DEPARTMENT OF THE ARMY
JOINT INVESTIGATION TEAM
LOUISIANA ARMY NATIONAL GUARD
UNITED STATES SPECIAL OPERATIONS COMMAND

30 March 2015

MEMORANDUM FOR

Commander, United States Special Operations Command, [redacted]

The Adjutant General, Louisiana National Guard, [redacted]

SUBJECT: Joint SOCOM and LAARNG Investigation: UH 60M (Model Tail Number 13-20624) Accident on 10 March 2015 Resulting in Fatalities

1. **PURPOSE:** This board was appointed to investigate the crash on 10 March 2015 of a Louisiana National Guard UH-60M model tail number 13-20624 (MOJO 69). The helicopter crashed on or about 2021:38 hours Central Standard Time (CST) in Santa Rosa Sound near Hurlburt Field, Florida.

2. **INVESTIGATION BOARD:** This joint investigation board was appointed on 13 March 2015 by GEN Joseph L. Votel, Commander US Special Operations Command, and MG Glenn H. Curtis, The Adjutant General of the Louisiana National Guard. The appointed members were [redacted] and [redacted] and [redacted] appointed technical experts to assist the investigation board. Those technical experts were [redacted] (Enclosures 1-4)

3. **CONCLUSION:** This investigation examined all aspects of the UH 60M (Model Tail Number 13-20624) accident on 10 March 2015 resulting in fatalities. The board determined that the direct cause of this accident was spatial disorientation of both pilots which caused them to lose control of the aircraft. The spatial disorientation was likely induced by both pilots failing to effectively transition from Visual Meteorological Conditions (VMC) to Instrument Meteorological Conditions (IMC) after deciding to fly the mission in weather conditions that had lower ceilings and less visibility than they had been briefed as the minimum weather conditions authorized to conduct the mission.

4. **CHRONOLOGY**

All times indicated in the memorandum are Central Standard Time (CST). All night flights were conducted with Night Vision Goggles (NVGs).

12 January 2015 - MARSOC contacted [redacted] (LAARNG) concerning HAVE ACE Support (EXHIBITS 1-7)

10 February 2015 - RAVEN (company level pre-deployment certification exercise) mission (EXHIBIT 8)

12 February 2015 - [redacted] (LAARNG [redacted]) requested authorization for training support to MARSOC from NGB (EXHIBIT 9)

18 February 2015 - [redacted] met with [redacted] in Hammond, Louisiana (EXHIBIT 1)

20 February 2015 - [redacted], authorized LAARNG to provide support to MARSOC until 31 December 2015 (EXHIBIT 10)

5-7 March 2015 - CW4 George Griffin and [redacted] conducted infiltration/exfiltration and coordination with HAVE ACE (EXHIBITS 1, 2, 6, 11, 22, 23)

8 March 2015 (0910) - MOJO 69 and [redacted] departed Hammond, arrived at Destin, Florida (EXHIBIT 12 & 17)

9 March 2015 - MOJO 69 and [redacted] conducted over land and water Special Patrol Insertions and Extraction System (SPIES) both day and night and Rolled Duck and HELOCAST both day and night (EXHIBITS 1, 11, 13,14)

5. **TIMELINE of 10 MARCH 2015:**

1430: MOJO 69 and [redacted] crew departed hotel (EXHIBIT 11)

1549: MOJO 69 and [redacted] departed Destin-Ft. Walton Beach airport (EXHIBIT 15)

1555: MOJO 69 and [redacted] landed A-15 (EXHIBIT 15)

1700: MOJO 69 conducted day Caving Ladder iterations ([redacted] on ground) (EXHIBITS 11, 13, 16)

1945: CW4 Griffin briefed [redacted] on weather at aircraft prior to launch. (EXHIBITS 11, 13, 16)

2016: MOJO 69 and [redacted] departed A-15 for drop zone (DZ) (EXHIBIT 18,19, 25)

2019: [redacted] lost visual of MOJO 69. [redacted] brings aircraft to a hover and aborts mission, begins return to A-15. (EXHIBITS 11, 13, 18, 19)

2020: MOJO 69 in distress approximately two (2) minutes and five (5) seconds. (EXHIBITS 18-20)

2021:38: MOJO 69 impacts the water. (EXHIBITS 18-20)

6. **NARRATIVE OF EVENTS:**

a. On 4 December 2014, MARSOC requested support from 160th SOAR and HSC-84, but neither had the resources to support the operation. (EXHIBITS 4 & 6) [redacted] (MARSOC) contacted [redacted] regarding helicopter support to MARSOC operations. (EXHIBITS 1 & 2) After approval, [redacted] handed off the planning to [redacted] to continue coordinating with [redacted]. (EXHIBITS 1 & 2) [redacted] CW4 Griffin, and [redacted] began developing Standard Operating Procedures (SOPs). (EXHIBITS 1, 11, 21)

b. The first training mission between LAARNG and MARSOC was RAVEN, which was conducted 10-11 February 2015 and included CW4 Griffin and [redacted] as the pilots. The missions included casualty evacuation (CASEVAC) and Quick Reaction Force (QRF) missions. The crews launched and recovered out of Hammond, Louisiana with the missions concentrated between Gulfport, Hattiesburg and Camp Shelby, Mississippi. (EXHIBITS 1, 8, 11) There were no issues with this mission.

