UNITED STATES AIR FORCE
AIRCRAFT ABBREVIATED ACCIDENT INVESTIGATION BOARD REPORT

MQ-9A, T/N 04-4011
11TH RECONNAISSANCE SQUADRON
432D WING
CREECH AFB, NEVADA

LOCATION: CREECH AFB, NEVADA

DATE OF ACCIDENT: 11 DECEMBER 2014

BOARD PRESIDENT: MAJOR KENNETH S. DEGON
Abbreviated Accident Investigation, conducted pursuant to Chapter 11 of Air Force Instruction 51-503

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

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JUL 31 2015

ACTION OF THE CONVENING AUTHORITY

The Report of the Accident Investigation Board, conducted under the provisions of AFI 51-503, that investigated the 11 December 2014 mishap, near Creech Air Force Base, Nevada, involving an MQ-9A, T/N 04-4011, assigned to the 432nd Wing, Creech Air Force Base, Nevada, complies with applicable regulatory and statutory guidance; on that basis it is approved.

JERRY D. HARRIS, JR.
Major General, USAF
Vice Commander

EXECUTIVE SUMMARY
AIRCRAFT ACCIDENT INVESTIGATION

MQ-9A, T/N 04-4011
Creech Air Force Base
11 December 2014

On 11 December 2014, at approximately 0849 hours local time (L), an MQ-9A, tail number 04-4011, assigned to the 11th Reconnaissance Squadron (11 RS), Creech Air Force Base (AFB), Nevada (NV) impacted terrain approximately two miles northeast of Creech AFB, NV, while conducting practice visual approach patterns to landings. The impact destroyed the mishap remotely piloted aircraft (MRPA). Damage to United States government property totaled $11,307,588.00. There were no fatalities, injuries, or damage to other property.

The mishap crew (MC) consisted of the mishap student pilot (MSP), the mishap instructor pilot (MIP), and the mishap sensor operator (MSO). The MSP was current and qualified in the MQ-9A, and was undergoing additional qualification training in takeoffs and landings under the direct supervision of the MIP. This was the second training mission for the MSP in MQ-9A takeoffs and landings. Prior to takeoff, pre-flight inspections indicated there were no discrepancies or abnormalities with the MRPA. The MRPA took off at 0752L and flew for 57 minutes before impacting terrain at 0849L. Between takeoff and impact with the ground, the MRPA conducted ten practice approaches to landing, with the tenth approach being the mishap approach. The approach pattern at Creech AFB has elevated terrain beneath it. On the tenth approach, the MRPA impacted the terrain as it turned and began its descent.

During the mishap approach, the MIP directed the MSP to initiate a descent and delay the turn towards the runway. The MIP also directed the MSP to increase the rate of descent by commanding the nose of the MRPA to pitch farther down. The MRPA's rate of descent was approximately twice what a normal rate of descent would be. At the time of initiating descent, the MC did not focus on the MRPA's rate of descent to ensure sufficient altitude was maintained to fly over terrain. In addition, the MIP's attention was focused on the MRPA's position to the exclusion of the rate of descent. As a result, the MIP did not adequately address the MRPA's rapid rate of descent. When the MSP initiated the turn towards the runway and descended, the data signal, which is used to control the MRPA from the ground, became obscured by terrain. This severely degraded the video display that the MC monitored to control the MRPA, and the MC attempted to reverse the descent and initiate a climb away from the ground. The MRPA responded to MSP inputs during the attempt to climb away from the ground, but was too close to terrain to avoid impact. Post-impact analysis of the MRPA indicated the MRPA was performing as commanded and within normal parameters.

The Abbreviated Accident Investigation Board President found by a preponderance of evidence that the cause of this mishap was channelized attention that resulted in a pilot-commanded excessive descent rate over elevated terrain.

SUMMARY OF FACTS AND STATEMENT OF OPINION
MQ-9A, T/N 04-4011
11 December 2014

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS iii
SUMMARY OF FACTS 1
1. AUTHORITY AND PURPOSE 1
a. Authority 1
b. Purpose 1
2. ACCIDENT SUMMARY 1
3. BACKGROUND 1
a. Air Combat Command (ACC) 2
b. Twelfth Air Force (12 AF) 2
c. 432d Wing (432 WG) 2
d. Eleventh Reconnaissance Squadron (11 RS) 2
e. Forty-Second Attack Squadron (42 ATKS) 3
f. MQ-9A Reaper 3
4. SEQUENCE OF EVENTS 3
a. Mission 3
b. Planning 3
c. Preflight 3
d. Summary of Accident 4
e. Impact 5
f. Egress and Aircrew Flight Equipment (AFE) 5
g. Search and Rescue (SAR) 5
h. Recovery of Remains 5
5. MAINTENANCE 5
a. Forms Documentation 5
b. Inspections 5
c. Maintenance Procedures 6
d. Maintenance Personnel and Supervision 6
e. Fuel, Hydraulic, and Oil Inspection Analyses 6
f. Unscheduled Maintenance 6
6. AIRFRAME, MISSILE, OR SPACE VEHICLE SYSTEMS 6
a. Structures and Systems 6
b. Evaluation and Analysis 7
7. WEATHER 7
a. Forecast Weather 7
b. Observed Weather 7
c. Space Environment 7
d. Operations 7
8. CREW QUALIFICATIONS 7
a. Mishap Student Pilot 8
b. Mishap Instructor Pilot 8

