

UNITED STATES AIR FORCE
AIRCRAFT ACCIDENT INVESTIGATION
BOARD REPORT



SC-7 SKYVAN III-200, T/N N46LH
17TH SPECIAL TACTICS SQUADRON
24TH SPECIAL OPERATIONS WING
FORT BENNING, GEORGIA



LOCATION: ELOY, ARIZONA
DATE OF ACCIDENT: 21 FEBRUARY 2014
BOARD PRESIDENT: MAJ GEN J. MARCUS HICKS
Conducted IAW Air Force Instruction 51-503

**EXECUTIVE SUMMARY
PARACHUTING ACCIDENT INVESTIGATION**

**SC-7 SKYVAN III-200, T/N N46LH
ELOY, ARIZONA
21 FEBRUARY 2014**

On 21 February 2014, at approximately 0853 local time (L), a Tactical Air Control Party Military Free-Fall (MFF) Jumpmaster died during an inadvertent parachute extraction from a contracted SC-7 Skyvan III-200, tail number (T/N) N46LH, using an MC-4 Parachute, while leading an MFF Canopy-Control Course at SkyDive Arizona in Eloy, Arizona (AZ). The mishap jumper (MJ) was a member of the 17th Special Tactics Squadron, Air Force Special Operations Command, assigned to Fort Benning, Georgia.

En route to the drop zone with the mishap aircraft (MA) approaching 9,700 feet mean sea level, the MJ stood and gave the “10 minute” warning and winds call, followed by the “don equipment (rucksack)” command. The MJ opened the Plexiglas ventilation door between the aft cargo door and aircraft floor and sat down on the seat next to the door to don his own rucksack. At approximately 0853L, the MJ made a comment causing the jumper sitting across the aisle to look up and see the MJ’s reserve parachute ripcord handle partially pulled and attached to, or overlaid on, the MJ’s rucksack quick-release shackle. The MJ’s reserve parachute top closing flap had popped open above the MJ’s shoulder, but the pilot chute was still contained between the MJ and aircraft inner wall. As the MJ leaned forward, the spring-loaded pilot chute popped up and fell directly through the open ventilation door taking the reserve parachute with it. In roughly two seconds, the MJ was extracted through the ventilation door opening—tearing off his rucksack, damaging the aft cargo door, and killing him instantly. The MJ landed under a fully inflated reserve parachute at about 0905L, southeast of Eloy, AZ. Both military and civilian emergency responders were immediately on scene, but local emergency medical services declared the MJ dead at 0924L. No other individuals were injured or killed in the mishap. The aircraft suffered the only damage to private property during the mishap.

The MJ was a highly trained MFF jumpmaster, acting in accordance with the best practices of the MFF jumpmaster community. The Accident Investigation Board (AIB) president found, by clear and convincing evidence, the mishap was caused by the MJ inadvertently pulling his reserve parachute ripcord while donning his rucksack in close proximity to the open ventilation door, which was of sufficient size for a parachute to pass through, but not large enough for safe passage of a person.

Additionally, the AIB president found, by a preponderance of evidence, one factor that substantially contributed to the mishap. This factor consists of the opening of the ventilation door without also immediately opening the cargo door, and prior to the time when all jumpers were prepared to depart the aircraft. The opening of the ventilation door in this manner did not violate either military or civilian guidance, but substantially contributed to the mishap.

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

SUMMARY OF FACTS AND STATEMENT OF OPINION
SC-7 SKYVAN III-200, T/N N46LH
21 FEBRUARY 2014

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ACRONYMS AND ABBREVIATIONS

17 STS	17th Special Tactics Squadron	KIAS	Knots Indicated Air Speed
24 SOW	24th Special Operations Wing	kts	Knots
AF	Air Force		
AFE	Aircrew Flight Equipment	Lt Col	Lieutenant Colonel
AFI	Air Force Instruction	LLC	Limited Liability Corporation
AFJ	Air Force Joint Publication	L	Local Time
AFMAN	Air Force Manual	MA	Mishap Aircraft
AFSOC	Air Force Special Operations Command	MC	Mishap Jump Crew
AFTO	Air Force Technical Order	MC-4	MC-4 Ram Air Free-Fall Personnel
AGL	Above Ground Level		Parachute System
AIB	Accident Investigation Board	METAR	Meteorological Reports
AMC	Air Mobility Command	MFF	Military Free-Fall
AZ	Arizona	MFF-JM	Military Free-Fall Jumpmaster
BRIG GEN	Brigadier General	MFF-CCC	Military Free-Fall Canopy
Capt	Captain		Control Course
CAC	Common Access Card	MJ	Mishap Jumper
CFR	Code of Federal Regulations	MM	Mishap Maintainer
COR	Contracting Officer Representative	MP	Mishap Pilot
		MSL	Mean Sea Level
DoD	Department of Defense	NOTAMs	Notices to Airmen
DoDI	Department of Defense Instruction	NVGs	Night Vision Goggles
DZ	Drop Zone	ORM	Operational Risk Management
DZSO	Drop Zone Safety Officer	PPPM	Personnel Parachute Program Manager
EMS	Emergency Medical Services	SME	Subject Matter Expert
F	Fahrenheit	SOCOM	Special Operations Command
FAA	Federal Aviation Administration	SOF	Special Operations Forces
FAR	Federal Aviation Regulation	SOW	Special Operations Wing
FL	Florida	ST	Special Tactics
GA	Georgia	STG	Special Tactics Group
HAHO	High-Altitude High-Opening	STS	Special Tactics Squadron
HALO	High-Altitude Low-Opening	TACP	Tactical Air Control Party
HFACS	Human Factors Analysis and Classification System	T/N	Tail Number
		T.O.	Technical Order
Hg	Mercury	USSOCOM	United States Special Operations Command
IAW	In Accordance With		
JM	Jumpmaster		
JMPI	Jumpmaster Personnel Inspections		