c. On Friday 6-7 March 2015, CW4 Griffin, [redacted] and [redacted] conducted infiltration/exfiltration and coordination with HAVE ACE. (EXHIBIT 1, 2, 6, 22, 23)

d. On Saturday, 7 March 2015, [redacted] met with CW4 Griffin and [redacted] He briefed no lower than one thousand (1000) foot ceilings and no less than three (3) statute miles visibility as the minimum weather conditions permitted for NVG iterations of this training mission. These weather minimums were annotated and acknowledged on all mission brief sheets. (EXHIBITS 11, 17, 23, 24)

e. On Sunday, 8 March 2015, at 0910, two UH-60M aircraft with eight (8) aircrew members, MOJO 69 and [redacted], departed Hammond, Louisiana and traveled to Destin, Florida, and arrived at 1037. (EXHIBIT 12) Later that day, MOJO 69 and [redacted] flew to and shut down at A-15 and met with MARSOC personnel. Aircrew members and MARSOC personnel then conducted a rehearsal and SOP review of all events they were to train during the upcoming week. Once complete, both MOJO aircraft recovered to Destin. (EXHIBITS 11, 13, 16, 22, 25)

f. On Monday, 9 March 2015, both aircraft conducted over land and over water SPIES, both day and night. Additionally, they conducted day and night Rolled Duck and HELOCAST operations. There were no issues with this mission. (EXHIBIT 11)

g. On Tuesday, 10 March 2015, at 1700, MOJO 69 conducted day Caving Ladder operations. [redacted] and [redacted] ([redacted]) watched from land. There were no issues with this mission. Both aircrews stayed at A-15 awaiting nightfall in order to conduct the night training iterations. (EXHIBITS 11, 13, 22, 25)

h. On the night of Tuesday, 10 March 2015, at approximately 1900, both aircrews prepared for the night Rolled Duck and HELOCAST missions. By this time the weather had deteriorated from earlier in the day. At approximately 2016 both aircraft took off and began slow movement toward the shore line. The weight of the evidence establishes that the ceilings were lower than one thousand (1000) feet and the visibility was less than three (3) statute miles prior to both aircraft taking off and entering mission profile. (EXHIBITS 11, 13, 16, 19, 20, 22, 25-28)

i. As both aircraft flew from A-15 to the shoreline, the weather continued to decline. As soon as MOJO 69 went over the water they experienced a Degraded Visual Environment (DVE). [redacted] did not cross over the shoreline. [redacted] turned east paralleling the road and then came to a hover. Shortly after going over the water, both CW4 Griffin and CW4 Strother exhibited signs of spatial disorientation. The flight data recorder and the cockpit communications transcripts indicate increasingly erratic flight control inputs and anxious verbal exchanges as both pilots tried, yet failed, to gain control of the aircraft. Approximately two (2) minutes and five (5) seconds after going over water, MOJO 69 crashed into the water, about one (1) statute mile north of A-15. There was an attempt to engage the autopilot, but the aircraft was outside the required flight parameters and the autopilot failed. (EXHIBITS 18-20)

7. SYNOPSIS OF INVESTIGATION: The Joint Investigation Board conducted a comprehensive review and analysis of the circumstances surrounding the accident. The board members conducted a site visit of the crash, recovery operations, and the aircraft debris as it was collected and consolidated inside of a Hurlburt Field hangar. This was followed by a series of recorded interviews that were transcribed into sworn statements. The appointed technical expert conducted a review of maintenance records and submitted a report. (EXHIBIT 29) A board member conducted a review of personnel records and submitted a report. (EXHIBIT 30) An analysis of flight data and subsequent animation was conducted by a technical expert. (EXHIBIT 20) All board members and experts reviewed intra-cockpit recordings and transcripts. (EXHIBIT 19)

8. **APPOINTMENT MEMORANDUM SCOPE RESPONSES:**

a. What was the mission and was the mission planning adequate and address all considerations?

(1) At the time of the accident the mission was to conduct a HELOCAST insertion of two (2) Marine Special Operations Teams (MSOTs) and two (2) Rolled Ducks. The mission planning was adequate and addressed all considerations.

(a) The mission for the week of 8-13 March 2015 was to conduct a progressive week of amphibious training in coordination with HAVE ACE, a special operations training unit located at Hurlburt Field, Florida. (EXHIBIT 31& 35) The plan consisted of conducting rehearsals and coordinating training iterations between the aircrew and MSOTs on 8 March 2015. On 9 March 2015, it was to conduct SPIES, Rolled Duck and HELOCAST over water and over land at day and at night. On 10 March 2015, it was to conduct day Caving Ladder and day/night Rolled Duck and HELOCAST. Follow on training was scheduled to be Rolled Duck and HELOCAST, over the horizon boat navigation, and paradrops with MC-130's. (EXHIBITS 1, 2, 7, 11, 14, 32)

(b) The mission plan is shown through documented e-mails and written SOPs. The mission planning was executed by face to face meetings and using the "crawl, walk, run method." There was thorough coordination between the supported unit, MARSOC, and the supporting unit, 1-244th AHB. (EXHIBITS 1, 2, 11, 21, 32, 33)