c. Mishap Sensor Operator....8
9. MEDICAL....9
a. Qualifications....9
b. Health....9
c. Pathology....9
d. Lifestyle....9
e. Crew Rest and Crew Duty Time....9
10. OPERATIONS AND SUPERVISION....9
a. Operations....9
b. Supervision....9
11. HUMAN FACTORS....10
a. Introduction....10
b. Applicable Factor....10
(1) Channelized Attention....10
12. GOVERNING DIRECTIVES AND PUBLICATIONS....10
a. Publically Available Directives and Publications Relevant to the Mishap (access through the AF e-Publishing web site: http://www.e-publishing.af.mil)....10
b. Other Directives and Publications Relevant to the Mishap....10
13. ADDITIONAL AREAS OF CONCERN....11
STATEMENT OF OPINION....12
1. Opinion Summary....12
2. Cause....13
3. Conclusion....14
INDEX OF TABS....15

ACRONYMS AND ABBREVIATIONS

11 RS	11th Reconnaissance Squadron
12 AF	12th Air Force
42 ATKS	42d Attack Squadron
432 WG	432d Wing
AAIB	Abbreviated Accident Investigation Board
ACC	Air Combat Command
AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFTO	Air Force Technical Order
AFSEC	Air Force Safety Center
AGL	Above Ground Level
AWBS	Aircraft Weight and Balance Sheet
CAPS	Critical Action Procedures
CM	Contract Maintainer
COMACC	ACC Commander
DEEC	Digital Electronic Engine Control
DL	Data Link
DOD	Department of Defense
EOC	Engine Operational Check
EPE	Emergency Procedures Evaluation
FA	Flight Authorization
FDP	Flight Duty Period
FPM	Feet Per Minute
FT	Feet
GA	General Atomics
GCS	Ground Control Station
GDT	Ground Data Terminal
GLS	Global Positioning Landing System
GMT	Greenwich Mountain Time
GPS	Global Positioning System
HQ	Headquarters
HUD	Heads-Up Display
IAW	In Accordance With
IO	Investigative Officer
KIAS	Knots indicating air speed
kts	Knots
L	Local Time
LOS	Line of Sight
LR	Launch and Recovery
MAG	Magnetic
METAR	Meteorological Aerodrome Report
MC	Mishap Crew
MCE	Mission Control Element
MIP	Mishap Instructor Pilot
MM	Maintenance Member
MSL	Mean Sea Level
MSP	Mishap Student Pilot
MRPA	Mishap Remotely Piloted Aircraft
MSO	Mishap Sensor Operator
NV	Nevada
POC	Point of Contact
RPA	Remotely Piloted Aircraft
SATCOM	Satellite Communication
SFO	Simulated Flame Out
SIB	Safety Investigation Board
TCTO	Time Compliance Technical Order
TO	Technical Order
T/N	Tail Number
UAV`	Unmanned Aerial Vehicle
US	United States
USAF	United States Air Force
V	Volume
VSI	Vertical Speed Indicator
VVI	Vertical Velocity Indicator

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 AND PURPOSE

a. Authority

On 08 June 2015, the Vice Commander of Air Combat Command (ACC), Major General Jerry D. Harris, Jr. appointed Major (Maj) Kenneth S. DeGon to conduct an Abbreviated Accident Investigation Board (AAIB) to investigate an MQ-9A (tail number (T/N) 04-4011) mishap approximately two miles northeast of Creech Air Force Base (AFB), Nevada (NV), on 11 December 2014 (Tabs J-2, N-31, Y-2 through Y-3, DD-2). The Convening Order appointed a Board President, a legal advisor, and a recorder (Tab Y-2 through Y-3). The AAIB conducted its investigation under the authority of and in accordance with (IAW) Air Force Instruction (AFI) 51-503, *Aerospace Accident Investigations*, Chapter 11, *Abbreviated Accident Investigations*, at Creech AFB, NV, from 10 June 2015 through 24 June 2015.

b. Purpose

IAW AFI 51-503, *Aerospace and Ground Accident Investigations*, this accident investigation board conducted a legal investigation to inquire into all the facts and circumstances surrounding this Air Force aerospace accident, prepare a publicly-releasable report, and obtain and preserve all available evidence for use in litigation, claims, disciplinary action, and adverse administrative action.

