SUMMARY OF FACTS AND STATEMENT OF OPINION
F-15C, T/N 79-0075
F-15C, T/N 81-0043
GULF OF MEXICO, 44 NM SOUTH OF TYNDALL AFB, FLORIDA
20 FEBURARY 2008

TABLE OF CONTENTS

COMMONLY USED ACRONYMS AND ABBREVIATIONS

°	Degree(s)
2 Vs	Two F15s vs. "X" Number of Adversaries
4 Vs	Four F15s vs. "X" Number of Adversaries
9X	Air Intercept Missile 9X
A1C	Airman First Class
A3	Director of Air and Space Operations
AAC	Air Armament Center
AB	After Burner
ACC	Air Combat Command
ACM	Air Combat Maneuvers
ACMI	Air Combat Maneuver Instrumentation
ACMR	Air Crew Mission Ready
ADCC	Assistant Dedicated Crew Chief
AEF	Air Expeditionary Force
AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFMC	Air Force Material Command
AFTO	Air Force Technical Order
AHC	Advanced Handling Characteristics
AIB	Accident Investigation Board
AIM	Air Intercept Missile
ALO	Air Liaison Officer
ALS	Airman Leadership School
AMU	Aircraft Maintenance Unit
AMXS	Aircraft Maintenance Squadron
AOA	Angle of Attack
AP	Associated Press
APG	Aircraft Power General
ASA	Air Sovereignty Alert
ATC	Air Traffic Control
ATSO	Ability To Survive and Operate
AUX	Auxiliary Radio
BM2	Boatswain Mate Second Class
BMC	Basic Mission Capable
BFM	Basic Fighter Maneuver
BPO	Basic Post-Flight Inspection
BPO/PRE	Combined BPO/Preflight
C	Celsius
CAF	Combat Air Force
CAMS	Core Automated Maintenance System
Capt	Captain
CBC	Canadian Broadcasting Centre
CD	Compact Disk
CGAS	Coast Guard Air Station
CGO	Company Grade Officer
CMR	Combat Mission Ready
CNN	Cable News Network
Col	Colonel
COMACC	Commander, Air Combat Command
COMM	Communications
CONAR	Continental U.S. Norad Region
CT	Continuation Training
CTK	Composite Tool Kit
DCA	Defensive Counter Air
DCC	Dedicated Crew Chief
Demo Bird	Demonstration Aircraft
DMT	Distributive Mission Trainer
DNIF	Duty Not Including Flying
DO	Director of Operations/Operations Officer
DOC	Declaration of Capabilities
EP	Emergency Procedures
EPE	Emergency Procedures Evaluation
ELT	Emergency Locator Transmitter
EOC	Emergency Operations Center
EOR	End Of Runway
EQ	Excellent Qualified
ER	Emergency Room or Exceptional Release
F	Fahrenheit
F/V	Fishing Vessel
FAIP	First Assignment Instructor Pilot
FCIF	Flight Crew Information File
FL	Flight Lead
FLUG	Flight Lead Up-Grade
FMC	Fully Mission Capable
FOD	Foreign Object Debris
FS	Fighter Squadron
FSTR	Full Scale Threat Response
FTIT	Fan Turbine Inlet Temperature
FTU	Formal Training Unit
FW	Fighter Wing
G	Gravity
HABFM	High Aspect Basic Fighter Maneuver
HIPAA	Health Insurance Portability & Accountability Act
HPO-2	Hourly Post Flight Inspection-2
HUD	Heads Up Display
IAW	In Accordance With
ICU	Intensive Care Unit
ID	Identification Card
IMDS	Integrated Maintenance Data System
INS	Inertial Navigation System
IP	Instructor Pilot
IPUG	Instructor Pilot Up-Grade
IRMD	Infrared Missile Defense
ISB	Interim Safety Board
JAG	Judge Advocate General
JOAP	Joint Oil Analysis Program
KIAS	Knots Indicated Airspeed
LOX	Liquid Oxygen
LPU	Life Preserving Unit

Lt	Lieutenant
Lt Col	Lieutenant Colonel
LVS	Left Vertical Stabilizer
MA	Mishap Aircraft
Maj	Major
MAN-2	Flare Actuation in F-15C
MARE	Major Aircraft Readiness Exercise
MEDIC	Minimal Expectant Delayed Immediate Contaminated
MF	Mishap Flight
MIKE 56	M-56 (20MM Bullet)
MJU	Infrared Missile Flare
MP	Mishap Pilot
MQT	Mission Qualification Training
MR	Mission Ready
MSgt	Master Sergeant
MSS-3	Mission Selectable Setting-3
NCO	Non Commissioned Officer
NM	Nautical Miles
NOTAMS	Notice to Airmen
OCA	Offensive Counter Air
OEF	Operation Enduring Freedom
OIC	Officer In Charge
OG	Operations Group
ONE	Operation NOBLE EAGLE
OPR	Office of Primary Responsibility
OPS	Operations Squadron
ORE	Operational Readiness Exercise
ORI	Operational Readiness Inspection
ORM	Operational Risk Management
OTI	One Time Inspection
OX Cullen	Oxygen and Electrical Specialist
P5	Air Combat Maneuver Instrumentation Upgrade
P5RC	see P5
PA	Public Affairs
PE	Periodic Phase Inspection
PFD	Personal Flotation Device
PFM	Pre Flight Message
PGM	Precision Guiding Munitions
PLF	Parachute Landing Fall
PTM	Practice Training Missile
PUCKS	Magnetic Nametags
QA	Quality Assurance
QC	Quality Control
RAP	Ready Aircrew Program
RAPCON	RADAR Approach Control
RESCAP	Rescue Combat Air Patrol
ROE	Rules Of Engagement
RTB	Return To Base
RTU	Replacement Training Unit
SA	Situational Awareness
SAR	Search and Rescue
SIB	Safety Investigation Board
SII	Special Interest Items
SIMS	Simulators
SME	Subject Matter Expert
SMSgt	Senior Master Sergeant
S/N	Serial Number
SNIPER Pod	Advanced Targeting Pod
SOF	Supervisor of Flying
SORTS	Status of Resources and Training
Stan and Eval	Standardization and Evaluation
SUP	Supervisor
SWATT	Squadron Weapons and Tactics Talk
T/N	Tail Number
T.O.	Technical Order
TDY	Temporary Duty
TCTO	Time Compliance Technical Order
TACAN	Tactical Air Navigation
TI Intercept	Tactical Intercepts
TOP 3	Squadron Supervisors
TR	Training Rule
TSgt	Technical Sergeant
TX Course	Transition Course
UHF	Ultra High Frequency
US	United States
USAF	United States Air Force
USCG	United States Coast Guard
USN	United States Navy
USS	United States Ship
VFR	Visual Flight Rules
VTR	Video Tape Recorder
WEZ	Weapon Engagement Zone
Z	Zulu, or Greenwich Mean Time

The above list was compiled from the Summary of Facts, the Statement of Opinion, the Index of Tabs, and Witness Testimony (Tab V).

SUMMARY OF FACTS

1. AUTHORITY, PURPOSE, AND CIRCUMSTANCES

a. Authority

On 23 February 2008, General John D. W. Corley, Commander, Air Combat Command, appointed Brigadier General Joseph Reynes, Jr. to conduct an aircraft accident investigation of a mishap that occurred on 20 February 2008 involving two F-15Cs from Eglin Air Force Base (AFB), Florida (Tab Y-3). The investigation was conducted at Eglin AFB, from 1 April 2008 through 1 May 2008, pursuant to Air Force Instruction (AFI) 51-503, *Aerospace Accident Investigations*. Board members were Lieutenant Colonel (Lt Col) David S. Cockrum (Medical), Captain (Capt) Travis J. Hazeltine (Pilot), Capt Kathy Malowney (Legal), Senior Master Sergeant (SMSgt) Thomas A. Parkinson (Maintenance), and Technical Sergeant (TSgt) Gloria L. Vizcaino (Recorder) (Tab Y-4 thru Y-6). Technical advisors were Capt Thomas DeGraff (Assistant Medical) and TSgt Russell Foley (Court Reporter).

b. Purpose

The purpose of this investigation was to provide a publicly releasable report of the facts and circumstances surrounding the accident, to include a statement of opinion on the cause or causes of the accident; to gather and preserve evidence for claims, litigation, disciplinary, and administrative actions; and for other purposes.

c. Circumstances

The accident investigation board (AIB) was convened to investigate the Class A accident involving two F-15Cs, tail number (T/N) 79-0075 and 81-0043, assigned to the 58th Fighter Squadron (58 FS), 33d Fighter Wing (33 FW), Eglin AFB, Florida, which occurred during a training mission on 20 February 2008 (Tab Y-3 thru Y-6).

2. ACCIDENT SUMMARY

On 20 February 2008, the mishap aircraft (MA), F-15C, T/N 79-0075 (MA1) and 81-0043 (MA2), departed Eglin AFB, Florida, at 1320 local time (L)/1920 Zulu (Z, or Greenwich Mean Time) to conduct a high aspect basic fighter maneuver (HABFM) mission in W-151B (Tab Z-5). Approximately 12 minutes later, at a position 44 nautical miles (NM) south of Tyndall AFB, Florida, the two mishap aircraft impacted in mid-air during a HABFM engagement (Tab M-4 thru M-5). United States Air Force (USAF), United States Navy (USN), and United States Coast Guard (USCG) rescue forces recovered both MPs from the Gulf of Mexico (Tab O-3 thru O-92). Mishap pilot 1 (MP1, call sign AXLE 41) ejected with minor injuries requiring no treatment, and mishap pilot 2 (MP2, call sign AXLE 42) was fatally injured at the time of the impact (Tab X-3). Both aircraft were destroyed; their combined loss was $83,336,713. The accident caused no damage to private property (Tab P-3 thru P-5). There was local, national, and international media coverage (Tab DD-1 thru DD-82).

