAP flight push button one one
SLAP 02	1524.27	Check
SLAP 01	1524.28	Two
SLAP 01	1524.29	Arrival SLAP zero one with you entering Julop, ASLAR drag
ARR	1524.38	SLAP zero one, Kunsan arrival, uh cleared ASLAR ILS runway three six, report Julop inbound

SLAP 02	1524.44	SLAP zero one, cleared the ILS, Wilco
ARR	1524.45	SLAP zero one, flight of two ASLAR ILS full stop
SLAP 02	1526.45	SLAP One, Julop inbound
LCL	1526.45	VEGAS two one, right zero three zero, taxi into position and hold
VEGAS 21	1526.47	Two one's on the hold
ARR	1526.48	SLAP zero one, roger
LCL	1526.48	Say again on the white
ARR	1526.58	SLAP zero one, flight of two ASLAR ILS full stop
LCL	1527.17	VEGAS two one, change to departure, wind three three zero at eight, cleared for takeoff
VEGAS 21	1527.19	Two one cleared for takeoff, push four
VENOM 31	1527.35	VENOM check
VENOM 32	1527.36	Two
VENOM 31	1527.43	Tower, VENOM ready for takeoff, yoking right zero three zero
LCL	1527.46	VENOM three one, hold short of runway, number two for departure
VENOM 31	1527.51	VENOM
LCL	1528.12	VENOM three one, change to departure wind two niner zero at eight, cleared for takeoff, traffic flight of two, nine miles final with GCA, correction RAPCON
VENOM 31	1528.25	VENOM three one
STINGRAY	1528.27	Tower, STINGRAY zero one ready, single-ship
LCL	1528.31	STINGRAY zero one, Kunsan, hold short of runway
STINGRAY	1528.34	Zero one holding

RFC	1528.54	SLAP zero one, Kunsan final controller, how do you hear me
SLAP 02	1528.57	Kunsan controller, SLAP zero one gets you loud and clear
RFC	1528.59	Loud and clear also
RFC	1529.09	SLAP zero one, wheels should be down
SLAP 02	1529.13	Standby for gear
SLAP 02	1529.19	Approach, SLAP zero two is out front and SLAP zero two is gear down, full stop
SLAP 02	1529.21	SLAP zero two roger
RFC	1529.32	Full stop
LCL	1529.35	Cleared to land
RFC	1529.40	SLAP zero two, wind two seven zero at eight, cleared to land
SLAP 02	1529.42	SLAP zero two, cleared to land
LCL	1530.12	Zero one, flight of two F-16s five mile final, change to departure, wind three one zero at four, cleared for takeoff
SLAP 01	1530.17	Zero one's gear down
RFC	1530.18	SLAP zero one, roger
STINGRAY	1530.18	STINGRAY zero one cleared for takeoff
LCL	1530.27	STINGRAY one active, single-ship
LCL	1530.58	Go around, go around, go around, go around
RFC	1531.00	SLAP zero one tower clearance canceled, climb and maintain one thousand until departure end, then climb and maintain two thousand, fly runway heading
Back-ground	1531.06	ELT

LCL 1531.09 Second guy go around, go around

RFC 1531.10 SLAP zero two, SLAP zero one, tower clearance canceled, climb and maintain one thousand until departure end, then climb and maintain two thousand five hundred, correction seven hundred, fly runway heading

LCL 1531.13 Second guy go around, exit right, go around

SLAP 01 1531.18 SLAP zero one's low approach

RFC 1531.23 Zero one low approach, SLAP zero one low approach

RFC 1531.29 SLAP zero two, you copy climbout

SLAP 01 1531.40 Approach, SLAP zero two, SLAP zero one's level at two thousand

e. IMPACT

(1) Slap 02 collided with Stingray 01 at 35 degrees 53 minutes 50 seconds north latitude, 126 degrees 37 minutes 5 seconds east longitude approximately 800 feet from the approach end of Runway 36, Kunsan AB, ROK, at 3:31 PM (Tabs A-1, C-1, and 2).

(2) The accident occurred on, and was confined to Kunsan AB, which is on Korean government property. Stingray 01 was totally destroyed by the collision and resulting fire (Tab M-1). Slap 02 sustained major foreign object damage (FOD) to its engine, and substantial structural damage to the intake, landing gear, and underside of the aircraft as a result of the collision and uncontrolled departure from the runway (Tabs J-1 thru 7, and M-5).

(3) Both aircraft were heading approximately 356 degrees at the time of impact (Tabs C-1, 2, and BB-2). Stingray 01 was on takeoff roll at 88 kts with Slap 02 flying at 11 degrees AOA, 8 degrees nose high, 0 degrees of bank, and 160 kts at impact (Tabs BB-2 and 3). Following the collision, both aircraft skidded down the runway and departed the prepared surface. The aircraft came to rest approximately 1600 feet apart with Stingray 01 just west of the runway and Slap 02 just off the prepared surface to the east. (Tabs R-1 and AA-3)

(4) The pilot of Stingray 01 was fatally injured in the mishap and the pilot of Slap 02 safely ejected and was uninjured (Tabs A-1 and X). Witnesses to the mishap did not observe any ejection attempt by Stingray 01 (Tabs V-46 and 50). Both pilots

were correctly attired/restrained and there was no evidence of any equipment failure or maintenance discrepancies (Tabs H-1, 4, EE-38, 40, 41, and 42).

f. EJECTION SEATS

(1) Each mishap aircraft was equipped with one Advance Concept Ejection Seat (ACES II) (Tab EE-30). The ejection seat of aircraft 86-0275 (Slap 02) was used, the components of which were recovered from the mishap site. The ejection seat from aircraft 87-0335 (Stingray 01) was not used and was found totally fragmented and burned in the cockpit area of the wreckage. (Tabs EE-38 and 40)

(2) Post crash analysis of the ejection seat from aircraft 87-0335 indicated that the initial impact rendered the escape system inoperative and that none of the components had been initiated (Tab EE-38). Post-mortem analysis indicated Lieutenant Colonel Gardner's injuries were not consistent with an attempted ejection (Tab EE-8).

(3) Analysis of system components from aircraft 86-0275 shows the pilot initiated a Mode-1 ejection, the low altitude and low airspeed mode of the ACES II seat. (Tabs EE-30 and 38)

g. PERSONAL AND SURVIVAL EQUIPMENT

(1) All required inspections on Lieutenant Colonel Gardner's and Captain LeBlanc's helmet, oxygen mask, torso harness, two anti-G suits, and survival vest were current on the day of the mishap. Survival equipment recovered from Lieutenant Colonel Gardner's aircraft indicated severe damage due to the impact and subsequent fire. (Tabs EE-40 and 41)

(2) Due to the extremely short time between Captain LeBlanc's ejection and rescue, very little of his personal survival equipment was used. His parachute canopy fully opened shortly before ground impact, however due to the limited time of descent, he did not accomplish the four-line jettison modification of his parachute. Additionally, Slap 02's life raft did not inflate during the ejection sequence. Analysis indicates the inflation sequencing for the raft was interrupted by ground impact due to the low altitude achieved during the ejection and the limited time from kit deployment. (Tabs EE-38 and 40) The Emergency Locator Transmitter (ELT) functioned normally, transmitting a beacon on guard frequency (243.0 MHz) upon successful seat-man separation. (Tab EE-37)

(3) Inspections of the parachutes in both aircraft were current. The inspections of both seat survival kits, including life rafts and medical kits were current. (Tab EE-42)

h. RESCUE

(1) Immediately following the impact, the tower flight data controller activated the primary crash phone alerting base crash, fire, and rescue forces (Tab V-4). The response by Kunsan AB fire protection flight's Rescue-9 (a fully equipped rescue vehicle with three personnel) was almost immediate (Tabs V-36 and 37). Shortly thereafter, the base's secondary crash net was activated and at 3:35 PM, a fully equipped ambulance with a flight surgeon and three medical technicians from the 8th Medical Group Clinic was dispatched to the mishap site (Tab EE-4). The ambulance arrived at the Entry Control Point (ECP) which had been established on the parallel taxiway in front of the control tower at 3:39 PM (Tab EE-4).

