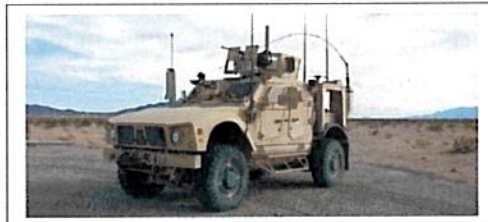


**UNITED STATES AIR FORCE**  
**GROUND ACCIDENT INVESTIGATION**  
**BOARD REPORT**



**Mine Resistant Ambush Protected All-Terrain Vehicle (M-ATV),  
S/N 10L00282**

**386th Expeditionary Security Forces Squadron  
386th Air Expeditionary Wing  
Ali Al Salem Air Base, Kuwait**



**TYPE OF ACCIDENT: Motor Vehicle Accident  
LOCATION: Ali Al Salem Air Base, Kuwait  
DATE OF ACCIDENT: 12 September 2020**

**BOARD PRESIDENT: Major General Maureen G. Banavige, USAF**

**Conducted IAW Air Force Instruction 51-307**




**DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE MATERIEL COMMAND  
WRIGHT-PATTERSON AIR FORCE BASE OHIO**

MAR 08 2021

**ACTION OF THE CONVENING AUTHORITY**

The report of the ground accident investigation board, conducted under the provisions of AFI 51-307, that investigated the 12 September 2020 mishap at Ali Al Salem Air Base, Kuwait, involving a vehicle accident fatality of an Airman assigned to the 386th Air Expeditionary Wing (home station Hanscom Air Force Base), complies with the applicable regulatory and statutory guidance and on that basis is approved.

  
[Redacted Signature]  
**CARL E. SCHAEFER**  
Lieutenant General, USAF  
Deputy Commander

**EXECUTIVE SUMMARY  
UNITED STATES AIR FORCE  
GROUND ACCIDENT INVESTIGATION**

**Motor Vehicle Accident, M-ATV 10L00282  
Ali Al Salem Air Base, Kuwait, 12 September 2020**

On 12 September 2020 at approximately 0900 Arabian Standard Time (AST), just outside the perimeter of Ali Al Salem Air Base (ASAB), Kuwait, the Mishap Airman (MA), a 26-year-old Senior Airman (SrA) on active duty, sustained fatal injuries when the Mine Resistant Ambush Protected All-Terrain Vehicle (M-ATV) in which he was a passenger rolled over while on patrol. Also in the vehicle were the Mishap Driver (MD), a 25-year-old Staff Sergeant (SSgt) Air Force Reserve member, and the Mishap Truck Commander (MTC), a 27-year-old SrA active duty member. The MD and MTC sustained minor injuries and have recovered. All three members of the Mishap Team (MT) were deployed Security Forces members assigned to the 386th Expeditionary Security Forces Squadron (386th ESFS), part of the 386th Air Expeditionary Wing (386th AEW), which has units and personnel located throughout Kuwait.

On 11 September 2020 at approximately 2330, the MT conducted turnover with the prior shift. Turnover included the transfer of the mishap M-ATV, serial number 10L00282. No anomalies or discrepancies were reported with the vehicle by the prior shift. The MT's shift began at 0000 (midnight) and was scheduled to end at 1200 (noon) on 12 September 2020. The MT was assigned as a Viper Patrol unit in Viperland, an area outside of the ASAB perimeter fence, but within the Military Exclusion Zone (MEZ) and Base Security Zone (BSZ) that are patrolled by U.S. forces.

At approximately 0900, the MT turned onto a hard-packed, rock and sand road about two kilometers from the base. After driving down the road for about 1-2 minutes, the MD reported she felt the M-ATV pulling to the right as if it was getting stuck in the sand. To compensate for this pulling, she steered the vehicle towards the left. When the vehicle responded, it veered to the left, at which point the MD lost control of the vehicle. The vehicle traveled in a serpentine pattern for approximately 100-200 yards, as the MD attempted to re-gain control. At that point, the vehicle entered a skid, rolled over, and flipped approximately 1.25 rotations, coming to rest on its driver's side facing the opposite direction to which it had been traveling. During the rollover, the back door behind the MD opened, ejecting the MA and shearing the door off its hinges. The vehicle had been traveling at least 43 miles per hour when it entered its skid. None of the MT members were wearing helmets or seatbelts, and the combat lock was not engaged on MA's door.

The MTC was the first out of the M-ATV and assisted the MD out. The MTC assessed the MA and concluded he had suffered fatal injuries. She contacted fellow 386th ESFS members for help. The MA was pronounced deceased at approximately 1035 by the Chief of Medical Staff at ASAB. The MD and MTC sustained non-life-threatening injuries and were treated and released.

**SUMMARY OF FACTS**  
**Motor Vehicle Accident, M-ATV 10L00282**  
**Ali Al Salem Air Base, Kuwait**  
**12 September 2020**

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## ACRONYMS AND ABBREVIATIONS

820th	820th Base Defense Squadron	DFAC	Dining Facility
A/C	Air Conditioning	DFC	Defense Force Commander
A1C	Airman First Class	DIM	Dead, Injured, Missing
A4	Directorate of Logistics, Engineering, and Force Protection	DOA	Dead on Arrival
A4S	Directorate of Logistics, Engineering, and Force Protection - Security Forces Division	E-7	Master Sergeant
ABS	Anti-Lock Breaking System	ECC	Emergency Control Center
ABG	Air Base Group	ECP	Entry Control Point
ABU	Airman Battle Uniform	EMER	Emergency
ACOG	Advanced Combat Optical Gunsight	EMT	Emergency Medical Technician
AE	Aero-Medical Evacuation	ESFS	Expeditionary Security Forces Squadron
AED	Automated External Defibrillator	ETA	Estimated Time of Arrival
AEP	Aerial Port	FAM	Familiarization
AEW	Air Expeditionary Wing	FAST	Fleet Antiterrorism Security Team
AFCENT	Air Force Central Command	FM&A	Fleet Management and Analysis
AFI	Air Force Instruction	FMC	Fully Mission Capable
AFMAN	Air Force Manual	FP	Force Protection
AFMC	Air Force Material Command	FPCON	Force Protection Condition
AFOSI	Air Force Office of Special Investigations	FSR	Field Service Representative
AFRC	Air Force Reserve Command	GAIB	Ground Accident Investigation Board
AFSC	Air Force Specialty Code	GMV	Government Motor Vehicle
AFTR	Air Force Training Record	GOV	Government Owned Vehicle
AIB	Accident Investigation Board	GPS	Global Positioning System
AOR	Area of Responsibility	HMMWV	High Mobility Multipurpose Wheeled Vehicle
ARC BOG	Air Reserve Component - Boots on the Ground	HRP	Human Remains Pouch
BDOC	Base Defense Operations Center	HWY	Highway
C2	Command and Control	IBA	Individual Body Armor
Capt	Captain	IC	Incident Commander
CAT	Crisis Action Team	IDP	Installation Deployment Plan
CC	Cross-Country	IED	Improvised Explosive Device
CCIR	Commander Initial Report	IFAK	Individual First Aid Kit
CDL	Commercial Driver's License	ISB	Interim Safety Board
CJSOAC	Combined Joint Special Operations Air Component	ISRT	Internal Security Response Team
COA	Course of Action	IV	Intravenous
CRTC	Combat Readiness Training Course	J4	Logistics Directorate of a Joint Staff
C-Spine	Cervical Spine	JFAK	Joint First Aid Kit
CTIS	Central Tire Inflation System	JPED	Joint Personal Affects Depot
DAGR	Defense Advanced GPS Receiver	KED	Kendrick Extrication Device
		KM/H	Kilometers per Hour
		LMR	Land Mobile Radio
		LMTV	Light Medium Tactical Vehicle
		LOR	Letter of Reprimand

*M-ATV Mishap, S/N 10L00282, 12 Sep 2020*

LP-OP	Listening Post - Observation Post	QRC	Quick Reaction Checklists
LRS	Logistics Readiness Squadron	QTP	Qualification Training Package
LSA	Logistics Support Area	RA	Resource Advisor
Lt Col	Lieutenant Colonel	RAMs	Random Anti-Terrorism Measures
LZ	Landing Zone	ROM	Restriction of Movement
MA	Mishap Airman	RTC	Regional Training Center
MACP	Mortuary Affairs Collection Point	RV	Rendezvous
M-ATV	Mine Resistant Ambush Protected	S4	Security Forces Logistics
	All-Terrain Vehicle	S5	Security Forces Reports and Analysis
MCC	Mission Control Center	SABC	Self-Aid and Buddy Care
MD	Mishap Driver	SAM	Surface to Air Missile
MEZ	Military Exclusion Zone	SCO	Summary Court Officer
MilGPS App	Military Global Positioning	SFM	Security Forces Manager
	System Application	SFTC	Security Forces Training Center
MPH	Miles per Hour	SIB	Safety Investigation Board
MRAP	Mine Resistant Ambush Protected	S/N	Serial Number
MSG	Mission Support Group	SNCO	Senior Noncommissioned Officer
MSgt	Master Sergeant	SOP	Standard Operating Procedure
MSS	Mud Sand & Snow	SrA	Senior Airman
MT	Mishap Team	SSgt	Staff Sergeant
MTC	Mishap Truck Commander	sUAS	Small Unmanned Aerial System
MVR	Master Vehicle Report	TASS	Tactical Automated Security System
MWD	Military Working Dog	TBA	Training Business Area
NCO	Noncommissioned Officer	TC	Truck Commander
NCOIC	Noncommissioned Officer in	TCTO	Time Compliance Technical Order
	Charge	TMEP	Theater Mortuary Evacuation Point
NMC	Non-Mission Capable	TPC	Task Performance Checklist
OCIE	Organizational Clothing and	TTP	Tactics, Techniques, and Procedures
	Individual Equipment	TVC	Tactical Vehicle Course
OCN	Other Country National	UDI	U-Drive It
OCP	Operational Camouflage Pattern	UDM	Unit Deployment Manager
OGMVC	Other Government Motor	UH-60	Utility Helicopter – Black Hawk
	Vehicle Conveyance	ULN	Unit Line Number
OI	Operating Instruction	USAFCENT	United States Air Forces
OPREP	Operation Report		Central Command
ORM	Operational Risk Management	USR	Unit Safety Representative
PA	Public Affairs	UXO	Unexploded Explosive Ordnance
PD	Patriot Defender	VCO	Vehicle Control Officer
PECP	Personnel Entry Control Point	VM	Vehicle Maintenance
PJ	Pararescue Jumper	VSA	Vehicle Search Area
PM	Periodic Maintenance	WARNORD	Warning Order
PPE	Personal Protective Equipment	WRM	War Reserve Material