3. BACKGROUND

The Mishap Aircraft were assigned to the 58 FS, one of two F-15C squadrons within the 33d Operations Group (33 OG), 33 FW, Ninth Air Force (9 AF). 9 AF is a Numbered Air Force within Air Combat Command (ACC).

a. Air Combat Command

ACC, headquartered at Langley AFB, Virginia, is a major command created 1 June 1992 by combining its predecessors, Strategic Air Command and Tactical Air Command. ACC is the primary force provider of combat airpower to America's war fighting commands and operates fighter, bomber, reconnaissance, battle-management, and electronic-combat aircraft to support global implementation of national security strategy. ACC's major units are: First Air Force, Tyndall AFB, Florida; Eighth Air Force, Barksdale AFB, Louisiana; Ninth Air Force, Shaw AFB, South Carolina; Tenth Air Force, Naval Air Station Joint Reserve Base, Fort Worth, Texas; Twelfth Air Force, Davis-Monthan AFB, Arizona; and US Air Force Warfare Center, Nellis AFB, Nevada (Tab CC-3 thru CC-5).

Air Combat Command Symbol

b. Ninth Air Force

9 AF, headquartered at Shaw AFB, South Carolina, is in charge of ACC fighter forces based on the East Coast of the United States (US), and serves as the air component for a 25-nation area within the US Central Command area of responsibility. 9 AF units are: 33d Fighter Wing, Eglin AFB, Florida; 18th Air Support Operations Group, Pope AFB, North Carolina; 820th Security Forces Group, Moody AFB, Georgia; 823d RED HORSE Squadron, Hurlburt Field, Florida; and the 5th Combat Communications Group, Robins AFB, Georgia (Tab CC-3 thru CC-5).

Ninth Air Force Symbol

c. 33d Fighter Wing

The 33 FW "Nomads" is a premier air-to-air combat unit in ACC and the largest tenant unit at Eglin AFB, Florida. With two F-15C squadrons and an air control squadron, the 33 FW's mission is to deploy worldwide providing air superiority and air control and maintain the world's best rapidly deployable air superiority forces for the theater Combatant Commanders. The Nomads have established and maintained a reputation as the leading tacticians in the fighter community. The 33 FW is composed of 2 groups: operations and maintenance (Tab CC-6 thru CC-8).

The 33d Fighter Wing Symbol

d. 33d Operations Group

The 33 OG consists of more than 600 pilots, air controllers, communicators, maintenance and civilian personnel who execute contingency and emergency war order missions. The 33 OG develops operational tactics, ensures unit mobility capabilities, and provides worldwide command and control for 52 F-15C aircraft valued at over $2.3 billion. The 33 OG has a flying program of approximately 13,000 hours, 10,110 sorties, and an annual operations budget of more than $81 million. The 33 OG is composed of four squadrons: 58 FS, 60 FS, 33d Operations Support Squadron, and the 728th Air Control Squadron (Tab CC-6 thru CC-8).

The 33d Operations Group Symbol

e. 58th Fighter Squadron

The 58 FS has flown the F-15C Eagle since 1979 when they became the first squadron in the 33d Tactical Fighter Wing to receive the F-15C Eagle. In 1982, the 58 FS deployed 24 F-15Cs making it the first full F-15C deployment in history. In 1989, the 58 FS participated in Operation Just Cause where forces successfully removed Panamanian dictator Manuel Noriega from power in Panama. Participating in Operations Desert Shield and Desert Storm in 1990 and 1991, the 58 FS became the first Air Force unit to employ the F-15C in combat. During the course of the war, the 58 FS flew 1,689 combat sorties, destroyed 15 enemy aircraft, had the

most air-to-air kills, the most double kills, and the most sorties and hours flown by any F-15C unit in theater. Currently, the 58 FS continues to support the various theater Combatant Commanders by providing air superiority to all who call upon its service (Tabs CC-3 thru CC-5, CC-9 thru CC-10).

The 58th Fighter Squadron Symbol

f. F-15C Eagle

The F-15C Eagle is an all-weather, extremely maneuverable, tactical fighter designed to permit the Air Force to gain and maintain air supremacy over the battlefield. Eagle pilots utilize the aircraft's maneuverability and acceleration, range, weapons, and avionics to achieve desired effects in aerial combat. The F-15C has electronic systems and weaponry to detect, acquire, track, and attack enemy aircraft while operating in friendly or enemy-controlled airspace. The weapons and flight control systems are designed so one person can safely and effectively employ the jet in air-to-air combat. The F-15C model entered the US Air Force inventory in 1979 (Tab CC-11 thru CC-13).

An F-15C Eagle from the 58th Fighter Squadron

4. SEQUENCE OF EVENTS

a. Mission

The mishap occurred during a high aspect basic fighter maneuver (HABFM) mission during surge operations. The mishap sortie was the first of three sorties scheduled for MP1 and MP2 that day (Tab V-12). Earlier that day, during the morning surge operations, both mishap aircraft had flown three times. HABFM is a basic fighter maneuver setup in which the initial maneuvers occur following a neutral pass (Tab O-103 thru O-107). Surge operations are conducted when a squadron plans to fly sorties at a higher than normal rate to maximize the number of sorties per pilot (Tab BB-4).

b. Planning

During surge operations, a mass briefing is used to brief the pertinent sortie information to all pilots at one time (Tab V-10.9). This allows the pilots to fly with any available and appropriate pilot. Prior to the mass brief, MP1 and MP2 discussed the focus of the upcoming mission. MP1 and MP2 then attended the mass briefing with nine other pilots (Tabs K-15, V-1.2). The pilots were scheduled to stagger their launches with normal ground operations and perform three BFM sorties at the discretion of the flight lead (Tab K-3 thru K-14). They were directed to fly one sortie, return to Eglin AFB, refuel on the ground with one engine running (hot pit), launch to fly another sortie, refuel in mid-air with a KC-135 tanker, and fly a third sortie.

Following the mass brief, MP1 and MP2 continued to brief more specifics of the mission (Tab V-1.2). They planned to execute HABFM during the first sortie, combat perch BFM during the second sortie, and standard perch BFM during the third sortie, with MP1 assessing the needs of MP2 to determine the specific setups (Tab V-1.4).

The mass brief and individual flight brief contained all applicable training rules and special instructions and were conducted in accordance with all applicable guidance and instructions.

c. Preflight

All required ground checks were accomplished in accordance with applicable guidance. The crew chief for MA2 noted the pilot seemed in a hurry and that MP2 strapped himself into the aircraft (Tabs R-37 thru R-39, V-22.4). It was visually assessed and presumed by the crew chief that all items were accomplished (Tabs R-39, V-22.4). Start, taxi, arming, and departure were uneventful.

d. Flight

The mishap flight (MF) departed Eglin AFB uneventfully at 1320:48L en route to W-151B working airspace (Tabs K-5, K-15, Z-5). On the way to the airspace, there was a scattered layer of clouds at approximately 10,000 feet with unrestricted visibility above and below. The horizon was discernable in all directions, and the sun was bearing 215° and 44° above the horizon. The sea states were reported at 3 – 4 feet with temperatures of 68° Fahrenheit (F) (Tab F-11 thru F-26).

Upon entering the airspace, W-151 B (Figure 1), the MF executed two 180° G-awareness turns. The first turn was performed at 3 – 4Gs to ensure aircraft systems were operating normally. The second turn was performed at 6 – 7Gs to ensure the pilot's anti-G gravity straining maneuver was effective and the pilot was experiencing normal capabilities. The G-awareness was executed normally (Tab V-1.4).