(c) There were no assets available from the 160th SOAR or HSC-84, so [redacted] contacted [redacted] and requested aviation support since they were slated to support MARSOC during a mission rehearsal exercise in April/May and the relationship had already been developed. (EXHIBITS 2, 4, 7) [redacted] contacted [redacted] and outlined the training objectives. Additionally, the [redacted] officers, [redacted] and [redacted], began building the training schedule for the week. Several teleconferences and face to face meetings were conducted and LAARNG leadership gave specific guidance regarding the conduct of the training to be executed. Both elements continued to work together to coordinate a plan that both units felt they could execute. By the time both elements linked up at A-15 on the afternoon of 8 March 2015, they had a coherent plan for the entire week. (EXHIBITS 1, 2, 11, 21, 31, 34, 35)

b. At what level was any risk assessments done, and was that appropriate to this mission? Were there any changes during mission planning to the mission or risk assessment?

(1) The risk assessment was done at the correct level and it was appropriate to this mission. There were no changes to the mission or risk assessment during the mission.

(2) The risk assessment for the aircraft mission was assessed as "High" and approved at the O-6 level of the LAARNG. (EXHIBIT 33) The mission Operational Risk Management (ORM) for MARSOC was approved at the O-5 level and categorized as "Moderate." The "seats-out" ORM was done at the O-6 level and was also categorized as "Moderate." (EXHIBIT 36)

(a) [redacted] was the final aircraft mission approval authority due to the Risk Assessment Worksheet (RAW) at "High." (EXHIBITS 1, 23, 33)

(b) The LAARNG RAW for 10 March 2015 showed an overall level risk factor of "HIGH" due to three (3) factors. The first factor was the "tactical infiltration/exfiltration." The second was the "over water operations" in which there was more than thirty (30) minutes from land or there was less than sixty degrees (60°) water temperature. The third factor was ""seats-out"." (EXHIBIT 33)

(c) The mission concept of operations (CONOP) and ORM for MARSOC was appropriately approved by [redacted]. Overall risk was assessed as "Moderate" IAW the Marine Raider Regiment (MRR)

training manual. The "seats-out" waiver was approved by [redacted], the [redacted] IAW USSOCOM 350-6; which requires an O-6 approval. He signed the ORM that was attached to the waiver. (EXHIBIT 36)

c. Identify all personnel involved in this mission execution, including mission approval authorities on the ground.

(1) The mission execution team was:

(a) MOJO 69 (Tail #13-20624)

Chief Warrant Officer 4 (CW4) George Wayne Griffin, SP
Chief Warrant Officer 4 (CW4) George David Strother, PI
Staff Sergeant (E6) Lance Bergeron, SI
Sergeant (E5)(P) Thomas Florich, CE

(b) [redacted] (Tail #13-20569)

[redacted]	

(c) MARSOC Personnel:

MOJO 69:	[redacted]:
Captain (O3) Stanford Henry Shaw III	[redacted]
Master Sergeant (E8) Thomas Saunders	
Staff Sergeant (E6) Liam Flynn	
Staff Sergeant (E6) Marcus Bawol	
Staff Sergeant (E6) Trevor P. Blaylock	
Staff Sergeant (E6) Michael Kemp	
Staff Sergeant (E6) Andrew Seif	

(2) The mission approval team was:

(a) LAARNG Personnel:

[redacted]	

(b) MARSOC:

[redacted]	

[redacted]
Capt Shaw - 8231 TL, Ground force commander (GFC)
MSgt Thomas Saunders - 8231 TL, Staff non-commissioned officer in charge (SNCOIC)

(3) The approval authority on the ground was:

LAARNG - CW4 Wayne Griffin
MARSOC - Capt Shaw

d. Identify all personnel manifested on the aircraft involved in the accident, including aircrew and Marine special operations personnel, and include their duty status at the time.

(1) Flight Crew:

Chief Warrant Officer 4 (CW4) George Wayne Griffin, Jr., LAARNG, Title 32 Additional Flight Training Period (AFTP)
Chief Warrant Officer 4 (CW4) George David Strother, LAARNG, Title 32 AFTP
Staff Sergeant (E6) Lance Bergeron, LAARNG, Title 32 AFTP
Sergeant (E5) Thomas Florich, LAARNG (posthumously promoted to Staff Sergeant (E6)), Title 32 AFTP

(2) Marine Special Operations personnel:

Captain (O3) Stanford Henry Shaw III, USMC, Active Duty, Temporary Assigned Duty (TAD)
Master Sergeant (E8) Thomas Saunders, USMC, Active Duty, TAD
Staff Sergeant (E6) Liam Flynn, USMC, Active Duty, TAD
Staff Sergeant (E6) Marcus Bawol, USMC, Active Duty, TAD
Staff Sergeant (E6) Trevor P. Blaylock, USMC, Active Duty, TAD
Staff Sergeant (E6) Michael Kemp, USMC, Active Duty, TAD
Staff Sergeant (E6) Andrew Seif, USMC, Active Duty, TAD

(EXHIBITS 37-41)

e. What was the status of training and qualification for each member of the aircrew? Include current status with regard to numbers of flight hours, night vision goggle proficiency, instrument qualification and recency of testing or evaluation in proficiency training, and what training was specific to the aircraft on this mission?