(2) Members of the 38th Rescue Squadron, who were at base operations at the time, heard the collision and ran out onto the airfield. They saw Captain LeBlanc, who had just ejected, and ran to assist him (Tabs V-81 and 82). The 35th Fighter Squadron, located a short distance from the mishap site, was notified of the accident by the supervisor of flying. A flight surgeon, who was at the squadron, along with two pilots, immediately proceeded to the scene in a military vehicle. All parties arrived almost simultaneously and assisted Captain LeBlanc. (Tabs V-17, 38, 78, and 82)

(3) Rescue-9 located Slap 02's aircraft just east of the runway and noted the canopy and ejection seat were missing and assumed the pilot had ejected (Tab V-37). Also arriving on the scene was the fire training chief who saw Captain LeBlanc with the flight surgeon, the two squadron pilots, and the members of the 38th Rescue Squadron. As the fire training chief pulled up to the flight surgeon he understood the flight surgeon to say "I have the pilots, you take care of the fire." This statement along with seeing several personnel in flight suits initially led the rescue forces to believe both pilots had been located. (Tabs V-36 and 37)

(4) Since both pilots were believed accounted for, Rescue-9 was detailed to assist with the fire fighting efforts. Rescue-9's crew chief then entered Slap 02's cockpit and secured the emergency power unit, shut the still running engine off, and turned the battery switch to off (Tabs V-36 and 37). At 3:39 PM, it was determined that only one of the pilots had in fact been located (Tab EE-1). At 3:41 PM, Rescue-9 again resumed efforts to locate the missing pilot. Arriving at Stingray 01's aircraft, which had been fully engulfed in flames since the initial impact, the crew chief of Rescue-9 attempted to approach the aircraft's cockpit area but was driven back by the intense heat. (Tabs V-36, 37, and EE-1)

(5) Additional forces joined in the search for the second pilot at 3:41 PM (Tabs V-35, 37, and EE-1). Sweeps of the airfield and its perimeter were accomplished. The Disaster Control Group (DCG) formed at 3:39 PM and coordinated security police assistance with the search. (Tabs V-43, 76, and EE-1) A UH-60 helicopter from the 38th Rescue Squadron based at Osan AB, ROK, which was at Kunsan AB on temporary duty, also joined rescue efforts. Launching at 4:05 PM, the helicopter initially searched portions of the Yellow Sea that surrounds the airfield on two sides and then assisted in the search of the airfield itself. (Tabs V-37, 38, 81, 82, 84, 86, and 87)

(6) A second ambulance arrived on location at approximately 3:45 PM with another flight surgeon and three medical technicians (Tabs V-38 and 79). Captain LeBlanc, who at this time had been evaluated in the first ambulance and was found to have no significant injuries, was transferred to the second ambulance and transported to the base clinic for further examination. (Tabs V-38, 39, 40, and 79).

(7) Search efforts continued while the intense heat from the fire that engulfed Stingray 01's aircraft prevented rescue forces from getting close to the aircraft. At 3:59 PM, 20 millimeter ammunition began exploding in Stingray 01's aircraft forcing rescue and fire fighting personnel to evacuate to a safe distance. Thirty minutes later at 4:29 PM, fire fighting efforts resumed, and by 4:52 PM, the fire on Stingray 01's aircraft was extinguished and potential remains were located in the wreckage. The flight surgeon identified the remains at 4:54 PM and officially determined that the pilot did not survive. The remains were later transported to the 8th Medical Group Clinic for positive identification. (Tabs V-36, 38, 40, 41, 79, and EE-1)

(8) Continuous medical support of the mishap scene was provided with one ambulance remaining until the evening of 28 Jul 93 (Tab V-79).

#### i. CRASH RESPONSE

(1) Alerted by the primary crash net at 3:31 PM, Kunsan's fire protection flight responded with all available crash, fire, and rescue forces. Chief-2 was dispatched in a carry-all vehicle and the fire training chief utilized a P20 command and control vehicle (Tabs V-36 and 37). In addition, Crash-3, 4, 5, and 6 in P19s, Rescue-9 in a P10, a P18 tanker, and a foam cart proceeded to the south end of Runway 36, arriving within minutes of the initial notification (Tabs V-36 and EE-1). Chief-1 established the ECP on the parallel taxiway in front of the tower at 3:39 PM (Tab EE-1).

A P24 fire engine and the hose cart proceeded to the transient ramp area to lay hose and prepare for resupply efforts. (Tabs V-35, 36, 37, and EE-1)

(2) Since the two aircraft involved in the mishap were separated by approximately 1600 feet, the responding units were apportioned to maximize their fire fighting capabilities (Tabs R-1, V-35, 37, and AA-3). The fire training chief established command and control of the fire fighting efforts on Stingray 01's aircraft which was west of the runway and totally engulfed in flames (Tabs V-35, 36, and EE-1). He directed three P19 fire fighting vehicles, the P18 tanker, and the foam cart in fighting the fire (Tabs V-35 and 36). Chief-2 established command and control of the fire fighting efforts on Slap 02's aircraft. He directed one P19 fire fighting vehicle to combat the small fire located at the right rear of the aircraft. (Tabs V-35 and 36) The fire was extinguished and the engine, which was still running when fire fighters arrived, was shut off by 3:41 PM (Tab EE-1).

(3) With the fire out on Slap 02's aircraft, the P19 supporting that effort now joined forces fighting the fire on Stingray 01's aircraft (Tabs V-36 and EE-1). The fire was extremely intense and difficult to fight. The 20 millimeter ammunition began detonating at 3:59 PM forcing the withdrawal of fire fighting personnel and equipment from the area around Stingray 01's aircraft (Tabs V-36 and EE-1). The fire training chief regrouped his forces on the transient ramp and discussed how to best fight the fire when it was safe to return (Tabs V-35, 36, and EE-1). At this time it was noted that one fireman had suffered a cut hand and one had broken a thumb (Tabs V-36, 38, 39, and EE-1). Additionally, two on-base fire responses were required, one at 4:13 PM and the other at 4:25 PM. Fire fighting vehicles responded to both with no compromise to the ongoing fire fighting efforts. At 4:29 PM, the fire training chief returned to Stingray 01's aircraft with four P19s, a P18, and the foam cart and continued to battle the fire which was finally extinguished at 4:52 PM (Tabs V-36 and EE-1).

(4) Explosive Ordnance Disposal (EOD) personnel inspected Slap 02's aircraft, at 4:22 PM, and determined it to be safe (EE-5). EOD personnel also conducted an initial survey of Stingray 01's aircraft at 5:05 PM, swept the area for any explosive devices, and determined the area to be safe at 6:16 PM (Tabs EE-1 and 5). At 5:30 PM, the hydrazine response team arrived to depressurize the systems and tanks on both mishap aircraft and was completed by 5:59 PM. (Tab EE-1)

(5) Fire fighting personnel returned to Slap 02's aircraft at 6:58 PM, when smoke was noted in the cockpit area of the aircraft. A chemical agent was applied and the smoking ceased. At

7

this time fuel was noted leaking from one of the wings. An internal wing fuel tank had ruptured in three places and had to be defueled. By 11:27 PM, the tank was defueled and the leaking had stopped. (Tab EE-1)

(6) Fire fighting vehicles remained on location, one by Stingray 01's aircraft and one on the taxiway near Slap 02's aircraft for the next 36 hours.

j. MAINTENANCE DOCUMENTATION

(1) AIRCRAFT 86-0275

(a) F-16C Serial Number 86-0275, a Combat Coded (CC) fighter aircraft, was accepted by the United States Air Force on 18 Nov 87 at General Dynamics Corporation, Fort Worth Division, Fort Worth, TX, and delivered to Kunsan AB, ROK, on 14 Dec 87. At the time of the accident, it had accrued a total of 1824.6 airframe flight hours (Tab U-1). A review of the aircraft's Air Force Technical Order (AFTO) Form 781 did not identify any maintenance discrepancies that would relate to the mishap.