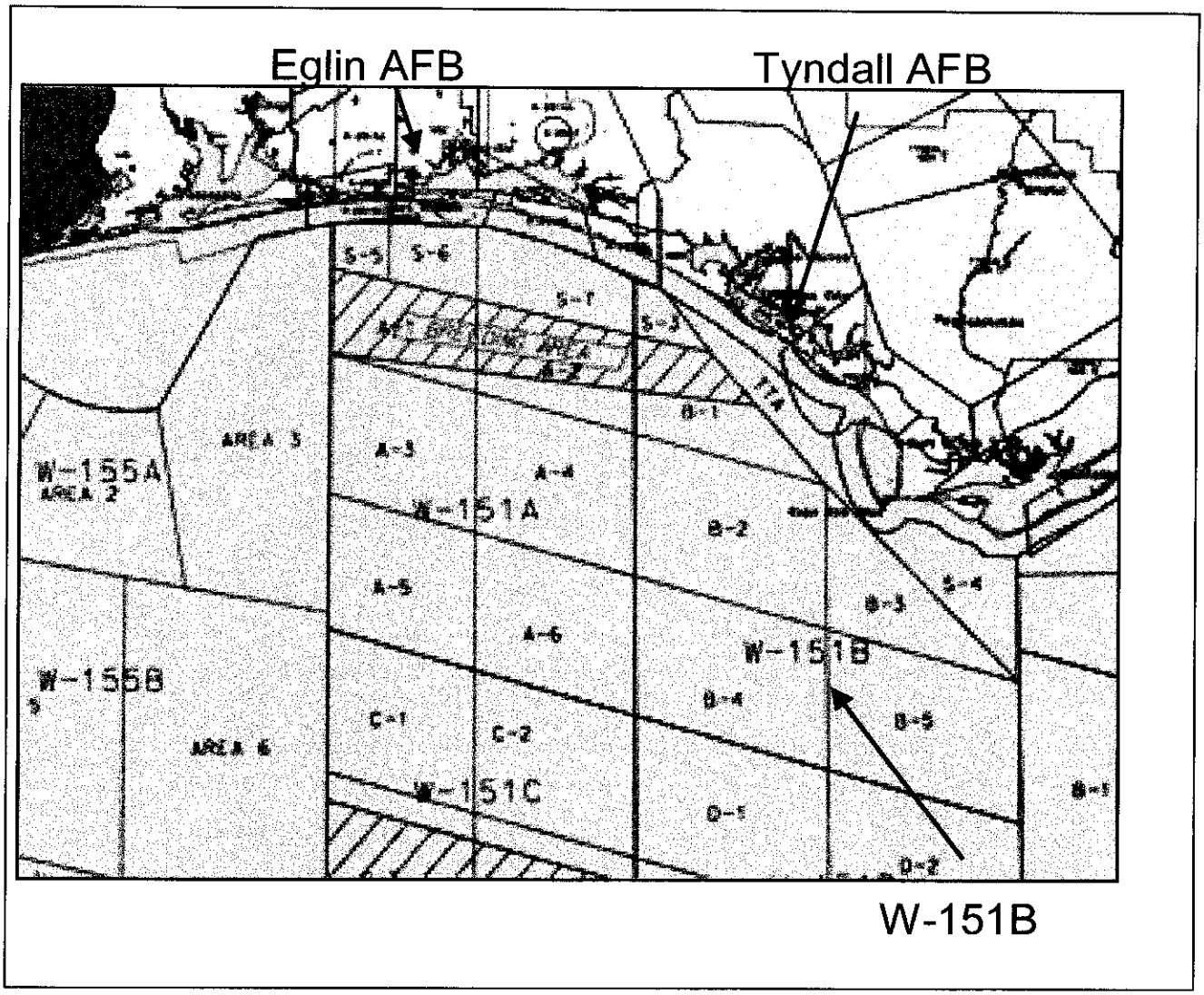


Figure 1

The first HABFM pass was established via a butterfly setup at 18,000 feet with MP1 in the west and MP2 in the east and the MF heading south (Tabs K-9, V-1.4). The butterfly setup is where both aircraft turn away from each other to gain 4-5NM separation prior to turning back towards each other to begin the engagement (Tab K-9).

At 1331:32L the initial butterfly setup was executed (Figure 2, #1). The turn back towards each other occurred at 1331:49L with approximately 3.8NM of separation between MA1 and MA2 (Figure 2, #2). Both aircraft descended to approximately 14,000 feet as they merged, MA1 was flying approximately 380 knots indicated airspeed (KIAS) and MA2 was at 400KIAS and slightly lower than MA1 (Tab V-1.4).

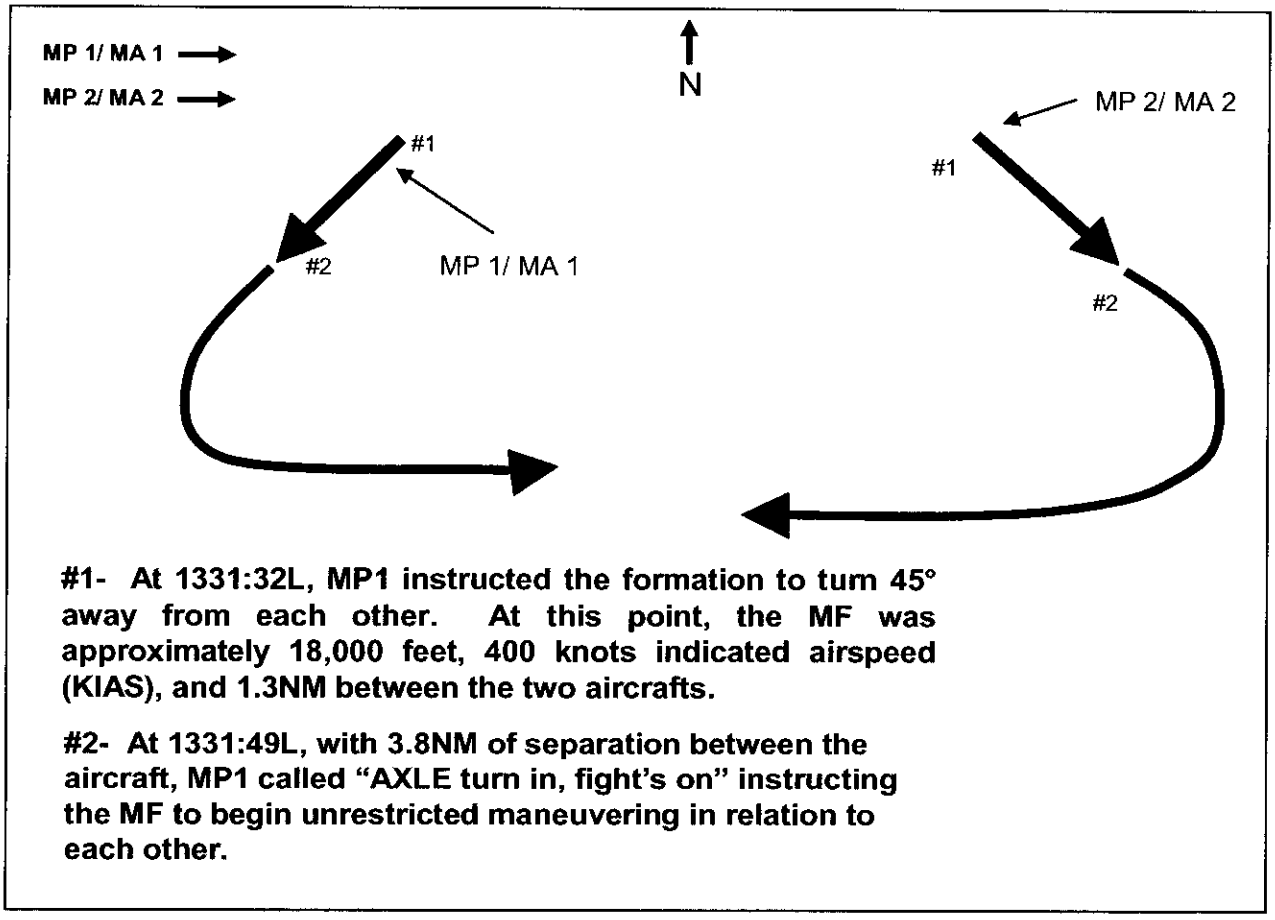
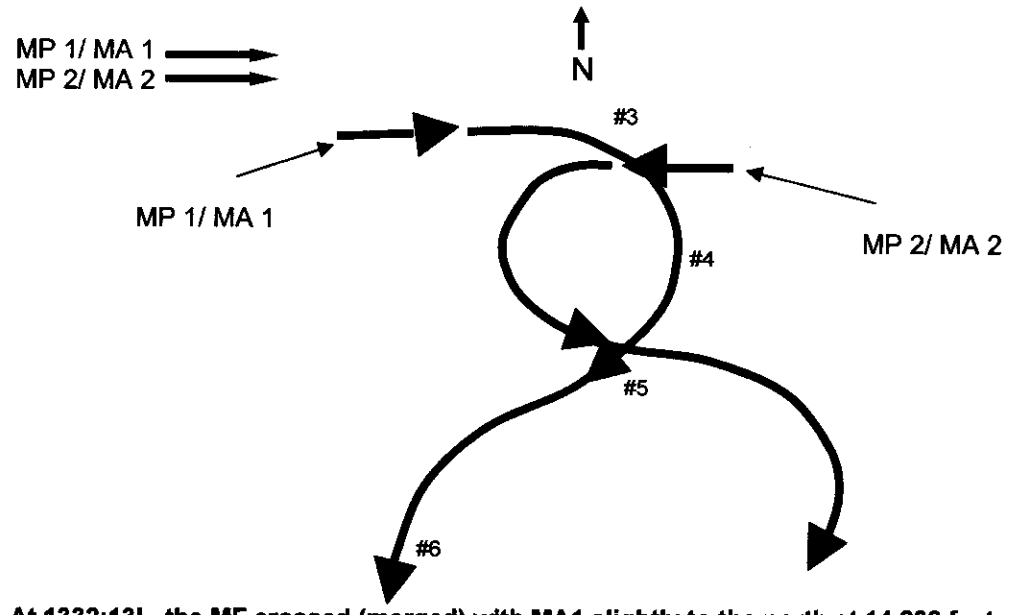


Figure 2

MA1 was slightly to the north as they merged and both aircraft initiated a turn to the south (Figure 3, #3). The MF reached 1.1NM separation with both aircraft still at approximately 14,000 feet with the flight flowing southerly (Figure 3, #4) (Tab V-1.4). At the second crossing (Figure 3, #5) MA1 was now slightly to the south just below 14,000 feet, heading west, and at 280KIAS. MA2 was at 13,200 feet, heading east-southeast, and at 270KIAS. MP1 rolled to place his wings parallel to the horizon and started a slight climb. Once he got the nose of the aircraft above the horizon, MP1 rolled to the left until he was partially inverted and his nose started to decrease back towards the horizon; MA1 eventually reached a nose low attitude while still in a left bank, moving back towards MA2. After merging the second time, MA2 rolled to the right to place his aircraft in a right hand bank and started a slight climb back towards MA1 (Tab V-1.5 thru V-1.6).



#3- At 1332:13L, the MF crossed (merged) with MA1 slightly to the north at 14,239 feet, heading east, and 381KIAS. MA2 was at 13,693 feet, heading west, and 400KIAS.

