UNITED STATES AIR FORCE
GROUND ACCIDENT INVESTIGATION BOARD REPORT

Air Force Combat Dive School
350th Special Warfare Training Squadron, Det 1
Special Warfare Training Wing
Naval Support Activity Panama City, Florida

TYPE OF ACCIDENT: Swim Fatality

LOCATION: Naval Diving & Salvage Training Center,
Naval Support Activity Panama City, Florida

DATE OF ACCIDENT: 19 March 2020

BOARD PRESIDENT: Major General James P. Scanlan, USAF
Conducted IAW Air Force Instruction 51-307

EXECUTIVE SUMMARY
UNITED STATES AIR FORCE GROUND
ACCIDENT INVESTIGATION Air Force
Combat Dive School Swim Fatality

Naval Support Activity Panama City, Florida
19 March 2020

On 19 March 2020, at approximately 1100 hours local time (L), the Mishap Airman (MA), a 24year old Airman First Class assigned to the Special Tactics Training Squadron, Hurlburt Field, Florida went missing while he was participating in a 2000-yard surface swim as part of the Air Force Combat Dive Course - Open Circuit. Following a mission brief, equipment donning, and transit to the 2000-yard swim course in St. Andrews Bay, 38 Air Force swimmers commenced a 2000-yard surface swim at approximately 1015L.

Just prior to the surface swim, the MA was reported to be in good spirits with no apparent medical issues. Weather conditions were favorable and the only notable environmental factor was a slight current that pushed swimmers to the northwest. In addition to the prescribed equipment, the MA wore a 3mm wetsuit during the swim, which provided thermal insulation and added buoyancy for the swimmer. Approximately halfway through the surface swim a fellow student observed the MA swimming without difficulty and with no signs of distress. This student swam near the MA for approximately 3-5 minutes, until the MA passed and pulled away from him between the 1000yard and 500-yard remaining markers. This was the last time the MA was seen alive.

At approximately 1100L, after the last swimmer finished, instructors noticed that one swimmer failed to record a finish time. Instructors quickly determined the missing swimmer was the MA and immediately commenced a search. After being unable to locate the MA for approximately 10 minutes, instructors notified the Air Force Combat Dive School Superintendent via radio of the missing swimmer. The Superintendent notified the Naval Diving and Salvage Training Center Quarterdeck, who in turn notified U.S. Coast Guard Station Panama City. At approximately 1130L, U.S. Coast Guard Station Panama City initiated a search and rescue mission.

Over the next several hours, approximately 87 personnel from the United States Air Force, Navy, Marine Corps, Coast Guard, Florida Fish and Wildlife Conservation Commission and Bay County Sheriff's Office engaged in a search and rescue effort. At approximately 1600L, a Fish and Wildlife Conservation Commission surface vessel detected the MA via sonar approximately 15 feet underwater. At 1628L, a U.S. Coast Guard Diver recovered the MA from the bottom of the bay. The MA was checked by an Air Force Pararescueman, who observed no apparent signs of

life. All of MA's equipment was intact, fully functional, and there was no indication he attempted to actuate his personnel flotation device. A Navy medical officer pronounced the MA deceased at 1630L.

An autopsy determined the cause of death was accidental drowning.

SUMMARY OF FACTS
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ACRONYMS AND ABBREVIATIONS

2Lt	Second Lieutenant
A1C	Airman First Class
AB	Airmen Basic
ABU	Airman Battle Uniform
ACC	Air Combat Command
AED	Automatic External Defibrillator
AETC	Air Education and Training Command
AETCI	Air Education and Training Command Instruction
AF	Air Force
AF Sup	Air Force Supplement
AFB	Air Force Base
AFCDC	Air Force Combat Dive Course
AFCDS	Air Force Combat Dive School
AHLTA	Armed Forces Health Longitudinal Technology Application
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFPAM	Air Force Pamphlet
AFSC	Air Force Specialty Code
AFSEC	Air Force Safety Center
AFSOC	Air Force Special Operations Command
AI	Assistant Instructor
AIB	Accident Investigation Board
AL	Alabama
AM	Ante Meridiem
AMMO	Ammunition
APC	Armored Personnel Carrier
Apr	April
ASSOC	Association
ATAC	Advanced Tactical Acquisition Corps
ATAK	Android Team Awareness Kit
ATC	Air Traffic Control
AZ	Arizona
BC	Buoyance Compensator
BDU	Battle Dress Uniform
BIC	Basic Instructor Course
BMT	Basic Military Training
°C	Celsius
CA	California
CAC	Common Access Card
Capt	Captain
CC	Closed Circuit
CC	Commander
CCAF	Community College of the Air Force
CCS	Combat Control School
CCSC	Combat Control Selection Course
CCT	Combat Controller
CDC	Combat Dive Course
CDI	Command Directed Investigation
CDO	Command Duty Officer
CG	Coast Guard
CGC	Coast Guard Cutter
CHCS	Composite Healthcare System

CIMB Commander's Inspection Management Board
CISM Critical Incident Stress Management
CO_2 Carbon Dioxide CO Commanding Officer COA Course of Action
Col Colonel CONS Contracting Squadron
CRO Combat Rescue Officer
CST Central Standard Time DAS Date Arrived on Station
DAID Date Arrived Instructor Duty
DDO Deputy Director of Operations
DET Detachment
DETCO Detachment Commander
DMO Diving Medical Officer
DMT Diving Medical Technician
doc. Microsoft Word Document
docx. Microsoft Word 2007/2010/2013 Document
DOD Department of Defense
DOB Date of Birth
DRS Diver Recall System
DSN Defense Switched Network
DSPI Diving Supervisor Personnel Inspection
E East EDT Eastern Daylight Time
EOD Explosive Ordinance Disposal EMS Emergency Medical Services EMT Emergency Medical Technician
ENR Enroute
EPIRB Emergency Position Indicating Radio Beacon
EP Emergency Procedures ESE East-Southeast
ETA Estimated Time of Arrival
EXT Extension
°F Fahrenheit FL Florida
FM Field Manual FM Frequency Modulation
FOD Foreign Object Debris ft. Foot
FW/SEG Fighter Wing Ground Safety
FWC Florida Fish and Wildlife Conservation Commission
GAIB Ground Accident Investigation Board
GMT Greenwich Mean Time GOMEX Gulf of Mexico
Gov Government GPS Global Positioning System
GRG Gridded Reference Graphic
GS General Schedule GV Ground Vehicle
HAZMAT Hazardous Material
HELO Helicopter HHW Household Hazardous Waste
Hg. Hectograms HLOC Hypoxic Loss of Consciousness HM1 Navy Hospital Corpsman First Class
HM Navy Hospital Corpsman
HMC Navy Chief Hospital Corpsman HMC Hazardous Material Control
HMC&M Hazardous Material Control Management HMUG Hazardous Material User's Guide
HQ Headquarters
IAW In Accordance With ID Identification
in. Inch IO Investigating Officer IVO In Vicinity Of
JSAP Joint Staff Action Processing JSAT Joint SOF Assessment Teams JSOC Joint Special Operations Command
Jun June Kts Nautical miles per hour
L Local
L/R Left/Right
LBE Load Bearing Equipment LBV Load-Bearing Vest
LCAL Local
LCL Local Clock LP Lesson Plan
LPU Life Preserver Unit LPV Life Preserver Vest
Lt Lieutenant
Lt Col Lieutenant Colonel m Meters M4 Small Arms Carbine Rifle
MAJCOM Major Command
Mar March MCD Marine Combatant Diver

MCI Marine Corps Intranet
MD Medical Member MDS Mission Design Series
METOC Meteorology and Oceanography mil Military MLLW Mean Lower Low Water
MPH Miles Per Hour
MRC Maintenance Requirement Card
MSgt Master Sergeant
MWR Morale, Welfare, and Recreation
MX Maintenance Member
MXG/CC Maintenance Group Commander
N North N/A Not Applicable
NCC National Command Center
NDSTC Naval Diving & Salvage Training Center
NEDU Navy Experimental Diving Unit
NETC Naval Education and Training Command PT Physical Therapist ng/mL nanograms per milliliter PWC Personal Watercraft (Jet Ski) NM Nautical Mile QA Quality Assurance
NM New Mexico QC Quality Control
NMCI Navy Marine Corps Intranet rcvd Received NMD Navy Medical Member REV Revised no. Number RCC Rescue Coordination Center
NOAA National Oceanic and Atmospheric Administration NOLA New Orleans Louisiana
NOK Next of Kin
Nov November NPQ Not Physically Qualified
NSA Naval Support Activity NSW Naval Special Warfare NTFD Notified
NWS National Weather Service
OC Open Circuit OOD Officer of the Deck
OPNAV Operational Navy
OPNAVINST Office of the Chief of Naval Operations Instruction
OPRV Over Pressure Resuscitate Valve
OPS Operations
ORM Operational Risk Management
OSC On-Scene Coordinator
OSS&E Operational, Suitability, and Effectiveness
PAO Public Affairs Office
PC Progress Check
pdf Portable Document Format
PFD Personal Flotation Device
PI Primary Instructor
PIW Person in Water
PJ Pararescueman
PM Program Manager
pm Post Meridiem
PMS Planned Maintenance System