2. ACCIDENT SUMMARY

On 11 December 2014, at approximately 0849 hours local time (L), the mishap remotely piloted aircraft (MRPA), an MQ-9A, T/N 04-4011, impacted terrain approximately two miles northeast of Creech AFB, NV, while conducting practice approaches to landing (Tabs DD-2, V-2.2). The impact destroyed the MRPA and damage to United States government property totaled $11,307,588.00 (Tab P-5). There were no fatalities, injuries, or damage to other property (Tabs D-2, P-2 through P-5).

3. BACKGROUND

The MRPA was an asset of the 432d Wing (432 WG) (Tab K-6). The mishap instructor pilot (MIP) and mishap sensor operator (MSO) were assigned to the 11th Reconnaissance Squadron (11 RS) (Tabs G-24, V-3.1). The mishap student pilot (MSP) was assigned to the 42d Attack Squadron (42 ATKS) (Tab V-2.1). Both squadrons are assigned to the 432 WG, Creech AFB, NV (Tab CC-12 through CC-17). The 432 WG is a component of Twelfth Air Force (12 AF), headquartered at Davis-Monthan AFB, Arizona (Tab CC-6). 12 AF is a component of ACC, headquartered at Joint Base Langley-Eustis, Virginia (Tab CC-2, CC-4). At the time of the mishap, the mishap crew (MC) controlled the MRPA from a ground control station (GCS) at Creech AFB, NV, on a launch and recovery (LR) training event (Tabs J-2, V-2.1, V-3.1).

a. Air Combat Command (ACC)

ACC is a major command of the United States Air Force and the primary force provider of combat airpower to America's warfighting commands (Tab CC-2). To support global implementation of national security strategy, ACC operates fighter, bomber, reconnaissance, battle-management and electronic-combat aircraft (Tab CC-2). It also provides command, control, communications and intelligence systems, and conducts global information operations (Tab CC-2). As a force provider, ACC organizes, trains, equips and maintains combat-ready forces for rapid deployment and employment while ensuring strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense (Tab CC-2). ACC numbered air forces provide the air component to U.S. Central, Southern and Northern Commands, with Headquarters ACC serving as the air component to Joint Forces Commands (Tab CC-2). ACC also augments forces to U.S. European, Pacific and Strategic Command (Tab CC-2).

b. Twelfth Air Force (12 AF)

12 AF has the warfighting responsibility for U.S. Southern Command as well as the U.S. Air Forces Southern (Tab CC-6). It is responsible for the readiness of nine active duty wings and one direct reporting unit (Tab CC-6). 12 AF's subordinate commands operate more than 600 aircraft with more than 55,000 uniformed and civilian Airmen (Tab CC-6). The command is also responsible for the operational readiness of 17 Twelfth Air Force-gained wings and other units in the Air Force Reserve and Air National Guard (Tab CC-6). As one of four numbered air forces assigned to ACC, 12 AF's mission is to enable combat-ready forces for rapid global employment; and receive, command and control, and employ joint air component assets to meet US strategic objectives in the U.S. Southern Command area of responsibility, across the full spectrum of operations (Tab CC-6).

c. 432d Wing (432 WG)

Following a period of inactivity, the 432 WG returned to active service in May 2007 at Creech AFB, NV, and formed the first unmanned aircraft systems wing (Tab CC-11). In doing so, the 432 WG took charge of existing and rapidly expanding unmanned precision attack and intelligence, surveillance, and reconnaissance combat missions there in support of overseas contingency operations (Tab CC-11). The wing and its subordinate units are components of the Air Force's ACC and 12 AF (Tab CC-4).

d. Eleventh Reconnaissance Squadron (11 RS)

Following inactivation in 1994, the 11 RS was re-designated and reactivated in July 1995 (Tab CC-12). In 1996, it became the first RPA Squadron in the Air Force and provided deployable, long-endurance, aerial

reconnaissance, and surveillance while flying the Predator RPA from 1996 through 2002 (Tab CC-13 through CC-14). The 11 RS transitioned to RPA flight training at Creech AFB, NV in 2003 (Tab CC-13 through CC-14).

e. Forty-Second Attack Squadron (42 ATKS)

Following inactivation in 1990, the 42 ATKS was reactivated in November 2006 (Tab CC-15). In 2007, 42 ATKS became the first operational USAF MQ-9A Reaper squadron (Tab CC-16). 42 ATKS provides combatant commanders with deployable precision engagement capabilities for time-critical targets, air interdiction, close air support, strike coordination, and reconnaissance (Tab CC-16). It is headquartered at Creech AFB, NV (Tab CC-15).

f. MQ-9A Reaper

The MQ-9A Reaper is an armed, multi-mission, medium-altitude, long-endurance remotely piloted aircraft that is employed primarily as an intelligence-collection asset and secondarily against dynamic execution targets (Tab CC-18). Given its significant loiter time, wide-range sensors, multi-mode communications suite, and precision weapons -- it provides a unique capability to perform strike, coordination, and reconnaissance against high-value, fleeting, and time-sensitive targets (Tab CC-18). Reapers can also perform the following missions and tasks: intelligence, surveillance, reconnaissance, close air support, combat search and rescue, precision strike, buddy-laser, convoy/raid overwatch, route clearance, target development, and terminal air guidance (Tab CC-18). The MQ-9A's capabilities make it uniquely qualified to conduct irregular warfare operations in support of combatant commander objectives (Tab CC-18).