(1) LAARNG-

(a) PC - CW4 George Wayne Griffin (twenty one (21) years of service):

Battalion Standardization Pilot	Rotary Wing Instrument Flight Examiner
UH-60 Instructor Pilot	LUH-72 Instructor Pilot Qualified - (no longer flying this aircraft)
C12 - Pilot	Tactical Operations Officer (TACOPS) Qualified
Total Flight Hours (military and civilian) - 6112.2 as of 9 March 2015	Total Combat hours - 1017
Total NVG time - 1082.9 as of 9 March 2015	Current Flight Physical - 4 March 2015
Aircrew Coordination Training - Enhanced (ACT-E) - 3 August 2014	

UH-60M specifics as of 9 March 2015:

UH-60M total time - 357.7	UH-60M SP time - 122.9	UH-60M IE time - 29.7
UH-60M IP time - 94.6	UH-60M NVG time - 81.8	
UH-60M NVG currency-good-last NVG flight logged 11 February 2015		
Weather/Hood flight time - 194.4	Total weather/hood with simulator - 471.1	
Instrument annual proficiency and readiness test (APART) - current-evaluation 19 March 2014		

(EXHIBIT 42)

(b) PI—CW4 George David Strother (twenty three (23) years of service):

UH-60 Instructor Pilot	TACOPS Qualified
Total Flight Hours - 2486.5 as of 9 March 2015	Total Combat hours - 724.9
Total NVG time - 569.6	Current Flight Physical - 7 January 2015
ACT-E - 19 September 2014	

UH-60M specifics as of 9 March 2015

UH-60M total time - 54.8	UH-60M NVG time - 13.0	UH-60M IP time - 10.8
UH-60M NVG currency-good - last NVG flight logged 6 March 2015		
Weather/Hood flight time - 32.6	Total weather/hood with simulator - 142.1	
Instrument APART - current-evaluation 14 September 2014		

(EXHIBIT 43)

(c) CE—SSG Lance Jacob Bergeron (seventeen (17) years of service):

UH-60 Enlisted non-rated Standardization Instructor (SI/FI)	Total NVG time - 51.4
Total Flight Hours - 1369.4 as of 9 March 2015	Total Combat hours - 377.4
ACT-E - 15 March 2014	Current Flight Physical - 3 July 2015

UH-60M specifics as of 9 March 2015:

UH-60M total time - 222.3	UH-60M NVG time - 51.4	
UH-60M NVG currency-good - last NVG flight logged 24 February 2015		

(EXHIBIT 44)

(d) CE-SGT (P) Thomas Charles Florich III (seven (7) years, eight (8) months of service):

Aircraft Helicopter Maintainer	Total NVG time - 34.6
Total Flight Hours - 129.7 as of 9 March 2015	Total Combat hours - 0
ACT-E – 24 March 2013 (initial)	Current Flight Physical - 25 April 2014

UH-60M specifics as of 9 March 2015:

UH-60M total time - 45.2	UH-60M NVG time - 20.5	
UH-60M NVG currency-good - last NVG flight logged 11 February 2015		

(EXHIBIT 45)

(e) The over water mission tasks of HELOCAST, Rolled Duck, Caving Ladder and SPIES are emerging tasks for the LAARNG aircrews. Prior to deploying to conduct this training AASF #1/ 1-244th AHB began developing SOPs and training plans for required tasks IAW TC 3-04.33 (TC 1-237), Aircrew Training Manual, Utility Helicopter, H-60 series.

(f) On 10-11 February 2015, CW4 Griffin, [redacted], [redacted] and SGT Florich conducted the RAVEN mission with MARSOC. Additionally, CW4 Griffin and [redacted] had also spent 6-7 March 2015 with MARSOC in preparation of this training iteration. This was the first training iteration with MARSOC for CW4 Strother (PI MOJO 69), [redacted] ([redacted]), SSG Bergeron (MOJO 69), and [redacted] ([redacted]). (EXHIBIT 1, 3, 4, 5, 6, 11, 13)

(g) Mission training to conduct both over water and over land SPIES, HELOCAST, Rolled Duck, Caving Ladder, and other over water mission tasks were only annotated in six (6) of the eight (8) crew members' individual flight records. AASF #1/1-244th AHB developed and approved SOPs that covered the conduct of over water mission tasks. Team briefings and rehearsals were conducted prior to the missions. While AASF #1/1-244th AHB had conducted over water training and demonstrated task proficiency with missions such as Bambi Bucket, they did not conduct any rehearsals without personnel specific to the tasks to be conducted on the week of 8-13 March 2015.

f. What was the maintenance status of the aircraft?

(1) UH60M tail number 13-20624 only had 60.6 flight hours logged on the airframe at the time of the accident. A detailed inspection of electronic historical maintenance records, to include oil analysis results, and the aircraft electronic logbook,

revealed no mechanical or electrical faults or history of faults. Weight and balance records, and the paper historical records not contained in in the Unit Level Logistics System-Aviation (Enhanced) (ULLS-A(E)), were also inspected. No faults or issues were noted. Personnel interviews were conducted with key maintenance personnel whom were intimately familiar with the maintenance conducted on UH60M 13-20624. They confirmed there were no mechanical or electrical faults on aircraft UH60M 13-20624 when it departed AASF #1, Hammond, Louisiana. (EXHIBIT 29)

g. What flight procedures were in place at the time of the accident, to include airspace restrictions, altitude restrictions, weather forecasts, flight corridors, and other factors that may have contributed to this accident?