PNG Portable Network Graphic
POI Plan of Instruction
POSN Position
PPE Personal Protective Equipment
PQS Personnel Qualification Standards
RN Registered Nurse
RQS Rescue Squadron
RTB Return to Base S Satisfactory
SA Situational Awareness SAR Search and Rescue SAT Satisfactory
SAV Staff Assistance Visit
SC Staff Contractor
SCUBA Self Contained Underwater Breathing Apparatus
SDS Safety Data Sheets
SE Southeast
SERE Survival, Evasion, Resistance & Escape
SEC Sector
SEC Secondary
Sec seconds
SEG Ground Safety
SEL Selection SEL Senior Enlisted Leader
Sep September
SF Special Forces
SIB Safety Investigation Board
SI Student Instructor SIBBP SIB Board President
SL Sea Level SM Search and Rescue Mission SMC Search & Rescue Mission Coordinator
SME Subject Matter Expert SMQ Subject Matter Qualified SMT Subject Matter Training SOCOM Special Operations Command SOF Special Operations Forces SOH Safety and Occupational Health SOP Standard Operating Procedure
SPMIG Standard PMS Materials Identification Guide
SrA Senior Airmen
SS Staff Superintendent
SSAN Social Security Account Number
SSE South-Southeast
SSgt Staff Sergeant
ST Student
Sup Supervisor STA Station STTS Special Tactics Training Squadron
SW Southwest SW Special Warfare SWCDC Special Warfare Combat Dive Course SWTG Special Warfare Training Group SWTS Special Warfare Training Squadron SWTW Special Warfare Training Wing
SYSCOM Systems Command TDY Temporary Duty
Thur Thursday
TRANET Training Network
TRS Training Squadron TSgt Technical Sergeant
TTMS Technical Training Management System
TTP Tactics, Techniques, and Procedures
TW Training Wing
TX Texas
U Unsatisfactory UCMJ Uniform Code of Military Justice UCT Underwater Construction Team
UDT Underwater Demolition Team
UEI Unit Effectiveness Inspection
UMIB Urgent Maritime Information Broadcast
USA United States Army
USAF United States Air Force
USCG United States Coast Guard
USN United States Navy
VHF Very High Frequency
W West
WARNO Warning Order
XO Executive Officer
yd Yard
Z Zulu

The above list was compiled from the Summary of Facts, the Index of Tabs, and Witness Testimony.

SUMMARY OF FACTS

1. AUTHORITY AND PURPOSE

a. Authority

On 9 April 2020, Lieutenant General Marshall B. Webb, Commander, Air Education and Training Command (AETC), appointed Major General James P. Scanlan, United States Air Force (USAF), as Board President of a Ground Accident Investigation Board (GAIB) to investigate the death of the Mishap Airman (MA) (Tab Y-3 to Y-4). The GAIB was convened from 20 April 2020 to 20 May 2020, and was conducted in accordance with Air Force Instruction (AFI) 51-307, *Aerospace and Ground Accident Investigations*, dated 18 March 2019 (Tab Y-3 to Y-4). Additional members of the board included a Dive Expert (GS-14), Legal Advisor (Major), Medical Advisor (Major), Assistant Legal Advisor (First Lieutenant), and Recorder (Senior Master Sergeant (SMSgt)) (Tab Y-3 to Y-6).

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 19 March 2020, at approximately 1015 hours local (L), the MA, Special Tactics Training Squadron (STTS), Hurlburt Field, FL, participated in the 2000-yard surface swim training event as part of the Air Force Combat Dive Course - Open Circuit (AFCDC-OC) while on temporary duty to the 350th Special Warfare Training Squadron, Detachment 1, Naval Diving and Salvage Training Center (NDSTC), Naval Support Activity (NSA) Panama City, FL (Tabs G-89 to G-95, K-3, K-57, and R-41).

At the outset of the training event, course instructors transported the MA and 37 other Air Force (AF) students in two dive boats to the starting point for the swim in St. Andrews Bay (Tab R-53, R-57, and R-117 to R-118). The students entered the water and were instructed to swim toward an "ammo" pier with a large crane (Tab R-321). The finish point was a final buoy marker located 2000-yards away adjacent to a stationary barge (Tab R-201). The students were required to complete the swim in under 60 minutes to successfully pass the progress check (Tab K-17). The MA was last seen between the 1000-yard and 500-yard buoy markers by another student swimmer, where the MA was observed to be swimming without difficulty and exhibited no signs of distress (Tabs R-420 to R-421 and V-23.4). The MA was discovered missing at approximately 1100L after an instructor noticed that the MA's swim time was not reported and there were no remaining students in the water (Tab R-30 and R-201 to R-203). After they were unable to locate the MA, AF instructors promptly requested assistance for a search and rescue effort; local law enforcement,

U.S. Marine Corps, U.S. Navy, and U.S. Coast Guard personnel responded (Tabs O-4, O-6, O-18 to O-19, and R-62). A U.S. Coast Guard diver recovered the MA's body at approximately 1628L (Tabs O-5, O-20, R-65, and R-293). The MA was pronounced dead at 1630L (Tabs R-66 and X3). An autopsy later determined the cause of death to be accidental drowning (Tab X-3).

3. BACKGROUND

a. Air Education and Training Command (AETC)

The mission of AETC is to recruit, train, and educate exceptional Airmen (Tab CC-3). As the First Command, it is AETC's vision to develop Airmen of character who serve as the foundation of a lethal force (Tab CC-3). AETC headquarters is located at Joint Base San Antonio (JBSA)-Randolph near San Antonio, TX (Tab CC-3). The command is composed of more than 58,000 personnel (Tab CC-4). The command oversees the AF Recruiting Service, two Numbered Air Forces, and Air University (Tab CC-4).

b. Second Air Force (2 AF)

The mission of 2 AF is to train, develop, and inspire the world's premier Airmen to power the world's greatest AF (Tab CC-4 and CC-13 to CC-14). 2 AF, with headquarters at Keesler AFB, MS, is responsible for conducting basic military and technical training for AF, Joint and Coalition Partners (Tab CC-4 and CC-13 to CC-14). 2 AF also trains and provides oversight of Airmen completing combat skills training in preparation for deployment in support of Combatant Command missions (Tab CC-4 and CC-14).

c. Special Warfare Training Wing (SWTW)

The SWTW, headquartered at JBSA-Lackland, TX, selects and trains the AF's conventional and special operations ground combat forces to meet the demands of the future battlefield (Tab CC-17). Their mission is to recruit, develop, and train ground combat forces that specialize in airpower application (Tab CC-20). They push the limits of human performance and technology to build a stronger, smarter, more lethal force capable of solving the nation's most complex military problems (Tab CC-17). The SWTW hosts courses across the United States including: Special Warfare Preparatory Course, Airborne School, Military Free Fall Course, Survival, Evasion, Resistance, and Escape (SERE) Training, Pararescue Indoctrination Course, Combat Control Selection Course, Tactical Air Control Party Apprentice Course, Special Operation Weather Course, Air Traffic Control, Pararescue EMT-B Course, Pararescue EMT-P Course, Pararescue Apprentice Course, Combat Control Apprentice Course, Special Tactics Training, and Air Force Combat Dive Course (Tab CC-18 to CC-19 and CC-21).

d. Special Warfare Training Group (SWTG)

The SWTG's mission is to forge Special Warfare Airmen. The SWTG selects, trains, and mentors Airmen for global combat operations and breeds quiet professionals, infused with a warrior ethos, fueled by scholarship and innovation (Tab CC-23). Their vision is to become the recognized leader among the Special Operations Forces (SOF) selection and training community, drive human performance innovation for tactical athletes, and to continue a legacy of valor and excellence (Tab CC-23).

e. 350th Special Warfare Training Squadron (350 SWTS)

The 350 SWTS's mission is to provide quality students to the Special Warfare apprentice courses as efficiently as possible with a vision of having the most physically fit, financially responsible, and socially engaged squadron in Special Warfare (Tab CC-25).

f. Air Force Combat Dive School (AFCDS)

The AFCDS is officially designated as the 350th Special Warfare Training Squadron, Detachment 1 (Tab CC-21). The AFCDS teaches students basic diving, advanced rescue diving principles, and advanced combat diving fundamentals (Tab CC-27 and CC33). Upon completion of the course, students are certified as United States Special Operations Command (USSOCOM) combatant divers, skilled on the use of open and closed circuit diving equipment to covertly infiltrate denied areas (Tab CC-27 and CC-33). The AFCDS is located at the NDSTC aboard NSA Panama City, FL (Tab CC-28).

1) Air Force Combat Dive Course (AFCDC)

The AFCDC incorporates diving fundamentals in both open circuit Self Contained Underwater Breathing Apparatus (SCUBA) and closed circuit underwater breathing apparatus (UBA) (Tab CC-28 to CC-29 and CC-33). Prior to attending AFCDC, students must successfully complete the Special Warfare Preparatory Course, Special Tactics/Guardian Angel Initial Entry Course, and AF Pre-dive Course at JBSA-Lackland, TX (Tab CC-21). SCUBA training is five weeks long while UBA training is three weeks long for a total of eight weeks of training (Tab CC-28). The course provides training to depths of 130 feet, stressing development of maximum underwater mobility under various operating conditions (Tab CC-27). Students learn basic diving and advanced rescue diving principles during the SCUBA portion of training (Tab CC-33). After completing SCUBA, students then learn advanced combat diving fundamentals during the UBA portion of training (Tab CC-33). This course occurs six times per fiscal year (Tab CC-28 to CC-29 and CC-33).

2) 2000-yard Surface Swim Training Event

During the first week of AFCDC-OC, students are required to accomplish a 2000-yard surface swim in combat gear (Tabs K-8 to K-10 and K-17). The 2000-yard surface swim serves as an

individual progress check on each student's swimming ability (Tab K-8 to K-10 and K-17). The AFCDC-OC Plan of Instruction (POI) states that students will swim in buddy pairs of similar swimming ability, as determined by the students' performance during the 1500-meter surface swim or 1000-yard surface swim administered prior to the 2000-yard surface swim (Tabs K-10 and V9.3). A maximum of 40 students may participate in the 2000-yard surface swim (Tab K-8).

A minimum of six instructors are required to administer the 2000-yard surface swim (Tab K-8). One instructor is required to serve as the primary instructor (PI) who administers the event guidelines, maintains overall control of the class, and scans all swimmers for signs of hypoxic loss of consciousness (HLOC) (Tab K-8). One assistant instructor (AI) is required to provide safety, security, and assist in the administration of the event, as well as scan all swimmers for signs of HLOC (Tab K-8). Two instructors serve as shallow water rescue vehicle drivers to assist in monitoring students' safety and respond to any students in distress (Tab K-8). One instructor serves as a diving medical technician (DMT) (Tab K-8). One instructor is required to perform safety swimmer duties and provide rescue assistance if needed, in accordance with the U.S. Navy Diving Manual (Tab K-8).