4. SEQUENCE OF EVENTS

a. Mission

The purpose of the MC's 11 December 2014 MQ-9A mission was to train the MSP in LR procedures (Tab V-2.1). Specifically, the training plan anticipated that the MC would conduct multiple approach patterns to landing (Tab V-2.1). The 432d Operations Group Commander authorized the mission (Tab V-3.1).

b. Planning

The MSP briefed the mission plan to the MC according to standard procedures (Tab V-2.1). The MSP briefed the plan for the flight, the proposed training activity, the logistical details of the mission, and the forecast weather conditions (Tab V-2.1). The briefing was supervised by the MIP (Tab V-2.1).

c. Preflight

After the MC completed mission planning and briefing, the MC accomplished final preflight paperwork and checked currencies (i.e., "stepped to the MRPA") IAW squadron standards (Tab V-2.1). The MC consisted of the MSP, MIP and the MSO (Tab K-3).

A pre-flight inspection of the MRPA was completed and no issues with the MRPA were noted (Tab V-2.1). The MC ran the pre-takeoff checklist and received clearance to taxi to the runway (Tab V-2.1). The MC then launched the MRPA for the mission at 0752L (Tabs V-2.1, DD-2).

d. Summary of Accident

The mission began with seven higher altitude approaches, known as "simulated flameout approaches," followed by three approaches flown from a normal downwind altitude (Tab U-5). Normal visual approach patterns consist of flying a rectangular pattern around a runway to conduct practice approaches to landing (Tab BB-7). When beginning the descent for landing, the aircraft normally continues on a downwind heading and initiates a descent as it turns to the base segment of the pattern (Tabs R-18, BB-7). See Figure 1. Normal descent rates in the visual pattern are typically -1,000 to -1,200 feet per minute (FPM) (Tab V-3.2). The visual pattern at Creech AFB has elevated terrain beneath it (Tabs R-18, V-3.2). The MIP indicated that there is known terrain beneath the pattern but the MC did not brief the terrain during their mission brief on the morning of the mishap (Tab V-3.2).

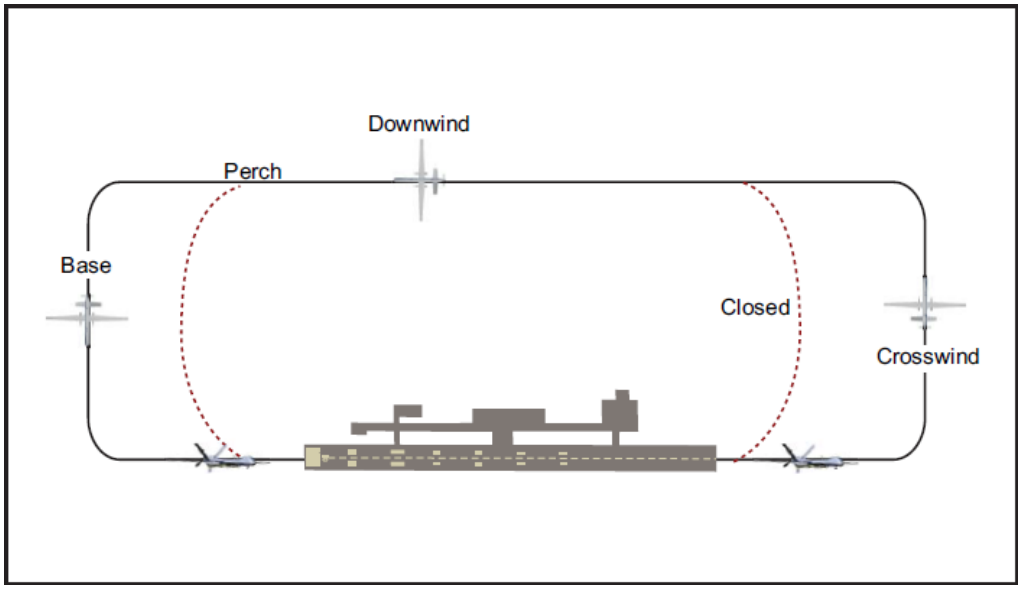

Figure 1 – Normal Visual Approach Pattern Segments (Tab BB-7)

During the two approaches prior to the mishap approach, the MRPA flew over terrain at low altitude, between 250 and 400 feet above ground level (Tab U-11).