(b) All required Time Compliance Technical Orders due to be accomplished prior to 27 Jul 93 were accomplished. The aircraft was overdue a Time Change Requirement for the replacement of the Inertial Navigation Unit battery, and the aircraft was overdue a 150 hour ultrasonic inspection of the engine midspan shroud. (Tab U-2)

(c) There was one delayed discrepancy annotated in the AFTO Form 781K and two open write-ups in the active AFTO Form 781As (Tabs U-3 and 4).

(d) A 1800 hour #4 phase inspection was accomplished on 9 Jul 93 with actual aircraft time of 1789.8 hours. Including the mishap sortie, the aircraft had flown a total of 27 sorties and 34.8 hours since the phase inspection. Seventeen sorties were Code 1, seven were Code 2, and three were Code 3. (Tab U-5)

(2) AIRCRAFT 87-0335

(a) F-16C Serial Number 87-0335, a Combat Coded (CC) fighter aircraft, was accepted by the United States Air Force on 6 Apr 89 at General Dynamics Corporation, Fort Worth Division, Fort Worth, TX, and delivered to MacDill AFB, FL, on 12 Apr 89. The aircraft was transferred to Kunsan AB, ROK, on 30 Jan 91. At the time of the mishap, it had accumulated a total of 1389.9 airframe flight hours (Tab D-1). A review of the aircraft's AFTO Form 781 did not identify any maintenance discrepancies that would relate to the mishap.

(b) All required Time Compliance Technical Orders and scheduled inspections due to be accomplished prior to 27 Jul 93 were accomplished. The aircraft, at the time of the mishap, was overdue a Time Change Requirement for the replacement of the Inertial Navigation Unit battery. (Tab U-6)

(c) There were three delayed discrepancies annotated in the AFTO Form 781K and one open write-up in the active AFTO Form 781A. (Tabs U-7 and 8)

(d) A 1350 hour #1 phase inspection was accomplished on 15 Jun 93 with actual aircraft time of 1345.6 hours. Prior to the mishap, the aircraft had flown a total of 30 sorties and 44.3 hours since the phase inspection. Twenty sorties were Code 1, six were Code 2, and four were Code 3. (Tab U-9)

k. MAINTENANCE PERSONNEL AND SUPERVISION

Supervision and training of individuals involved in the maintenance performed on aircraft 86-0275 and aircraft 87-0335 from preflight inspection on 26 Jul 93 through the EOR inspection for the mishap flight revealed no deficiencies. Individuals were qualified for the work they accomplished as reflected in their AF Forms 623, On-the-Job Training (OJT) record.

1. ENGINE, FUEL, HYDRAULIC, OXYGEN, AND OIL INSPECTION ANALYSIS

(1) AIRCRAFT 86-0275

(a) General Electric F110-GE100 turbofan engine, Serial Number E509778, was installed in aircraft 86-0275. All required inspections, Time Change Requirements, and Time Compliance Technical Orders due to be completed prior to 27 Jul 93 were accomplished (Tab U-10). The Oil Analysis Record for engine Serial Number E509778 shows 30 samples analyzed between 5 May 93 and the mishap. Testing indicates all parameters were within normal limits. (Tab U-11)

(b) Prior to the mishap flight, the aircraft was refueled in the hot pits. Fuel samples were taken from Hydrant Filter Separator #1, Hydrant Filter Separator #2, Hydrant Tank #2 (bulk storage), and Loop #1 (delivery system). All parameters were within normal limits. (Tab U-12)

(c) There were no hydraulic oil samples taken following the mishap.

(d) From 15 Jul 93 until the mishap, all 8th Fighter Wing aircraft were serviced by liquid oxygen carts filled from Bulk Tank #12. A liquid oxygen sample was taken from Bulk Tank #12. Test results indicated all parameters within normal limits. (Tab U-13)

(e) Engine oil samples were taken from oil carts OC-4, OC-6, OC-8, and OC-17. Test results showed all parameters within normal limits. (Tab U-14)

(2) AIRCRAFT 87-0335

(a) General Electric F110-GE100 turbofan engine, Serial Number E509403, was installed in aircraft 87-0335. All required inspections, Time Change Requirements, and Time Compliance Technical Orders due to be completed prior to 27 Jul 93 were accomplished (Tab U-15). The Oil Analysis Record for engine Serial Number E509403 shows 30 samples analyzed between 14 May 93 and the mishap. Testing indicates all parameters were within normal limits. (Tab U-16)

(b) On 26 Jul 93 the aircraft was refueled from Fuel Truck 81L-357. On 27 Jul 93, a 300 gallon external fuel tank was hung on the aircraft and it was also refueled from Fuel Truck 81L-357. A fuel sample from Fuel Truck 81L-357 was taken. The results showed all parameters were within normal limits. (Tab U-17)

(c) There were no hydraulic oil samples taken following the mishap.

(d) From 15 Jul 93 until the mishap, all 8th Fighter Wing aircraft were serviced by liquid oxygen carts filled from Bulk Tank #12. A liquid oxygen sample was taken from Bulk Tank #12. Test results indicated all parameters within normal limits. (Tab U-13)

(e) Engine oil samples were taken from oil carts OC-4, OC-6, OC-8, and OC-17. Test results showed all parameters within limits. (Tab U-14)

m. AIRFRAME AND AIRCRAFT SYSTEMS

(1) AIRCRAFT 86-0275

The launch crew chief, assistant crew chief, expediter, and end of runway supervisor testified that there were no problems encountered throughout the aircraft's launch and end of runway inspection prior to it taxiing on to the runway for takeoff (Tabs V-46, 47, 64, 65, 66, and 68). Additionally, there are no indications of any

aircraft malfunctions during the mishap sortie prior to the collision (Tabs V-1 and 2). However, testimony indicated that the lower left wingtip light was not functioning during the aircraft launch (Tabs V-64 and 66). Operational testing was accomplished by 8th Fighter Wing personnel on the ARC-164 UHF Radio, the anti-collision light, exterior lighting control panel, the landing light switch, the top and bottom wingtip lights from the right wing, and the Heads Up Display (HUD) unit. All systems/components functioned normally. Downloads of the crash survivable memory unit, the signal acquisition unit, and the seat data recorder were accomplished by Lockheed Fort Worth Company, Fort Worth, TX. The data indicated a normal approach for landing until the collision with aircraft 87-0335. (Tab BB-2)

(2) AIRCRAFT 87-0335

The launch crew chief, assistant crew chief, expediter, end of runway supervisor, and end of runway crew testified that there were no problems encountered throughout the aircraft's launch and end of runway inspection prior to it taxiing on to the runway for takeoff (Tabs V-47, 48, 50, 54, 57, 58, 60, and 68). Testimony also indicated that all exterior aircraft lights were functioning normally (Tabs V-45, 48, 54, 58, and 60). Due to extensive aircraft damage, there were no pertinent component or accessory systems on which operational testing or tear down was accomplished. Downloads of the crash survivable memory unit and the seat data recorder were accomplished by Lockheed Fort Worth Company, Fort Worth, TX. The data indicated a normal takeoff until approximately 88 Knots Calibrated Air Speed, at which time the collision with aircraft 86-0275 occurred. (Tab BB-3)

n. OPERATIONS PERSONNEL AND SUPERVISION

(1) The 35th Fighter Squadron is tasked by Headquarters, Pacific Air Forces (HQ PACAF) to maintain a Designed Operational Capability (DOC) of interdiction, counter air, close air support, and air superiority. Lieutenant Colonel Gardner was authorized to fly a CAS mission on the mishap flight by the squadron operations officer. The operations officer had also authorized Captain LeBlanc to fly a SEAD mission on the mishap flight. The authorization was documented on a local computer generated Form 35, Local Flight Clearance/Flight Authorization on 27 Jul 93. (Tabs K-5, 6, EE-27, and 31)

(2) The alternate intercept mission flown by Slap 01 flight and the alternate instrument mission planned by Stingray 01 were authorized in accordance with PACAFR 55-116/8 FW Chapter 8 (Tab O-30).