Immediately prior to the 2000-yard surface swim, students receive a mission briefing on the training event (Tabs K 23 to K-48, V-6.6 to V-6.7, and V-6.13 to V-6.16. Items briefed to students include: (1) an overview of the goals and procedures for the training event, (2) names of instructors on duty, (3) equipment that will be utilized, (4) students' boat assignments, (5) the day's environmental factors such as tide, air temperature, and water temperature, (6) potential hazards, (7) emergency procedures, and (8) a map of the students' swim path (Tabs K-23 to K-48 and V-6.13 to V-6.16).

Students then participate in "jock-up," wherein students don the required gear for the surface swim and line up for an inspection (Tabs K-8, K-17, and R-55). For the 1000-yard and 2000-yard surface swim training events, students wear a mask, a load bearing vest (LBV) with two 2-pound weights (to simulate ammunition magazines), a personal floatation device (PFD), a dive tool, and a rubber AR-15 weapon (Tab K-17). Students are then required to pair up and inspect each other to ensure their equipment is donned properly (Tab R-55). Following student inspections, a team of instructors inspects the students, noting and correcting any discrepancies (Tabs K-8, K-17, and R20 to R-21).

Following instructor "jockup" inspection, students board one of two combat dive boats (CDBs) for transport to the starting point of the training event (Tab R199). A third CDB is also deployed with the PI, DMT, and safety swimmer on board (Tab R-199). This third CDB is referred to as the supervisory boat or "Sup Boat" (Tab R-199). When the students arrive at the starting point, they simultaneously enter the water, line up along the starting buoy, and a horn sounds indicating the start of the event (Tab R-198). To pass the progress check, students must swim 2000 yards in under 60 minutes without instructor assistance **(Tab Z-3) (Tab Z-4)** to a final marker, where students receive and report their swim time (Tab K-8 and K-17).

Figure 1 – Jock-up (Front View)

Figure 2 – Jock-up (Side View)

The AFCDC-OC routinely administers the 2000-yard surface swim in St. Andrews Bay (Tab K36 to K-41). Along the swim path are yellow buoy markers indicating the 2000, 1500, 1000, and 500-yard points (Tab K-36). The final marker for the 2000-yard swim is ordinarily an ammo pier located on the shoreline (Tab K-41).

Figure 3 – St. Andrews Bay 2000-Yard Surface Swim Path (Not to Scale)
(Tabs K-36, K-41, and Z-11)

After the surface swim begins, the instructor boats position themselves in such a way to ensure they are able to observe the swimmers and prevent boat traffic from entering the swim path (Tab R-248). The Sup Boat trails the slowest swimmer for the duration of the training event (Tab R200). One CDB proceeds to the north and stays on pace with the fastest swimmer (Tab V-4.3 and V-6.5). The second CDB then follows to the north and maintains a position between the first CDB and the Sup Boat, providing supervision for the middle section of swimmers (Tab V-4.3). Additionally, two instructors operate two WaveRunner jet skis to patrol for students in distress and to intercept incoming boat traffic (Tab R-12 and R-148 to R-149).

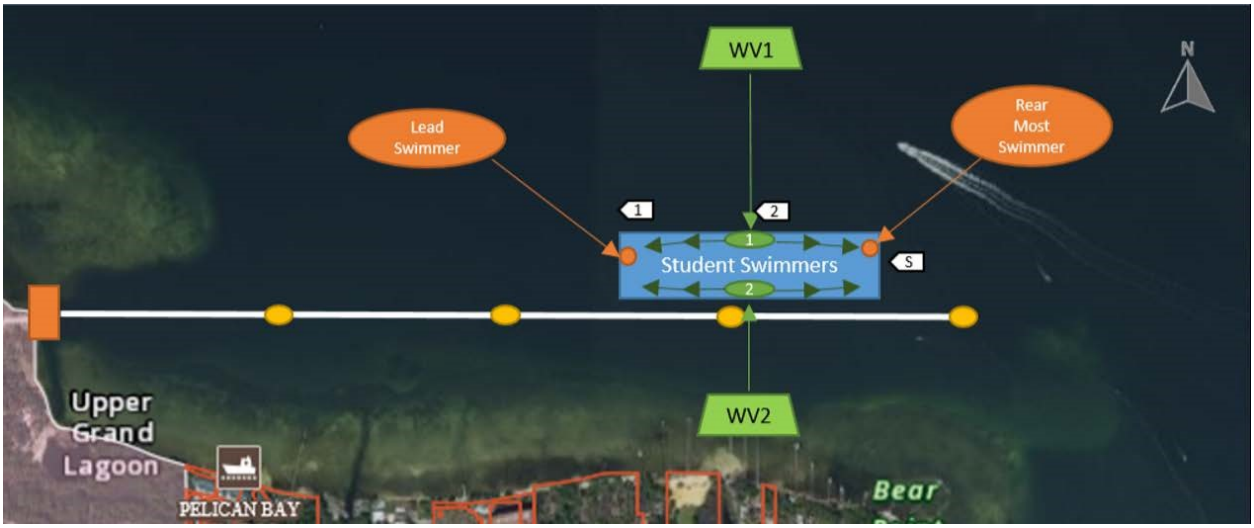

Figure 4 – Example Instructor Positions During 2000-Yard Surface Swim (Not to Scale)
(Tabs R-12, R-148 to 149, R-200, and Z-11 to Z-16)

3) Buddy Pairs

An open water surface swim presents challenges to the swimmer attempting to cover distance on the surface, as well as challenges to the logistical staff overseeing the event (Tab DD-23). Factors such as boat traffic, water temperature, tidal change, currents, and surface visibility drive planning to ensure event success and swimmers' safety (Tab DD-23). Of the many training protocols in place for an open water event, one is assigning swimmers to two-man swim teams commonly known as "buddy pairs" (sometimes referred to as "buddy teams") (Tab DD-23). When assigned as a buddy pair, a two-man swim team is expected to stay in close proximity to one another during the swim (Tab DD-23). The short distance between swimmers allows for tactical communication between members, equipment transfers, and reasonable safety oversight of one another (Tab DD23). A commonly used device to ensure buddy pairs remain in close proximity is a "buddy line" (Tab DD-23). This line is simply a rope or some type of flexible fabric stretched between each swimmer and attached with a snap link to each swimmer (Tab DD-23). The length of a buddy line can vary based on the event and/or swim team's desire, but is usually not longer than ten feet for a swim pair (Tab DD-23). The mechanics of the buddy line permit individual swimmers to focus their attention on other aspects of the surface swimming event and still maintain an acceptable surface interval to their swim partner (Tab DD-23).

4) Combat Dive Boat (CDB)

Manufacture: SAFE Boat International
Overall Length: 37ft
Overall Beam: 10ft Max HP: 1,050
Seated Positions: 6 Max Persons: 31
Operational Load: 14,023lbs
Dry weight: 8,500lbs
Draft (Engines up): 25”
Power: Mercury Outboard 300hp x3
(Tab DD-21)

5) Yamaha WaveRunner Jet Skis

Manufacturer: Yamaha
Overall Length: 123.6”
Overall Width: 44.5”

Figure 5 – Combat Dive Boat #2 (Tab DD-22)

Engine Type: 3-cylinder, 4-stroke TR-1 Yamaha Marine Engine
Max Persons: 3 (up to 485lbs)
Dry Weight: 600lbs (Tab DD-22)

Figure 6 – (Yamaha WaveRunner Tab DD-23)

g. Air Force Special Operations Command (AFSOC)

AFSOC is one of ten major commands of the USAF, and the AF component of USSOCOM, a unified combatant command (Tab CC-35). Headquartered at Hurlburt Field, Florida, AFSOC’s mission is to provide USAF SOF for worldwide deployment and assignment to regional

unified commands (Tab CC-35). USAF SOF are composed of highly trained, rapidly deployable Airmen, conducting global special operations missions ranging from precision application of firepower to infiltration, exfiltration, resupply, and
refueling of SOF operational elements (Tab CC-35). AFSOC has more than 20,800 personnel and owns flying units that operate fixed and rotary-wing aircraft (Tab CC-36).

h. 24th Special Operations Wing (24 SOW)

The 24 SOW is an active duty special operations wing assigned to AFSOC and based at Hurlburt Field, Florida (Tab CC-39). It is the only Special Tactics (ST) wing in the USAF (Tab CC-39). The primary mission is to provide ST forces for rapid global employment to enable airpower success through airfield reconnaissance, assessment and control, personnel recovery, joint terminal attack control (JTAC), and environmental reconnaissance (Tab CC-39). The 24 SOW is also USSOCOM's tactical air and ground integration force (Tab CC-39).

i. Special Tactics Training Squadron (STTS)

The STTS, located at Hurlburt Field, Florida is charged with training AFSOC's special tactics operators (Tab CC-40, CC-43, and CC-46). The STTS assesses, selects, trains and develops five-level ST operators to conduct and support precision strike, global access, personnel/sensitive item recovery, and austere trauma surgery on the battlefield (Tab CC-40, CC-43, and CC-46 to CC-47). They do this while also providing initial joint terminal attack control training to Army, Marine Corps, and Air Force SOF (Tab CC-40 and CC-43).

j. Combat Controller (CCT)

USAF CCTs are assigned to ST units to deploy, undetected, into combat and hostile environments to establish assault zones or airfields, while simultaneously conducting air traffic control, fire support, command and control, direct action, counter-terrorism, foreign internal defense, humanitarian assistance, and special reconnaissance in the joint area (Tab CC-49). CCTs maintain air traffic control qualification skills throughout their careers, and many are qualified in JTAC procedures, as well as other SOF skills, such as infiltration, combat dive, and demolition (Tab CC-50).

k. Pararescueman (PJ)

The primary mission of a USAF PJ is to perform personnel recovery operations and provide battlefield emergency medical care within the special operations battlefield (Tab CC-53). A PJ's unique technical rescue skill sets are utilized during humanitarian and combat operations; they deploy anywhere, anytime, employ air-land-sea tactics into restricted environments to authenticate, extract, treat, stabilize, and evacuate injured or isolated personnel (Tab CC-53).