During the mishap approach, the MIP directed the MSP to delay the turn to the base segment in order to extend the downwind segment of the pattern to align the MRPA with the runway farther out from the runway (Tabs N-30, V-2.2). The MSP reduced engine power to idle (Tab U-7). When the MSP initiated the descent, he decreased the pitch angle by lowering the nose of the aircraft, which caused the MRPA's rate of descent to reach -1,200 FPM (Tab DD-2**)**. Although the descent was already established, the MIP directed the MSP to increase the rate of descent (Tab N-30). The MSP commanded the nose of the MRPA lower and the rate of descent further increased to -2,300 FPM (Tab DD-2). Shortly thereafter, the MRPA reached a position where the data signal that is used to control the MRPA from the ground began to be obscured by terrain

(Tab U-8). This severely degraded the video display that the MC monitored to control the MRPA from the ground (Tab U-5). Four seconds later, the MC called for and attempted to reverse the rate of descent and climb away from the ground (Tab U-5). The MRPA responded to MSP inputs during the attempt to climb away, but the MRPA was too close to terrain to avoid impact (Tab U-5). Once the video feed was completely lost, the crew initiated the "Lost Link Checklist" and turned off the data link connection between the ground and the MRPA per the checklist (Tabs N-30 through N-31, V-2.2).

e. Impact

Once the MC could no longer see the video feed from the MRPA on the ground, the MSP notified the Creech air traffic control tower that the MC had turned off the data link connection and that the MRPA should be flying west towards the runway (Tab N-31). The tower notified the MC that they did not see the MRPA (Tab N-31). The tower then indicated they could see black smoke in the mountains to the northeast of the tower (Tab N-31). The MRPA impacted the ground at 0849L (Tabs N-31, DD-2).

f. Egress and Aircrew Flight Equipment (AFE)

Not applicable.

g. Search and Rescue (SAR)

Not applicable.

h. Recovery of Remains

Not applicable.

5. MAINTENANCE

a. Forms Documentation

A Production Superintendent from the 432d Aircraft Maintenance Squadron reviewed the Air Force Technical Order (AFTO) 781-series forms for the MRPA (Tab U-2 through U-3). The forms were documented IAW applicable maintenance guidelines (Tab U-2). The inspection included a visual examination of the MRPA's servicing components and systems to ensure there were no defects or malfunctions hazardous to flight on 11 December 2014 (Tab U-2). No relevant discrepancies were noted during the inspection (Tab U-2). Additionally, a review of the forms indicated that there were no overdue MRPA Time Compliance Technical Orders, time change items, or special inspections that would have prevented the MRPA from flying on the day of the mishap (Tab U-2).

b. Inspections

All required aircraft inspections were accomplished (Tab U-2). On 10 December 2014, the maintenance crew satisfactorily completed a Through Flight inspection of the MRPA (Tab D-3).

On 11 December 2014, a pre-flight inspection, which included a visual walk around of the MRPA, was conducted by a member of the flight crew (Tab V-2.1). The individual that conducted the inspection did not note any issues with the MRPA prior to the mishap flight (Tab V-2.1).

c. Maintenance Procedures

All maintenance procedures were properly performed on the MRPA (Tab U-2).

d. Maintenance Personnel and Supervision

According to the AFTO Form 781 for T/N 04-4011, all preflight maintenance for the MRPA mission was properly performed prior to the mishap flight (Tab D-3).

e. Fuel, Hydraulic, and Oil Inspection Analyses

According to the forms review, maintenance personnel properly serviced fuel tanks and oil reservoirs (Tab D-4). The servicing certification on the AFTO form 781H reflected adequate oil and fuel levels on the day of the mishap (Tab D-4). Due to the destruction of the MRPA, post-mishap analysis was not conducted nor provided (Tab D-2).

f. Unscheduled Maintenance

On 10 December 2014, the day before the mishap flight, a pilot noted two discrepancies with the MRPA (Tab D-12 through D-13). First, the pilot noted the MRPA experienced high rates of descent with the engine power commanded to idle (Tab D-12). Second, the pilot noted that the MRPA required high power settings to taxi.

To correct the excessive descent rates, the maintenance crew removed and replaced an engine pressure switch (Tab D-12). Following this maintenance, maintenance personnel performed a previously unscheduled Engine Operational Check (EOC) (Tabs D-12 through D-13, U-12). The Digital Electronic Engine Control (DEEC) card from the EOC indicated normal engine and propeller operation (Tab U-12).

When addressing the second issue, the maintenance crew observed an issue with a wheel brake that was partially actuated and, therefore, dragging against the wheel. To correct this discrepancy, the maintenance crew replaced the brake piston seals (Tab D-13).

6. AIRFRAME, MISSILE, OR SPACE VEHICLE SYSTEMS

a. Structures and Systems

The MRPA's engine and propeller were recovered from the wreckage site (Tab U-10). The engine, the propeller rigging, and other components were too damaged to determine pre-impact conditions (Tab U-10).

b. Evaluation and Analysis

Flight idle fuel flow appeared normal during the MRPA's previous flight, during the EOC following the unscheduled maintenance, and during the final three approaches of the mishap flight (Tab U-12).