## SUMMARY OF FACTS

### 1. AUTHORITY AND PURPOSE

#### a. Authority

On 24 September 2020, Lieutenant General Carl E. Schaefer, Deputy Commander, Air Force Materiel Command (AFMC), appointed Major General Maureen G. Banavice as Board President of a Ground Accident Investigation Board (GAIB) to investigate the death of the Mishap Airman (MA) during a motor vehicle accident near Ali Al Salem Air Base, Kuwait. (Tab Y-2). The GAIB convened from 23 October 2020 to 8 January 2021, and was conducted in accordance with Air Force Instruction (AFI) 51-307, *Aerospace and Ground Accident Investigations*, dated 26 February 2020. Additional members of the GAIB included a Legal Advisor (Major), Medical Member (Captain), and Recorder (Technical Sergeant (TSgt)). (Tabs Y-2, Y-4). Members appointed to advise the GAIB as Subject Matter Experts include a Traffic Accident Investigator and Security Forces Career Field Subject Matter Expert (TSgt), a Mine Resistant Ambush Protected All-Terrain Vehicle (M-ATV) Maintenance Subject Matter Expert (Contractor), and a Downrange M-ATV Vehicle Maintenance Subject Matter Expert (Contractor). (Tabs Y-5, Y-6, Y-7).

#### b. Purpose

In accordance with AFI 51-307, *Aerospace and Ground Accident Investigations*, this Ground Accident Investigation Board conducted a legal investigation to inquire into all the facts and circumstances surrounding this Air Force ground 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 12 September 2020, three members assigned to the 386th Expeditionary Security Forces Squadron (ESFS) were patrolling in M-ATV number 10L00282 in an area outside the main Ali Al Salem Air Base (ASAB) perimeter fence, but within the area still patrolled by base Security Forces. (Tabs V-4.4, GG-6). The patrolling Mishap Team (MT) in the mishap M-ATV consisted of the Mishap Driver (MD), the Mishap Truck Commander (MTC) in the front passenger seat, and the Mishap Airman (MA) in the back passenger seat behind the MD. (Tab V-3.9). At approximately 0900 Arabian Standard Time (AST) while traveling down an unpaved but hard-packed road of rock and sand, the M-ATV rolled over, eventually coming to a rest on the driver's side facing the opposite direction to which it had been traveling. (Tabs V-4.14, V-2.11, V-2.16, V-6.4, GG-6 to GG-7). At some point during the rollover sequence, the MA was ejected from the vehicle, and sustained fatal injuries. (Tabs X-2, GG-7). After the M-ATV came to a stop, the MTC exited through the turret of the overturned vehicle. (Tab R-64). The MTC observed that the MA had sustained fatal injuries, and focused on assisting MD out of the vehicle and caring for her, and getting help to the location. (Tabs R-64 to R-65). The MTC called for assistance from fellow 386th ESFS members using her personal cell phone, and those members were able to coordinate additional medical and accident response while en route to the scene. (Tab R-65). Help arrived after approximately 10 minutes. (Tabs O-15, V-7.5). The MA was pronounced deceased at the

*M-ATV Mishap, S/N 10L00282, 12 Sep 2020*



scene by emergency responders and the ASAB clinic doctor due to injuries sustained in the M-ATV rollover. (Tabs R-86 to R-87). Additionally, the MD sustained a head injury, and was transported to Camp Arifjan military medical facility via medical evacuation flight (MEDEVAC) from the mishap scene, and the MTC sustained minor injuries, and was transported to the local medical clinic at ASAB, and subsequently transported by ambulance to Camp Arifjan military medical facility for further evaluation. (Tabs X-3, X-4).

### **3. BACKGROUND**

#### **a. Air Force Materiel Command (AFMC)**

AFMC, headquartered at Wright-Patterson Air Force Base, Ohio, is one of the major commands of the United States Air Force (USAF). (Tab CC-2). AFMC's primary mission is to deliver war-winning expeditionary capabilities to the warfighter through development and transition of technology, professional acquisition management, exacting test and evaluation, and world-class sustainment of all Air Force weapon systems. (Tab CC-2). The command conducts research, development, test and evaluation, and provides acquisition services and logistics support necessary to keep Air Force weapon systems ready for war. (Tabs CC-2 to CC-7). AFMC has approximately 87,000 military and civilian employees. (Tab CC-3).



#### **b. United States Air Forces Central Command (USAFCENT)**

USAFCENT, also referred to as AFCENT, is the air component of United States Central Command, a regional unified command. (Tab CC-8). AFCENT is responsible for air operations, either unilaterally or in concert with coalition partners, and developing contingency plans in support of national objectives for USCENTCOM's 20-nation area of responsibility (AOR) in Southwest Asia. (Tab CC-8). Additionally, AFCENT manages an extensive supply and equipment prepositioning program at several AOR sites. (Tab CC-8).



#### **c. Air Force Reserve Command (AFRC)**

The AFRC's mission is to provide combat-ready forces to fly, fight, and win. (Tab CC-12). AFRC is headquartered at Robins AFB, Georgia. The Air Force Reserve is a combat ready, cost effective and experienced force. The purpose of the reserve component is to provide trained units and qualified persons available for active duty in the armed forces, in time of war or national emergency, and at such other times as the national security may require, to fill the needs of the armed forces whenever more units and persons are needed than are in the regular components. (Tabs CC-12, CC-116).



**d. 439th Airlift Wing (439th AW)**

The 439th AW, headquartered at Westover Air Reserve Base (ARB), Massachusetts, is a Wing within the AFRC. (Tab CC-14). The 439th AW is the AFRC's largest Wing with more than 5,000 military and civilian workers. Current military operations at Westover ARB are centered on its exceptionally long runways. (Tabs CC-14, CC-19). The AFRC uses Westover ARB for its largest cargo aircraft. It maintains a fleet of eight assigned C-5M Super Galaxy aircraft operated by the 439th AW. (Tabs CC-15, CC-18).



**e. 386th Air Expeditionary Wing (386th AEW)**

The 386th AEW, headquartered at Ali Al Salem Air Base (ASAB), Kuwait, serves as the primary airlift hub and gateway for delivering combat power to joint and coalition forces in the United States Central Command Area of Responsibility (AOR). (Tab CC-20). The Wing delivers decisive combat power and theater support to the secure and stabilize the United States Central Command AOR. (Tab CC-20). ASAB and Cargo City are the busiest aerial ports in the AOR supporting ongoing Operations Inherent Resolve and Freedom's Sentinel. (Tab CC-20). The 386th AEW's flying units operate the C-130 Hercules, the C-17 Globemaster III, and the MQ-9 Reaper. (Tab CC-125). The 386th AEW has units and personnel throughout Kuwait. (Tab V-10.3).



**f. 66th Air Base Group (66th ABG)**

Hanscom AFB is located in Massachusetts and its host unit is the 66th ABG, which is part of the Air Force Life Cycle Management Center, which falls under AFMC. The men and women of the 66th ABG secure, support, and sustain more than 10,000 active duty, Reserve and National Guard military personnel, Department of Defense civilians, and contractors who work and live at Hanscom AFB. (Tab CC-23). The Hanscom AFB mission, supported by the 66th ABG, is to acquire critical warfighting systems for the Air Force and its sister services. (Tab CC-120). These systems provide the connectivity for and between our warfighters with items such as radar, communication and intelligence systems, command and operations centers and network infrastructure and cyber defense. (Tab CC-120).



**g. 386th Expeditionary Security Forces Squadron (386th ESFS)**

The 386th ESFS provides security for all base weapons, property, and personnel at ASAB. (Tab CC-26). Security Forces personnel are the Air Force's first line of defense and it is their job to maintain the rule of law on all Air Force bases and installations. (Tab CC-28).





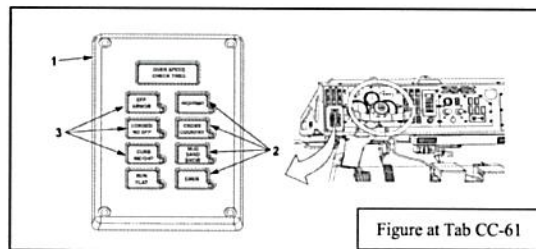
#### **h. Mine Resistant Ambush Protected All-Terrain Vehicle (M-ATV)**

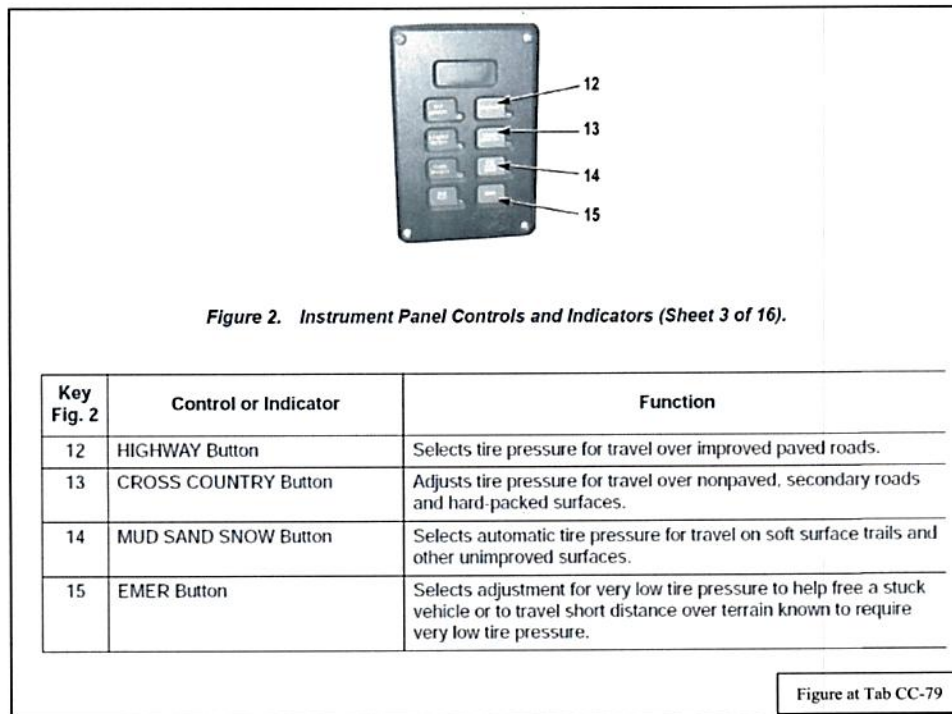
The M-ATV is a tactical vehicle manufactured by Oshkosh Defense, a division of the Oshkosh Corporation. (Tabs CC-37 to CC-60). It is a type of mine resistant armored personnel carrier (MRAP) vehicle. (Tab CC-59). The M-ATV is the smallest of the MRAP family of vehicles and is designed to have the MRAP level of protection, with the mobility of a High Mobility Multi-purpose Wheeled Vehicle (HMMWV). (Tab CC-123). The M-ATV is designed to increase survivability of its occupants over the traditional HMMWV with an increased level of armor, and is for use in highly restricted rural, mountainous, and urban terrain with off-road movement required. (Tab CC-123). Depending on the variant of M-ATV and additional attachments to the vehicle, the weight of the vehicle is between 24,500 and 37,000 pounds. The variants utilized by the 386th ESFS weigh approximately 28,000 pounds. (Tab EE-24). Colloquially, operators pronounce the word M-ATV: "Mat-Vee" when referring to the vehicle. (Tab U-29).