4. SEQUENCE OF EVENTS

a. The Air Force Combat Dive Course – Open Circuit (AFSDC-OC) Class 20-03

The AFCDC-OC Class 20-03 began on Monday, 16 March 2020 with 38 AF students enrolled (Tab K-3 and K-57). Students were assigned roster numbers for the course; the MA was assigned roster #2 (Tab K-57). On the first day of class, all students participated in the AFSOC physical training (PT) test (Tabs K-57 and R-313). The test consisted of a 3-mile run, pull-ups, sit-ups, push-ups, and a 1500-meter swim (Tab T-3). The MA completed 71 push-ups in two minutes, 127 sit-ups in four minutes, 17 pull-ups in two minutes, ran three miles in 18 minutes and 50 seconds, and swam 1500 meters in 28 minutes and 40 seconds (Tab T-3). His overall performance on the five components of the PT test ranked him #8/38 in the class (Tab T-3).

On Tuesday, 17 March 2020, the class participated in 90 minutes of group PT in the morning, followed by four hours of classroom instruction on dive physics, surface swim, and dive equipment (Tab K-3). The surface swim block of instruction was briefed by SI6 (Tabs K-3 and V-6.4). SI6 instructed the class on the objectives and guidelines for the upcoming surface swim events (Tabs K-23 to K-48, V-6.7 to V-6.8, and V-6.13 to V-6.14). Students were briefed that a large yellow crane located on the ammo pier would serve as a reference point to help orient their direction during surface swim event (Tab R-359). During the brief, SI6 verbally instructed the students that the 1000-yard and 2000-yard surface swims are individual events and neither buddy teams nor buddy lines would be used (Tabs R-18 and V-1.8). Because the water temperature did not require the use of wetsuits, the students were instructed that they had the option to wear a 3mm wetsuit during the surface swim (Tabs R-53 to R-54, R-384, and V-6.5). Tuesday concluded with students participating in two hours of skills training, specifically a 50-meter underwater swim, underwater knot tying, and drown proofing techniques (Tabs K-3 and R-317).

On Wednesday, 18 March 2020, the class again participated in 90 minutes of group PT and then prepared for the 1000-yard surface swim (Tabs K-3, R-320, and V-6.4). For the 1000-yard surface swim, students were required to don their gear, known as "jocking-up" (Tab R-321). Students then paired up and inspected each other to ensure their equipment was donned properly, and were then inspected by instructors (Tab R-55 and R-358).

As briefed by SI6 the day prior, the 1000-yard surface swim was conducted without the use of buddy lines and students did not swim in buddy pairs (Tab V-24.3). The MA completed the

1000yard surface swim in 19 minutes and 3 seconds, which placed him #14/38 in the class (Tab K-58).

b. Summary of Accident

The 2000-yard surface swim was scheduled to begin at 0600L on Thursday, 19 March 2020 (Tab R-185). However, due to anticipated fog in the weather forecast, instructors delayed the surface swim by three hours (Tabs R-52, R-185, R-193, and V-2.5). Students instead reported to the classroom, where they received instruction on dive decompression, a block of instruction originally scheduled for later in the training day (Tabs K-3, R-41, and R-53). At approximately 0915L, SI2 briefed the students on the 2000-yard surface swim progress check, including the day's weather and environmental conditions (Tabs R-41, V-2.6, and V-27.5). SI2 asked if any of the students were experiencing any injuries, musculoskeletal pain, or were taking any medications; none of the students reported any medical concerns (Tab R-41). At approximately 0930L, the students were directed to don their gear and prepare for the 2000-yard surface swim (Tabs R-41, R-54, R-195, and V-27.5). While students were donning their gear, SI2 briefed the group of instructors that would be participating in the event on their roles, what to do in the event of a medical emergency, and risk management (Tabs R-41, R-80, and R-232).

During the jock-up inspection, students paired off and partners checked to ensure each other's equipment was donned properly (Tabs R-55, R-196, and V-2.10). The instructors checked all of the students, with the only discrepancy among the entire class being one canteen not clipped properly to a student's belt (Tab R-41). The MA had no noted discrepancies with his equipment (Tab R-454 to R-455). Students were not assigned in buddy pairs and were not provided buddy lines for the 2000-yard surface swim (Tab V-1.11 to V-1.12, V-2.6, and V-24.3). The MA elected to wear a 3mm wetsuit for the training event (Tab R-54, and R-379). He told other students that he preferred to wear a wetsuit for the additional buoyancy it provided (Tabs R-385, R-391, V-15.4, and V-16.3).

Students who observed the MA on the morning of the 2000-yard surface swim observed he was in good spirits and noticed nothing out of the ordinary with regard to his behavior (Tab R-385, R391, and R-461). The MA did mention to ST2 that he was experiencing soreness in his hip flexors, an issue that he had been dealing with for several weeks (Tabs R-351, R-373, R-407, V-12.7, and V-20.2 to 20.3). After jock-up, the class was transported to the starting point for the 2000-yard surface swim (Tab R-185).

A minimum of six instructors and a safety diver were required to administer this training event (Tab K-8). On the date of the mishap, eight instructors and a safety diver participated in the event (Tab R-41 and R-238).

CDB1 transported students with roster numbers 1-19, including the MA, and CDB2 transported roster numbers 20-38 (Tabs R-53). Also aboard CDB1 were the boat driver (SC2), the assistant instructor (SI6) and a new instructor (SI4) (Tabs R-41, R-186, R-255, and V-4.3). Also aboard CDB2 were the boat driver (SC3) and two additional instructors (SI3 and SI8) (Tabs R-41, R-83, R-186, R-232, and R-259). CDB 3 (Sup Boat) also transited with CDB1 and CDB2 to the starting point for the surface swim (Tab R-41). Aboard the Sup Boat were the boat driver (SC1), the primary instructor (SI2), the diving medical technician (SI7), and the safety diver (SI9) (Tabs R-238, R-243, R-247, and V-7.3). Additionally, WaveRunner 1 (WV1) was manned by SI1 and WaveRunner 2 (WV2) was manned by SI5 (Tab R-41).

Figure 7 – View of the Swim Path from Starting Point (Tab Z-5)

There were two deviations from standard procedure during the 2000-yard surface swim on 19 March 2020 (Tabs R-57 and V-8.5). First, the ammo pier that typically serves as the finish point was under construction (Tab R-57 and R-197). A floating barge approximately 100 yards east of the ammo pier was used as an alternate location from where instructors would drop a finish buoy marker that students would need to touch in order to receive their final swim time (Tab R-57). As a result, instructors dropped a starting buoy marker approximately 100 yards east of the standard 2000-yard buoy marker (Tab R-57).

Figure 8 – Model of White Yacht (Tab Z-7)

Second, a privately owned 65-foot white yacht was anchored between the 1000-yard and 500-yard buoy markers in the swim path (Tabs V-8.5, DD-25, and Z-7). This yacht was located in approximately the same position the day prior during the 1000-yard surface swim and presented no problems for the students (Tab R-7 and R-328). Although the area of St. Andrews Bay in which the 2,000-yard surface swim took place is designated as a restricted area, there was nothing which prohibited privately owned vessels from entering the area (Tab BB-21 to BB22). Prior to the training event, SI1 approached the yacht on WV1 to inform the owners that the AF would be conducting a training event (Tab R-24 and R-512). SI1 did not request the yacht relocate; however, he confirmed that the yacht owners did not have any fishing lines in the water that would pose a hazard to the students (Tab R-24).

Figure 9 - Irregularities During 2000-yard Surface Swim on 19 Mar 20 (Not to Scale)
(Tabs R-57, V-8.5, and Z-11)

The students entered the water at approximately 1010L and lined up along the starting buoy marker (Tab R-41 and R-238). The MA and ST2 entered the water together and ST2 observed that the MA was in good spirits (Tabs R-373 and V-13.9). At approximately 1015L, SI2 sounded the bull siren indicating the start of the training event (Tab R-41 and R-57). All 38 students simultaneously began swimming (Tab R-198).

Almost immediately, students noticed the current pushing them to the northwest (Tab R-404 and R-474). Although the current required them to make an effort to remain on the swim path, it was not so strong as to pose a safety risk (Tab R-390, R-416, R-420, and R-436).

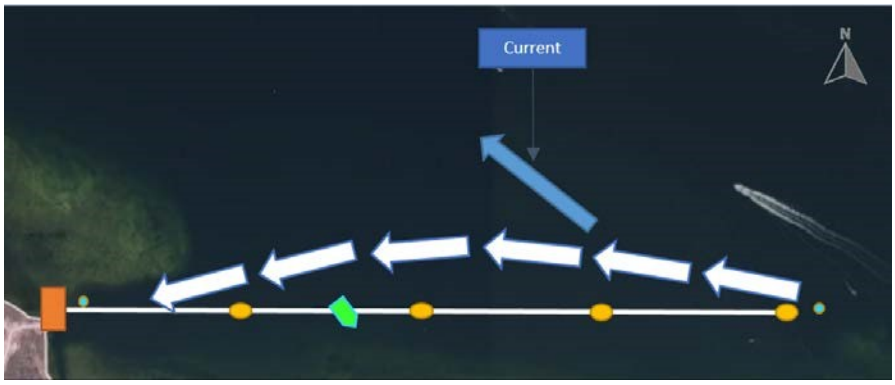

Figure 10 – Approximate Swimmer Path
(Tabs R-474 and Z-12)

ST2 started out near the MA, who appeared to have no trouble swimming (Tab V-13.4). After approximately 100 yards, ST2 lost track of who was swimming near him (Tabs R-373 and V-13.5). During the swim, separation between the students reached approximately 400 yards between the lead swimmer and rear swimmer, and 150 yards between northern-most and southern-most swimmers (Tab R-247).