Datalogs from another MQ-9A in the pattern during the time of the mishap and from other MQ-9As in the pattern on previous days were provided and analyzed (Tab U-5). When comparing similar power settings and flight parameters, the MRPA had a comparable range of descent rates (Tab U-5).

According to the manufacturer's initial technical analysis, there did not appear to be any anomalies or faults with the commands between the MRPA and the GCS (Tab J-2). In addition, the MRPA followed all GCS commands throughout the mishap flight (Tab J-2).

7. WEATHER

a. Forecast Weather

The forecast for the area in which the MRPA was operating at the time of the mishap consisted of unlimited visibility with a broken cloud layer at 15,000 feet and winds coming from the southeast at 12 knots (kts) gusting to 20 kts (Tab F-4).

b. Observed Weather

The weather at the time of the mishap was reported as visibility of 10 statute miles with few clouds at 18,000 feet and winds from the southwest at 4 kts (Tab F-11). The weather post-mishap was reported as winds variable at 4 kts, with visibility of 10 statute miles and few clouds at 19,000 feet (Tab F-11).

c. Space Environment

Not applicable.

d. Operations

The MRPA was operated within its prescribed weather limitations (Tab V-2.1).

8. CREW QUALIFICATIONS

All members of the MC were current and qualified to fly on 11 December 2014 (Tabs G-11, G-40, G-53, G-111, G-198, T-11). On the morning of the mishap, the MSP was undergoing LR qualification training under the supervision of the qualified LR MIP (Tab V-2.1).

a. Mishap Student Pilot

At the time of the mishap, the MSP was a current and qualified pilot in the MQ-9A (Tab G-40, G-198). However, he was not qualified to conduct unsupervised LR operations and, therefore, was under the direct supervision of the MIP (Tabs G-198, V-2.1). The MSP had 74.3 MQ-9A simulator hours and 471.4 total MQ-9A hours (Tab G-40). The mishap flight was the MSP's second instructional flight conducting LR and pattern operations (Tab V-2.1).

Recent flight and simulator time is as follows (Tab G-40):

	Flt Hours	Flt Sorties	Sim Hours	Sim Sorties
Last 30 Days	8.0	2	10.0	4
Last 60 Days	65.5	19	11.3	6
Last 90 Days	114.2	35	12.3	7

b. Mishap Instructor Pilot

The MIP was a current and qualified MQ-9A LR Instructor Pilot at the time of the mishap (Tabs G-53, T-11). According to AF Aircrew Resource Management System Records, the MIP had 99.4 hours of MQ-9A simulator time and 139.3 hours of total MQ-9A time (Tab T-11). The MIP also had 53.7 hours of flying time as an MQ-9A Instructor Pilot (Tab T-11). In addition to his AF experience, the MIP had been qualified to pilot the MQ-9A since 2008, with experience supporting U.S. Customs and Border Protection, overseas operations, and most recently as a Special Projects Test and Evaluation pilot contractor (Tab G-6).

Recent flight and simulator time is as follows (Tab T-11):

	Flt Hours	Flt Sorties	Sim Hours	Sim Sorties
Last 30 Days	5.8	6	12.5	5
Last 60 Days	20.0	14	22.0	9
Last 90 Days	36.2	24	33.0	14

c. Mishap Sensor Operator

The MSO was a current and qualified MQ-9A Instructor Sensor Operator at the time of the mishap (Tab G-8, G-111). The MSO had 244.0 hours of MQ-9A simulator time and 236 hours of total MQ-9A flying time (Tab G-23). The MSO also had 93.2 hours as an MQ-9A Instructor Sensor Operator (Tab G-23).

Recent flight and simulator time is as follows (Tab G-23):

	Flt Hours	Flt Sorties	Sim Hours	Sim Sorties
Last 30 Days	10.8	7	9.5	4
Last 60 Days	23.3	14	14.0	7
Last 90 Days	29.7	18	35.0	16

9. MEDICAL

a. Qualifications

All MC members were medically qualified for flight duty at the time of the mishap and had current annual flight physical examinations on record (Tab G-17, G-36, G-51).

b. Health

Post-mishap toxicology reports showed negative results for all MC members and maintenance personnel involved in preflight maintenance (Tab T-2 through T-10).

c. Pathology

Not applicable.

d. Lifestyle

There is no evidence to suggest lifestyle factors were a factor in the mishap.

e. Crew Rest and Crew Duty Time

Aircrew members must have proper rest, as defined in AFI 11-202, Volume (V) 3, *General Flight rules*, (ACC Supplement), dated 28 November 2012, prior to performing in-flight duties (Tab BB-3). AFI 11-202 V3 defines normal crew rest as a minimum of 12-hour non-duty period before the designated flight duty period begins, during which time an aircrew member may participate in meals, transportation, or rest (Tab BB-3).

All members of the MC met all requirements for crew rest and were within their respective crew duty days at the time of the mishap (Tab V-2.2, V-3.3).