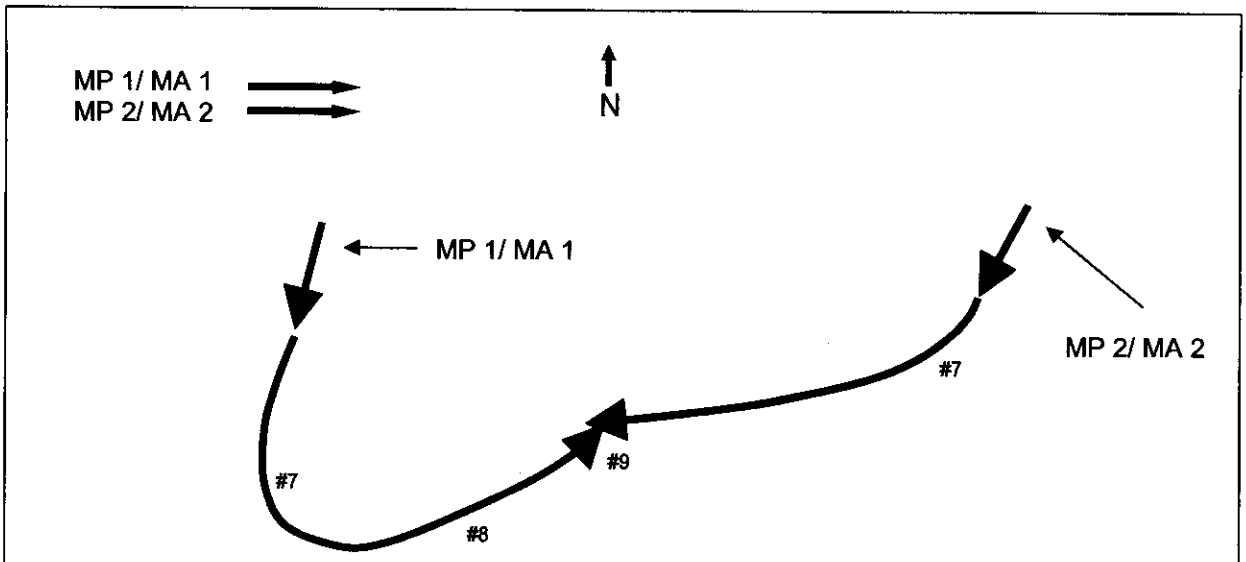
#4- Both aircraft turned immediately to the south, the MF reached 1.1NM separation with both aircraft at 14,000 feet with the flight heading south.

#5- At 1332:28L, the MF merged for a second time with MA1 slightly to the south at 13,737 feet, heading west, and at 283KIAS. MA2 was at 13,224 feet, heading east-southeast, and at 266KIAS.

#6- MP1 initiated a wings level vertical pull to 35° nose high and then initiated a roll with a rate of approximately 20° per second until the aircraft was banked 45° below the horizon to the left placing MA1's lateral axis directly on MA2.

Figure 3

For approximately one to two seconds, MA1 was transitioning from approximately 25° above the nose to 10° above the nose of MA2 (Figure 4, #7); this could place MA1 behind the canopy bow of MA2, causing MP2 to momentarily lose sight of MA1 (Figure 5). MA1 continued with his nose low, left turn holding around 230KIAS (Figure 4, #8). MA2 continued his right turn with his aircraft until he pointed just below aircraft at MA1. At 1332:46.50L, both mishap aircraft impacted (Figure 4, #9) (Tab O-119).



#7- The attitude of the MA 1decreased through the horizon until it stabilized at 35° nose low and the bank angle was slowly reduced to approximately 85° still in a left bank. MA2 rolled to the right to place his aircraft in a 70° right hand bank also placing his lateral axis on MA1 and brought his aircraft to 25° nose high.

#8- At 1332:40L, MA1 continued with his nose low, left turn holding around 230KIAS. MA2 continued his right turn with his aircraft until he pointed just below aircraft at MA1.

#9- At 1332:46.50L, the aircraft impacted.

Figure 4

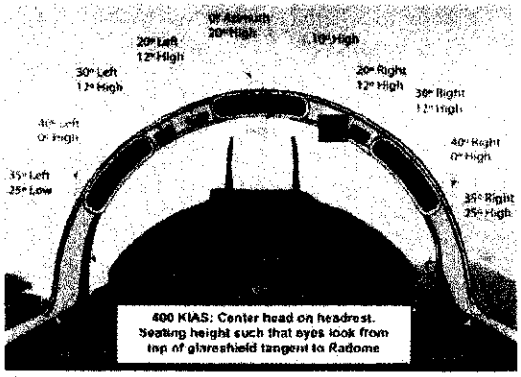
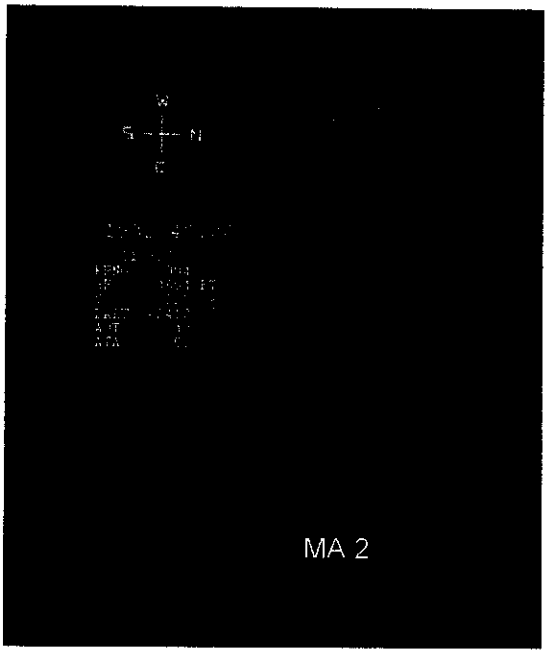
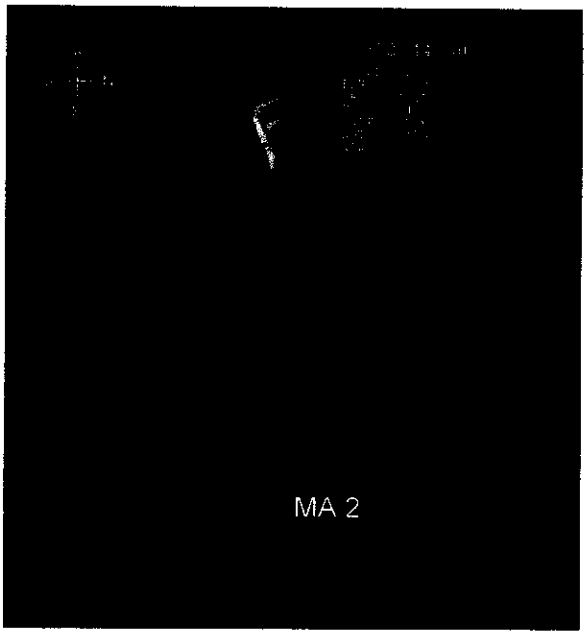


Figure 5: Canopy Bow (Tab O-119)

(The pictures on pages 10 and 11 are taken from a graphical representation that displays terrain in the background for reference. The mishap sortie was flown and the impact occurred over water.)



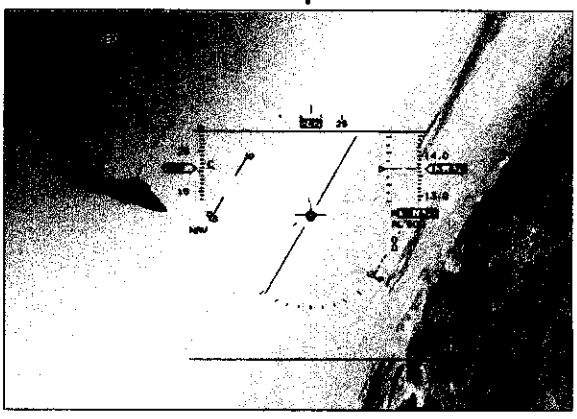
MA 1 (#21) continuing to turn, partially inverted and nose descending below the horizon. MA 2 (#22) in a right bank, nose above the horizon, turning towards MA 1.



MA 1 and MA 2 pointing at each other inside at 1500 feet with approximately 825 feet per second of closure. The impact will happen in 1.70 seconds.