#### **i. Central Tire Inflation System (CTIS)**

The CTIS system in the M-ATV controls the level of tire inflation. It can be manually set in several different modes depending on the terrain on which the vehicle is operating. (Tab CC-61). The controls for the CTIS are on the left side of the steering wheel on the dashboard of the vehicle. The CTIS is designed to adjust the pressure of all tires on the truck for different terrain conditions. (Tab CC-61). The CTIS controller has four terrain settings, three load settings, and a run flat setting, which the operator selects and activates in the capsule. The Highway (HWY) setting inflates the tires to the maximum extent, which indicates that the terrain the vehicle is operating on is a paved surface. Cross-Country (CC) setting deflates the tires marginally from HWY mode, and indicates that the terrain the vehicle is operating on is a non-paved, but hard-packed surface. The Mud Sand & Snow (MSS) setting deflates the tires even more, and is for use on unimproved terrain, and for conditions where the vehicle may easily slip due to the road surface. Emergency (EMER) setting deflates the tires as much as possible and is used to free a stuck vehicle, or to travel over extremely uneven terrain, slowly, for a short period of time. (Tabs CC-61, CC-66, CC-79). The main components of the CTIS consist of control valves for air supply and distribution, a dash mounted electrical controller that adjusts tire pressure, associated air tubing, and electrical cables. The driveline lock controls are integrated with the CTIS to simplify operation of the M-ATV. (Tabs CC-72, CC-77). The CTIS will engage a specific driveline lock configuration based on the terrain and load settings chosen by the operator. (Tabs CC-77).





#### j. Automatic Traction Control System (ATC)

The brake system for the M-ATV incorporates an Automatic Traction Control (ATC) system. (Tab CC-77). The ATC system helps improve traction on slippery or unstable driving surfaces by reducing drive wheel slippage. (Tab CC-77). The ATC system constantly monitors the wheel for a wheel slip condition. If a wheel slip condition occurs, the ATC system activates and throttles back the engine to help reduce wheel slip. (Tab CC-77). If the vehicle is traveling at a speed of less than 25 mph (40 km/h), the ATC will also pulse the service brake system, through the Traction Control Valve, to aid in reducing wheel slip. Once the ATC system detects that the wheel slip condition is no longer present, it will return the engine and service brake system to normal operating condition. (Tab CC-77).

The ATC system is automatically disabled when operating the vehicle in CC, MSS, or EMER CTIS settings. (Tab CC-75). In CTIS modes other than HWY mode, the ATC light will be illuminated steady yellow on the dashboard to indicate to the operator that the ATC system is disabled. (Tab CC-75).

#### k. Viperland/Viper Posting and Patrol

Viperland is the colloquial name for the area outside the base perimeter fence at ASAB that is still within the defensible and patrolling zone of the base defense security forces. (Tabs R-90, R-114, V-2.3, V-3.3 to V-3.4). Viperland is made up of two patrol zones, one referred to as the "2k" and one referred to as the "5k" colloquially among Security Forces members. (Tabs O-5, R-119, R-144 to R-145, V-4.9).



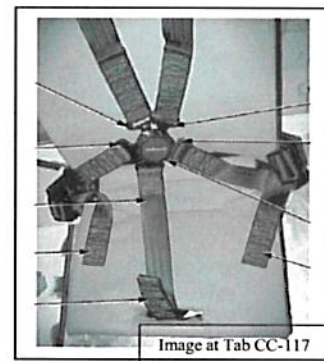
Viper Patrols or Postings refer to the Security Forces members and their vehicles who patrol within Viperland during their shifts, with call signs that include “Viper” dash number, for example: “Viper-2.” (Tabs O-5, FF-10). These patrols utilize either Toyota Hilux pickup trucks, or M-ATVs. (Tabs R-124, R-128, R-144 to R-145). M-ATVs are only permitted up to the 2k, and not beyond that point. (Tab O-5).

#### **I. Truck Commander (TC)**

A title given to the Airman in a patrol vehicle who is the primary individual in charge of the vehicle and persons inside. (Tab CC-108). This concept is taught in 3-level technical school. This person is not the driver, but usually the front passenger. The truck commander is responsible for the following six areas: 1) Normally armed with an M-4; 2) Equips, organizes, and supervises; 3) Organizes fire team within the vehicle; 4) Maintain communications with convoy commander and other vehicle commanders; 5) Provides direction to driver; 6) Serves as alternate navigator. (Tab CC-108).

#### **m. Five-Point Seat Belt**

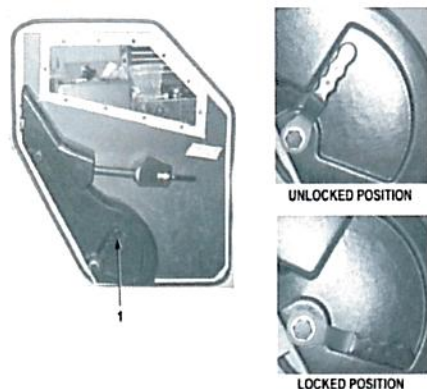
This type of safety belt is present in all M-ATVs for occupant use. All 5 belts buckle into the central receiver. To unhook the belts, the wearer would turn the receiver clockwise or counter-clockwise while wearing it, and all buckles inserted into the receiver will release in a quick-release fashion, except for the belt between the legs, which falls away. The circular receiver remains attached to the belt between the legs. This type of safety belt is designed to distribute the force of an impact equally over the body, and also to keep the user restrained in the seat in the event of a rollover. (Tabs U-30, CC-117).



#### **n. Combat Locks**

All M-ATV doors are equipped with Combat Locks. They are engaged and disengaged by using a lever handle on the bottom of each door on the inside of the vehicle. When engaged, the locks prevent the doors from opening using the door handle. This type of lock protects the occupants from external threats, and from the inadvertent opening of a door during a mishap. If a rescue situation arises where the occupants are combat locked into the vehicle, friendly rescue units routinely carry special keys to disengage the lock to be able to access the members inside. Combat locks are to be engaged before the vehicle goes into motion to ensure the safety of all occupants. (Tabs U-30, CC-118).

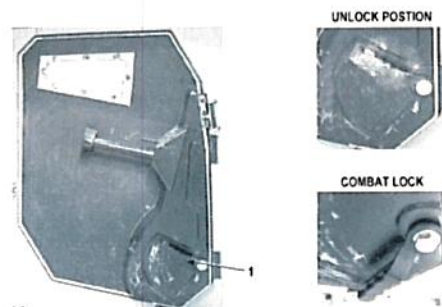
ENGAGE/DISENGAGE COMBAT LOCK (FRONT DRIVER SIDE AND FRONT PASSENGER SIDE)



1. To engage, push handle (1) down to combat lock position.
2. To disengage, pull handle (1) up to unlock position.

Image at Tab CC-118

ENGAGE/DISENGAGE COMBAT LOCK (REAR DRIVER SIDE AND REAR PASSENGER SIDE)



**NOTE**

Both combat locks are engaged and disengaged the same way. Driver side shown.

1. To engage, push handle (1) down to combat lock position.
2. To disengage, pull handle (1) up to unlock position.

Image at Tab CC-119

## 4. SEQUENCE OF EVENTS

### a. Summary of Accident

Sometime between 2315 and midnight (0000) Arabian Standard Time (AST) on 11 September 2020 at ASAB, two members of the MT, the MD and MA, conducted turnover with the prior shift's Viper-4 team. (Tabs R-28, R-63, V-5.12, FF-10). The patrol units within the 386th ESFS work in two 12-hour shifts, day shift, from noon to midnight, and night shift, from midnight to noon. (Tabs R-142, V-4.3, V-11.6, V-12.5). Day shift's Viper-4 team used the mishap M-ATV S/N 10L00282 immediately before the MT, who were on night shift, took possession of it. (Tab V-5.12). Turnover included a discussion of the status of the vehicle, with the day shift reporting they used the mishap M-ATV without incident. (Tab V-5.12). An AF Form 1800 card was reviewed and signed by the gaining shift. (Tabs V-2.3 to 2.4). The AF Form 1800 is an Air Force form used to document the condition of a vehicle by the operator. (Tab DD-45). It is the Operator's Inspection Guide and Trouble Report, and is to be used for all registered vehicle equipment except refueling vehicles and equipment. (Tab DD-45). Upon turning over a vehicle to another operator, the accepting operator will inspect the vehicle and note any issues on the AF Form 1800. (Tab DD-45). The MT's shift, night shift, officially started at 0000 (midnight) and lasted for 12 hours, which is the standard shift length for Security Forces deployed to the AFCENT AOR. (Tabs R-79, R-142, V-4.3, V-11.6). The MTC, the third member of the MT, was working an additional duty in the squadron armory that shift, and met up with the MT at approximately 0100 on 12 September 2020, after the MT had completed turnover. (Tab R-63).