There was higher than normal boat traffic on the day of the 2000-yard surface swim (Tab R-27). This was attributed to the fact the swim was delayed from the normal 0600 start and "stay at home" restrictions associated with Corona Virus Disease 2019 (Tab R-27). As the group of students approached the 1500-yard buoy, SI1 on WV1 broke from the group of student swimmers to stop two boats from entering the training area from the north (Tab R-7). The two boats kept a safe

distance from all of the students and moved around without incident (Tab R-7). After directing these boats away from the students, SI1 stayed on the north side of the student swimmers watching for any additional boat traffic (Tab R-7).

Shortly after the swim began, SI5 on WV2 engaged a fishing boat approximately 200 yards to the east to ensure it did not enter the swim lane (Tab V-5.3). After directing the fishing boat away from the students, as the students approached the white yacht located between the 1000-yard and 500-yard buoys, SI5 positioned WV2 in front of the yacht (Tabs R-502 and V-5.4). As students approached, SI5 rode up to them on WV2 to warn them about the yacht and direct them safely around it (Tabs R-158 to R-159, R-486, R-502, R-524, and V-5.4).

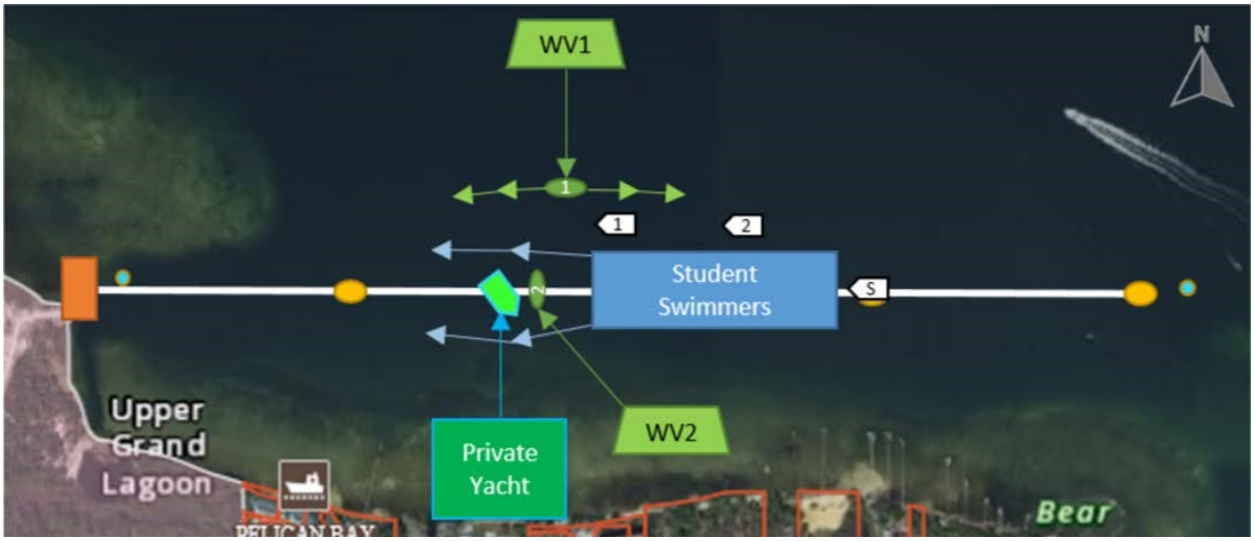

Figure 11 – Instructor Positions as Students Approached Yacht (Not to Scale)
(Tabs R-25 to R-26, R-85 to R-86, V-5.4, Z-11, Z-12 and Z-14 to Z-17)

The MA was seen by another student, ST12, between the 1000-yard buoy and the white yacht (Tabs R-420 to R-421 and V-23.3). ST12 was able to identify the MA by his roster number #2, which was taped to the rubber weapon on his back (Tab V-23.3). The MA was a stronger swimmer than ST12, so ST12 used the MA to help him keep his pace for approximately three to five minutes, or 150-300 yards (Tabs R-421, V-23.4, and V-23.5). To ST12, the MA appeared to be swimming without difficulty and exhibited no signs of distress (Tabs R-420 to R-421 and V-23.5). It was around the time that ST12 approached the white yacht when the MA pulled away from him and he lost sight of the MA (Tabs R-420 and V-23.5).

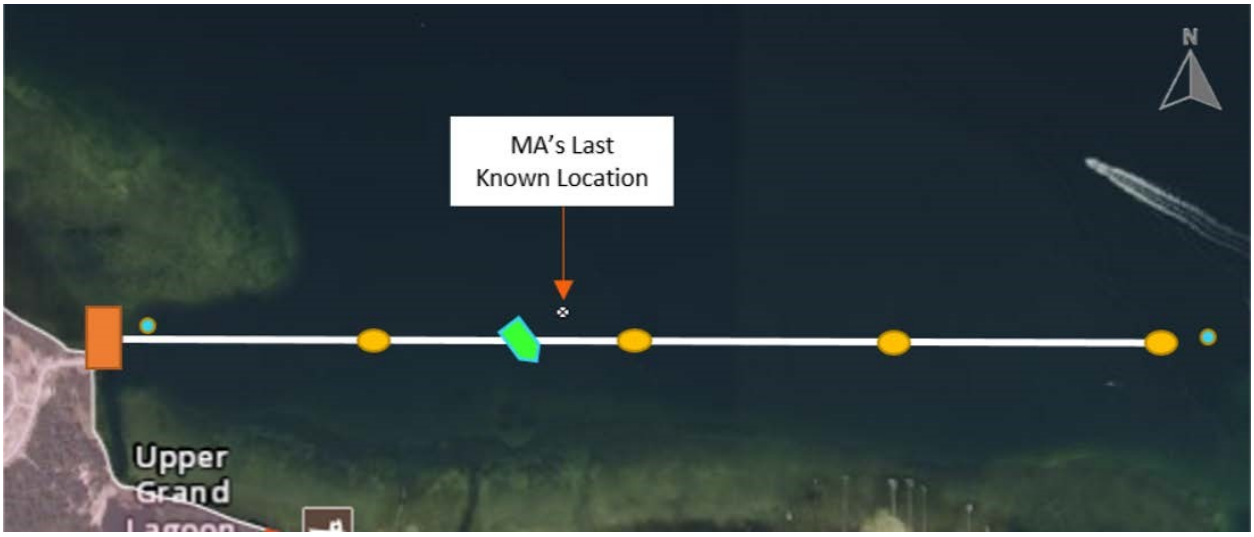

Figure 12 – MA's Last Known Location (Not to Scale)
(Tabs R-420, V-24.4, and Z-13, Z-18)

c. Search and Rescue (SAR)

When the lead swimmer was approximately 500 yards from the finish point, CDB1 transited to the barge to await the students as they completed the swim (Tab V-6.6). As students completed the surface swim, they touched the final buoy marker to receive their swim time from SI1 (Tab R-30). The students then reported their time to SI6, who recorded the times (Tab R-185). At approximately 1100L, SI6 told SI1 that there were five students who had not yet reported their swim times (Tab R-30 and R-185). SI1 responded that he only saw four swimmers remaining in the water (Tab R-30 and R-185). After three more students reported their swim times, SI6 told SI1 that two students still needed to report their times, but SI1 responded that he only saw one swimmer remaining (Tab R-30 and R-185).

SI6 then asked the instructors on CDB1 and CDB2 if the MA was on board either vessel (Tab R60 and R-203). Head counts were taken of all of the students on both CDBs and the MA could not be located (Tab R-42, R-125, and R-232). SI1 then went on WV1 to search the shoreline and shallow waters to the northwest, while SI5 on WV2 went to the southern shoreline (Tab R-8 and R-163 to R-164). The Sup Boat backtracked to the 2000-yard start point and followed the current back to shore in an effort to locate the MA (Tab R-61).

SI2 directed CDB1 to return the students on board to the AFCDS (Tab R-42). SI2 directed that CDB2 assist with the search and rescue effort by having the students on board walk the shoreline to search for the MA (Tab R-42).

After approximately ten minutes of searching for the MA, SI6 called the AFCDS superintendent, (SS), and informed him that there was a missing student and requested assistance for the SAR effort (Tabs R-185 and V-28.2). At 1115L, SS notified the NDSTC quarterdeck that the MA was

missing (Tab O-18). SI9 returned to shore to locate and operate an additional WaveRunner to assist in the search (Tab R-239).

At 1128L, the Navy notified the U.S. Coast Guard that the MA was missing and requested SAR support (Tab O-15 and O-18). A total of 87 personnel on 18 boats, a police helicopter, and a C130 engaged in the SAR effort, including assets from the Air Force, Navy, Marine Corps, Coast Guard, Florida Fish and Wildlife Conservation Commission (FWC), and Bay County Sheriff's Office (Tabs O-4, O-6, O-18 to O-19, and R-62). Five dive teams were utilized in the SAR mission (Tab R-62). ST12 informed SAR personnel of the MA's last known location (Tab R-420). At approximately 1200L, CDB2 returned its students to the AFCDS (Tab R-92).

After initial search efforts were unsuccessful, at approximately 1250L the on-scene commander called over the radio for all SAR personnel to rendezvous to coordinate a search plan (Tabs O-19, R-42, R-62, and R-207). It was decided that boats with side sonar capability would fan out to the north and move south scanning the training area (Tab R-42 and R-63). Other boats would position themselves on the north end of the bay, spread out 100-200 meters apart, and search moving to the south (Tab R-63). The divers were distributed among the non-sonar boats (Tab R-63). When a boat with sonar detected an object in the water, the closest boat with divers would respond to search the area (Tab R-63 and R-245). This method of searching continued until approximately 1430L (Tab R-63).

At approximately 1430L, several boats transited to the 2000-yard buoy, lined up approximately 100-200 yards apart, and searched toward the ammo pier along the swim path (Tab R-42 and R-64). This method of searching continued until approximately 1600L (Tab R-42 and R-64).