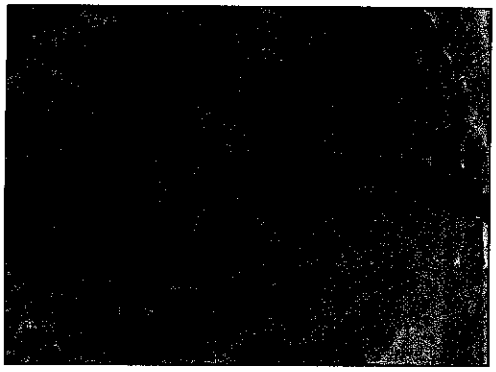
MA 1 Cockpit View

MA 2 Cockpit View

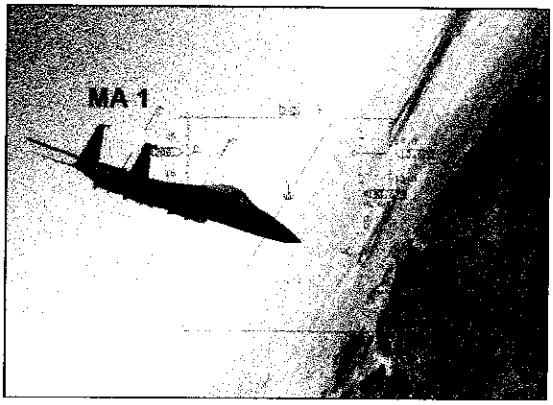


The above pictures show the estimated cockpit views that MP1 and MP2 would have had. At this point the aircraft are .2 seconds from impact at just inside of 200 feet with 800 feet per second of closure. (Tab Z-6)

MP 1 Cockpit View

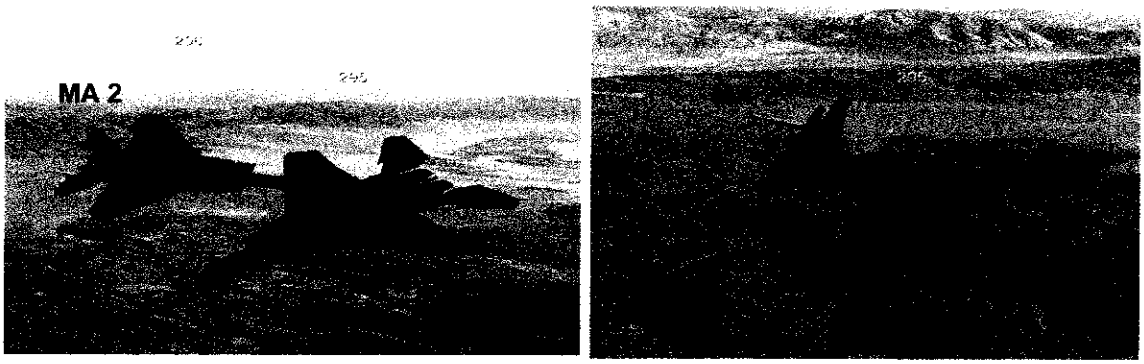


MP 2 Cockpit View



The above pictures show the estimated cockpit views that MP1 and MP2 would have had. At this point the aircraft are .1 seconds from impact at just inside of 50 feet with 800 feet per second of closure. (Tab Z-6)

At 1332:46.50L, the aircraft impacted.



(Tab Z-6)

e. Impact

The MF impacted at 13,650 feet, at North 29° 21.315 latitude, West 085° 49.253 longitude. MA1 was heading 067°, 235KIAS, 35° nose low, and 64° of left bank. MA2 was heading 246°, 163KIAS, 2.75° nose high, and 64° right bank. The aircraft departed controlled flight and fell over 13,000 feet to the water. MA1 was found at North 29° 21.785 latitude, West 085° 48.622. MA2 was found at North 29° 21.314 latitude, West 085° 49.377.

f. Life Support Equipment

MP1 ejected safely from MA1. MP1's life support equipment was fully functional with the exception of the life raft which had a slow leak. The life raft was recovered inflated but

subsequently deflated due to a loose nut attached to the CO_2 bottle (Tab H-7). MP1 disconnected his seat kit while under the parachute and was unable to utilize any survival equipment while waiting for recovery (Tabs V-1.19, V-3.3 thru V-3.4). MP1 had a strobe and survival mirror available in his harness but neither was used in the joint search and rescue operation (Tab V-1.23).

The seat and cockpit area of MA2 were not found during salvage efforts. There is no clear evidence as to whether a normal ejection sequence was attempted or MP2 was forcibly ejected from the cockpit of MA2 due to the forces of cockpit intrusion.

MP2's life support equipment was determined to have experienced forces that exceeded design specifications at various stages during the mishap (Tab J-5).

MP2 was found without his seat kit, and it was determined that due to impact forces the seat kit buckles failed, forcibly removing MP2 from his seat kit (Tab J-5); the survival equipment was never located.

MP2's torso harness was found with only the right riser fitting attached to the torso Koch fitting (Tab J-5). It was determined that impact forces could not have disconnected the attachments and no one removed the left side fitting (Tabs J-5, R-41 thru R-42, V-9.1). The parachute is designed to provide a fully functioning canopy with just one riser attached and MP2 was seen under a canopy after the impact (Tabs V-1.18, V-3.4). The sequence of events that resulted in parachute deployment could not be determined.

MP2's helmet suffered structural damage, and it was determined MP2 was looking 11° to the right with his eyes level at the time of impact (Tab J-4). MP2's lap belt was attached at the time of impact and his anti-G garment hose fitting suffered damage which suggested an ejection was not initiated (Tabs J-5, J-14). MP2 was found in the water with a fully inflated Life Preserving Unit (LPU), however he was not found in a proper floating position (Tabs J-6, R-113, V-8.1). The cause of the failure of the LPU and harness to provide proper positioning was not able to be determined (Tab J-6).

g. Search and Rescue (SAR)

The following is an approximate timeline of the events related to the Search and Rescue (SAR) efforts. All times are local. Actions that are not directly associated with a specific time (based on witness testimony) are presented in best estimation of chronological order.

1333 Good Samaritan vessel 1 radioed the United States Coast Guard (USCG) to report two downed USAF aircraft (Tab O-5).

1333 The USCG notified the Tyndall AFB Command Post. The Tyndall AFB Supervisor of Flying (SOF) initiated a recall of all aircraft and notified the Eglin AFB SOF (Tab R-119).

1337 USCG Station Panama City launched the 41-foot rescue vessel Coast Guard (CG) 41495 with 5 persons on board (Tab O-5). CG 41495 reported an en route time of 2 hours 25 minutes (Tab R-111).

1355 ATARI 01, a single F-15C airborne from Tyndall AFB, informed the Tyndall SOF he heard a radio transmission regarding the missing aircraft, and he proceeded to the coordinates included in the transmission (Tabs R-43, V-4.2). ATARI 01 arrived on scene, but could not locate the crash site. Eglin Mission Control then provided ATARI 01 with updated coordinates (Tabs R-44, V-4.2 thru V-4.3).

1400 ROCK 21, a flight of three F-15Cs, departed Eglin AFB, checked in with Eglin Mission Control, and realized a rescue operation was under way (Tabs R-63, V-5.2, V-5.4). ROCK 21 spread his formation out to a line-abreast formation approximately 5NM in total width and began to fly south towards the crash site at 1,000 – 2,000 feet above the water (Tabs R-63, V-5.4). After a couple of sweeps working westerly, ROCK 21 directed ROCK 22 to climb to a higher altitude and be a radio relay to Eglin Mission Control and the Eglin SOF (Tabs R-63, V-5.7). ATARI 01 was east of their position by 10 – 15NM working north-south and flowing easterly (Tabs R-44, V-4.3). ROCK 23 spotted and reported the crash site, approximately 5NM west of their position (Tabs R-63, V-5.4 thru V-5.5). Shortly after the crash site was detected, ATARI 01 departed for a tanker and designated ROCK 21 as the on-scene-commander (OSC) (Tabs V-4.9, V-5.7).

1405 The US Naval Research Vessel USS Seafighter was contacted by Coast Guard Air Station (CGAS) Mobile to assist in the SAR effort (Tab R-87).

1412 The USS Seafighter started underway (Tab R-87).

1415 All Tyndall AFB aircraft were accounted for, and at Eglin AFB, only AXLE 41 (MP1) and AXLE 42 (MP2) failed to report in (Tabs R-119, V-6.2).

1434 CGAS Mobile redirected a single HU-25A, call sign CG 2127, to the mishap location. CG 2127 was low on gas so they returned to CGAS New Orleans for gas (Tab V-28.1).

1505 CG 6019, a single HH-60J, launched from CGAS Clearwater (Tab R-109).

1512 CG 2303, a single HC-144A, diverted from a training mission to assist (Tab V-28.1).

1512 While searching the crash site, ROCK 21 identified a parachute and a life raft in the water (Tabs R-65, R-73, R-78, V-5.6 thru V-5.7).

1515 CG 2127 departed CGAS New Orleans en route to the mishap site (Tab V-28.1).

1520 CG 6014, a single HH-60J, launched from CGAS Mobile (Tab R-115).

1529 The USS Seafighter arrived on scene (Tab R-88). A single boat, Good Samaritan vessel 2, was already on the scene and working through the debris field searching for survivors (Tab V-7.1, Tab V-28.1).

1530 CG 2303 arrived on scene and checked in with ROCK 21 who directed them to the crash site. CG 2303 located the raft and parachute, contacted Good Samaritan vessel 2, and directed it north to search the area (Tabs R-65, R-73, R-78, V-28.1).

1535 CG 2127 arrived on scene (Tab 28.1).

1545 Good Samaritan vessel 2 located and retrieved a life raft and survival equipment. Good Samaritan vessel 2 then located and picked up MP1 (Tab R-88). Good Samaritan vessel 2 was then directed to proceed to the USS Seafighter (Tabs R-88, V-1.24, V-7.2, V-7.8 thru 7.9).

1557 Rock 21 passed on-scene-commander duties to CG 2127 (Tabs R-66, V-5.8).

1557 CG 2303 runs low on fuel and returns to Panama City, Florida for gas (Tab V-28.1).

1605 CG 41495 located MP2 and removed him from the water (Tabs R-111, R-113, V-28.1 thru 28.2). The crew of CG 41495 identified MP2's fatal injuries and requested assistance from CG 2127 (Tab R-111, R-113). CG 2127 attempted to have HOVER 01, a USAF UH-1, lower the on board flight surgeon to its deck. HOVER 01 had no maritime radio capabilities, so it was decided that CG 6014 would hoist MP2 on board once it arrived on scene. The flight surgeon would then be lowered from HOVER 01 to the USS Seafighter and then hoisted on board the CG 6014 (Tabs V-28.2, V-9.1).