(1) HAVE ACE had reserved A-15 and A-13 in restricted airspace 2915B in Eglin area of operations. Last known communications between Eglin Approach control and MOJO 69 indicated that MOJO 69 would be working in the vicinity of those ranges at or below three hundred (300) feet. No communications were required between the MOJO element and approach control or range control for these operations. MOJO 69 was scheduled to use the Sound Water DZ where no communications with Hurlburt Field, Range Control, nor Eglin Approach are required. (EXHIBIT 46)

(2) The altitude restrictions for 2915B was three thousand (3000).

(3) Weather forecasts were available and appeared to be accurate. For further weather descriptions see paragraph 6(i)(2).

(4) There were no flight corridor restrictions placed on the aircrew for this mission. Training area 2915B was reserved for their training mission set. The only requirement for communications with Eglin Approach was for entering and departing the airspace. (EXHIBIT 32)

(5) There were no other factors in the flight procedures that contributed to this accident.

h. Identify whether there were any communications issues between aircraft on the mission, or aircraft and ground control elements.

(1) There is no evidence that there were any communications issues between aircraft on the mission, or aircraft and ground control elements.

(a) There is no record of any transmissions from either aircraft around the time of the accident with Hurlburt Tower. There were recordings of the aircraft transitioning from Destin airport (KDTS) to A-15, the pick-up zone (PZ) around 1545 the day of the accident. When they landed at A-15 around 1550, Eglin told them to make contact with Hurlburt Tower (KHRT) when conducting the mission if they were going to enter the surface Class D. The first contact made with Eglin was [redacted] reporting

MOJO 69 as overdue, which occurred around 2145 on 10 March 2015. (EXHIBIT 11, 13, 16, 35, 46, 49)

(b) Eglin Approach advised this investigation board that once aircraft are cleared into the restricted area, as long as they stay in the same general area and remain below three hundred (300) feet, they do not need to get clearance every time they take off and land while in the restricted area. The audio tapes support the fact that the aircrews did not make contact with Eglin Approach when taking off for the training scenario in which the accident occurred. (EXHIBIT 46)

(c) Hurlburt tower verified that Sound Water DZ is outside KHRT's surface Class D airspace (about seven hundred (700) meters outside) and the flight did not have to talk with them when flying the mission. There were no radar returns or transponder squawks from the aircraft during the mission time. Aircraft around the DZ at low level would probably not show up on radar since the aircraft must be three hundred (300) – five hundred (500) feet above ground level (AGL). The tapes support the fact that the MOJO 69 did not make contact with KHRT Tower during the mission time. (EXHIBIT 46)

(d) There was attempted communication by the boat crew to MOJO 69. However, according to the transcript, their radio communication did not start until after the aircraft was already in distress. (EXHIBIT 19)

i. What were the weather conditions and illumination during this flights and particularly at the time of the accident?

(1) The accident occurred at 2021:38 on 10 March 2015. Sunset was at 1851. Nautical Twilight ended at 1943. The moon did not rise until 2338 so there was zero illumination at the time of the accident. (EXHIBIT 47)

(2) Hurlburt Field is the closest weather facility to the training area and was a facility the MOJO elements could have used to obtain a weather briefing. At 1958 the weather at KHRT showed visibility of one (1) statute mile and a ceiling of three hundred (300) feet. At 2058, the visibility was one (1) statute mile and a ceiling of three hundred (300) feet.

Surface Observations from Hurlburt Tower

Time L / Z	Visibility (Statute Miles)	Cloud Ceiling
1848 / 2348	8	Overcast 600'
1855 / 2355	6	Overcast 300'
1858 / 2358	5	Overcast 300'
1932 / 0032	3	Overcast 300'
1941 / 0041	1	Overcast 300'
1958 / 0058	1	Overcast 300'
2058 / 0158	1	Overcast 300'
2155 / 0255	3	Overcast 300'

(EXHIBIT 47)

(3) [redacted], the [redacted] on the ground, was co-located with MSgt Saunders and CW4 Griffin at the aircraft. [redacted], who was [redacted] at Sound DZ, observed deteriorating conditions over the water and called Hurlburt Field at 1926 to receive a weather report. At that point [redacted] was unable to see the lights on a 300' tower. He relayed this information and his concern to the aircrew via MSgt Saunders, and CW4 Griffin stated that he wasn't concerned about seeing the tower because his flight path kept him clear. Additionally, [redacted] heard CW4 Griffin say that he had the required ceilings to fly the mission. (EXHIBITS 16, 25, 26, 27, 28)

(4) The [redacted] stated that the weather appeared satisfactory before run-up, but by the time of takeoff they could no longer see the observation tower located approximately two point three (2.3) miles away. (EXHIBIT 19, 25 27) According to the transcript of MOJO 69, the weather continued to worsen. Within minutes after takeoff it appeared that sea fog rolled in causing extremely reduced visibility. (EXHIBIT 19 & 20)

j. Were all crew members in compliance with applicable crew rest standards?