(3) Slap and Stingray flights both attended the squadron's morning mass briefing on the day of the mishap. The briefing was conducted by the mission commander for the LFE exercise that both flights participated in that morning. A combination of the squadron's mission commander briefing slides and a personal briefing guide were used to conduct the briefing, which addressed all required items. The 7th Air Force Director of Operations and the 35th Fighter Squadron Operations Officer, participated in the exercise and attended the briefing. Following the mass briefing individual flight briefings were accomplished. (Tabs V-1, 2, 14, 15, and 74)

(4) The individual flight briefing for Stingray 11 flight was accomplished by Lieutenant Colonel Gardner using a standard squadron briefing guide. Testimony by flight members indicates no deficiencies in the briefing. The 7th Air Force Director of Operations, and the 35th Fighter Squadron Assistant Operations Officer were flight members and attended the briefing. A separate flight briefing was conducted by Lieutenant Colonel Gardner prior to the mishap sortie using the same squadron guide. The 7th Air Force Director of Operations attended the briefing as a member of the flight and indicated the briefing to be thorough and complete. (Tabs V-14 and 74)

(5) Captain Patterson, the flight lead for Slap 21 flight (first sortie) and Slap 01 flight (second sortie) conducted the individual flight briefing utilizing a personal briefing guide. Since the flight was scheduled to hot pit refuel and not return to the squadron between sorties, both sorties were briefed at this time. Testimony indicates that the briefing was thorough and adequate. No supervisory personnel attended Slap flight's individual flight briefing. (Tabs V-1 and 2)

o. AIRCREW QUALIFICATIONS

(1) Lieutenant Colonel Gardner held an aeronautical rating of Command Pilot with an effective date of 8 Dec 92 (Tab T-1). His total military flying time was 3182.9 hours, including the 1.8 hours flown on the morning of the mishap (Tab G-5). He had flown 1,818.6 hours in the F-16 including 1,225.6 hours in the F-16A/B model and 593.0 hours in the F-16C/D model. Graduating from the United States Air Force Academy in 1976, Lieutenant Colonel Gardner then completed Undergraduate Pilot Training on 8 Dec 77 at Vance AFB, OK. Following upgrade training and an 18 month tour at Kadena AB, Japan, where he accumulated 383.7 hours as an F-4 pilot, Lieutenant Colonel Gardner transitioned to the T-37 at Vance AFB, OK. After flying 737.9 hours as a T-37 instructor pilot he transitioned to the F-16 with assignments at Hill AFB, UT, Kunsan

AB, ROK, MacDill AFB, FL, and Langley AFB, VA, where he upgraded to flight examiner and instructor pilot, and eventually logged a total of 1,732.3 hours in all models of the F-16. Following a short conversion course in the F-16C/D at MacDill AFB, FL, Lieutenant Colonel Gardner was assigned to the 8th Fighter Wing, Kunsan AB, ROK, where he achieved Mission Ready (MR) status as a wingman on 23 Apr 93. (Tabs G-4, T-4, 10, and 17)

(2) On 28 Apr 93, Lieutenant Colonel Gardner was entered into the four-ship flight lead upgrade program (Tab T-9). A review of his training folder indicated he had not completed all required training nor had he been certified by the squadron commander as a four-ship flight lead. Although not addressed in any of his upgrade program, a two-ship flight lead certification sortie was flown on 20 May 93 with Captain Davis, a squadron assistant operations officer, but Lieutenant Colonel Gardner still had not been certified by the squadron commander as a flight lead. (Tabs T-9 and 16)

(3) Lieutenant Colonel Gardner was instrument qualified in the F-16C/D. He completed the Instrument Refresher Course (IRC) and passed the pilots written instrument examination with a grade of 98 on 3 Dec 92. His Initial Qualification/Instrument Checkride was flown on 10 Dec 92 and was valid through 31 May 94 (Tab T-4). He was approved by the squadron commander as a "B" weather category on 3 May 93. (Tabs T-8 and EE-33)

(4) His last F-16C sortie prior to the mishap flight was earlier that same day in aircraft 86-0290, where he logged 1.8 hours as the flight lead of a four-ship Weapons Delivery Surface Attack Tactics (WDSAT) mission (Tabs T-20 and EE-27). Lieutenant Colonel Gardner's F-16 currency was as follows: (Tabs G-1 and 6 thru 8)

	<u>F-16C/D Sorties</u>	<u>Flight Time</u>
Last 30 Days	18	25.6
Last 60 Days	26	36.0
Last 90 Days	50	68.3

(5) Lieutenant Colonel Gardner's Emergency Egress Training, Hanging Harness Training, Water Survival Training, Annual Life Support Training, and Physiological Training were all current. His Situational Emergency Procedures Training had expired on 31 May 93. (Tab T-18) His duty Air Force Specialty Code (AFSC) was X1455N, Aviation Service Date was 10 Jan 77, and Aviation Service

Code was 2A on Aeronautical Order 0020, dated 11 Feb 93. The F-16C was Lieutenant Colonel Gardner's primary aircraft. (Tabs G-3, T-1, and EE-23)

(6) Captain LeBlanc held an aeronautical rating of Pilot effective 9 Jun 89 (Tab T-21). His total military flying time was 1229.1 hours, including the 1.7 hours flown on the morning of the mishap and the .9 hour flown on the mishap sortie (Tabs G-12 and 14). He received his commission through Officer Training School on 5 May 88 and graduated from Undergraduate Pilot Training at Reese AFB, TX, on 9 Jun 89. After completing upgrade training in Dec 89, Captain LeBlanc was assigned to an operational A-10 squadron at Myrtle Beach AFB, SC, where he accumulated 789.2 hours as a pilot in the A-10. Graduating with distinction from F-16C/D conversion training at Luke AFB, AZ, in Nov 92, he was assigned to Kunsan AB, ROK, reporting in Dec 92. Assigned to the 35th Fighter Squadron at Kunsan AB, Captain LeBlanc achieved Mission Ready (MR) status as a wingman on 7 Jan 93 and had logged a total of 206.0 hours in the F-16C/D prior to the mishap. (Tabs G-11, 12, T-26, and 27)

(7) On 7 Jan 93, following Mission Qualification Training (MQT) and certification as MR, Captain LeBlanc's previous ASLAR qualification from Luke AFB was accepted by the squadron commander (Tab T-26). He was certified Peacetime Aerial Reconnaissance Program (PARPRO) qualified on 8 Mar 93. He was entered in the Dissimilar Air Combat Training (DACBT) and Low Altitude Step-Down Training (LASDT) for Air-to-Air (A/A) programs and was fully qualified on 8 Mar 93 and 12 Apr 93 respectively. He was Infrared (IR) Maverick qualified on 28 Apr 93, completed Chemical Warfare Defense Training on 2 Jun 93, and qualified as a HARM pilot on 14 Jul 93. On the day of the mishap Captain LeBlanc was not entered in or participating in any upgrade program. (Tabs T-27, 35 thru 41, V-7, and EE-23)

(8) Captain LeBlanc's instrument rating in the F-16C was valid until 28 Feb 94. He had completed IRC on 12 Aug 92, obtained a grade of 100 on the pilots written instrument examination, and accomplished an Initial Qualification/Instrument Checkride on 3 Sep 92. He was upgraded to an "A" weather category on 23 Jun 93. (Tabs T-24, 28, and EE-33).