1618 CG 6019 arrived on scene at (Tab V-28.2).

1618 MP1 was transferred from Good Samaritan vessel 2 to a rescue boat launched from the USS Seafighter and was brought aboard the Seafighter (Tabs R-88, V-1.25).

1630 CG 6014 arrived on scene (Tab V-28.2).

1649 CG 6019 has MP1 on board and is en route to Eglin AFB hospital (Tab V-28.2).

1707 MP2 was hoisted on board CG 6014 from CG 41495 (Tab V-28.2).

1715 CG 6014 reported the flight surgeon was hoisted on board from the USS Seafighter and that they were en route to Pensacola which has the only Level 1 trauma center in the area (Tab V-28.2).

1718 All USAF aircraft returned to base (Tab V-28.2).

1725 CG 6014 changed direction and proceeded to Eglin AFB hospital on the direction of the flight surgeon on board (Tab V-28.2).

1730 MP1 arrived at Eglin AFB hospital and was met by medical personnel (Tabs V-12.5, X-3).

1739 CG 2127 reached his minimum fuel and returned to CGAS Mobile (Tab V-28.2).

1745 MP2 arrived at Eglin AFB hospital and was met by medical personnel (Tabs V-12.6, X-3).

Other aircraft assisting in the SAR effort but not actively involved were:

RAVEN 33	V-22 Osprey
SPECTR 61	AC-130 Gunship
RACER 01	4 x F-16 Fighting Falcons
RHETT 01	KC-135 Stratotanker
CG 2134	HU-25A

h. Recovery of Remains

At 1605L, MP2 was recovered and the remains were brought aboard the 41-foot Coast Guard vessel 41495. The remains were covered with a blanket, transferred to a Stokes litter and hoisted up to CG 6014 (Tabs R-2, V-8.1). A USAF flight surgeon was then hoisted up from the USS Seafighter to CG 6014 and escorted the remains to the Eglin AFB hospital emergency room arriving at approximately 1745L (Tabs V-9.1, V-28.2). The 96th Services Squadron Mortuary Affairs coordinated all mortuary affairs.

i. Military Honors

Following the autopsy, the remains of MP2 were transferred to a funeral home in Tampa, Florida. The casket was draped in the U.S. flag and formally escorted by military personnel to Tampa.

j. Decorations

On 27 February 2008, MP2 was posthumously awarded the Air Force Commendation Medal encompassing his service with the 58 FS at Eglin AFB (Tab CC-31).

k. Memorial Service

The funeral was held on 22 February 2008 with full military honors including a single ship fly over and a 21 gun salute conducted by the Honor Guard from MacDill AFB, Florida. The 58 FS members attended the funeral in service dress (Tab V-3.7). On 27 February 2008, the 33 FW at Eglin AFB held a memorial service in the 58th Aircraft Maintenance Unit hangar that was attended by the 33d Fighter Wing Commander, the 33d Operations Group Commander, and members of the 60 FS, the 58 FS, and the 33d Maintenance Group (Tab V-3.8). Four F-15Cs from the 33 FW performed a "missing man" formation fly-over while the Eglin AFB honor guard rendered a 21 gun salute (Tab DD-11).

5. MAINTENANCE

a. Forms Documentation

The 33d Aircraft Maintenance Squadron maintained the aircraft forms for both aircraft. Maintenance is documented on Air Force Technical Order (AFTO) 781 series forms and in the Integrated Maintenance Data System (IMDS). AFTO 781 series forms are hard copy forms used to document daily maintenance actions. They are maintained in a binder that is specifically assigned to each aircraft. IMDS is an automated system of aircraft discrepancies, repair actions and flying history. All existing aircraft AFTO 781 series forms were reviewed to determine air worthiness up to the point of the mishap (Tab D1 thru D-54). Minor documentation errors were found but were not a factor in the mishap.

Mishap Aircraft 1

MA1 flew with two open discrepancies in the AFTO 781A forms. The first discrepancy was a Left Vertical Stabilizer light was not working. This type of discrepancy would be corrected by maintenance personnel at the end of the flying period (Tab D-14). A review of the IMDS for this discrepancy revealed that the discrepancy was corrected on 26 February 2008, six days after the mishap (Tab U-26). However, this could not have happened since MA1 never returned from the sortie. This is not standard practice. The standard practice is AFTO 781A series forms are to be signed off prior to IMDS being signed off. This incorrect and out-of-sequence documentation was not a factor in the mishap.

The second discrepancy was the Air Intercept Missile-9 (AIM-9) had a seeker failure which would not allow the missile to track the target (Tab D-15). IMDS records showed the training missile was replaced before the mishap sortie (Tab U-27). Although the AFTO 781A series forms do not reflect this maintenance action (Tab D-15), all indications were that the new AIM-9 was working properly prior to and during the mishap flight.

AFTO 781K section C lists aircraft and engine hourly and calendar required inspections (Tab D-22 thru D-23). There were no overdue inspections at the time of the mishap. AFTO 781K section C listed a One Time Inspection to inspect the canopy (Tab D-25). A one time inspection is an inspection with a specific time frame in which the inspection must be completed before the aircraft is grounded. This particular inspection was not yet over due.

AFTO 781K section D lists seven Time Compliance Technical Orders (TCTO) which lists maintenance actions or modifications to a specific aircraft system (Tab D-24). None of the listed TCTOs were overdue. AFTO 781K section D listed two delayed discrepancies (Tab D-25). A delayed discrepancy is a maintenance condition that does not affect the air worthiness of an aircraft and is usually deferred when parts are not available or sufficient aircraft downtime is required to correct the discrepancy. In both of these cases, parts were on order and had not been received yet. Neither one of these discrepancies had an effect on air worthiness of the aircraft.

Mishap Aircraft 2

MA2 flew with two open discrepancies in the AFTO 781A forms. The first discrepancy was a One Time Inspection to inspect the canopy. This inspection was not overdue at the time of the mishap (Tab D-31). The second discrepancy was a radar acquisition failure in which the switch worked correctly, but the radar would not lock on any targets in any mode while airborne (Tab D-36). This type of discrepancy would be corrected by maintenance personnel at the end of the flying period.

On AFTO 781H block 6, there was a minor documentation error noted (Tab D-29). The AFTO 781H is used to document servicing and reflect the status of the aircraft (e.g. the serviceability of the aircraft). Before the start of the flying day, the Flight Line Production Supervisor reviewed the aircraft forms for accuracy and signed block 6 certifying that the aircraft forms were accurate and the aircraft was ready for flight (Tab V-18.2 thru V-18.3). For subsequent sorties, the assigned aircrew will sign the Exceptional Release. Before the mishap sortie, MP2 did not sign block 6 for the Exceptional Release, but the crew chief and his assistance observed MP2 reviewed the aircraft forms (Tabs R-41 thru R-42, V-22.4).

AFTO 781K section C revealed no overdue hourly or calendar inspections (Tab D-42 thru D-43). AFTO 781K section D had six documented TCTOs that were not over due and were not factors in the mishap (Tab D-44). AFTO 781K section D had a delayed discrepancy regarding a ground re-fuel receptacle leaking which required it be replaced. This leaking was with-in limits. However, a review of IMDS revealed that the receptacle only leaked when the cap was removed (Tab U-3). At the time of the mishap, the re-fuel receptacle was functioning within limits.

b. Inspections

Mishap Aircraft 1

The last major scheduled inspection for MA1 was the 1200-hour Periodic Phase Inspection performed at 7,344.5 flight hours on 9 August 2007 (Tab D-22). F-15C aircraft require a phase inspection every 200 flight hours. Phase inspections are comprehensive inspections in which maintenance technicians inspect the aircraft and subsystems (Tab BB-10) During a Periodic Phase Inspection, the aircraft is held off the flying schedule for seven to ten days. The next scheduled phase inspection for MA1 was due at 7,549.9 flight hours. At the time of the mishap sortie, MA1 had flown 111.1 flight hours since the last phase inspection (Tab U-28).

Prior to the mishap sortie, MA1 had two required minor inspections. The first inspection was a combined Basic Post Flight/Preflight inspection (BPO/PRE) that is required at the end of the flying day (Tab BB-8). Aircraft are not allowed to fly until this inspection is accomplished. MA1's inspection was accomplished on 19 February 2008 at approximately 1930L (Tab D-9). The only major finding during this inspection was a left main tire was worn beyond limits. The tire was replaced during the inspection. The second inspection was a ThruFlight inspection accomplished on 20 February 2008 at approximately 1145L hours (Tab D-9). A ThruFlight is an inspection that is used to determine airworthiness between sorties (Tab BB-9). During this inspection, a major discrepancy was noted requiring the right main landing gear strut required servicing (Tab D-19). This servicing was completed prior to the mishap sortie.

Mishap Aircraft 2

The last major scheduled inspection for aircraft MA2 was a 400-hour Hourly Phase Inspection-2 performed at 7,548.9 flight hours on 26 July 2007 (Tab D-42). The next scheduled 400-hour Hourly Phase Inspection 2 was due at 7,756.9 flight hours. At the time of the mishap sortie, MA2 had flown 142.3 flight hours since the last phase inspection (Tab U-4 thru U-5).