(1) According to the testimony of the crew from [redacted] and a review of the hotel room access card reader records it appears that all crew members were in compliance with applicable crew rest standards. It appears by the testimony that the crewmembers bedded down at approximately 2230 on 09 March 2015 and started their duty day at approximately 1430 on 10 March 2015. They were only approximately six (6) hours into their duty day when the accident occurred. In the prior forty-eight (48) hours to the day of the accident, the MOJO 69 crew had logged three point eight (3.8) hours of flight. (EXHIBIT 11, 29, 48)

k. Were there any flight policies, procedures or directions that contributed to the accident?

(1) There is no evidence to support a finding that any flight policies, procedures or directions contributed to the accident.

l. Were there communications with the flight crew and MARSOC elements? If so, identify individuals involved and the transcripts or substance of such communications.

(1) There is no evidence to support a finding that the MARSOC personnel, including passengers, MARSOC elements at Hurlburt or Camp Lejeune, pressured the flight crew to fly the mission that night. The aircraft were scheduled to remain supporting MARSOC for two (2) more nights and the mission could have been completed at a later time if necessary. (EXHIBITS 11, 13, 14)

m. Whether the actions of the MARSOC personnel during the flight contributed to the accident.

(1) There is no evidence that any actions by MARSOC personnel during the flight contributed to the accident. On 26-27 February 2015, prior to deploying to Hurlburt Field, the MARSOC teams conducted Helicopter Ropes Suspension Techniques (HRST) tower training, Ditch and Don training, and water parachute training. There were two Castmasters, Master Sergeant Saunders and Staff Sergeant Seif aboard the MOJO 69 aircraft. (EXHIBIT 16, 25-27)

n. Whether the crew and passengers were wearing appropriate protective equipment.

(1) The crew and passengers were wearing appropriate protective equipment for the mission. The crew were wearing LPU40/Ps (life preserver horse collars). The MARSOC personnel were wearing NVGs, eye-pro, helmet, gloves, wet-suit, cammies, underwater demolition team (UDT) vest, swimmer rig, fins, booties, and chem lights. (EXHIBIT 11 & 31)

(2) Operations were being conducted with "seats-out" so personal restraint devices were used by all MARSOC personnel. All "seats-out" approvals were properly attained and had no bearing on the survivability of the crash sequence. (EXHIBIT 36)

o. Whether procedures for emergency egress of the aircraft or survival equipment, either type or availability, contributed to the loss of life in this accident.

(1) Neither emergency egress procedures, nor survival equipment, contributed to the loss of life in this accident.

p. Were all necessary and appropriate steps initiated for rescue/recovery operations?

(1) All necessary and appropriate steps were initiated for rescue/recovery operations.

(a) Due to the weather conditions there was no visual of the crash. MOJO 69 was last seen climbing and assumed performing Inadvertent Instrument Meteorological Conditions (IIMC) recovery procedures as briefed. After [redacted] returned to the helipad at A-15 they began making calls via radio, phones, and aviation emergency frequency relays. When no contact was made after approximately one (1) hour and fifteen (15) minutes, appropriate authorities were notified and SAR began. (EXHIBIT 11 & 13)

(b) MARSOC personnel on [redacted] launched zodiacs beginning at approximately 2215 to begin SAR. (EXHIBIT 16, 31, 35) Eglin was notified and [redacted], [redacted] began activating SAR. Subsequent search, rescue and recovery efforts continued until all attainable aircraft parts and human remains were recovered. (EXHIBIT 49)

9. **FINDINGS:** Identify key factors (human, material, environmental) that caused or contributed to the accident. Explain the cause of the deaths. Identify the system inadequacy(ies) that permitted the accident to occur, the aircraft systems to fail, or the environment to be a factor in the accident. After determining the root causes or system inadequacies, you should examine each cause or inadequacy and determine if the source was in the Doctrine, Organization, Training, Material, Leadership, Personnel, or Facilities (DOTMLPF) capabilities or processes.

(1) **Finding 1** (Present and Contributing: Human Error – Training, Standards, and Individual Failures)**:** The cause of the accident was spatial disorientation of both pilots, which caused them to lose control of the aircraft.

(a) Based on the Flight Data Recorder, which indicates the aircraft position in relation to earth, and the transcripts of the crew communications from starting the aircraft until impact with the water, the main cause of the accident was spatial disorientation. (EXHIBIT 18-20)

(b) By the time the aircraft took off to a hover and entered mission profile, the weather had significantly deteriorated. The crew elected to continue at a slow pace but lost complete visual reference with the surface (water) upon going over the water, which was approximately two (2) minutes and fifty three (53) seconds after takeoff. The Pilot in Command (PC), CW4 Griffin, who was on the flight controls, began to exhibit elements of unrecognized (Type 1) spatial disorientation immediately after crossing the shoreline, as indicated by the fact that the aircraft came to zero (0) knots indicated airspeed (IAS) and flew backwards as MOJO 69 departed from their scheduled flight path without the PC announcing it or any other crewmember recognizing it. (EXHIBIT 18-20)