All three members of the MT were locally trained and certified to drive the M-ATV. (Tabs T-5, T-6). The MA attended local training on 16 August 2020, and the MD and MTC attended on 11 September 2020. (Tabs T-5, T-6). The MD, the senior ranking member of the MT as a Staff Sergeant, elected to drive that night, with the MTC, a Senior Airman, in the front passenger seat, and the MA, also a Senior Airman, sitting in the back behind the MD. (Tabs V-2.6 to V-2.8, V-

*M-ATV Mishap, S/N 10L00282, 12 Sep 2020*

3.9). The M-ATV has a four-seat configuration, two in front and two in back. (Tab U-30). The maximum authorized capacity of their M-ATVs was four occupants, due to the number of seat belts present in the vehicle. (Tabs BB-28, GG-4). The MT started their patrol about 60 minutes after the start of their shift due to the armory tasking of the MTC. (Tab R-63).

The first three-quarters of the MT's shift as Viper-4 went as expected, with the team patrolling Viperland around the 2k area as assigned. (Tabs V-2.7, V-3.4). They stopped for meals as necessary and performed their routine patrol tasks, which included Random Anti-Terrorism Measures (RAMs), and patrol checks of different outposts at various grid points on the perimeter of the installation. (Tabs V-2.10 to V-2.11, V-3.4, GG-2). Due to the MTC's requirement to perform armory duties at the end of shift as well, the MT was required to return to their squadron building earlier than usual. (Tab V-3.6). The shift ended at 1200, but the MTC was required to be back at the armory at approximately 0930. (Tabs V-2.15, V-3.6, V-4.16).

At approximately 0830, the MT met up with Viper Lead and his team in Viper-1. (Tabs V-4.10, V-7.3). This meeting was just a check-in and lasted approximately 15-20 minutes, at the end of which their supervisor instructed the MT to finish patrolling in their sector, as they were slightly out of their patrol zone and still had remaining patrol tasks to complete. (Tabs V-2.11, V-6.3, V-7.3). The MT did as instructed, and departed in the direction of their final patrol duties for the shift at approximately 0845. (Tab V-2.11).

Approximately 15 minutes later, at about 0900, the MT was driving southeast on the mishap road, a straight, sandy and rocky road with a very gentle slope. (Tabs V-4.12 to V-4.13, V-6.4, V-8.4, GG-7). Shortly thereafter, approximately 1-2 minutes after the MT turned onto the mishap road, the MD stated she felt a pulling effect from the M-ATV steering her to the right side, as if the truck was getting stuck in the sand. (Tabs V-2.12, V-2.18 to V-2.19, V-2.25). She continued to press down on the gas pedal, which she recalled from her training was a key to avoid getting stuck in sand, while she tried to steer to the left to compensate for the M-ATV pulling to the right. (Tabs V-2.6, V-2.20). At some point the M-ATV responded and veered towards the direction she was steering, which was to the left. (Tabs V-2.12, V-2.20). The MD then lost control of the M-ATV. (Tabs V-2.20, V-9.4, GG-3).





Witness testimony indicated that the MD told others she thought the M-ATV's brakes were not working properly as she lost control of the vehicle. (Tabs V-4.16, V-7.6 to V-7.7). The MD and MTC also reported audible alarm tones sounding inside the truck and at least one light flashing on the dashboard during the mishap sequence. (Tabs R-64, V-2.12). A steady light would be expected from the normal functioning of the ATC system, a flashing light is consistent with the overspeed indicator, and the audible tones are consistent with indicators from the overspeed and rollover warning systems. (Tabs R-20 to R-21, CC-63, CC-68, CC-75, FF-7). The brakes were functioning at the time of the mishap. (Tab GG-7). Approximately 100-200 yards from the mishap M-ATV's final resting place, the M-ATV began to swerve, which left several serpentine tire marks noted on the roadway leading up to the vehicle impact point, which is where the vehicle began its rollover sequence. (Tabs GG-3, GG-6). These serpentine tire marks were noted in photographs taken on the day of the crash, and by witnesses and first responders to the scene. (Tabs V-4.14 to V-4.15, V-8.4, V-14.5, Z-3, Z-4, GG-6).





The M-ATV rolled approximately 1.25 rotations, and came to a stop resting on its driver's side, facing northwest, the opposite direction from the way they had been traveling. (Tabs V-3.9, V-4.14, GG-3). During the mishap sequence, the MA was ejected from the M-ATV through the rear driver's side door, which opened during the rollover. (Tabs X-2, GG-7). The MA landed on hard-packed sand three to five feet from the overturned M-ATV, and suffered immediate fatal injuries, due to the unplanned ejection from the vehicle. (Tabs X-2, GG-7). The MTC was able to exit the vehicle through the turret, and then helped the MD exit through the turret as well. (Tabs R-64 – R-65, V-2.12, V-2.22). Both sustained injuries to include lacerations, mild TBIs, and bruising. (Tabs X-3, X-4).

The MT members had not been wearing seatbelts or helmets, and the doors to the vehicle were not all combat locked, although the driver's door may have been. (Tabs R-65 to R-66, V-2.23). The MD and MTC were wearing their Individual Body Armor (IBA). (Tabs R-35 to R-36). The MA was not wearing his IBA. (Tabs R-65 to R-66, V-6.6 to V-6.7). The MTC was the first to assess the MA and noted multiple fatal injuries. (Tab R-64). She used her personal cell phone to call for help, because they were unable to find their land mobile radios (LMRs) in the immediate aftermath of the crash. (Tab R-65). At approximately 0903, the MTC reached a fellow Viper Patrol Security Forces member on his cell phone, designated that day as Viper-2, and provided him coordinates

of their location using a commercial GPS application from her cell phone. (Tabs R-65, V-7.5). Viper-2 alerted Viper Lead, and both teams responded to the scene. Viper Lead, driving a pickup truck, was the first to arrive on scene as the truck could safely maintain higher speeds than Viper-2, a M-ATV. (Tabs R-65, V-4.11, V-6.5).

While en route to the mishap scene, members of the responding patrols reported the accident to the Base Defense Operations Center (BDOC) and requested that BDOC dispatch medical support. (Tabs O-16, O-18, R-71 to R-72). Viper Lead, riding in Viper-1, arrived at the mishap scene at 0913, and conducted a primary survey of the MA. (Tabs V-4.18, O-15). He determined that no lifesaving measures could be successfully performed, and made an unofficial pronouncement of death for the MA at 0913. (Tabs V-4.18, O-15). The Viper Lead on duty that morning was a reserve member of Security Forces, and is a Fire Chief and Emergency Medical Technician in his civilian capacity. (Tabs R-71 to R-72, V-4.14). The remaining responding Airmen secured the scene, respectfully covered the deceased MA, and provided medical care to the MD and MTC until the dispatched medics arrived. (Tabs V-6.5 to V-6.6). The MD appeared to be in shock, and the MTC was more coherent and in better condition. (Tabs R-66, R-87, V-6.5 to V-6.6).

Emergency Medical Services (EMS) received a call from BDOC requesting their assistance stating that someone had been hurt out in the "5k." The label of "5k" for a patrol area within Viperland was a term the medic was not familiar with, so she requested the call be routed through the 911 system so they could be dispatched by the fire department and receive more detailed instructions. (Tab R-86). At approximately 0915, Fire dispatched EMS over the radio, and relayed there had been a vehicle rollover, but they did not have a location for the response. (Tabs O-15, R-86). EMS was told to meet up with and follow Security Forces to the scene. The medics were given no information regarding the status of the mishap victims, to include that there was a fatality. (Tabs R-86 to R-87).

The responding Security Forces Airmen provided medical care to the MD and MTC until the dispatched medics arrived. (Tabs V-6.5 to V-6.6). The ambulance initially followed a Security Forces pickup truck out to the scene. (Tabs R-86 to R-87). The ambulance, unsuited for traveling over the unimproved roads on the way to the mishap site, got stuck on a sand dune, and could not make the trip. (Tabs R-86 to R-87). The medics took their necessary gear and equipment out of the ambulance and transferred into their guide vehicle, who took them out to the scene. (Tabs R-86 to R-87). When EMS arrived, they confirmed the MA's condition, and performed further on-scene medical care on the MD and MTC. (Tab R-87). One of the medics determined a MEDEVAC was necessary for the MD, who was medically unstable at the time, and the on-scene Security Forces members made the request through BDOC. (Tabs R-71 to R-72, R-87). The BDOC controller prepared the request for the MEDEVAC, which would airlift the MD to the military medical facility at Camp Arifjan, an Army post in Kuwait with a higher level of care available. (Tabs R-71 to R-72, R-87). After preparing the request at 0941, the controller observed that a viable telephone number to call in the request was not contained in the checklist. (Tabs R-71 to R-72). He was eventually able to find a good phone number, the request was made, and the MEDEVAC team was dispatched to the scene. (Tabs R-71 to R-72). The MEDEVAC arrived at the mishap scene at 1022, and departed with the MD for Camp Arifjan at 1049. (Tab O-15).

An on-scene medic phoned the Chief of Medical Staff at the 386th Expeditionary Medical Group (EMDG) clinic on base at ASAB, who officially pronounced the MA deceased at 1035 after the medic walked through and relayed MA's injuries and condition. (Tabs O-15, R-87). At that time BDOC contacted mortuary affairs in accordance with their checklist for fatalities. (Tabs O-15, O-17).

#### **b. Impact**

The GAIB's Traffic Collision Investigator calculated the minimum speed the M-ATV was traveling when it entered a skid immediately prior to its rollover sequence. (Tab GG-3). Based on evidence collected at the scene, to include measurements, pictures, and witness testimony, the mishap M-ATV created approximately 200 yards of serpentine tracks before it entered a yaw skid and began to roll over. (Tabs V-8.5, GG-3). A yaw mark is made by a tire that is rotating and slipping over the roadway more or less parallel to that wheel's axle. Yaw marks are always curved, and they are created when a vehicle is turning in a radius that is as tight as possible for a given speed, causing the vehicle to lose some lateral stability, with the rear tires tracking outside the corresponding front tires. When this happens, the vehicle's tires begin to slide sideways, while still rotating, leaving characteristic tire 'scuff' marks with diagonal striations. (Tab GG-8). At the end of the serpentine tracks, when the vehicle entered the yaw skid, the vehicle was traveling a minimum of 43.25 mph, and quite possibly faster. (Tabs GG-3, GG-6). This number was calculated using a friction coefficient determined based on the surface type of the road, the believed CTIS setting of the tires, the approximate weight of the vehicle and its occupants, and the radius of the yaw skid created by the mishap M-ATV. (Tabs GG-4 to GG-5). A skid test was conducted in a similarly configured and loaded M-ATV on a similarly sloped sandy road, to enable the speed calculations. (Tab GG-7).