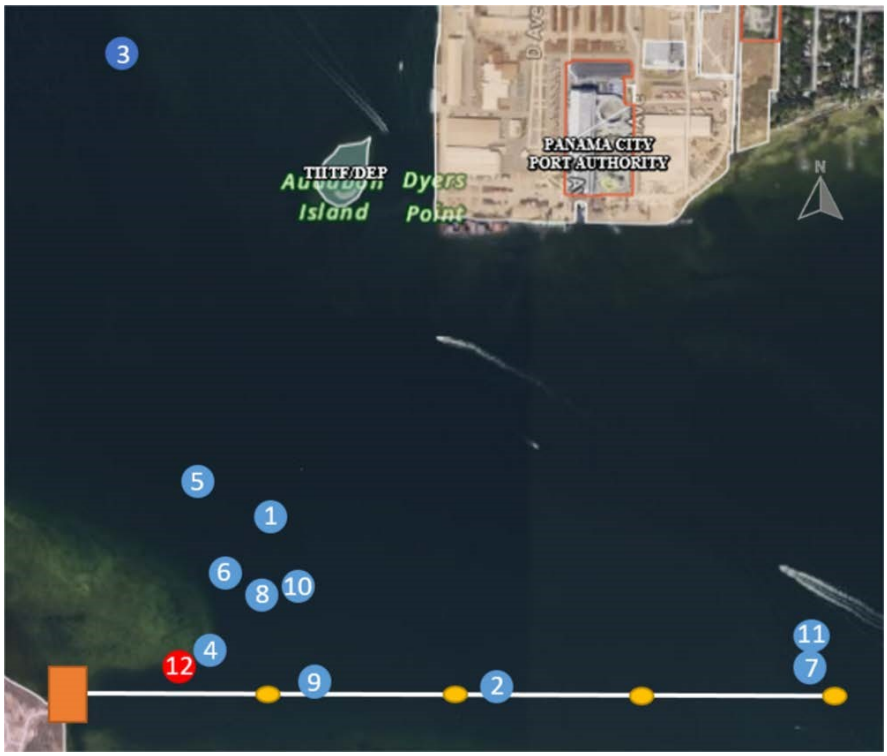

Figure 13 - Searched Locations (Blue) and MA Recovery Point (Red) (Tabs O-21 and Z-13)

At approximately 1615L, a FWC boat radioed that it detected an object on sonar that could potentially be the MA (Tab R-42 and R65). The Sup Boat transited to the location of the sonar hit and deployed DIVER, a U.S. Coast Guard diver, to investigate

(Tab R-65, R-293, and R-299). At approximately 1628L, DIVER located the MA resting on the bottom of St. Andrews Bay at a depth of approximately 15 feet (Tabs O-20, R-65, and R-293).

d. Recovery of Remains

Navy personnel assisted SI7 in bringing the MA on board the Sup Boat and onto a litter (Tabs R43, R-65, R-301, and V-27.8). SI2 observed that the MA exhibited signs incompatible with life and was unable to find a pulse (Tab R-43 and R-65). SI2 observed no signs of trauma or broken bones (Tabs R-65 and V-27.8). SI2 performed a visual check of the MA's dive gear, all of which appeared to be intact (Tabs R-43, R-65, and V-2.4). The MA's PFD also remained intact, with both CO2 cartridges still installed, with no indication the MA had pulled either of the activation lanyards or attempted to orally inflate the vest (Tabs R-43, R-65, R-293, and V-11.3).

SI2 requested a blanket, placed it on the MA, and buckled him to the litter (Tabs R-43, R-66, R293, and V-27.10). SI2 requested a U.S. flag, which SI3 retrieved, and a flag ceremony was performed for the MA on board the vessel (Tabs R-43, R-67, R-93, and V-27.10). A Navy doctor declared the MA deceased at 1630L (Tabs R-66 and X-3).

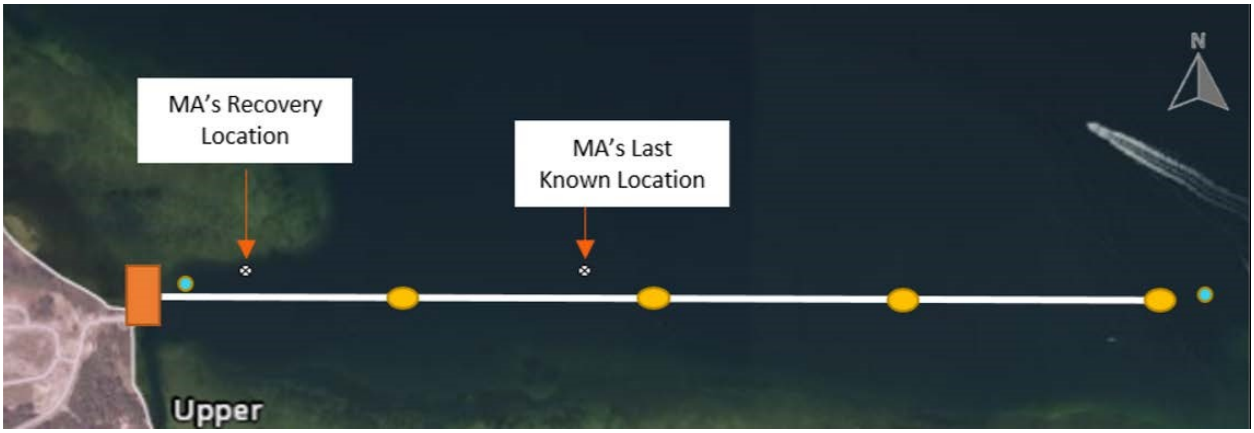

Figure 14 – MA's Last Known Location and Recovery Point (Not to Scale)
(Tabs O-21 and Z-18)

5. MAINTENANCE

Not Applicable.

6. EQUIPMENT, VEHICLES, FACILITIES, AND SYSTEMS

Figure 15 – Wetsuit Worn by MA (Tab Z-5)

In accordance with the AFCDC-OC POI, during the 2000yard surface swim the MA wore: Battle Dress Uniform (BDU), booties (sneakers), PFD with CO2 cartridges, whistle, mask, dive tool (knife), LBV, weapon, and fins (Tabs K-8 and DD-23). Additionally, the MA wore a 3mm wetsuit, which was optional (Tab R-54 and R-379). The dry weight of the gear worn by the MA in total was 30.4 lbs (Tab DD-23). This amount of weight created intentional negative buoyancy for the students participating in this event and partial inflation of the flotation vest was not permitted to mitigate (Tabs V-2.10, V-2.12, and DD-23).

a. Function

There is no evidence to indicate any swim gear malfunctioned at the time of the mishap (Tab DD23).

b. Maintenance History

MA's PFD is required to be inspected annually and prior to storage (Tab J-3). The PFD worn by the MA underwent its last annual inspection on 9 July 2019 with no identified deficiencies (Tab U-3). The PFD is also required to be inspected prior to and after diver operations (Tab J-9 and Tab J-11). A documented pre-inspection and post-inspection was conducted on 19 March 2020 (Tab O-41).

c. Condition

Figure 16 – PFD Worn by MA (Tab Z-6)

On 27 March 2020, all surface swimming equipment issued to and worn by the MA was checked postincident for proper swimmer fit and function (Tab O31 to O-40). All straps and slings were observed as clipped and fastened properly as to not impede the swimmer (Tab R-65 to R-66). The Navy A1-R inspection is a checklist driven inspection of a post-use PFD (Tab J-11 to J-12). The A1-R inspection conducted by the NDSTC covered all aspects of the PFD, including a full functionality test (Tab O-27 to O-29). Although corrosion was noted on several parts of the PFD, such corrosion is consistent with a vest unwashed for eight days following salt-water immersion (Tabs O-34 to O-38 and DD-23). Both left and right side inflation mechanisms functioned as designed (Tab DD-23). Independently, both CO2 cartridges fired upon activation, filling the PFD with CO2 as designed (Tab O-37 to O-38). Dunk testing indicated no leaks from the MA's PFD (Tab O-40). The safety whistle was attached to the PFD oral inflation hose (Tab O-31). The oral inflation hose was intact with knurl nut in the up position (Tab R-43). The PFD was properly fitted to the swimmer with both left and right side beaded activation handles accessible to the MA (Tabs R-65 and DD-23). All swim gear recovered from the mishap site was

intact, in serviceable condition, and there was no evidence the functionality or condition of any equipment was a factor in the mishap (Tab DD-23).

7. ENVIRONMENTAL CONDITIONS

a. Forecasted Weather

The forecasted weather used prior to the mishap could not be obtained (Tab DD-24). According to instructors, there was no significant weather in the forecast other than a possibility of fog the morning of 19 March 2020 (Tabs R-52, R-185, R-193, and V-2.5).

b. Observed Weather

At 1053L the air temperature was 78°F with a dew point of 65°F (Tab W-6). Humidity was at 64% with 14-knot surface winds steady out of the southeast (Tab W-6). Zero precipitation fell during the 2000-yard surface swim event and during the recovery (Tab W-6). Sky conditions were clear with nautical visibility recorded as 10 miles (Tab O-13). Water temperature was 76° with an incoming tidal current of ~2.28 knots with wave heights of 1ft (Tabs O-13 and R-193).

c. Restrictions, Warnings, and Procedures

None noted.