10. OPERATIONS AND SUPERVISION

a. Operations

At the time of the mishap, the operations tempo for the unit was normal and sustainable (Tab V-2.2, V-3.3). The MSP was enrolled in the takeoff and landing training full time beginning in November of 2014 in anticipation of deploying to support overseas operations (Tab V-2.1). In the previous thirty days, the MSP flew two flights and four simulators with the longest pause in training being seven days (Tabs G-40, G-47 through G-48, V-2.1).

b. Supervision

On 11 December 2014, the MC performed all of the standard flight briefings (Tab V-2.1, V-3.1). The MC was directly supervised by the MIP (Tab V-2.1, V-3.1).

11. HUMAN FACTORS

a. Introduction

AFI 91-204, *Safety Investigations and Reports*, contains the Department of Defense Human Factors Analysis and Classification System that lists potential human factors that can play a role in aircraft mishaps (Tab BB-4).

b. Applicable Factor

(1) Channelized Attention

Channelized Attention is a factor when the 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 (Tab BB-5). Channelized Attention may be described as a tight focus of attention that leads to the exclusion of comprehensive situational information (Tab BB-5).

Throughout the mishap flight, the MSP had difficulty maintaining ground track, air speed, and altitude, and was inconsistent with capturing ground track and using the Global Positioning System Landing System (Tab V-3.1). In an effort to minimize corrections during the mishap pattern, the MIP was focused on ensuring the student pilot could maintain ground track and could initiate the turn to the base segment of the pattern (Tab V-3.1). As a result of channelized attention, the MIP directed a descent when a descent had already been established (Tabs N-30 through N-31, DD-2). In addition, the MC did not notice the rapid rate of descent and subsequently did not take corrective action to correct the rate of descent in the moments before the mishap (Tabs N-30 through N-31, V-3.2). The provided audio recording did not include the MC discussing descent rate (Tab U-13).

12. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Publically Available Directives and Publications Relevant to the Mishap (access through the AF e-Publishing web site: http://www.e-publishing.af.mil)

(1) AFI 11-202, Volume 3, *General Flight Rules (ACC Supplement)*, 28 November 2012
(2) AFI 51-503, *Aerospace Accident Investigations*, 14 April 2015
(3) AFI 91-204, *Safety Investigations and Reports*, 12 February 2014, Corrective Actions Applied on 10 April 2014

b. Other Directives and Publications Relevant to the Mishap

(1) AFTTP 3-3.MQ-9, Air Force Tactics, Techniques, and Procedures, Combat Aircraft Fundamentals MQ-9, 14 December 2012
(2) T.O. 1Q-9(M) A-6WC-1, Preflight, Thruflight, Basic Postflight, Combined Basic Postflight/Preflight Inspection Requirements, 08 June 2015

(3) T.O. 1Q-9(M) A-6WC-2, Aircraft Periodic Inspections and Maintenance Requirements, MQ-9A Remotely Piloted Aircraft, 1 April 2013

13. ADDITIONAL AREAS OF CONCERN

Not applicable.

26 JUNE 2015

KENNETH S. DEGON, Maj, USAF
President, Abbreviated Accident Investigation Board

STATEMENT OF OPINION

MQ-9A, T/N 04-4011
Creech AFB, Nevada
11 December 2014

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

1. OPINION SUMMARY

On 11 December 2014, at approximately 0849 hours local time (L), an MQ-9A, tail number 04-4011, assigned to the 11th Reconnaissance Squadron (11 RS), Creech Air Force Base (AFB), Nevada (NV) impacted terrain approximately two miles northeast of Creech AFB, NV, while conducting practice visual approach patterns to landings. The impact destroyed the mishap remotely piloted aircraft (MRPA). Damage to United States government property totaled $11,307,588.00. There were no fatalities, injuries, or damage to other property.

The mishap crew (MC) consisted of the mishap student pilot (MSP), the mishap instructor pilot (MIP), and the mishap sensor operator (MSO). The MSP was current and qualified in the MQ-9A, and was undergoing additional qualification training in takeoffs and landings under the direct supervision of the MIP. This was the second training mission for the MSP in MQ-9A takeoffs and landings. Prior to takeoff, pre-flight inspections indicated there were no discrepancies or abnormalities with the MRPA. The MRPA took off at 0752L and flew for 57 minutes before impacting terrain at 0849L. Between takeoff and impact with the ground, the MRPA conducted ten practice approaches to landing, with the tenth approach being the mishap approach. The approach pattern at Creech AFB has elevated terrain beneath it. On the tenth approach, the MRPA impacted the terrain as it turned and began its descent.