The vehicle rolled approximately 1.25 times before coming to a rest. (Tab GG-6). The front end of the vehicle made impact with the ground, then the turret impacted the ground, then the rollover continued. (Tabs GG-6 to GG-7). At some point during the continued roll, the rear passenger door on the driver's side opened and was sheared off at the hinges, before the vehicle came to rest on its driver's side. (Tab GG-7). The detached rear door was lodged underneath the vehicle when it came to a final rest. (Tab GG-7). The M-ATV came to rest at approximate grid coordinate 38 R QT 41123 49161 facing northwest. (Tab GG-7).

#### **c. Search and Rescue (SAR)**

The MA was ejected from the M-ATV during the rollover sequence and landed on hard-packed sand approximately three to five feet from the vehicle in a supine position. (Tab GG-3). After the M-ATV came to rest, the MTC climbed out the turret of the overturned M-ATV and discovered the MA. (Tab R-64). The MTC was the first to assess the MA after the mishap and noted multiple fatal injuries. (Tab R-64). The MTC performed an initial assessment of the MA, during which the MTC did not feel a pulse or observe signs of respiratory effort. (Tabs R-64, V-2.12). The MTC used her personal cell phone to call other ESFS members on Viper Patrol for help. (Tab R-65). The MTC made contact with an ESFS member of Viper-2 at approximately 0903, and provided the mishap location coordinates using a commercial GPS application on her phone. (Tabs R-65, V-7.5). Viper Lead, first on the scene, arrived at approximately 0913. (Tab O-15).



Viper Lead initially became Incident Commander (IC) and conducted a primary survey of the MA. (Tab V-4.18). The IC determined no lifesaving measures could be successfully performed for the MA, and made an unofficial pronouncement of death for the MA at 0913. (Tabs O-16, V-4.18). BDOC dispatched Fire EMS at 0915. (Tab O-15). Members of Viper-2 and Viper-1 secured the mishap scene, respectfully covered the deceased MA, and provided medical attention to the MD and MTC while awaiting EMS. (Tab V-4.18).

As stated above, EMS had difficulty responding to the scene for multiple reasons, which caused delays in response. (Tabs R-86 to R-87). First, BDOC used colloquial terminology that EMS was not familiar with, causing them to ask that BDOC re-route their request through the 911 system directly to the Fire Department on base. (Tab R-86). Second, they were not given any details at the time they were dispatched regarding the number or severity of injured or deceased personnel. (Tab R-87). Third, the radios in the ambulance were not able to communicate directly with the Security Forces members in the truck that was escorting them. (Tab R-139). And finally, their ambulance was not equipped to drive over the unimproved terrain, and they got stuck on a sand dune. (Tabs R-86 to R-87). They eventually made it to the mishap site in a Security Forces truck. (Tab R-87).

After EMS arrived on scene, they determined a higher level of immediate care was necessary for the MD, who was unstable at the time. (Tabs R-86 to R-87). They requested MEDEVAC. (Tabs R-86 to R-87). As stated above, the BDOC controller preparing the MEDEVAC request could not initially find a viable phone number to submit the request. (Tab R-72). Approximately five minutes later, the BDOC controller located the appropriate contact, completed the request, and the MEDEVAC team was dispatched to the scene. (Tab R-72). MEDEVAC arrived to the mishap scene at 1022 and departed with the MD for Camp Arifjan at 1049. (Tab O-15). MEDEVAC arrived at Camp Arifjan with the MD at 1111. (Tab O-15).

EMS transported the MTC to the local ASAB clinic, departing the mishap scene at 1049 and arriving at the 386th EMDG clinic at 1108. (Tab O-15). At some point after her initial medical evaluation, the 386th EMDG medical personnel determined the MTC required additional care at Camp Arifjan as well, and she was transported there via ground ambulance. (Tabs R-87, X-4).

The MA was officially pronounced dead at the scene by the Chief of Medical Staff at ASAB at 1035, Saturday, 12 September 2020. (Tab O-15).

At 1045, BDOC notified Air Force Office of Special Investigations (AFOSI) of the mishap. (Tab O-15). At 1142, AFOSI and the 386th AEW/SEG arrived to assume control of the scene. (Tab O-15). Mortuary Affairs arrived on scene at 1345. (Tab O-16).

#### **d. Recovery of Remains**

At 1435 on 12 September 2020, the MA's remains were respectfully recovered by Mortuary Affairs and subsequently transported to the Armed Forces Medical Examiner Office at Dover AFB, Delaware, arriving via dignified transfer on 14 September 2020. (Tabs O-16, EE-22).



## **5. MAINTENANCE**

All maintenance documentation is captured utilizing local forms and the Integrated Maintenance Data System (IMDS). (Tab U-2). IMDS is the Air Force standard electronic database used to collect and store all maintenance history on Air Force weapon systems. (Tab U-30). All overseas platform and communication system maintenance pertaining to AF MRAPs is contracted, including in the AOR. (Tab EE-23).

The contractor support includes performing initial acceptance inspections, and Fully Mission Capable (FMC) and Safety repair support for MRAPs. (Tab EE-24). MRAP contractors also provide support for the field units, Sustainment, Battle Damage Assessment and Repair (BDAR) and also track inspections and results for the AF. (Tab EE-24). All maintenance is performed by ManTech International and Science Applications International Corporation (SAIC). (Tab EE-23). Both contracted companies have positions assigned all through the Middle East and are embedded within the Air Force Vehicle Management Flights, which are part of Logistics Readiness Squadrons. (Tab EE-23). Contractors are assigned to locations that are assigned AFCENT-operated MRAPs to perform all maintenance, minimize vehicle down time, and provide personnel protection and maximize the war fighter capability. (Tab EE-23).

### **a. Maintenance Documents**

There were only three maintenance actions noted in the review of the maintenance documentation related to 10L00282. (Tab U-24). Both rear tires were replaced on 2 August 2020 because they were unserviceable. (Tab U-24). Given the terrain in Kuwait it is considered routine maintenance to replace tires on vehicles for safety and driving conditions. (Tab U-29). Additionally, a CTIS dump valve was replaced on 9 August 2020. (Tabs D-57, U-27 to U-28, U-29). The dump valve was leaking air when the CTIS was cycling, which was preventing the vehicle from being Fully Mission Capable. (Tab U-29). The valve was replaced, and the MRAP was returned to service with no further maintenance action required, and no overdue maintenance inspections found. (Tabs U-17, U-29). This valve replacement is also considered routine maintenance. (Tab U-29). Historical records do not show any reoccurring maintenance issues. (Tabs U-2, U-17).

### **b. Maintenance Forms**

There is no evidence that any local maintenance procedures contributed to the mishap, nor were there any outstanding maintenance advisory messages for this type of vehicle. (Tab U-30). The mishap M-ATV had previously gone through an overhaul depot located at the Marine Corps Logistics Base (MCLB) in Barstow, California. (Tab U-30). This brought the vehicle to condition Code "A," which means all parts exhibit no evidence of damage, mutilation, or poor workmanship of construction, and all necessary repairs and modifications at the request of the Air Force are completed. (Tabs U-5, U-30). The mishap M-ATV was returned to service in March 2019, and was forward deployed to ASAB in February 2020 where it was inspected and accepted by the contracted maintenance personnel upon its arrival in Kuwait. (Tab EE-24).

**c. Scheduled Inspections**

All scheduled inspections were up to date, to include Periodic Maintenance and Annual Inspection (PM&I), Automatic Transmission Filter inspection, and Wheel End Inspection and Lube. (Tabs U-17 to U-19).

**d. Maintenance Procedures**

There is no evidence that any local maintenance procedures performed by the contractors contributed to the mishap. (Tabs U-2, U-29 to U-31).

**e. Unscheduled Maintenance**

There were no overdue or outstanding unscheduled maintenance work orders open at the time of the mishap. (Tabs U-17, U-30). As previously stated, the M-ATV had recently gone through an extensive overhaul reset at MCLB Barstow, California. (Tabs U-3, U-30). The overhaul is a comprehensive inspection of all systems and parts, driving inspections associated with the vehicle, and modernizations to affected systems that were developed or upgraded after the vehicle went into service. (Tabs U-5, U-30). This was the mishap M-ATV's first time going through the reset facility since it was fielded in the USAF shortly after 2010. (Tabs U-3, U-30). The road test and final inspection were performed and passed on 13 March 2017. (Tabs U-3, U-30).

**f. Maintenance Personnel and Supervision**

There is no evidence that any local maintenance procedures performed by ManTech International contributed to the mishap. (Tab U-31). The two local contractors in Kuwait are fully qualified and each have 20+ years' worth of experience with Tactical and Non-Tactical vehicles, including MRAPs, and neither have any negative items in their work histories. (Tabs U-22 to U-23).

## 6. EQUIPMENT, VEHICLES, FACILITIES, AND SYSTEMS

### a. Structures and Systems

#### (1) CTIS

As previously defined in the Background section 3(i) above, the CTIS adjusts the inflation level of the tires to compensate for the terrain to improve traction, and prevent the vehicle from skidding or getting stuck. (Tabs U-29, CC-61, CC-79). The mishap vehicle was most likely in CC mode at the time of the mishap. (Tabs V-2.25, V-3.17, GG-4). According to witness interviews, the locally-trained drivers were instructed not to adjust the CTIS settings, and many drivers were unfamiliar with the system. (Tabs R-3, R-77 to R-78, V-7.9 to V-7.10). According to the user manual for the vehicle, CC would have been the correct CTIS setting based upon the road they were traveling on at the time of the mishap as it was unpaved, yet a solid surface. (Tabs V-4.13, V-9.3, V-9.5, CC-61, CC-79).



As described in the MD's and MTC's interviews, there were audible tones and flashing lights coming from the dashboard. (Tabs R-64, V-2.26). One light that would have been steadily illuminated in CC mode is the ATC light. (Tab CC-75). The ATC system is disabled in all CTIS settings, except for HWY. (Tab CC-75). In CC mode the light would have been illuminated yellow on the dash. (Tab CC-75). The flashing lights were likely attributable to the overspeed and rollover warning systems. (Tab U-31).