(9) The last F-16C sortie flown by Captain LeBlanc prior to the mishap was on that same morning in aircraft 86-0275, where he logged a total of 1.7 hours. Examination of his flight records revealed a discrepancy of 4 sorties and 5.9 hours from those reported by the safety mishap investigation board at Tab G-1. Two of the sorties and 2.7 hours were those flown on the day of the mishap with the remaining 2 sorties and 3.2 hours flown in an F-16D

on 15 Jun 93. Captain LeBlanc's adjusted F-16 currency follows:  
(Tabs G-1, 13 thru 15, T-47, and EE-27)

	<u>F-16C/D Sorties</u>	<u>Flight Time</u>
Last 30 Days	10	13.3
Last 60 Days	24	35.6
Last 90 Days	43	60.3

(10) Captain LeBlanc's Emergency Egress Training, Hanging Harness Training, Water Survival Training, Annual Life Support Training, and Physiological Training were all current. His Situational Emergency Procedures Training had expired on 31 May 93 (Tab T-44). His duty Air Force Specialty Code (AFSC) was 1115Q, Aviation Service Date was 8 Jun 88, and Aviation Service Code was 1A on Aeronautical Order 0036, dated 21 Feb 90. The F-16C was Captain LeBlanc's primary aircraft. (Tabs G-10, T-21, and EE-23)

p. MEDICAL

(1) A thorough review of Lieutenant Colonel Gardner's medical records indicate he was medically qualified for flying duty on the day of the mishap. His last Flying Class II physical examination was performed on 6 Oct 92 and was current through 31 Dec 93. His physiological training was accomplished on 24 Sep 92 and was valid until 30 Sep 95. He accomplished centrifuge training on, 19 Jan 90, at Holloman AFB, NM. Dental records showed Lieutenant Colonel Gardner to be Dental Class I (fully qualified for duty) on 29 Oct 92. (Tabs T-2 and 3)

(2) Lieutenant Colonel Gardner's remains were identified at the 8th Medical Group Clinic, Kunsan AB, ROK. Positive identification was accomplished utilizing dental records and the concurrence of three 8th Medical Group dental officers. Post-mortem examination was accomplished by Commander Kilbane, Medical Corps, United States Naval Reserve, on 31 Jul 93 at the 121st Evacuation Hospital, Seoul, ROK. Cause of death was multiple blunt force trauma secondary to F-16 aircraft accident--death was instantaneous. Toxicology tests performed on the remains by the Armed Forces Institute of Pathology, Washington D.C. revealed no evidence of drugs present. Alcohol was found to be present in blood samples at a level of 96 milligrams percent and a level of 28 milligrams percent in vitreous fluid. This was thought to be caused by the delay in performing the autopsy and of no significance. Further post-mortem evaluation of photographs and X-ray examinations completed by the Armed Forces Institute of

Pathology did not reveal any injuries consistent with an ejection attempt. (Tabs X, EE-6, 7, 8, and 10)

(3) Captain LeBlanc's medical records indicate he was medically qualified for flying duties on the day of the mishap. His most recent Flying Class II physical examination was dated 12 Nov 92. It did not reveal any disqualifying defects and was valid until 31 Dec 93. Captain LeBlanc completed centrifuge training on 11 Sep 89 and accomplished physiological training on 10 Jun 92 which was current until 30 Jun 95. A review of dental records showed Captain LeBlanc to be Dental Class I (fully qualified for duty) as of 8 Jun 93. (Tabs T-22 and 23)

(4) A thorough medical evaluation was completed on Captain LeBlanc following the mishap even though he had indicated no physical difficulties. A radiographic examination of his entire spine was accomplished and was without abnormality. A complete physical examination revealed no external injuries were sustained. Toxicology tests, performed on both urine and blood samples showed no evidence of alcohol or drugs present. A complete visual examination by an optometrist, to include contrast sensitivity, was accomplished on 4 Aug 93 at the 51st Medical Group Hospital, Osan AB, ROK, and revealed no significant abnormalities. (Tabs DD-2 and EE-9)

(5) Toxicology, routine chemistry, complete blood count, and urinalysis testing was conducted on the pilot of Slap 01. His blood specimen revealed no detectable ethanol, but an ethanol level of 25 milligrams percent was found in his urine. The urine ethanol was discussed with the Armed Forces Institute of Pathology and was felt to be secondary to microbiological activity and to be of no significance. All other tests were within normal limits. (Tabs DD-3 and EE-6) Toxicology screens on urine and blood ethanol levels were also obtained on the supervisor of flying, air traffic control personnel, and maintenance personnel associated with aircraft 86-0275 and aircraft 87-0335. All results were negative. (Tabs DD-5 and 6)

q. NAVAIDS AND FACILITIES

There is no evidence regarding malfunctioning NAVAIDS or facilities (Tabs O-1 thru 5, V-3, 4, 24, 26, and EE-35).

r. WEATHER

(1) In the early afternoon of 27 Jul 93, weather cells skirted the west coast of Korea, bringing moderate intensity rain showers to Kunsan AB throughout the afternoon. Kunsan AB carried moderate and heavy rain showers for four and one half hours

starting at 1:55 PM. During this time, 1.75 inches of rain fell. The heaviest precipitation occurred during the hour of the mishap when .72 inches accumulated. (Tab O-21)

(2) The latest 12-hour forecast (disseminated at 0609Z [3:09 PM], valid from 27/0600Z [27 Jul 93/3:00 PM] thru 27/1800Z [28 Jul 93/3:00 AM]) for the afternoon of 27 Jul 93 was; wind: 300 degrees at 10 knots; visibility: 1 1/2 miles; sky conditions: 500 feet scattered, 1500 feet broken, ceiling 1500 feet, 3000 feet overcast, improving to 1500 feet scattered, 3000 feet overcast, ceiling 3000 feet, by 0900Z (6:00 PM) (Tab O-25). The latest hourly observation prior to the accident was disseminated at 0555Z (2:55 PM) and read as follows; wind: 290 degrees at 05 knots; visibility: 1 1/2 miles with moderate rain showers; sky condition: 500 feet scattered, 1800 feet broken, ceiling measured 1800 feet, 3000 feet overcast; temperature: 23 degrees celsius; dew point: 21 degrees celsius; altimeter setting: 29.65 inches; remarks: approach ceiling estimated 1800 feet and approach visibility 1 1/2 miles with a wet runway (Tab O-24). Immediately following the accident, an observation was taken at 0635Z (3:35 PM) which read; wind: 280 degrees at 04 knots; visibility: 1 1/2 miles with moderate rain showers; sky conditions: 500 feet scattered, 1800 feet overcast, ceiling measured 1800 feet; temperature: 22 degrees celsius; dew point: 21 degrees celsius; altimeter setting: 29.65 inches; remarks: approach ceiling estimated 1800 feet and approach visibility 1 1/2 miles with a wet runway (Tab O-25).

(3) There was no great disparity in forecasted weather and that actually observed by official weather observers at Kunsan AB (Tabs O-24 and 25). Weather as described by witnesses identifies conditions at the time of the mishap to be lower than that reported by official base weather reports. The conditions described by the witnesses were an approximated ceiling between 300 and 500 feet, with visibility varying between 3/4 and 1 1/2 miles. All witnesses described moderate to heavy rain showers during the mishap with intermittent breaks in the precipitation as the rain showers passed through the area. (Tabs V-1, 3, 10, 18, 46, 47, 60, 64, 65, and 86)

(4) Three Pilot Reports (PIREPs) of the weather were made in the hour prior to the mishap. Two departure PIREPs reported entering the clouds at 500 feet while one arrival aircraft reported an arrival ceiling of 1800 feet with approach visibility of 1 1/2 miles. The arrival PIREP and one of the departure PIREPs were passed to the base weather station by control tower personnel. (Tab O-21)

s. DIRECTIVES AND PUBLICATIONS

(1) The following applicable publications and directives were reviewed. In all cases Major Command, Numbered Air Force, and 8th Fighter Wing volumes, chapters, and supplements were reviewed:

(a) Federal Aviation Administration Handbook (FAAH) 7110.65G, Air Traffic Control, 27 May 93

(b) Department of Defense Flight Information Publication (Enroute), Flight Information Handbook, 19 Aug 93

(c) Department of Defense Flight Information Publication (Enroute), Supplement Pacific, Australasia and Antarctica, 27 May 93

(d) Department of Defense Flight Information Publication (Terminal), High and Low Altitude Pacific, Australasia and Antarctica, 24 Jun 93

(e) Air Force Regulation (AFR) 60-4, Supervisor of Flying (SOF) Program, 10 May 93