Prior to the mishap sortie, MA2 had two required minor inspections. The first inspection was a BPO/PRE. This inspection was accomplished on 19 February 2008 at approximately 2100L hours (Tab D-29). There were three major discrepancies noted during this inspection: 1) the number one engine required oil servicing; 2) the left main tire required replacement; and 3) the right main tire required replacement. All three discrepancies were corrected prior to the mishap sortie. The second inspection was a ThruFlight inspection accomplished on 20 February 2008 at approximately 1050L hours (Tab D-29). There were no major discrepancies noted during this inspection.

c. Maintenance Procedures

Review of AFTO 781 series forms and IMDS revealed maintenance actions were completed up to the mishap sortie. Minor AFTO 781 series documentation errors were noted but were not a factor in the mishap.

d. Maintenance Personnel and Supervision

From a maintenance perspective, even though they were in planned sortie surge operations, it was a successful sortie generation day and there were no unusual circumstances surrounding either aircraft preceding the mishap sortie (Tabs R-58, V-23.4 thru 23.5). AFI 21-165 defines a sortie surge as a scheduling option where flying and maintenance units may plan to produce sorties at a higher than normal rate (Tab BB-4). Maintenance personnel involved in performing maintenance on both aircraft were qualified (Tab G-73).

e. Fuel, Hydraulic and Oil Inspection Analysis

Lab results determined that hydraulic fluid, aircraft engine oil, aviators breathing oxygen and JP-8 (aviation fuel) samples taken from servicing equipment were normal (Tab D-47 thru D-54). A review of engine oil samples from the 10 sorties preceding the mishap sortie revealed no evidence of abnormal wear of internal engine components (Tab U-45 thru U-48).

f. Unscheduled Maintenance

MA1 flew 69 sorties since the last phased inspection (Tab U-28). Ten of these sorties landed with a status of code 3 (U-29 thru U-34). Code 3 means an aircraft or system has major discrepancies in mission essential equipment that may require extensive repair or replacement prior to further mission assignment (Tab BB-6). All 10 of these discrepancies were corrected prior to the mishap sortie. A review of data from the last 10 years of automated AFTO Form 95 Significant Historical Data revealed no adverse trends. This form is used to permanently record major repairs/inspections to aircraft (Tab U-35 thru U-44).

MA2 flew 89 sorties since the last phased inspection (Tab U-4 thru U-5). Thirty-seven of these sorties landed with a status of code 3 (Tab U-6 thru U-13). All 37 of these discrepancies were corrected prior to the mishap sortie. A review of data from the last 10 years of automated AFTO Form 95 Significant Historical Data revealed no adverse trends (Tab U-14 thru U-25).

6. AIRCRAFT AND AIRFRAME, MISSILE, OR SPACE VEHICLE SYSTEMS

a. Condition of Systems

Due to forces from both the mid-air impact and water impact, both aircraft and their subsystems were destroyed beyond any working capability. While major portions of both MA were recovered, it was decided that further salvage of MA was not necessary. An expert in structural analysis from Robins AFB, Georgia, evaluated the recovered wreckage and provided input to the Board's analysis of the mishap (Tab U-49).

b. Testing

No aircraft items from the recovered wreckage were submitted for testing.

c. Analysis of Engine

The engines on both MA were operating normally prior to the mishap (Tab U-45 thru U-48).

7. WEATHER

a. Forecast Weather

At Eglin AFB, the weather conditions for 20 February 2008 were: sky- broken at 10,000 feet and broken at 25,000 feet; temperature – 19° Celsius; visibility – 10 statute miles; wind – 130° at 9 knots; altimeter – 30.24; hazards – none (Tabs F-8, F-11 thru F-16). Wave height, sea states, and surface temperature were all within limits for F-15C training and rescue operations (Tab F-22 thru F-26).

b. Observed Weather

The observed weather in the airspace was a scattered layer at approximately 8,000 – 10,000 feet above the water (Tab R-61). The visibility was unrestricted and the sea states were 4 – 6 feet with winds out of the west, the sun bearing 215° at 45° above the horizon (Tab R-62).

Within an hour after the mishap, the weather was reported as sky clear (Tab V-4.3).

c. Space Environment

Not applicable.

d. Conclusions

The mishap flight occurred during day visual meteorological conditions (VMC). Weather conditions were ideal for the planned sortie and follow on rescue operation.

8. PILOT QUALIFICATIONS

a. Mishap Pilot 1

MP1 was a current and qualified 4-Ship Flight Lead in the F-15C (Tab T-3). He had 484.2 hours in the F-15C and 761.7 total hours not including civilian time (Tab G-23). The following table summarizes MP1's flight time preceding the mishap (Tab G-25):

	Sorties	Hours
30 Days	14	23.9
60 Days	17	26.9
90 Days	17	26.9

Throughout pilot training, MP1 was recognized for his professionalism and leadership qualities (Tab T-9 thru T-11). He was identified as an average pilot but a well above average officer, receiving the 58 FS Company Grade Officer of the Year Award for 2007 (Tabs R-20, R-102, R-125 thru R-126, V-5.12, V-10.7). He was under consideration for upgrade to Instructor Pilot (Tabs R-20, R-27, V-12.8).

MP1 was current and qualified to fly the sortie. He was the 58 FS Activities Security Monitor at the time of the mishap (Tab V-1.1).

b. Mishap Pilot 2

MP2 was a current and qualified Wingman in the F-15C. He had 118.9 hours in the F-15C and 210.6 total hours not including civilian time (Tab G-53). The following table summarizes MP2's flight time preceding the mishap (Tab G-56):

	Sorties	Hours
30 Days	11	19.5
60 Days	13	21.1
90 Days	14	22.4

MP2 attended pilot training at Laughlin AFB, Texas, where he graduated third in his class. He went to Moody AFB, Georgia, for Introduction to Fighter Fundamentals. MP2 then attended F-15C Initial Qualification Course at Kingsley Field, Klamath Falls, Oregon, where he graduated as the "Top Book" an award for highest academic average in his class (Tab T-4). He received his initial Mission Qualification Checkride on 23 October 2007 and received an Exceptionally Qualified rating identifying well above average performance (Tabs G-52, R-20). Throughout formal training and during his operational assignment, MP2 was identified as having an outstanding attitude, high willingness to learn, and above average military bearing (Tab T-4 thru

T-8). MP2 had flown in his first RED FLAG exercise just prior to the F-15C stand-down. MP2 was identified as an above average pilot and an above average Lieutenant with outstanding motivation (Tabs R-86, R-102, R-108, R-127, V-10.2, V-15.2).

MP2 was current and qualified to fly the sortie. He was the 58 FS Morale Officer at the time of the mishap (Tab V-15.3).

9. MEDICAL

a. Qualifications

MP1 underwent a routine annual flying physical at Eglin AFB on 17 January 2007. His records indicated that he remained in good health after this physical was performed. He was enrolled in the Aircrew Contact Lens Program and was fully current with all requirements. His most recent optometry follow-up occurred on 08 January 2008 and was normal (Tab X-3).

MP2 underwent an initial medical clearance to fly at Eglin AFB on 17 September 2007 and his annual flight physical on 28 September 2007. He remained in good health after this evaluation was performed (Tab X-3).

b. Health

MP1 sustained mild abrasions as a result of the ejection. He also appeared to be suffering from early hypothermia as a result of being immersed in the Gulf of Mexico for approximately two hours (Tabs V-1.25, V-7.2, V-7.9). During his physical at the Eglin AFB hospital after the mishap, he had no complaints of pain and did not report any ongoing medical issues related to the mishap, ejection, or recovery sequence (Tab X-3).

MP2 died immediately upon impact of the two aircraft due to multiple blunt force injuries consistent with a mid-air impact with cockpit intrusion (Tab X-3).

c. Toxicology

Toxicological studies performed after the mishap showed normal carbon monoxide levels and no evidence of drug or alcohol use in either MP1 or MP2 (Tab X-3).

d. Lifestyle

There were no unusual events in the life of either of the pilots in the days prior to the mishap. Both pilots were respected by their colleagues and perceived to be professional officers and Airmen. There is no evidence that the mishap pilots had any unusual habits, behaviors, or stressors that contributed to the mishap (Tabs V-9.1, X-3).

e. Pilot Rest and Pilot Duty Time

Prior to the mishap, both of the MPs' fatigue levels were above the accepted standard for safety (Tab X-3). On the day of the mishap, the MPs appeared to be alert, in good spirits, and focused

on the upcoming flight (Tab V-15.3). The MPs met all requirements for crew rest (Tab BB-14 thru BB-15).

10. OPERATIONS AND SUPERVISION

a. Operations

All F-15C aircraft were grounded from 3 November 2007 to 10 Jan 2008, except for three short flying periods (19-21 November, 26-27 November and 3 December 2007). During the time of the F-15C grounding, MP1 had 22 simulator sorties and MP2 had 18 simulator sorties (Tabs G-25, G-55). Both MPs had an Emergency Procedures Simulator with a squadron supervisor prior to resuming flying operations in January 2008. Both MPs had completed the 33 OG required program to regain landing currency and flight re-qualification requirements and were current at the time of the mishap (Tabs V-10.8, V-12.10). The 33 OG re-qualification program required the following: one Advanced Handling Characteristics sortie, One Basic Fighter Maneuvers sortie, Air Combat Maneuvering, and six additional flying sorties prior to pilots regaining CMR status (Tabs V-10.8, V-12.10). MP1 had flown 14 of the required 30 RAP sorties in the last 90 days and 14 of the required 9 sorties in the last 30 days. (Tab G-25) During the F-15C grounding MP1 did not fly for 51 days (Tab G-23 thru G-24). MP2 had flown 14 of 30 required RAP sorties in the last 90 days and 11 of the required 10 sorties in the last 30 days. During the F-15C grounding MP2 did not fly for 54 days (Tab G-71 thru G-72). Lt Col Jaxx described his pilots as current and qualified but less proficient than normal and more apt to make mistakes (Tab V-11.2).