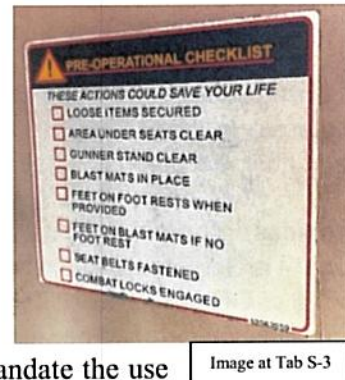
To confirm the CTIS was working properly at the time of the mishap, this GAIB applied power to the mishap M-ATV to confirm the system would properly pressurize. (Tab GG-4). Power had not been applied to the mishap M-ATV since it was turned off at the mishap scene on 12 September 2020. (Tab GG-4). Unfortunately, due to the extent of the damage from the mishap, the vehicle automatically shut down before it could fully pressurize. (Tab GG-4). The vehicle did continue to pressurize until it shut down. (Tab GG-4). Based on all available evidence, the CTIS was working properly at the time of the mishap, and it was properly set in CC mode. (Tab GG-4).

Additionally, an audible overspeed warning would have begun repetitively chiming while the vehicle was operating in CC mode, as this warning is triggered at 40 mph, plus or minus 5 mph, depending on vehicle's current load. (Tabs U-31, CC-66 to CC-67, GG-6). Since this GAIB's calculations determined the vehicle was traveling at a minimum speed of 43.25 mph when it entered its skid, and likely faster, it is likely the overspeed warning and the rollover warning were the sounds responsible for the beeping reported by the MD and the MTC. (Tabs R-26, U-31, GG-3).



## (2) 5 Point Safety Belt

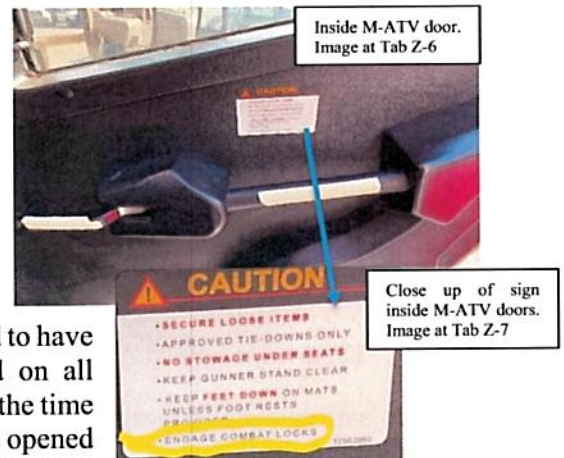
The M-ATV is equipped with a 5-point safety belt as described and depicted in the Background section 3(m) of this report. (Tab CC-117). The mishap M-ATV had four 5-point safety belts – one for each seat. (Tab GG-4). All safety belts in the mishap M-ATV appeared to be fully functional, even after the mishap. (Tab GG-4). There were no reports of problems with or damage to any of the safety belts prior to the mishap. (Tab U-30). There are signs posted throughout the M-ATV reminding occupants to fasten their seat belts. (Tab S-3). Phase One training, which all 386th ESFS members attend upon arrival at ASAB, in addition to a Security Forces training about local driving regulations, both specifically mandate the use of seat belts while operating or riding in a government, tactical, or special use vehicle while it is in motion. (Tabs DD-9, DD-29).



None of the MT members were wearing their 5-point safety belts at the time of the mishap. (Tab R-66). AFI 91-207, *The US Air Force Traffic Safety Program*, paragraph 3.5.1 mandates the use of installed seat belts while operating or riding in a motor vehicle. (Tab BB-28). The MT deviated from this requirement.

## (3) Combat Locks

All doors on a M-ATV, and most other types of tactical vehicles, are equipped with combat locks, as described in the Background section 3(n) of this report. (Tab CC-118). The mishap M-ATV had combat locks, and placards placed within the vehicle by the door handles instructing the occupants to engage the combat locks. (Tabs S-3, U-30, Z-6 to Z-7). There were no reports of problems with or damage to any of the combat locks prior to the mishap. (Tab U-30). The GAIB viewed the mishap M-ATV and tested the combat locks. (Tab GG-4). The only damage noted appeared to have been caused by the rollover itself. (Tab GG-4). Based on all available evidence, the combat locks were fully functional at the time of the mishap. (Tab GG-4). It is unlikely a door would have opened during the rollover sequence had that door been combat locked. (Tabs R-79, U-30). A warning to engage the combat locks before driving is found both on the Pre-Operational Checklist as well as the Caution sign, both posted in multiple places within the vehicle. (Tabs S-3, Z-6 to Z-7).



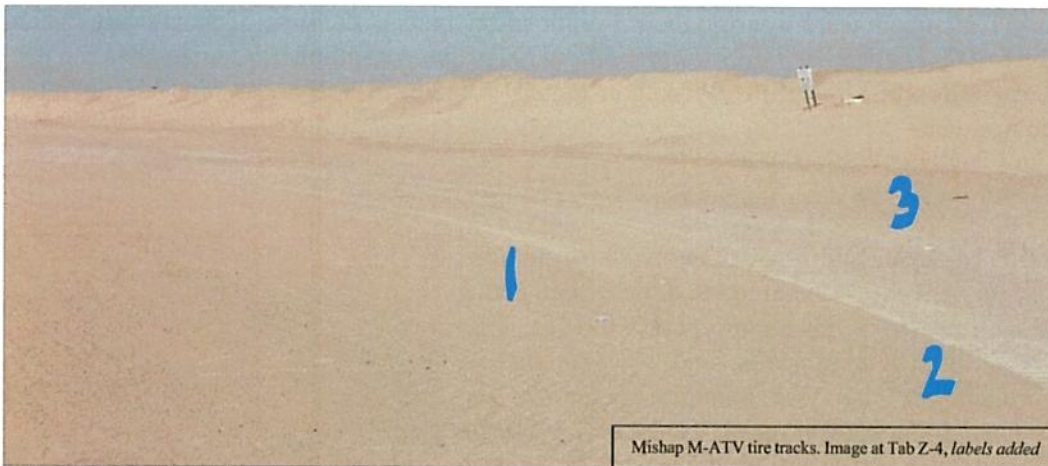
The only door that was possibly combat locked was the driver's door. (Tab V-2.23). Due to the fact the rear passenger door opened during the rollover, it was likely not combat locked at the time of the mishap. (Tabs U-30, V-6.7).



## **b. Evaluation and Analysis**

### **(1) Vehicle Track Analysis**

Unfortunately, full scene preservation was difficult due to the sandy surface of the road, and the requirement for MEDEVAC to respond to the mishap scene. (Tab V-8.4). The first responders were able to record the serpentine tire marks closest to the final resting place of the M-ATV before MEDEVAC arrived, and some were also visible 2 days later when the accident investigator who provided information to the Interim Safety Board (ISB) arrived to take measurements. (Tab V-9.5). The serpentine tracks were followed immediately by yaw skid marks in the roadway. (Tabs GG-6 to GG-7, GG-8). The vehicle had 100% braking efficiency throughout the skid, which was able to be determined because each of the four tires left individual skid marks. (Tabs GG-7, GG-8). While the tires left three visible track marks in the sand during the skid, the front driver's side tire and rear passenger tire followed the same track and left an overlapping skid. (Tabs GG-6 to GG-7, GG-8).



1. Front Passenger Side Tire Track
2. Front Driver Side Tire Track and Rear Passenger Side Tire Track
3. Rear Driver Side Tire Track

### **(2) Maintenance Analysis**

There is no evidence indicating any maintenance or equipment malfunction or failure of the mishap M-ATV. (Tabs U-29 to U-31).

## **7. ENVIRONMENTAL CONDITIONS**

### **a. Forecast Weather**

The forecast on the day of the mishap, 12 September 2020, was dry, sunny, and hot. (Tabs F-2, W-2 to W-3). There was a forecasted high of 115 degrees Fahrenheit at approximately 1500 local time (L). (Tab W-2). The accident occurred at approximately 0900L, at which time the forecasted temperature was 105 degrees Fahrenheit, the wind speeds were about 2-3 miles per hour, and there was zero forecasted precipitation. (Tab W-2). The forecasted conditions were consistent with the desert environment.

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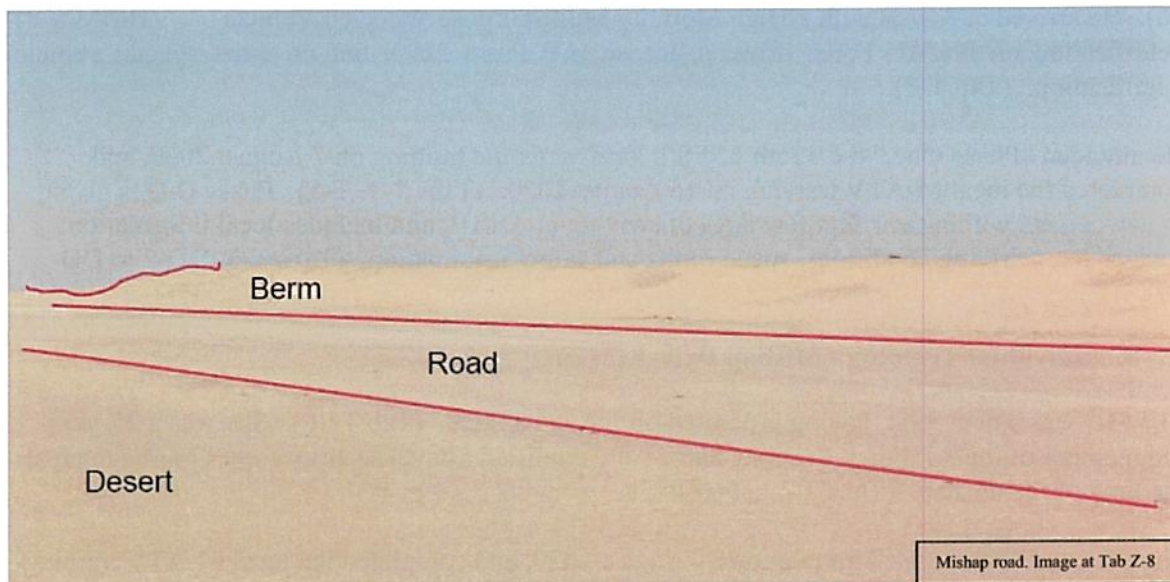
### **b. Observed Weather**

Witnesses indicated that it was hot the day of the accident, and the observed weather was consistent with the forecasted weather described above. (Tab V-8.2). No one indicated that wind speeds or precipitation was a factor, which is consistent with the forecast for the mishap date. (Tab W-2).