(f) Air Force Regulation (AFR) 60-5, Air Traffic Control, 28 Feb 92

(g) Air Force Regulation (AFR) 60-16, General Flight Rules, 27 Jan 92

(h) Air Force Regulation (AFR) 110-14, Investigations of Aircraft, Missile, and Nuclear and Space Accidents, 15 Dec 89

(i) Air Force Regulation (AFR) 127-4, Investigating and Reporting US Air Force Mishaps, 3 Jan 90, Change 1, 13 May 91

(j) Air Force Regulation (AFR) 160-43, Medical Examinations and Standards, 16 Feb 93

(k) Air Force Manual (AFM) 2-1, Aerospace Operational Doctrine Tactical Air Operations-Counter Air, Close Air Support, and Air Interdiction, 2 May 69

(l) Air Force Manual (AFM) 51-37, Instrument Flying, 15 Jul 86, Change 4, 1 Apr 92

(m) Air Force Manual (AFM) 66-279, Volume I, Attachment 1, Introduction to CAMS, 1 Jul 93

(n) Air Force Pamphlet (AFP) 60-19, Volume I, Pilots' Instrument Refresher Course (IRC) Instructor Guide, 10 Sep 91

(o) Multi-Command Regulation (MCR) 51-50, Tactical Aircrew Training, 30 Oct 85

(p) Multi-Command Regulation (MCR) 55-116, F-16 Pilot Operational Procedures, 7 May 93

(q) Pacific Air Forces Regulation (PACAFR) 55-65, Aircraft Surge Launch and Recovery Implementation Procedures (ASLAR), 22 Feb 91

(r) Technical Order (T.O.) 1F-16C-1, Flight Manual USAF Series Aircraft F-16C/D Blocks 25, 30, and 32, 17 Oct 88, Change 8, 10 May 93

(s) Technical Order (T.O.) 1F-16C-1-2, Supplemental Flight Manual USAF Series Aircraft F-16C/D Blocks 25, 30, and 32, 1 Oct 92

(t) Technical Order (T.O.) 1F-16C-2-27FI-00-1, Technical Manual Flight Control System USAF Series F-16C and F-16D Aircraft Blocks 25, 30, and 32, 8 Aug 90, Change 8, 22 Apr 93

(u) Technical Order (T.O.) 1F-16C-2-31GS-00-1, Technical Manual Crash Survivable Flight Data Recorder System USAF Series F-16C and F-16D Aircraft Blocks 25, 30, and 32, 4 Nov 87, Change 4, 27 Aug 90

(v) Technical Order (T.O.) 1F-16C-2-33GS-00-1, Technical Manual Lighting System USAF Series F-16C and F-16D Aircraft Blocks 25, 30, and 32, 13 Aug 83, Change 11, 19 Feb 91

(w) Technical Order (T.O.) 1F-16C-6-11, Technical Manual Scheduled Inspection and Maintenance Requirements USAF Series F-16C and F-16D Aircraft Using F110-GE-100 Engine Block 30, 10 Apr 91, Change 7, 12 Apr 93

(x) Technical Order (T.O.) 1F-16C-34-1-1, Avionics and Nonnuclear Weapons Delivery Flight Manual USAF Series Aircraft F-16C/D Blocks 25, 30 and 32, 18 Mar 92

(y) Technical Order (T.O.) 1F-16C-38, Force Management Data Collection Procedures USAF Series F-16C and F-16D Aircraft Blocks 25, 30, 32, 40, 42, 50, and 52, 28 Jan 91, Change 3, 13 Apr 93

(z) Technical Order (T.O.) 5F5-4-28-2, Technical Manual Maintenance Instructions Intermediate Central Air Data Computer Part No. 4025116-905 and Part No. 4025116-907, 17 Aug 81, Change 7, 7 Sep 90

(aa) Wing Standards, 8th Fighter Wing Wolfpack Standards, Mar 93

(bb) Wing Training Plan, 8th Fighter Wing Wing Training Plan, 1 Jan 93

(cc) Operations Letter, Kunsan Control Tower/Radar Approach Control (RAPCON) Coordination Procedures, 16 Jul 93

(dd) DOFR Operating Instruction (OI) 60-1, Facility Memorandums, 1 May 93

(ee) DOFCT Operating Instruction (OI) 60-1, Facility Memorandums, 17 Jul 93

(2) The following are known or suspected violations of regulations and/or directives:

(a) Federal Aviation Administration Handbook 7110.65G, paragraph 5-114, Departure and Arrival, states: "Except as provided in paragraph 5-115, separate a departing aircraft from an arriving aircraft on final approach by a minimum of 2 miles if separation will increase to a minimum of 3 miles (5 miles when 40 miles or more from the antenna) within 1 minute after takeoff." Additionally, paragraph 5-114 note 1 states: "This procedure permits a departing aircraft to be released so long as an arriving aircraft is no closer than 2 miles from the runway at the time. This separation is determined at the time the departing aircraft commences takeoff roll." (Paragraph 5-115 deals with Departures and Arrivals on Parallel or Nonintersecting Diverging Runways and is not applicable.) (Tab O-13)

RATIONALE: The control tower local controller failed to ensure compliance with the established standard, thus allowing separation to decrease below 2 miles as evidenced by the mishap (Tabs A-1, 3, 4, 47, 48, and 68).

(b) Federal Aviation Administration Handbook 7110.65G, paragraph 3-124 Landing Clearance, note, states: "A clearance to land means that appropriate separation on the landing runway will be ensured." (Tab EE-11)

RATIONALE: The control tower local controller failed to ensure adequate separation existed on the runway as evidenced by the mishap (Tabs A-1, V-3, 4, 47, 48, and 68).

(c) Air Force Regulation 60-5, paragraph 2-1, Personnel Titles, Qualifications, and Responsibilities, subparagraph g(2), Watch Supervisor (WS) Responsibilities, states: "Responsible for the overall operation of the facility during their shift and maintains general situational awareness of air traffic." (Tab EE-12)

RATIONALE: The control tower watch supervisor failed to maintain situational awareness of air traffic in that he allowed the control tower local controller to direct aircraft in violation of Federal Aviation Administration Handbook 7110.65G (Tabs A-1, V-3, and 4).

(d) Air Force Regulation 60-5, paragraph 3-1, ATC Forms, subparagraph b, AF Form 3616, Daily Record of Facility Operation, states: "Each WS or SC who performs supervisory duties for all or any portion of a shift signs the AF Form 3616 when completing their shift. Their signature certifies the entries are correct and the form contains all required entries." (Tab EE-12)

RATIONALE: During the course of the investigation approximately 90 days worth AF Form 3616s were examined. Approximately twenty-five percent of the forms failed to have the required watch supervisor or senior controllers signatures. Documented review by both the Chief Controller and Chief Air Traffic Control Operations failed to identify the deficiency.

(e) Air Force Regulation 60-5, paragraph 3-5, Local Operating Procedures, subparagraph k, states: "CCTLRs issue operating instructions to regulate and standardize administrative practices within a facility. CATCOs issue operating instructions to regulate and standardize administrative practices of more than one facility under their jurisdiction. Number operating instructions according to their subject series." (Tab EE-12)

RATIONALE: Each facility chief controller has established one Operating Instruction (OI), which serves as a directory for Facility Memorandums, instead of establishing OIs for each operation or function.

(f) Air Force Regulation 60-5, PACAF SUPPLEMENT 1, Air Traffic Control Management, paragraph 2-1C(2), states: "CCTLRs shall establish a program to ensure controllers maintain proficiency in all positions they are certified in, except as noted in paras 2-1b(1)(d) and 2-1d(1)(c). The program must include minimum monthly/quarterly requirements, a means of tracking proficiency, and actions that will be taken when a controller fails to meet requirements. Proficiency observation procedures/time frame should be contained in a facility operating instruction." (Tab EE-13)

RATIONALE: Each facility addresses its proficiency program in a facility memorandum vice an operating instruction. The radar facility program fails to set or track standards. Although the tower has set standards for proficiency, their program lacks a system to track and document those standards.