(c) The aircraft continued on this unplanned route flying backwards for approximately twenty (20) seconds before CW4 Griffin stated he was "coming back to the right....pulling back to the East," when in fact he had turned to the North. The

aircraft was still flying backward as it made the turn to the North, rotating to the right around the yaw axis, and it increased pitch to over twenty (20) degrees nose up. During the cockpit exchanges from that point forward both pilots indicated increasing apprehension and a lack of awareness regarding the flight path of the aircraft that caused progressively more erratic flight control inputs. Approximately fifty-six (56) seconds after the first indications of spatial disorientation the Pilot (PI) announced "we climbed up in it," and noticed the IAS stating "where's our airspeed?" (EXHIBIT 18-20)

(d) At this point in the flight, CW4 Griffin, still on the controls, exhibited severe spatial disorientation, to include rapid climb and descent maneuvers, erratic airspeeds, and spinning the aircraft. About one minute and thirty-six seconds after CW4 Griffin first exhibited signs of spatial disorientation he asked the PI, CW4 Strother, to take the flight controls, but CW4 Strother too was exhibiting signs of spatial disorientation. It appears that CW4 Griffin came back onto the flight controls about eight (8) seconds after he relinquished them, and it is likely that both were flying the aircraft when it impacted the water approximately fifteen (15) seconds later. (EXHIBIT 18-20)

(e) The lack of visual references and the decision to not immediately execute IIMC flight recovery procedures caused the pilots to experience spatial disorientation. As they attempted to gain control of the aircraft they applied varying airspeeds, altitudes, and excessive movement among the pitch, yaw and lateral axis, causing even more erratic flight maneuvers. Without an effective and immediate transition to instrument flight and executing established flight instrument recovery procedures, the aircraft soon became unrecoverable and impacted the water at an airspeed and angle that was not survivable to the crew and passengers.

(f) The source of this cause can be found in training capabilities.

(2) **Finding 2** (Present and Contributing: Human Error – Standards, and Individual Failures): A contributing and causative factor to the accident was the pilots' choice to fly in lower than briefed weather conditions.

(a) Throughout the mission planning and approval process, [redacted] was clear that the minimum weather to conduct the mission was a ceiling of no less than one thousand (1000 feet) and visibility of no less than three (3) statute miles for any NVG missions. The mission brief process was properly conducted and the PCs of each aircraft initialed the briefing sheets, acknowledging the weather minimums of no less than a 1000 foot ceiling and no less than 3 miles visibility for NVG missions. Both aircrews of MOJO 69 and [redacted] disobeyed a direct order of [redacted] by choosing to fly in lower then briefed weather minimums. (EXHIBIT 23 & 24)

(b) As the Air Mission Commander (AMC), CW4 Griffin was responsible for delegating mission planning tasks to aircrew members. However, for the mission on the evening of 10 March 2015, CW4 Griffin kept the weather planning and briefing task

himself, making it his responsibility to obtain a proper weather briefing, and subsequently brief the other aircrew members. (EXHIBIT 11, 13)

(c) On the evening of 10 March 2015, at approximately 1900, both aircrews prepared for the night Rolled Duck and HELOCAST missions. By this time, the weather had deteriorated from earlier in the day. At approximately 1945, CW4 Griffin met with [redacted] and [redacted] at the nose of MOJO 69 for a mission update, which among other things, included an updated weather briefing. CW4 Griffin indicated that the weather forecast was "good tonight," but he did not give a clear briefing of current weather conditions. The brief consisted of a review of IIMC procedures and recovery airports. CW4 Griffin's most likely method of checking weather was through a phone application or web site on his cell. (EXHIBIT 11, 25, 26, 27, 47). At approximately 2016, both aircraft took off and began slow movement toward the shore line. The weight of the evidence shows that the ceilings were lower than one thousand (1000) feet and the visibility was less than three (3) statute miles prior to both aircraft taking off and entering mission profile. Before the aircraft started up, crew members could see stars, see across the bay, and see a tower that was two point three (2.3) miles away, however, by the time they took off none of these things were visible. (EXHIBITS 19 & 25). At 1926, the [redacted], called Hurlburt Weather. [redacted] relayed to [redacted] and [redacted] over the Motorola Radio that the ceilings were two hundred (200) feet. This information was conveyed to CW4 Griffin indicating that they were aware and all they needed were their instruments to fly. HAVE ACE has the authority to set and enforce weather minimums to assist the training of units not locally based. (EXHIBITS 16, 26 & 27)

(d) By taking off and entering into mission profile in weather conditions that were less than authorized, the lead aircraft entered into IMC soon after take-off. This required the aircrew to immediately transition to IIMC in order to recover the aircraft in a safe manner, however, they failed to properly perform those procedures. Had the aircrew in MOJO 69 abided by the weather minimums as briefed, they would have avoided this accident.

(e) The source of this cause can be found in training capabilities and a break-down of leadership at the crew level.

(3) **Finding 3** (Present and Contributing: Human Error – Training)**:** A contributing factor to the accident was a break down in Aircrew Coordination.