8. PERSONNEL QUALIFICATIONS

a. Mishap Airman (MA)

The MA enlisted in the USAF in June 2018 and graduated Basic Military Training in August 2018 (Tab O-23). He was selected for CCT in October 2018 and arrived at his first training location in November 2018 (Tab O-23). In December 2019, the MA graduated from the Combat Control Apprentice Course (Tab O-23). On 6 January 2020, the MA arrived at his new duty location at Hurlburt Field, Florida as a member of the STTS (Tab O-23). On 23 January 2020, the MA became
Physiological Training certified and on 9 March 2020 he graduated from Special Warfare PreDive Training school (Tab O-23). He arrived at the NDSTC on 15 March 2020 for the AFCDCOC (Tab R-312).

b. Primary Instructor (SI2)

SI2, assigned as the PI for the 19 March 2020 2000-yard surface swim, completed all requisite training to instruct at the AFCDS (Tab G-8 to G-9). SI2 completed the Instructor Qualification Course on 15 November 2019 (Tab G-8). SI2 completed AFCDC-OC Subject Matter Training on 6 January 2020 and the AF Combat Dive Supervisor Course on 6 March 2020 (Tab G-8). The 19 March 2020 event was the first time SI2 was assigned as the PI for the 2000-yard surface swim (Tabs G-8 and R-51).

c. Alternate Instructor (SI6)

SI6, assigned as the alternate instructor for the 19 March 2020 2000-yard surface swim, completed all requisite training to instruct at the AFCDS (Tabs G-20 and R-189 to R-190). SI6 completed the Community College of the AF Teaching Internship on 5 September 2012, and the AF Combat Dive Supervisor Course on 16 July 2018 (Tab G-20). SI6 was AFCDC Subject Matter Trained (SMT) for Open-Circuit on 5 April 2017 and Closed-Circuit on 27 April 2017 (Tab G-20). SI6 has been assigned to the AFCDS since September 2011 (Tabs G-20 and V-6.2).

d. Unit Instructor Supervisor (SI10)

SI10 completed all requisite training to instruct and serve as the instructor supervisor at the AFCDS (Tab T-5). SI10 completed a Community College of the AF Teaching Internship on 22 December 2009 and the AF Dive Supervisor Course on 16 July 2018 (Tab T-5). SI10 was AFCDC SMT for Open-Circuit on 5 April 2017 and Closed-Circuit on 27 April 2017 (Tab T-5). SI10 completed the Training Supervisor Course on 2 August 2011 (Tab T-5).

9. MEDICAL FACTORS

a. Qualifications

The MA held a current Flying Class III certification dated 26 September 2018 and a current Department of Defense (DoD) Form 2992, *Medical Recommendation for Flying or Special Operational Duty*, with an expiration date of 20 December 2020 (Tab X-3). The MA was medically qualified without restriction to participate in the AFCDC-OC (Tab X-3).

b. Health

There is no evidence in the medical history to suggest that the MA's physical or mental health had any bearing on the mishap (Tab X-3). The MA had been examined and treated for minor musculoskeletal disruptions common to individuals in the special warfare training pipeline, but none that were considered significant in relation to the mishap (Tab X-3).

The MA was reported to have used over the counter medication to aid with sleep (Tabs R-334 and X-4). There is no further evidence to suggest that lifestyle factors contributed to the mishap (Tab X-3).

c. Post-Mortem

1) Medical Examiner Report

The autopsy 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-3). The autopsy was performed at the 96th Medical Group, Eglin AFB, FL, at 0900 hours, Saturday 21 March 2020 (Tab X-3).

The MA was positively identified using dental record comparisons (Tab X-3). The MA did not sustain any notable external or internal injuries in the mishap (Tab X-3).

No other parties sustained injury in the mishap (Tab X-4).

2) Toxicology Analysis

At the time of autopsy, the MA had peripheral blood diphenhydramine (DPH) levels of 54 ng/mL and confirmed DPH in the urine (Tab X-4). The MA told ST1 on the morning of the mishap that he had taken two Unisom the night prior and expressed subjective fatigue at breakfast that morning (Tab R-334). The Unisom capsules in possession of the MA were 50mg gel caps (Tab Z-7).

DPH is the active ingredient found in the Unisom gel caps that were in the MA's possession (Tabs DD-11, and DD-15 to DD-17). DPH readily crosses the blood-brain barrier and influences H-1 histamine receptors in the central nervous system (CNS) that control arousal increases in the circadian cycle, reinforce learning and memory, and support balance, body temperature control, cardiovascular control, and mediation of stress hormone release (Tabs DD-12 to DD-13 and DD15). Suppression of the H-1 receptor function on these CNS pathways results in notable side effects of sedation, drowsiness, fatigue, and impaired concentration and memory, and can cause decreased cognitive and psychomotor performance (Tab DD-15).

Standard dosage of DPH for the treatment of insomnia in adults is 25-50mg taken at bedtime, not to exceed 100mg in a single dose (Tabs DD-10 to DD-12, and DD-13 to DD-15). DPH reaches peak blood concentrations approximately two hours after ingestion (Tab DD-13 and DD-17). The half-life elimination of DPH is long, ranging from 7-12 hours (average 9 hours) in healthy adults (Tab DD-10 to DD-11 and DD-13 to DD-17). Due to the extended half-life elimination time and side effect profile, the USAF aerospace medical community does not approve use of sedating antihistamines for personnel on flying or special operations status (Tab BB-7 to BB-14).

The estimated blood concentration thresholds required for DPH to cause sedation effects are assessed at 30.4-41.5 ng/mL, while the concentrations considered to produce mental impairment are calculated at 58.2-74.4 ng/mL (Tab DD-14 and DD-16). The blood levels of DPH in the MA at the time of his incapacitation and subsequent drowning are unknown, but the presence of the drug at autopsy approximately 46 hours after his death is consistent with the testimony of ST1 that the MA ingested two Unisom the night before the 2000-yard surface swim (Tabs R-334 and X-4). Post-mortem changes can affect blood concentrations of substances in the time interval between death and autopsy, so the level of DPH in the MA's blood measured during the autopsy cannot reliably indicate the actual levels at time of death. (Tab DD-5 and DD-16). These changes are widely unpredictable and can result from degradation of the substance itself or a modification of the equilibrium levels between blood and tissues as barriers break down within the body (Tab DD5 and DD-16).

All other toxicology testing from event staff was negative (Tab X-4).

d. Incapacitation Analysis

Incapacitation is defined as the physiological inability to perform complex and longer lasting movements independent of consciousness or intention (Tab DD-19). Although the exact cause is unknown, an incapacitating event occurred during the 2000-yard surface swim that rendered the MA unable to signal, visibly struggle, or actuate his PFD prior to submersion, sinking, and ultimately drowning (Tabs R-36, R-67, X-3 to X-4, DD-5, DD-9, and DD-16 to DD-19).

The MA incurred a variety of mild musculoskeletal issues while he was in the combat control training pipeline (Tab X-3). It was noted by his fellow students that he had been complaining about and frequently stretching out his sore/tight hip flexors (Tabs R-351, R-373, R-407, V-12.7 to V-12.8, and V-20.2 to 20.3). Despite his complaints, the MA had been able to perform well on the AFSOC fitness test administered on 16 March 2020 and the 1000-yard surface swim on 18 March 2020 (Tabs K-58 and T-3).

As a community, special warfare operators are driven, highly-motivated individuals who strive to push themselves to the limits of their physical abilities (Tab V-10.12). The MA was no exception, and fellow classmates classified him as one of the smartest and strongest in the class (Tabs R-333, R-389, R-394, R-435, and R-459).

The MA elected to wear a full 3mm wetsuit during the 2000-yard surface swim to increase his buoyancy in the water (Tabs R-385, R-391, V-15.4, and V-16.3). Several students noted the benefits of wearing wetsuits included increased buoyancy and warmth in cold environmental conditions, while a potential drawback was the risk of becoming uncomfortably warm if swimming/training aggressively in warm weather (Tab V-13.6 to V-13.7, V-14.4, V-20.3, and V23.5). Although the weather and water conditions on the day of the mishap event were mild, an exertional heat injury or other thermal event cannot be eliminated as a factor in the incapacitation of the MA (Tabs F-6 to F-7, F-12, and DD-6 to DD-9).

Exertional heat injuries most commonly occur in the setting of strenuous exercise in a warm environment, often with facets of dehydration, lack of prior acclimatization, and external loading with clothing, equipment, and protective gear (Tab DD-6 to DD-9). The possibility of a heat injury can be increased by drugs and other substances that impair sweating (poikilothermic), cause impaired cardiac performance, increase heat production, trigger electrolyte imbalances, and decrease perception of fatigue (Tab DD-6 to DD-9). Studies of open-water competitive swimmers show that swimming at higher intensity (>50% max effort) inhibits the ability of sweat to evaporate paired with reduced convection and conduction rates in the water, yielding increased heat gain if swimming in warmer water (Tab DD-7 to DD-8). Development of fatigue from exercise in the heat is multifactorial and associated with several physiologic processes; but the probability is amplified when combined with gear that both inhibits heat release and adds weight/drag, substances that can alter thermoregulation and psychomotor performance (antihistamine), and drive to perform at maximal effort (Tab DD-6 to DD-9).

e. Drowning Analysis

Forensic pathology investigation of drowning cases is complicated as the diagnosis is one of exclusion – requiring medical ruling out of specific other causes – and the root cause of what incapacitated the victim may not be discoverable (Tabs X-3 to X-4, DD-2 to DD-3, and DD-5). External findings in drownings are variable, non-specific, and non-diagnostic (Tab DD-3 and DD5). Bodies recovered from cool, deeper water may have little sign of decomposition, which gives medical examiners the greatest chance to determine the cause of drowning (Tab DD-3 and DD-5).

A risk factor to incapacitation and drowning, particularly in young and healthy swimmers, is the practice of hyperventilation in order to prolong capability to swim underwater without taking another breath (Tab DD-3 to DD-4 and DD-6). Assuming exclusion of other causes for unconsciousness in this situation, the phenomenon is called hypoxic blackout – a condition commonly seen during breath-holding training, competitive race events, endurance underwater swimming or diving and with a large number annually reported in conjunction with military training (Tab DD-5). There was no evidence from those who knew the MA to suggest that he intended to purposefully hyperventilate in order to improve underwater swimming performance (Tab V-23.11).