(g) Air Force Regulation 60-16, paragraph 8-14, Approach and Landing Minimums, subparagraph d, states: "No person may operate an aircraft below the prescribed MDA or continue an approach below the DH unless: (1) The aircraft is in a position to make a normal approach to the runway of intended landing; and (2) The pilot clearly sees the approach threshold of the runway, approach lights, or other markings identifiable with the approach end of that runway." (Tab EE-14)

RATIONALE: Despite Slap 02's testimony that he initially saw the lighted T, runway marker lights, and VASIs; his testimony to the contrary that he did not see the painted runway markings and didn't expect to see them clearly because of rain and poor visibility and his testimony that he never saw Stingray 01 on the runway, clearly establishes Slap 02's non-compliance with the above regulation. Further supporting this, was evidence that Slap 02 was unaware of his collision with an aircraft on the runway until advised of that fact approximately one hour after the mishap. (Tabs V-1, 13, 17, and 78).

(h) Air Force Regulation 60-16, paragraph 8-14, Approach and Landing Minimums, subparagraph e, states: "If on arrival at the missed approach point or DH (or at any time thereafter) any of the requirements in paragraph d above are not met, the pilot must immediately execute the appropriate missed approach procedure." (Paragraph 8-14d is quoted in paragraph [g] above.) (Tab EE-14)

RATIONALE: Testimony indicates that no attempt was made to execute either a missed approach, climb-out or a go-around at any time during the mishap approach and/or attempted landing (Tabs V-1, 48, and BB-2).

(i) Multi-Command Regulation 51-50, Volume 8, paragraph 6-6, Flight Lead Upgrade, subparagraph e, states: "The provisions of this section do not prohibit pilots who have not yet entered FLUG and are not FL-qualified from leading limited portions of a mission under the supervision of an IP or FL-qualified SQ supervisor." (Tab EE-15)

RATIONALE: Testimony and transcripts of radio transmissions verify Slap 02 as the leader of Slap 01 flight during the latter portion of the mishap sortie (Tabs V-1, 2, and EE-37). At the time of the mishap Slap 01 was neither a squadron supervisor or instructor

pilot (Tabs V-2, 7, and EE-24). Testimony also indicated that Lieutenant Colonel Gardner had led a four-ship mission on the morning of the mishap. (Tabs V-14, 74, and EE-27). A review of his training folder indicated all required training to upgrade to flight lead had not been accomplished nor had the squadron commander certified him as a flight lead. (Tabs T-9 and 16)

(j) Pacific Air Forces Regulation 55-116, 8th Fighter Wing Chapter 8, section B, General Policy, paragraph 8-6, Command and Control/Flight Supervision, subparagraph d, states: "Prebriefed portions of the flight may be tactically led by a wingman on the wing of a squadron supervisor or instructor pilot." (Tab O-30)

RATIONALE: See (i) above.

(k) Air Force Regulation 127-4, Chapter 5, Aircraft Flight Mishap Reporting, paragraph 5-4, Flight, Flight Related, and FOD Mishap Reporting Requirements, subparagraph g(7), Other Events Reportable as Class C Flight Mishaps, identifies "Flight control malfunction (including helicopter flight control, stability augments, autopilot, and trim systems) resulting in an unexpected, hazardous change of flight attitude, altitude, or heading." as a reportable Class C Mishap. (Tab EE-16)

RATIONALE: Testimony indicates Captain LeBlanc experienced a departure from controlled flight on 9 Jul 93. It further confirms that a Class C Mishap Report was not accomplished even though extensive maintenance was performed on the aircraft. (Tab V-1, 12, and EE-36)

(l) Air Force Regulation 60-16, Chapter 6, Life Support Systems, Table 6-1, Oxygen Requirements For Pressurized Aircraft, identifies the requirement for the pilot of an aircraft operating above Flight Level 500 to wear a pressure suit. (Tab EE-17)

RATIONALE: Data from the Electronic Component Assembly of aircraft 86-0286 which is not equipped to support pressure suit operations, piloted by Captain LeBlanc on 9 Jul 93, was examined for a departure from controlled flight. This data confirms the aircraft's operation above Flight Level 500. (Tab EE-2) Additionally, testimony confirms that AFR 60-16/PACAF Sup 1 paragraph 6-2g was not applicable (Tab V-1).

(m) Multi-Command Regulation 51-50, Volume 8, Chapter 4, Continuation Training, paragraph 4-2, Ground Training, subparagraph d(2)(a), Situational Emergency Procedures Training (SEPT), states: "This training will be accomplished each calendar month. Failure to accomplish by the end of the month will result in grounding until subsequently completed." (Tab EE-18)

RATIONALE: A review of the individual currency summary printout for both Lieutenant Colonel Gardner and Captain LeBlanc shows both pilots were overdue the required situational emergency procedures training on the day of the mishap (Tabs T-18 and 44).

(n) Technical Order 1F-16C-6-11, section 1, part H, Phased Inspections Requirements, page 1-H-038, identifies the requirement to perform an ultrasonic inspection of the F110 engine midspan shroud every 150 flight hours (Tab EE-43).

RATIONALE: A review of inspection requirements for aircraft 86-0275 indicated the 150 hour ultrasonic midspan shroud inspection was overdue by 26.4 hours (25.5 hours corrected time) at the time of the mishap. (Tabs U-1 and 2)

(o) Technical Order 1F-16C-1-2, Figure 5-10, Sheet 99, identifies authorized configurations for F-16 Block 30 aircraft when loaded with CATM-88/A captive air-to-ground training missiles. (Tab EE-19)

RATIONALE: Testimony confirms that an unauthorized configuration was flown by both aircraft in Slap 01 flight during their first sortie on the day of the mishap (Tabs V-1, and 2).

(p) Pacific Air Forces Regulation 55-116, 8th Fighter Wing Chapter 8, paragraph 8-6, Command and Control/Flight Supervision, subparagraph b, states: "The most senior flight commander may be approved as TOP-3 by the 8 OG/CC on a case by case basis." (Tab O-30)

RATIONALE: The flying schedule for the 35th Fighter Squadron indicates Captain Norris, "C" Flight Commander, as the squadron's TOP-3 at the time of the mishap. Testimony indicates he had not been approved by the operations group commander as a TOP-3. (Tabs V-84 and EE-27)

### 3. STATEMENT OF OPINION

Under 10 U.S.C. 2254(D), any opinion of the accident investigator as to the cause of, or the factors contributing to, the accident set forth in the accident investigation report may not be considered as evidence in any civil or criminal proceeding arising from an aircraft accident, nor may such information be considered an admission of liability by the United States or by any person referred to in those conclusions or statements.

a. FACTORS CAUSING THIS ACCIDENT

(1) In the course of my investigation, certain information was discovered, which in my opinion, provided clear and convincing evidence as to the cause of the mishap involving Stingray 01 and Slap 02. The main factors involve (1) did the control tower local controller maintain proper aircraft separation in accordance with all appropriate regulations? (2) was the control tower watch supervisor aware of the situation as required by Air Force regulations and should/could he have prevented the mishap? and (3) did Slap 02 continue his approach without clearly defined visual references of the runway environment contrary to Air Force regulations?

(2) Specifically, the control tower local controller failed to comply with Federal Aviation Administration Handbook (FAAH) 7110.65G, paragraphs 5-114 (Tab O-13) and 3-124 (Tab EE-11). These specific paragraphs deal with separation of aircraft approaching a runway for landing and clearing an aircraft for takeoff. In clearing Stingray 01 for takeoff at the exact time he did, the control tower local controller failed to ensure the minimum separation of two miles between aircraft simultaneously arriving and departing under instrument flight rules conditions as required by the FAAH paragraphs cited above. Additionally, by clearing Stingray 01 onto the runway, the control tower local controller failed to ensure that the runway environment was free and remained free of any obstructions after he cleared Slap 02 to land. (Tab EE-37). Had he complied with either of the above referenced regulations, in my opinion, Slap 02 would not have been in a position to collide with Stingray 01. (Tab A-1)

(3) The facts also clearly established that the control tower watch supervisor failed to maintain general situational awareness of operations in the control tower at the time of the mishap in accordance with Air Force Regulation 60-5, paragraph 2-1g(2) (Tab EE-12). During the course of events, the control tower watch supervisor admits to feeling "something wasn't right", yet he failed to take any positive actions to verify any traffic conflicts, nor did he take any corrective action (Tab V-3). If the control tower watch supervisor had exercised the requisite situational awareness as to the actions/inactions of the control tower local controller regarding Slap 01 flight, ample opportunity would have been available to take corrective action. Thus, his lack of action contributed to the course of events leading up to the mishap.