(a) The crew of MOJO 69 and [redacted] did not challenge CW4 Griffin when he decided to conduct the mission when weather conditions were at lower ceilings and less visibility than the authorized weather minimums. This is likely because of the high respect and over-confidence that the aircrews of both aircraft had in the decision making and piloting abilities of CW4 Griffin. During the run-up of both aircraft individuals exhibited trepidation regarding the weather and the lack of ambient

illumination. However, no one spoke up and questioned the wisdom to conduct the mission. (EXHIBIT 11, 13, 19)

(b) During the flight of the incident aircraft, CW4 Strother was hesitant to question CW4 Griffin after he began demonstrating clear indications of spatial disorientation. The basic aircrew tasks of transfer of controls and assistance with interpreting flight instrument indications were not adequately executed, and neither CW4 Griffin nor CW4 Strother were able to assist each other in effectively transitioning from VMC to IMC, or regaining control of the aircraft once indications of spatial disorientation became evident. (EXHIBIT 19)

(c) The source of this cause can be found in training capabilities and a break-down of leadership at the crew level.

(4) **Finding 4** (Present and Not Contributing): A noncontributing, noncausative, factor involved in this accident was incomplete mission task training, incomplete record keeping, and AMC not conducting an Air Mission Brief (AMB) IAW with AASF #1 SOP.

(a) Mission training to conduct over water and over land Special Patrol Insertion/Extraction System (SPIES) missions, HELOCAST, Rolled Duck, Caving Ladder, and other over water mission tasks were not properly annotated in two (2) of the eight (8) individual flight records, nor were simulated iterations completed prior to conducting operations with personnel. (EXHIBITS 30, 42-45)

(b) [redacted] discussed the CTLs, although some of the flight records did not indicate that the CTLs were updated with these Mission Tasks. The formal training plan to properly train or integrate these tasks into the unit's capability set lacked sufficient structure. (EXHIBIT 24)

(c) The above mentioned training inadequacies did not contribute to this crash. Even if the training had been properly conducted and annotated, the events of 10 March 2015 would likely have occurred in the same manner.

(d) The source of this cause can be found in training capabilities.

(5) The proximate cause of death of the eleven (11) individuals on MOJO 69 was impact with the water at an airspeed and angle that was not survivable. (EXHIBIT 50)

10. **RECOMMENDATIONS:**

a. **Recommendation 1: Spatial Disorientation**

(1) Unit Level Action: [redacted]

(a) Ensure all units brief all assigned and attached personnel on the facts and circumstances surrounding this accident.

(b) Ensure all units conduct refresher training on spatial disorientation and degraded visual environment flight, including signs and symptoms of spatial disorientation, how to recognize it in your fellow crew members, and how to recover from it.

(2) Higher Level Action: [redacted]:

(a) Ensure all units brief all assigned and attached personnel on the facts and circumstances surrounding this accident.

(b) Ensure all units conduct refresher training on spatial disorientation and degraded visual environment flight, including signs and symptoms of spatial disorientation, how to recognize it in your fellow crew members, and how to recover from it.

(3) DA Level Action: [redacted] publish the facts and circumstances surrounding this accident as lessons learned in the on-line Flightfax.

b. Recommendation 2: Weather Briefing

(1) Unit Level Action: [redacted]

(a) Conduct refresher training for aircrews on the approved sources for obtaining a weather brief when not at a location that has military weather, IAW FIH, Section C. Including weather requirements IAW AR 95-1, NG Supp 1 to AR 95-1, FIH, interpretation of weather products, and weather hazards specific to over water environment.

(2) Higher Level Action: [redacted]

(a) Conduct refresher training for commander, briefers, AMCs, and Final Mission Approval Authorities on the importance of not pushing weather minimums for mission accomplishment.

(3) Higher Level Action: [redacted]

(a) Upon arrival for HAVE ACE training, supporting aviation units must receive an aviation weather brief focused on local weather patterns.

(b) HAVE ACE leadership will be the approval authority for continuing training below 1000 foot ceilings and three (3) miles visibility.

(4) DA Level Action: None

(5) TAG-LA: Review the actions [redacted] and take appropriate actions as deemed necessary.

c. Recommendation 3: Aircrew Coordination

(1) Unit Level Action: [redacted]

(a) Ensure all units conduct a detailed refresher academic training on Aircrew Coordination Training – Enhanced IAW TC 3-04.33.

(2) Higher Level Action: [redacted]

(a) Ensure all units conduct a detailed refresher academic training on Aircrew Coordination Training – Enhanced IAW TC 3-04.33.

(3) DA Level Action: None

d. Recommendation 4: Training Deficiencies

(1) Unit Level Action: [redacted]

(a) Develop a phased training plan for non-standard infiltration/exfiltration tasks (HELOCAST, SPIES, Caving Ladder, T-Duck, etc.) consisting of Academics, Individual/Crew Flight Training, and Collective Training taught utilizing subject matter experts (SME). If SME's are not resident within the unit, then they should be requested from outside agencies to provide the required training. If the mission is being flown over water, the Directorate of Training and Doctrine (DOTD) approved Maritime Operations Training Support Package, available at [redacted], shall be used.

(2) Higher Level Action: [redacted] None

(3) DA Level Action: None

SUBJECT: JOINT SOCOM and LAARNG Investigation: UH 60M (Model Tail Number 13-20624) Accident on 10 Mar 15 Resulting in Fatalities

[redacted]
Co-Investigating Officer

[redacted]
Co-Investigating Officer

[redacted]
Board Member

[redacted]
Board Member