Squadron Operations tempo during the month prior to the mishap was normal as the squadron pilots focused on regaining their CMR status. Within two weeks of the resumption of F-15C flying activities the 33 FW resumed AEF tasking. During the week of the mishap, the 58 FS was flying "surge operations" in an effort to maximize sorties for all squadron pilots (Tabs V-5.2, V-10.2, V-10.9, V-12.2, V-12.11).

b. Supervision

58 FS supervision was engaged and involved in the developing the schedule and the progression of MP2 (Tab V-12.9). While MP2's Flight Commander was not an Instructor Pilot and never flew with MP2, he was actively engaged in scheduling MP2's flying program (Tab V-15.2). Squadron leadership has a program to schedule and review their programmed flying schedule accounting for ORM. Both MPs were considered very professional and competent in their progression by the squadron leadership. (Tabs V- 5.12 thru V-5.13, V-10.7)

The 33 FW and 58 FS Operational Risk Management (ORM) programs do not meet the intent of the ACC ORM Flight Crew Information File (FCIF) (Tabs V-16.2 thru V-16.6, CC-37 thru CC-38). During their flight brief each pilot assesses his ORM for the mission to be flown. There is no formal declaration of pilot or flight ORM or review with squadron Top Three/leadership prior to the flight step or mission execution (Tabs V-11.2 thru 11.3, V-13.3 thru 13.6). ACC FCIF does not require squadrons to use ORM to shape mission planning and sortie execution.

The day before the mishap flight, MP2 had a training rule violation (close pass inside of 300 feet) with his flight leader during a HABFM engagement. This close pass was discussed during the mission debrief with his flight leader. (Tab V-14.2) No squadron supervision or leadership was notified of the close pass training rule violation (Tabs V-10.6, V-12.8, V-14.3). AFI 11-214, guidance on training rules does not require that training rules are briefed or that violations are debriefed (Tab BB-27 thru BB-82). The 58 FS policy is to debrief training rule violations during flight briefings. Trends are identified by instructor pilots during their quarterly instructor meeting (Tabs V-11.3, V-13.6). Squadron leadership and MP1, the flight lead for MP2's next sortie were never informed of this training rule violation, nor was this incident taken into account in any ORM review prior to the flight or briefed in the morning mass briefing. (Tab V-2.8, V-11.3, V-13.6).

11. HUMAN FACTORS

a. Introduction

Historical analysis indicates that human error is identified as a causal factor in 80 to 90 percent of mishaps, and is present but not causal in another 50 to 60 percent of all mishaps, and is therefore the single greatest mishap hazard (Tab BB-20 thru BB-21). The Department of Defense Human Factors Analysis and Classification System (DoD HFACS) includes a list of the potential human factors that may be contributory to a mishap. All factors in the guide were assessed for relevancy to the current mishap under investigation. Following are human factors that can be applied directly to this mid-air impact.

b. Applicable Factors

Channelized attention is a factor when an individual is focusing all conscious attention on a limited number of environmental cues to the exclusion of others of a subjectively equal or higher or more immediate priority, leading to an unsafe situation. It may be described as a tight focus of attention that leads to the exclusion of comprehensive situational information (Tab BB-22). MP1's behavior is consistent with channelized attention because he was focused on the engagement and whether MP2 was in position to fire on him (Tabs V-1.5, V-1.13). The lack of actions on the part of both pilots to avoid the impact with each other is indicative of channelized attention which led to a failure to anticipate the mishap.

Misperception of Operational Conditions is a factor when an individual misperceives or misjudges altitude, separation, speed, closure rate, sea conditions, or aircraft location within the performance envelope or other operational conditions and this leads to an unsafe situation (Tab BB-23). Misperception is relevant in this mishap because MP1 misperceived the vertical closure rate between the two aircraft (Tabs V-1.10, V-2.10 thru V-2.11, V-3.2, V-3.12 thru V-3.13). Based on the fact that MP2 failed to take timely action to avoid the impact, he may have misjudged the closure rate as well. These misperceptions resulted in errors as described below.

Error due to Misperception is a factor when an individual acts or fails to act based on an illusion, misperception, or disorientation state and this act or failure to act creates an unsafe situation (Tab BB-24). Errors occurred due to the misperception presented above. This incorrect

comprehension of the closure rate by both pilots resulted in an error in perception of their flight paths, which resulted in a failure to clear their flight paths. This error also led the pilots to fail to anticipate the impending high aspect mid-air impact (Tab V-1.16).

Decision-Making During Operation is a factor when the individual through faulty logic selects the wrong course of action in a time-constrained environment (Tab BB-24). This factor applies because based on the time-constrained environment of the mishap sequence, MP1 elected to brace for impact rather than attempt a rapid maneuver to avoid the impact (Tab V-1.16).

Visibility Restrictions is a factor when the visibility is obstructed creating an unsafe situation (Tab BB-25). A visibility restriction occurred due to the construction of the F-15 canopy with the presence of the canopy bow across the pilot's field of view. The flight paths of the aircraft show that MA1 may have been obscured behind the canopy bow of MA2 for 1-2 seconds as the two aircraft approached each other (Tab O-119).

Complacency is a factor when the individual's state of reduced conscious attention due to an attitude of overconfidence, under motivation, or the sense that "others have the situation under control," leads to an unsafe situation (Tab BB-26). MP2 displayed complacency because he may not have moved his head to see around the canopy bow and regain visual contact with MA1. This could occur for two reasons: 1) as a less experienced pilot, he had not developed the habit of moving his head to compensate for the canopy bow, or 2) he expected MA1 to be in a less threatening position when it appeared below the canopy bow.

Necessary Action – Delayed is a factor when the individual selects a course of action but elects to delay execution of the actions and the delay leads to an unsafe situation (Tab BB-24). MP2's behavior shows delayed action because during the final few seconds prior to the impact MA2 "bunted" (eased off back-pressure or applied some forward pressure on his control stick turning his aircraft downward). This action may have averted the impact had it occurred earlier in the mishap sequence.

12. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Primary Operations Directives and Publications

1. Air Force Instruction (AFI) 11-202, Volume 1, *Aircrew Training*, 17 May 2007
2. AFI 11-202, Volume 3, *General Flight Rules*, 5 April 2006
3. AFI 11-214, *Air Operations Rules and Procedures*, 22 December 2005, Incorporating Change 1, 11 April 2007
4. AFI 11-215, Volume 3, *USAF Flight Manuals Program (FMP)*, 6 April 2005
5. Air Force Tactics, Techniques, and Procedures 3-3.F-15C, *Combat Aircraft Fundamentals – F-15C*, 1 July 2007
6. 96th Medical Group Instruction 48-101, *Aircraft Accident/Incident Procedures*, 31 July 2004

b. Maintenance Directives and Publications

1. T. T.O. 1F-15A-6, *Inspection and Maintenance Requirements Manual*, 1 September 2000, Change 18 – 1 May 2007

NOTICE: The AFIs listed above are available digitally on the AF Departmental Publishing Office internet site at: **http://www.e-publishing.af.mil.**

c. Known or Suspected Deviations from Directives or Publications

There are no known or suspected deviations from directives or publications by crew members or others involved in the mishap mission.

13. NEWS MEDIA INVOLVEMENT

Local, national, and international media outlets immediately reported on this mishap. The 33d Fighter Wing Public Affairs Office (33 FW/PA) received initial mishap notification at 1445L on 20 February 2008 and notified the media through an official written media release at 1640L (Tab DD-3). The 1st Special Operations Wing Public Affairs Office at Hurlburt Field, Florida, and the United States Coast Guard Public Affairs Office also released press releases regarding their roles in the search and rescue efforts (Tab DD-9 thru DD-10).

At 1900L, Colonel Todd Harmer, commander, 33 FW, held a ten minute press conference at the Air Force Armament Museum in Shalimar, Florida, in front of 11 media outlets from television, local newspapers, and the Associated Press (AP). In total, the 33 FW/PA released six press releases over six days providing information on the mishap, the search and rescue, the status of the pilots, the release of MP2's name, the salvage efforts, and the on-base memorial service. (Tab DD-3 thru DD-8).

Articles about the mishap were posted on the 33 FW web site, including a picture of the 60 FS flying F-15Cs in the missing man formation for the memorial ceremony held on 27 February 2008 and articles from the Air Force Print News Today (Tabs DD-11, DD-13 thru DD-14).

Local, national, and international media coverage generated over 50 news articles, web site postings, and broadcast stories. The mishap story ran in local papers, in the Air Force Times, on national (CNN and FOX) and several local news wires (Tab DD-15 thru DD-27, DD-29 thru DD-60). It was also covered by over 10 international news sources, including AP, United Press International, Reuters, BBC News, AFP in France, Al Jazeera, The New Zealand Herald, The Herald Sun in Australia, Sify News in India, and three Canadian news sources (CBC News, News 1130 radio, and eCanada Now) (Tab DD-61 thru DD-71).

Early reports concentrated on the initial mishap and the search and recovery efforts of the MPs. Coverage shifted to cover the fact that MP2 was fatality injured in the mishap. On 22 February 2008, the Air Force Print News Today posted an article releasing MP2's name and photograph (Tab DD-13).

MP2's name was placed on the F-15 that is assigned to the West Coast Demonstration Team. The aircraft will be at air shows around the United States and other countries over the next 8 months (Tab DD-12).

On 25 March 2008, the United States Navy posted an article on its website highlighting the recovery of the two MAs by the United States Naval Ship, the Grasp from 1 March to 22 March 2008 (Tab DD-28).

14. ADDITIONAL AREAS OF CONCERN

There are no additional areas of concern.

1 May 2008

JOSEPH REYNES, JR.
Brigadier General, USAF
President, Accident Investigation Board