(4) The facts also clearly indicate that the pilot of Slap 02 operated his aircraft in violation of Air Force Regulation 60-16, paragraphs 8-14(d) and (e), when he failed to execute the appropriate missed approach procedure, and continued his approach

below the decision height for the ASLAR ILS Runway 36 approach at Kunsan AB, without clearly defined visual references to the runway environment (Tab EE-14). In thoroughly examining the facts of this mishap, the investigation analyzed several areas which could impact Slap 02's ability to fly the approach in compliance with the above regulation.

(a) Examination of the official weather forecast and observation at Kunsan AB at the time of the mishap shows the weather well above the 200 foot ceiling and 3/4 mile visibility minimums required to fly the approach (Tabs O-14, 21, and W-1). Testimony by Slap 02 and witnesses to the mishap confirm the weather at the approach end of Runway 36 at a 300 foot ceiling and 1 mile visibility; i.e. 100 feet and 1/4 mile above the minimum requirements. Testimony also confirms moderate to heavy rain showers at the approach end of the runway at the time of the mishap. (Tabs O-14, V-1, 3, 10, 18, and 47)

(b) Slap 02 stated he broke out of the ceiling at 330 feet MSL, 101 feet above decision height and the minimum ceiling for the approach (Tabs O-14 and V-1). Witnesses stated they observed the aircraft come out of the clouds over the beginning of the approach lights which are approximately 3700 feet from the runway point of interception for the approach (Tabs O-14, V-47, AA-3, and EE-20). This position on final, for the glide path Slap 02 stated he flew, would be consistent with the altitude that Slap 02 testified that he broke out of the clouds and close to the decision height of 229 feet MSL (Tabs O-14 and V-1). It would have been at this point (i.e. decision height) that Slap 02 would have to execute a missed approach, or any time thereafter, if he did not clearly have the runway environment in sight.

(c) To continue the approach in accordance with regulations, Slap 02 had to be in a position to make a normal approach to the runway and clearly see the approach threshold of the runway, approach lights, or other markings identifiable with the approach end of the runway (Tab EE-14). In my opinion, the evidence shows that Slap 02 was in a position to make a normal approach to the runway. Witnesses to the mishap indicated a normal glidepath and data captured by the flight data recorder is consistent with a normal approach to landing (Tabs BB-2, V-1, 46, 47, and 48).

(d) The requirement to clearly see the runway environment is where Slap 02 deviated from the regulation. His testimony that he saw the lighted T, runway marker lights, and the visual approach slope indicator (VASI) lights when he broke out of the clouds indicates he saw portions of the runway environment (Tab V-1). His testimony to the contrary that he did not see the threshold, touchdown zone, and centerline runway markings, and

didn't expect to see them very clearly because of the rain and the poor visibility confirms that although he could see some approach lighting it was insufficient to meet the requirement to clearly see the runway environment. (Tab V-1)

(e) To insure that a thorough investigation was accomplished, additional factors that may have unknowingly limited Slap 02's forward visibility were examined. Rain collecting on the canopy in front of the HUD is a known problem and is addressed in the F-16 flight manual, however, testimony by Slap 02 confirmed it was not a factor (Tabs V-1 and EE-32). Also excluded as a factor was the potential for HUD symbology to obscure forward visibility. An ASLAR ILS to Runway 36 at Kunsan AB was flown in the F-16 simulator with the same HUD symbology and weather conditions Slap 02 experienced on the day of the mishap. The photos, at Tab Z, clearly show that HUD symbology would not have prevented Slap 02 from clearly seeing the runway environment or the approach end of the runway where the collision occurred (Tabs Z-1 thru 5). Slap 02 also testified that the HUD symbology did not hamper his forward visibility. Testimony also indicated that Captain LeBlanc was not known to suffer from HUD fixation or to have any known problems with situational awareness. (Tabs V-1, 2, 9, 11, 13, and EE-34)

(f) The primary evidence that establishes Slap 02's violation of Air Force Regulation 60-16 is his own testimony that he never saw Stingray 01, even at the moment of impact, when Stingray 01's entire 49 foot long and 33 foot wide aircraft, with a white flashing (approximately 50 times a minute) anti-collision light operating on its tail, was less than ten feet in front of him. The only way Slap 02 could not see Stingray 01 on the runway at some time would be if his vision was totally blocked or if Stingray 01 was not in Slap 02's field of view during the final portions of the approach and attempted landing. (Tabs V-1, EE-44, and 45)

(g) If visibility was below minimums, and Slap 02, for whatever reason elected to continue the approach in violation of regulations, it is quite possible to use on-board navigation aides and the limited visual cues he described in his testimony to fly the F-16 to a landing (Tab V-1). This can be accomplished by looking out either side of the canopy, acquiring visual references from below and to the side of the aircraft, which in low visibility situations are much better than forward visibility due to the shorter slant ranges. Using this technique to land the aircraft would allow the pilot to fly a "normal" approach in limited visibility. If this type of approach is flown, the pilot would continue looking out the side and low from the cockpit until just above the runway where he would then transition to looking forward as he began to flare the aircraft moments prior to touchdown. When flying an approach in this manner, it would be impossible to see an

aircraft on the runway until the pilot looked forward. If this is not done until the flare, a pilot could collide with another aircraft on the runway and never see it, as Slap 02 did.

(h) Irrespective of how he flew the approach, Slap 02 failed to execute a missed approach as required by regulations and continued his approach without clearly defined visual references. Had he complied with the regulations described above, this mishap would not have occurred.

b. CONTRIBUTING FACTORS

(1) In addition to those factors that caused the mishap there were other elements which, in my opinion, may have contributed to the sequence of events leading to the mishap. These contributing factors are not based on clear and convincing evidence but on my personal experience as a pilot and commander.

(2) Testimony indicated Captain LeBlanc's scheduled departure on mid-tour leave, the morning after the mishap, had no impact on his decision making process that afternoon (Tabs V-1, 2, 7, and 13). However, I find it difficult to believe that diverting the afternoon prior to his mid-tour leave would not have been of any consequence to his decision to continue the approach. This, as well as the squadron's direction to land by 3:30 PM may have contributed to Captain LeBlanc's decision to continue the approach (Tabs V-1 and 2).

(3) Captain LeBlanc's demonstrated lack of flight discipline was also a contributing factor in this mishap. His actions, on 9 Jul 93, when he flew above Flight Level 500 and, on the day of the mishap, when he led Slap 01 flight, indicate Captain LeBlanc's propensity to disregard regulations and his lack of flight discipline (Tabs V-1, 2, and EE-2). Had Captain LeBlanc been a more disciplined pilot, he would have executed the appropriate missed approach procedure in accordance with Air Force regulations and thus prevented the mishap.

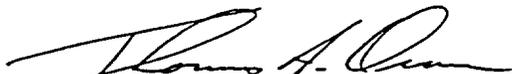
4. SUMMARY:

This report is submitted as a complete document of all factual information available to the Investigating Officer, in accordance with AFR 110-14, regarding the aircraft accident involving F-16C Serial Number 86-0275 and F-16C Serial Number 87-0335 on 27 Jul 93.



THOMAS A. ORAM, Lt Col, USAF  
Investigating Officer

In some instances a copy or other facsimile has been substituted for the original. I certify that all such facsimiles contained herein are true and accurate copies of the originals.



THOMAS A. ORAM, Lt Col, USAF  
Investigating Officer