Both SI2's exam of the MA upon recovery, as well as the autopsy exam, revealed no signs of trauma to the MA's body externally (Tabs R-66, V-27.8 to V-27.9, and X-3 to X-4). There were no fractures to any bones and no evidence of head trauma of any kind (Tab X-3 to X-4). The MA's lungs were the only organ system that appeared abnormal and were indicative of drowning (Tabs X-3, DD-2, and DD-5). There was no evidence the MA suffered from a heart attack, stroke, or pulmonary embolus (Tab X-3 to X-4). The evidence suggests the MA did not have a seizure or engage in vigorous struggle in the process of incapacitation and drowning (Tab DD-3). The findings of the autopsy do not support a diagnosis of heatstroke, but does not rule out heat as a factor (Tabs X-3 to X-4 and DD-7 to DD-9).

10. OPERATIONS AND SUPERVISION

a. Operations

The day's training events were scheduled in accordance with established norms (Tab K-21). All instructors were appropriately qualified to administer the 2000-yard surface swim training event (Tab G-3 to G-36). The minimum instructor requirement for the training event was satisfied (Tabs K-8, R-41, and R-238). Neither the AFCDC Air Force members nor the contract personnel were affected by any unusual pace of operations (Tab R-13 to R-16, R-41, R-54 to R-57, R-150 to R152, and R-193 to R-197). The PI delayed the 2000-yard surface swim due to possible fog in the training area to ensure proper surface visibility prior to event start (Tab R-52).

1) Buddy Pairs and Buddy Lines in Surface Swim Operations

The AFCDC-OC POI mandates the use of buddy pairs during the 2000-yard surface swim (Tab K-10). In addition, buddy lines are listed as training equipment for the event (Tab K-8). However,

neither buddy pairs nor buddy lines had been utilized during AFCDC-OC surface swims since February 2019 (Tab V-2.7 to V-2.8 and V-9.4). There is an apparent conflict in the POI's description of the 2000-yard surface swim: the POI mandates the use of buddy pairs, but also characterizes the progress check as an individual evaluation (Tab K-10). This conflict has created an inconsistent understanding of the guidance among the AFCDS staff (Tabs R-96 to R-100, R132, R-275, V-1.7 to V-1.14, V-2.7 to V-2.8, V-10.7 to V-10.8, and V-25.8). Some AFCDS instructors viewed swimming in buddy pairs to be inappropriate when conducting an individual evaluation of students (Tabs R-35, V-1.10 to V-1.12, V-2.8, V-3.7 to V-3.8, V-9.3 to V-9.6, V10.8, and V-25.8).

Two weeks prior to the mishap event, several instructors at the AFCDS engaged in a discussion related to the use of buddy pairs and buddy lines (Tabs V-1.7 to V-1.8 and V-2.18). At the conclusion of the discussion, the prevailing sentiment was that buddy pairs and buddy lines would be used for the 2000-yard surface swim (Tabs K-21, R-15, and V-1.8). SI2 finalized the warning order (WARNO) for the training event reflecting this decision (Tabs K-21, V-1.7, and V-2.18). Two days prior to the mishap, SI6 presented the students with the classroom lesson on surface swims (Tabs K-6, V-1.8, and V-1.10). The approved slide presentation for this block of instruction listed buddy pairs and buddy lines; however, SI6 verbally briefed the students neither would be used for surface swim events (Tabs K-24, K-27, V-1.8, and V-1.10).

This verbal contradiction to posted and printed guidance during the briefing contributed to instructor confusion related to the requirement for buddy pairs and the conditions under which buddy lines would be used (Tab V-1.8). After SI6's brief, SI1 addressed the issue with SS, who confirmed that buddy lines would not be used for surface swims (Tab V-1.10 and V-9.4). SS affirmed that all surface swims are individual assessments (Tabs V-1.10 and V-9.3 to V-9.4). The agreed justification of not having an assigned swim buddy is that all students will maintain 360 degree situational awareness at all times while in the water (Tabs R-275, V-1.11, V-10.5, V-25.8, and V-27.13).

The POI lists buddy lines under the 2000-yard surface swim's "Training Equipment" section; however, there is no substantive discussion as to when and under what circumstances buddy lines must be used (Tab K-8 to K-10). Also listed under "Training Equipment" is the 3mm wetsuit, which instructors understood as mandatory only when water temperature is below a certain level (Tabs K-8, K-27, V-6.5, and V-6.16). Instructors at the AFCDS understood buddy lines to be similarly optional at the discretion of the PI (Tabs R-16 to R-17, V-1.11, and V-10.6).

As of 19 March 2020, there had been no formal amendment to the POI eliminating the requirement to utilize buddy pairs or to clarify the usage of buddy lines for surface swims (Tabs V-10.10 to V10.11, V-25.15, and EE-3 to EE-21).

2) AFCDC-OC Risk Management (RM)

The AFCDS implements RM at two levels: 1) Deliberate RM that was approved with the curriculum; and, 2) real-time RM conducted at the time of briefing or execution of a training event (Tabs K-51 to K-56, BB-3 to BB-5, and BB-19).

The most recent published Deliberate RM guidance is dated 28 June 2016 (Tab BB-19). Since that time, there were two official curriculum changes to the AFCDC-OC (Tab V-25.4 to V-25.6 and V-26.2 to V-26.5). The Deliberate RM policy includes a matrix of risk mitigation measures applicable to all AFCDC-OC training events (Tab BB-3 to Tab BB-5). One section in the matrix addresses risk mitigation measures to be implemented during "surface swimming and open circuit jock up" (Tab BB-3). This section does not make any reference to the use of buddy pairs or buddy lines during surface swim events (Tab BB-3). There is a later section, however, titled "Lost swimmer: Drowning," that directs that, "Students must be in buddy teams connected with a buddy line, buoy line, and buoy or be surface tended" (Tab BB-4). Given that surface tending is normally associated with diving events, and in consideration of the independent surface swimming section in the matrix, it is unclear whether the directives in the "Lost swimmer: Drowning" section were intended only for diving events or were meant to apply to surface swimming events as well (Tab DD-23 to DD-24). The AFCDS leadership did not utilize buddy pairs or buddy lines as risk mitigation measures during the 19 March 2020 surface swim (Tab V-1.11 to V-1.12, V-2.6, and V-24.3).

Daily real-time RM worksheets are used to assess the risks associated with any given iteration of a training event, taking into consideration environmental factors such as weather, tides, and water temperature (Tabs K-51 to K-56, R-192, R-269 to R-270, R-285, and BB-19). When completing an RM worksheet, instructors note hazards, risk levels, and safety controls not already outlined in the Deliberate RM Matrix (Tab K-51 to K-56). On 19 March 2020, prior to the 2000-yard surface swim, SI2 lined through all blocks on the RM worksheet and did not note any additional risks or mitigation measures; SI10 then concurred on the RM worksheet (Tabs K-56 and R-55).

b. Supervision

The PI completed all prerequisite training to perform duties as a PI for the 2000-yard surface swim (Tab G-8 to G-9). The PI ensured that all students were physically prepared to accomplish the training evolution for the day (Tab R-41).

Air Force units regularly undergo Unit Effectiveness Inspections (UEIs) and Staff Assistance Visits (SAVs), which are conducted to allow supervisory commanders an opportunity to observe how a subordinate unit is executing its mission (Tab BB-26 to BB-28). The AFCDS had not undergone a UEI or SAV since the AFCDC-OC POI was first implemented in 2017 (Tab R-266 and R-282). Although USSOCOM conducted a Joint Special Operations Forces (SOF) Assessment Team (JSAT) visit in February 2019, this did not satisfy the overall intent of a UEI (Tab R-266 and R-283).

11. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Publically Available Directives and Publications Relevant to the Mishap

(1) AFI 51-307, *Aerospace and Ground Accident Investigations,* 18 March 2019

(2) AFI 91-204_AFGM2019-01, *Safety Investigation and Hazard Reporting,* 30 July 2019

(3) AFI 48-123, *Medical Examinations and Standards,* 5 November 2013

(4) AFI 48-151, *Thermal Injury Prevention Program,* 22 April 2020

(5) AFI 90-201, *The Air Force Inspection System,* 20 November 2018

(6) AETCI 36-2651, *Basic Military Training and Technical Training,* 8 August 2019

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) Navy Diving Manual, Volume 1, *Diving Principles and Policy*

(2) USSOCOM Manual Number 350-4, Volume 1, *Special Operations Forces Baseline Interoperable Combat Diving Training Standards,* 7 April 2017

(3) 350 SW TS Operating Instruction 36-3b, *Special Warfare Airmen Preparatory Handbook*, 21 October 2019

(4) Air Force Combat Dive Course – Open Circuit Plan of Instruction, 18 March 2019

c. Known or Suspected Deviations from Directives or Publications

1) MA's Ingestion of Unisom Sleep Aid (DPH)

MA ingested two 50mg caps of Unisom the night before the mishap, without any medical authorization (Tabs R-334 and X-4). Air Force Instructions and AFCDC policy prohibit students and operators on flight status to take medications such as DPH without the permission of a doctor. These prohibitions are in AFI 48-123, para 6.21.3, and the Special Warfare Airmen Preparatory Handbook, para 6.11.

2) Failure to Implement Use of Buddy Pairs

The AFCDC deviated from written policy when they did not implement the use of buddy pairs during the 2000-yard surface swim training event on 19 March 2020.

Air Education and Training Command Instruction 36-2651, para. 2.28.1, requires instructors to provide training in accordance with approved plans of instruction. The AFCDC-OC POI instructional guidance to training "OBJECTIVE 3g" states, "Brief students that although students will be in groups this is an individual evaluation and requires each student to complete all tasks successfully. Also brief students that they will swim in buddy pairs for surface swim and that pairs will be determined from the AFSOC PT 1500m surface swim or 1000yd surface swim in combat gear (LBV, weapon, BC/UDT, BDUs)" (Tab K-10 and K-24).

AFCDS staff did not assign buddy pairs prior to the 2000-yard surface swim on 19 March 2020 and buddy pairs were not utilized as a safety mitigation measure during the training event (Tab V1.11 to V-1.12, V-2.6, V-10.5, and V-24.3).

20 May 2020

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President, Ground Accident Investigation Board

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