### **c. Other Environmental Conditions**

Visibility at the time of the accident was good. At 0900L, the sun was shining and it was daytime. (Tab W-3). The road on which the mishap occurred is unpaved, long, rocky, and flat with a slight decline to the southeast, and there are no aggressive hills or curves on the road. (Tabs V-4.13, V-6.4, V-8.4, V-9.3, V-13.10). The mishap road is a mostly even rock base with sand covering the surface. Due to the environment, the sand shifts and occasionally causes pockets of deeper soft sand, and in some places exposes the rock beneath the sand. (Tabs V-9.5 to V-9.7). Witnesses described a “washboard” effect, or rippling in the rocky surface of the road. (Tabs V-9.3 to V-9.4, V-9.5 to V-9.6).

Some witnesses described a rock sticking out of the ground when they viewed the accident scene, and others specifically stated there was nothing in the roadway sticking out of the ground. (Tabs R-66, V-3.14, V-4.15, V-8.4, V-9.3, V-9.5, V-13.10). Three days after the mishap, the MTC was interviewed and specifically stated that she observed nothing abnormal in the roadway. (Tab R-66). This GAIB did not observe anything in the road consistent with the rock described by some witnesses, except for the gouge caused by the M-ATV itself during the rollover. (Tab GG-7). The mishap road is surrounded by mostly flat desert on one side, and a sand berm separating the road from more desert on the other side. (Tabs V-7.4 to V-7.5, V-13.10, Z-8).





#### **d. Restrictions, Warnings, and Procedures**

Viperland, where the MT was patrolling at the time of the accident, has a speed limit of 19 mph. (Tab CC-83). This speed limit is contained in a briefing called "Viper Land" created by 386th ESFS personnel, and is supposed to be briefed to all patrol members of the squadron. (Tabs R-96, CC-80 to CC-94). Off the installation, improved roads have a speed limit of 62 mph, and other roads and desert areas have a speed limit of 19 mph. (Tab CC-83). There are no signs in the desert indicating such limits. (Tabs R-117 to R-118, V-9.7). The commander of the 386th ESFS testified that the speed limit in the sand is 20 mph, but he was unsure if and how this was communicated to his squadron, but he believes it was in the M-ATV training slides. (Tab R-96). There is also an on-base driving training slide deck from the 386th ESFS stating that while operating a M-ATV, speed is not to exceed 25 mph, no matter where it is operated. (Tab DD-38). The M-ATV operator's manual states that the max speed of the vehicle in CC mode is 45 mph, and this is also posted in a different part of the "Viper Land" briefing, contradicting guidance earlier in the briefing. (Tabs CC-67, CC-87, DD-38). Witnesses did not know for sure what speed they were supposed to be driving on the mishap road, as it was an unmarked, off-base road, and most did not seem to remember being briefed on a particular speed limit for the area. (Tabs R-80 to R-81, R-96, R-117 to R-118, R-141 to R-142, R-155, R-168 to R-169, V-7.11, V-12.10).

### **8. PERSONNEL QUALIFICATIONS**

#### **a. Individual Training - Mishap Airman (MA)**

The MA was a new SrA, having promoted on 17 August 2020. (Tab T-24). He was 26-years old, on active duty, and he was a fully qualified 5-level security forces journeyman. (Tabs T-24, T-26). He arrived at ASAB with a High Mobility Multi-purpose Wheeled Vehicle (HMMWV) qualification on his Air Force driver's license, AF Form 2293, but no other special vehicle qualification. (Tab T-3).

He attended "Phase One," the 386th ESFS's local welcome training on 7 August 2020, and completed the local M-ATV training on 16 August 2020. (Tabs T-4, T-5). Phase One is given to newcomers within their first few days of arriving at ASAB, and includes local information such as local driving conditions, speed limits and safety information. (Tabs T-8, DD-2 to DD-39).

#### **b. Individual Training - Mishap Driver (MD)**

The MD was a new SSgt, having promoted on 1 August 2020. (Tab T-10). She was a 25-year-old member of the Air Force Reserve, and a fully qualified 5-level security forces journeyman at the time of the mishap. (Tabs T-12, T-28).

She attended "Phase One" training on 21 August 2020, and completed the local M-ATV training on 11 September 2020, one day prior to the mishap. (Tabs T-6, T-19).



### **c. Individual Training - Mishap Truck Commander (MTC)**

The MTC was a SrA. (Tabs T-36, V-3.1). She was a 27-year-old active duty member, and was a fully qualified 5-level security forces journeyman at the time of the mishap. (Tabs T-20 to T-21, T-22, T-34, T-36).

She attended "Phase One" training on 12 August 2020, and completed the local M-ATV training on 11 September 2020. (Tabs T-6, T-23).

### **d. Local M-ATV Training Course at ASAB**

The standard course for M-ATV operator training is the Tactical Vehicle Course (TVC), which is conducted in person at the Security Forces Training Center (SFTC) at Fort Bliss, Texas. (Tabs R-90, R-107, R-129 to R-130, R-163, DD-41). This course also teaches students to operate the larger MRAP. (Tab R-132). The course is part of the continuum of learning training, and would be an appropriate level for Senior Airmen. (Tab DD-41). The course is approximately 47 hours total, and includes a robust classroom portion, multi-terrain behind the wheel training, day and night time driving training, and a rollover simulator. (Tabs R-5, R-19, R-75). An Airman who completes the in-person course at Fort Bliss would have the qualification entered on his or her military driver's license documentation, the AF Form 2293, U.S. Air Force Motor Vehicle Operator Identification Card. (Tabs R-18, DD-42).

As an alternative to TVC, individual units or bases may conduct local vehicle training to qualify Airmen to operate the M-ATV. (Tab BB-10). In order to conduct local training, the unit Commander must appoint in writing an Airman who is fully qualified to operate the M-ATV, and has taken the Air Force Trainer's Course, to conduct the training, per AFMAN 24-306. (Tab BB-10). The trainer must teach from the standardized Air Force Qualification Training Package (QTP), QTP24-3-C507 "Mine Resistant Ambush Protected (MRAP) Vehicle - Vehicle Management Codes: C507, L290 – L296." (Tabs BB-9, BB-12). The M-ATV in particular carries the vehicle code L292. (Tabs U-29, BB-12). Locally trained M-ATV drivers receive an AF Form 171, Request For Driver Training And Addition To U.S. Government Driver's License, indicating they are qualified within their local installation to operate the M-ATV. (Tabs BB-10, FF-8). A person locally trained on a vehicle can have that vehicle added to their AF Form 2293, if the Vehicle Control Officer (VCO) selects box 22 on AF Form 171, indicating that the operator completed all training required for that vehicle type, including using an approved QTP. (Tabs BB-10, DD-42, FF-8). In the case of the M-ATV, that would mean an approximately 47-hour training course via QTP24-3-C507. (Tab BB-16). The 386th ESFS local ASAB operator training program for the M-ATV deviated from these AFMAN and AFI requirements.

Due to COVID-19 challenges, to include the Department of Defense stop movement order, two TVC course cancellations, multiple Restriction of Movement (ROM) requirements for in-person trainings, and ensuring security forces members were able to deploy on time to prevent a gap in manning, AFCENT/FP waived the requirement for Airmen to arrive in-theater having completed the in-person Tactical Vehicle Course (TVC). (Tabs G-2, EE-2, EE-16). They noted that the training "can be conducted at down-range locations." (Tab EE-2). While this line remark requirement to attend TVC had been waived on an individual basis in the past, the challenges COVID presented resulted in a more widespread waiver. (Tabs G-2, V-15.3). Based on witness

testimony, recommended training materials were not pushed to the deployed units throughout the AOR, and concerns were not raised by the 386th AEW or 386th ESFS concerning the requirement to conduct the local training for M-ATVs. (Tabs V-15.4, V-16.5, EE-6). Although not specified in the AFCENT/FP email instructing downrange units to conduct tactical vehicle training locally, AFMAN 24-306 requires that “[u]pon publication, standardized vehicle lesson and qualification training plans will take precedence over locally produced lesson plans and will be the curriculum used for training and certification on the identified vehicle.” (Tab BB-9). The QTP used by the local trainers was not the published QTP for the M-ATV, which deviates from the AFMAN requirements. (Tabs R-6, V-1.5 to V-1.6, EE-6).

Based on the local threat level at ASAB and availability of sufficient vehicles, the 386th ESFS Commander decided to use M-ATVs for Viper Patrol vehicles on each shift, pursuant to manning constraints. (Tabs R-90, R-104 to R-105). Because of the line remark waivers and resultant low number of Security Forces members who deployed with current TVC training, the decision was made to conduct local M-ATV training at ASAB. (Tabs V-1.4 to V-1.5, V-11.4). The VCO and an opposite shift SNCO conducted the training. (Tabs R-129, V-1.5, V-1.8). They were both qualified on the M-ATV as noted on their AF Form 2293 having gone through TVC; however, they were not formally appointed as trainers by the Squadron Commander, as required by AFMAN 24-306. (Tabs R-16, R-91, V-1.4, BB-10). Both trainers used items they located on the squadron’s online computer shared drive to lead the training. (Tabs R-16 to R-17, R-20, V-1.5). While the training was not coordinated between the two trainers prior to their training events, their trainings were conducted in a similar manner, using a PowerPoint presentation and a short behind the wheel session for each trainee. (Tabs V-2.8, V-5.2). According to witness testimony, the training lasted approximately 20 to 30 minutes for the PowerPoint portion, was viewed on an average sized computer screen, and each trainee received approximately 5-20 minutes of behind the wheel training. (Tabs R-7, R-22 to R-23, R-75, R-78, V-2.8, V-5.2). The day shift conducted four different training classes on four different days, and the night shift conducted only one course on one day. (Tabs T-5 to T-6). A total of 48 members of the 386th ESFS were locally trained to operate the M-ATVs. (Tabs T-5 to T-6).