During the mishap approach, the MIP directed the MSP to initiate a descent and delay the turn towards the runway. The MIP also directed the MSP to increase the rate of descent by commanding the nose of the MRPA to pitch farther down. The MRPA's rate of descent was approximately twice what a normal rate of descent would be. At the time of initiating descent, the MC did not focus on the MRPA's rate of descent to ensure sufficient altitude was maintained to fly over terrain. When the MSP initiated the turn towards the runway and descended, the data signal, which is used to control the MRPA from the ground, became obscured by terrain. This severely degraded the video display that the MC monitored to control the MRPA, and the MC attempted to reverse the descent and initiate a climb away from the ground. The MRPA responded to MSP inputs during the attempt to climb away from the ground, but was too close to terrain to avoid impact. Post-impact analysis of the MRPA indicated the MRPA was performing as commanded and within normal parameters.

I find by a preponderance of evidence that the cause of this mishap was channelized attention that resulted in a pilot-commanded excessive descent rate over elevated terrain.

I developed my opinion by analyzing witness testimony and witness statements, subject matter expert testimony, factual data from the flight data recordings, the manufacturer's technical analyses, aircraft maintenance records, and Air Force directives and guidance.

2. CAUSE

I find by a preponderance of evidence that the cause of this mishap was channelized attention that resulted in a pilot-commanded excessive descent rate over elevated terrain.

During the mishap pattern, the MIP initially directed the MSP to lower the nose of the aircraft and reduce engine power to idle. Normal descent rates in the visual pattern are -1,000 to -1,200 feet per minute (FPM). When the MSP initially lowered the nose of the MRPA and reduced engine power to idle, vertical speed decreased to -1,200 FPM. The MIP then directed the MSP to command the nose of the MRPA lower. At this time, the rate of descent increased to -2,300 FPM.

The MRPA's rate of descent was approximately twice what a normal rate of descent in the visual pattern would be. The approach pattern at Creech AFB has elevated terrain beneath it and the MIP stated during his testimony that he was familiar with the terrain. Descending at -2,300 FPM over high terrain caused the MRPA to descend too low before the MRPA was able to pass over the terrain. As the MRPA approached the terrain, the video display that the MC monitored to control the MRPA was severely degraded, and the MC attempted to reverse the descent and initiate a climb away from the ground. The MRPA responded to MSP inputs during the attempt to climb away from the ground, but was too close to terrain to avoid impact.

At the time of initiating descent, the MC did not focus on the MRPA's rate of descent to ensure sufficient altitude was maintained to fly over the terrain. In addition, the MIP experienced channelized attention and was focused on the MRPA's position to the exclusion of the rate of descent. As a result, the MC did not notice nor adequately address the rapid rate of descent. The audio recording indicates no one member of the MC attempted to correct the rate of descent before initiating a climb away from the ground moments before impact.

Had the MC corrected the excessive rate of descent over the terrain, it is highly likely the mishap would not have occurred.

3. CONCLUSION

I find by a preponderance of evidence that the cause of this mishap was channelized attention that resulted in a pilot-commanded excessive descent rate over elevated terrain.

26 JUNE 2015

KENNETH S. DEGON, Maj, USAF
President, Abbreviated Accident Investigation Board

INDEX OF TABS

SAFETY INVESTIGATOR INFORMATION ..... A

NOT USED ..... B

NOT USED C

MAINTENANCE REPORT, RECORDS, AND DATA ..... D

NOT USED ..... E

WEATHER AND ENVIRONMENTAL RECORDS AND DATA ..... F

PERSONNEL RECORDS ..... G

EGRESS, AIRCREW FLIGHT EQUIPMENT (AFE), IMPACT, AND CRASWORTHINESS ANALYSIS ..... H

DEFICIENCY REPORTS I

RELEASABLE TECHNICAL REPORTS AND ENGINEERING EVALUATIONS ..... J

MISSION RECORDS AND DATA ..... K

FACTUAL PARAMETRIC, AUDIO, AND VIDEO DATA FROM ON-BOARD RECORDERS L

DATA FROM GROUND RADAR AND OTHER SOURCES ..... M

TRANSCRIPTS OF VOICE COMMUNICATIONS ..... N

ANY ADDITIONAL SUBSTANTIATING DATA AND REPORTS ..... O

DAMAGE SUMMARIES ..... P

AIB TRANSFER DOCUMENTS ..... Q

RELEASABLE WITNESS TESTIMONY ..... R

RELEASABLE PHOTOGRAPHS, VIDEOS, AND DIAGRAMS ..... S

PERSONNEL RECORDS NOT INCLUDED IN TAB G ..... T

MAINTENANCE REPORT, RECORDS, AND DATA NOT INCLUDED IN TAB D ..... U

AAIB WITNESS TESTIMONY AND STATEMENTS..... V

NOT USED.....W

NOT USED..... X

LEGAL BOARD APPOINTMEMT DOCUMENTS..... Y

NOT USED.....Z

NOT USED.....AA

APPLICABLE REGULATIONS, DIRECTIVES, AND OTHER GOVERNMENTDOCUMENTS .....BB

FACT SHEETS.....CC

HUD REVIEW MEMORANDUM FOR RECORD .....DD