## **9. MEDICAL FACTORS**

The GAIB medical member reviewed the medical records of the MT to assess overall health and determine whether any duty limiting conditions were present. (Tabs X-2, X-3, X-4). Additionally, the GAIB reviewed available 72-hour and 7-day histories. (Tabs X-3, X-4).

### **a. Qualifications**

At the time of the mishap, all MT members were medically qualified for duty without restrictions. (Tabs X-2, X-3, X-4).

### **b. Health**

Review of medical records of the Air Force military personnel involved in the mishap did not identify any pre-existing physical or mental health attributes relevant to the mishap. (Tabs X-2,

X-3, X-4). Review of the 72-hour and 7-day history statements did not demonstrate illnesses, injuries, unusual habits, behaviors, or stressors for the MD, or MTC. (Tabs X-3, X-4).

Toxicology analysis of the MA, MD, and MTC did not show alcohol, prescription medications, or common drugs of abuse as factors in the mishap. (Tabs X-2, X-3, X-4).

### **c. Injuries and Pathology**

The MA was ejected from the M-ATV during the rollover sequence and landed on the hard-packed rocky and sandy road approximately three to five feet from the vehicle. (Tabs V-7.4 to V-7.5, GG-3, GG-7). The MA's injuries were consistent with impacting the ground after an unplanned ejection from the rolling vehicle. (Tab X-2). The MA was officially pronounced dead at the scene by the Chief of Medical Staff at ASAB at 1035 Saturday, 12 September 2020, due to injuries sustained during the mishap. (Tabs O-16, R-87, T-2). The delayed emergency response timeline was not a factor in the final disposition of the MA. (Tab X-2).

The MD and the MTC sustained multiple, minor injuries related to the mishap, including mild traumatic brain injury, lacerations, contusions, and abrasions. (Tabs X-3, X-4). The MD was airlifted from the mishap site to Camp Arifjan, an Army post with a regional medical treatment facility where a higher level of care was available than at the ASAB clinic. (Tab X-3). The MD was evaluated, treated, and released. (Tab X-3). All laboratory tests and radiographic imaging were negative or unrelated to the mishap. (Tab X-3). MD completed follow-up care for injuries sustained during the mishap and returned to full duty. (Tab X-3).

The MTC was transported via ground ambulance from the mishap site to the local ASAB clinic and ultimately to Camp Arifjan's military medical facility, where the MTC was evaluated, treated, and released. (Tab X-4). All laboratory tests and radiographic imaging were negative or unrelated to the mishap. (Tab X-4). The MTC completed the appropriate follow-up care and returned to full duty. (Tab X-4).

There is no evidence that delays in emergency and medical response were a factor in the final disposition of the injured members of the MT. (Tab X-2).

The autopsy of the MA was performed by a medical examiner from the Armed Forces Medical Examiner Office, Defense Health Agency, Dover AFB, Delaware, in accordance with 10 United States Code 1471. (Tab X-2). The autopsy was performed at the Office of the Armed Forces Medical Examiner, Dover AFB, DE, at 0730, Tuesday, 15 September 2020. (Tab X-2).

The MA was positively identified using ante-mortem and post-mortem fingerprint and dental comparisons. The cause of death was multiple injuries due to vehicular mishap. The manner of death was accident. (Tab X-2)

### **d. Lifestyle**

There is no evidence that lifestyle factors were a factor in the accident. (Tabs X-2, X-3, X-4).



## **10. OPERATIONS AND SUPERVISION**

### **a. Operations**

At ASAB, the OPSTEMPO is reported by Wing leadership as steady. (Tab V-10.3). They maintain a busy flying schedule as well as the largest facility in the AOR for moving passengers. (Tab V-10.3). On the day of the mishap, 12 September 2020, there were four vehicles assigned to perform Viper Patrol functions. (Tab FF-10). Viper-1, acting as the lead Viper unit, was riding in a pickup truck. (Tabs V-6.5, FF-10). Each Viper unit was assigned three Airmen: a driver, a truck commander and an additional defender. (Tabs V-13.3 to V-13.4, FF-10). Each Viper unit was assigned to patrol a particular area within the 2k and 5k areas in Viperland. (Tabs V-13.6 to V-13.7). Individual defenders were assigned to a specific patrol and vehicle by their Flight leads, but who took which position within the vehicle itself was determined by the Airmen themselves; there were no driver or seat assignments made at the Flight level. (Tabs V-13.3 to V-13.4).

As part of patrolling Viperland and defending the base, the Viper Patrols conduct assigned RAMs. (Tabs V-13.4, GG-2). They also complete several Listening Post/Observation Post (LP/OP) assignments per shift. (Tabs V-13.4, GG-2). Throughout the shift, Viper Lead will normally meet up with the individual Viper units to conduct training and check in with the teams. The shift during which the mishap occurred followed this basic pattern. (Tabs V-4.4 to V-4.5).

While Viper patrols have been conducted utilizing M-ATVs in the past, until the weeks just prior to the mishap, Viper patrols were generally conducted using Toyota Hilux pickup trucks. (Tabs R-128, V-4.5 to V-4.6, V-13.7). Due to local threats, unit leadership directed the use of more M-ATVs per shift for Viper patrols. (Tabs R-90, R-128, V-11.2 to V-11.3). 12 September 2020 was the MD's and the MTC's first shift utilizing a M-ATV. (Tabs V-2.5, V-3.18). According to at least one witness who held several local training courses for the M-ATV, he expected more experienced M-ATV operators to take out newly trained operators for their first patrol in a M-ATV, as that is what he experienced in his career. (Tab V-1.6). However, one of the Flight Chiefs who made the patrol schedule indicated that he did not have access to any information related to experience level in the M-ATV when making the schedule. (Tab V-13.4). He only had access to whether someone was trained as a driver or not, not whether they took the full TVC, were locally trained, or had ever patrolled in a M-ATV before. (Tab V-13.4). He ensured each M-ATV had at least one driver who had been trained, but did not take any other variables, such as practical experience, into consideration. (Tab V-13.4).

### **b. Supervision**

The 386th ESFS leadership directed increased M-ATV use, and was aware they did not have sufficient TVC-trained Airmen to be able to man multiple M-ATVs per shift on a 3:1 shift schedule, where each defender works a 12-hour shift three days in a row, and then has one day off. (Tabs V-11.3 to V-11.6, V-12.4). Local training was required to augment the number of trained M-ATV operators available for Viper Patrols, but little involvement or oversight from Squadron leadership was given to ensure the training was accomplished in accordance with AFMAN 24-306. (Tabs R-92, R-96, R-131, R-163). The trainers, while qualified to instruct, were not appointed by the Commander, and neither the proper QTP nor 47-hour training plan was used. (Tabs R-5 to R-8). AFMAN 24-306 was issued 31 July 2020, very close to the deployment date

of the associated Airmen; however, review of the previous version shows no substantial changes to the procedures for local training. (Tabs BB-2, EE-9 to EE-13).

Daily safety briefings were conducted at each shift change, which by witness accounts included vehicle safety. (Tabs R-135, V-12.10). Safety placards were affixed in multiple locations inside the M-ATVs reminding vehicle occupants to wear seatbelts and to use combat locks prior to operating the vehicle. (Tab Z-8).



Image at Tab Z-9



Image at Tab Z-10



Image at Tab Z-11

From witness testimony, the safety culture regarding seatbelt use within the 386th ESFS elicited a wide range of responses. (Tabs R-41, R-80, V-2.27 to V-2.28, V-4.11, V-5.14, V-7.9). Many witnesses from different home station units indicated seat belts were routinely buckled behind them without restraining them, so the seatbelt alarm did not sound in normal patrol vehicles, and the seatbelts did not get stuck on their gear as they frequently exited the vehicle on patrol. (Tabs R-41, R-76, R-112, V-2.27). Others indicated they always wore their seatbelt and did not notice a problem in the Squadron with regard to safety culture and the wearing of safety belts. (Tabs R-150, V-13.8).

Supervision at the SNCO level was aware that Airmen on Viper Patrols used a commercial GPS app on their personal cell phones, which they paid for themselves, to navigate and communicate in Viperland. (Tabs V-2.2, V-4.8). Airmen used location services on their personal cell phones while patrolling outside the base perimeter to pinpoint current location, meeting points and LP/OP locations, which they were then able to share with each other over the internet or using wireless data. (Tabs V-6.3 to V-6.4). Prior to the mishap, Squadron leadership did not appear to know that the government-provided Defense Advanced GPS Receiver (DAGR) devices often did not work, and consequently were not being used by Airmen on patrol, or that the government-provided Land Mobile Radios (LMRs) were not always in range of BDOC or other Viper Patrols. (Tabs R-73, R-170 to R-171, S-3, V-11.7, V-12.9 to V-12.10). Multiple witnesses stated that the provided



DAGRs were difficult to use and members on patrol often chose to navigate using their personal cell phones and commercial GPS applications. (Tabs R-73, V-4.8 to V-4.9).

The MD and MTC were able to call for assistance using their personal cell phones, and were able to let rescue teams know where they were by using the commercial GPS app on their phones. (Tab R-65).

## 11. GOVERNING DIRECTIVES AND PUBLICATIONS

### a. Publically Available Directives and Publications Relevant to the Mishap

- (1) AFI 51-307\_AFGM2020-01, *Aerospace and Ground Accident Investigations*, 26 February 2020
- (2) AFI 91-204\_AFGM2020-01, *Safety Investigation and Hazard Reporting*, 7 July 2020
- (3) AFI 36-2670\_AFGM2020-03, *Total Force Development*, 7 December 2020
- (4) AFI 24-302, *Vehicle Management*, 20 February 2020
- (5) AFMAN 24-306, *Operation of Air Force Government Motor Vehicles*, 30 July 2020

**NOTICE:** All directives and publications listed above are available digitally on the Air Force Departmental Publishing Office website at: <http://www.e-publishing.af.mil>.

### b. Other Directives and Publications Relevant to the Mishap

- (1) Mine Resistant Ambush Protected (MRAP) Vehicle Qualification Training Package, QTP24-3-C507, 14 January 2019
- (2) Security Forces Specialty Career Field Education and Training Plan, CFETP3P0X1AB, 18 October 2018

### c. Known or Suspected Deviations from Directions or Publications

All deviations previously discussed.

8 March 2021

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MAUREEN G. BANAVIGE  
Major General, USAF  
President, Ground Accident Investigation Board



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