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

SUMMARY OF FACTS

1. AUTHORITY AND PURPOSE

a. Authority

On 25 February 2014, Major General Norman J. Brozenick, Jr., Vice Commander, Air Force Special Operations Command (AFSOC), appointed then Brigadier General J. Marcus Hicks to conduct an accident investigation of a fatal parachuting mishap that occurred on 21 February 2014 involving a contracted SC-7 Skyvan III-200, tail number (T/N) N46LH. The mishap jumper used an MC-4 Ram Air Free-Fall Personnel Parachute System during a Military Free-Fall Canopy-Control Course (MFF-CCC) conducted at SkyDive Arizona in Eloy, Arizona (AZ). On 24 March 2014, the accident investigation board (AIB) convened at Hurlburt Field, Florida (FL). A legal advisor, medical officer, aircrew flight equipment (AFE)/rigger, jumpmaster (JM), and a recorder were also appointed to the board (Tab Y-3 to Y-4, Y-10, Y-11). Additionally, a jumpmaster and contract management functional area expert were appointed to the board (Tab Y-6, Y-8). The accident investigation was conducted in accordance with (IAW) Air Force Instruction (AFI) 51-503, *Aerospace Accident Investigations*.

b. Purpose

This is a legal investigation convened to inquire into the facts surrounding the aircraft or aerospace accident, to prepare a publicly-releasable report, and to gather and preserve all available evidence for use in litigation, claims, disciplinary actions, administrative proceedings, and for other purposes IAW AFI 51-503, paragraph 1.2.

2. ACCIDENT SUMMARY

On 21 February 2014, at approximately 0853 hours local time (L), a Tactical Air Control Party (TACP) MFF Jumpmaster (MFF-JM), hereinafter referred to as mishap jumper (MJ), died during an inadvertent parachute extraction from an SC-7 Skyvan. The mishap jumper used an MC-4 Ram Air Free-Fall Personnel Parachute System, during an MFF-CCC conducted at SkyDive Arizona (Tabs P-2, V-3.3, X-3, BB-26 to BB-35, DD-15 to DD-20, EE-3). En route to the drop zone (DZ) with the mishap aircraft (MA) approaching 9,700 feet mean sea level (MSL), the MJ inadvertently deployed his reserve parachute while donning his rucksack (Tabs V-1.4, V-3.10, V-4.17, V-6.25, V-7.5, V-8.4, V-16.5, Z-3, Z-4). The reserve parachute was pulled through a ventilation opening at the base of the cargo door and rapidly extracted the MJ causing fatal injuries when he impacted the ventilation opening (Tabs V-1.4, V-4.11, V-6.9, V-6.19, V-6.21, V-6.26, V-7.5, V-7.12, V-8.4, V-10.8, S-2, U-3, X-3). The MA suffered damage during the extraction of the MJ (Tabs U-3, S-2). The MJ's parachute, harness, rucksack and altimeter were severely damaged during the mishap, with the government's loss valued at \$5,308 (Tab P-2). The mishap pilot (MP) and the nine remaining members of the mishap jump crew (MC) landed safely (Tab V-16.6). No other individuals were injured or killed in the mishap.

3. BACKGROUND

The MJ was an Air Force Special Tactics Airman, a TACP member, a Ranger, Pathfinder and qualified MFF-JM, who was assigned to the 17th Special Tactics Squadron (STS), 720th Special Tactics Group (STG), 24th Special Operations Wing (SOW), Air Force Special Operations Command, stationed at Fort Benning, Georgia (GA) (Tab EE-3 to EE-4, EE-27). He was a 16-year veteran with 10 combat deployments to Iraq and Afghanistan where he earned three Bronze Star Medals, two Joint Service Commendation Medals with Valor, two Air Force Commendation Medals, and an Army Commendation Medal (Tab EE-3 to EE-4, EE-39 to EE-40). At the time of the mishap, the MJ was performing JM duties during an MFF-CCC conducted by SkyDive Arizona under AFSOC contract FA0021-13-C-0002 (Tabs BB-26 to BB-35, DD-15 to DD-20, EE-38, K-17, V-3.3). A services contract with the United States Air Force required SkyDive Arizona to provide a set amount of canopy control instruction, airlift and landing zone for a designated period of time (Tab BB-26 to BB-35).

The MA was owned by SkyVenture Arizona, a Limited Liability Corporation (LLC), and operated by SkyDive Arizona, Inc., on the day of the mishap (Tabs U-4, V-10.5).

a. Air Force Special Operations Command

AFSOC, headquartered at Hurlburt Field, FL, is one of ten major Air Force (AF) commands. It is the Air Force component of United States Special Operations Command (USSOCOM), a unified command located at MacDill Air Force Base, FL. AFSOC provides Air Force Special Operations Forces (SOF) for worldwide deployment and assignment to regional unified commands. The command's 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-3, CC-4).



AFSOC's unique capabilities include special tactics (ST) squadrons that combine combat controllers, TACP members, special operations weathermen and pararescuemen with other service SOF to form versatile joint special operations teams (Tab CC-3, CC-4).

b. 24th Special Operations Wing

The 24th Special Operations Wing is one of three Air Force active duty special operations wings assigned to Headquarters AFSOC. The 24 SOW is based at Hurlburt Field, FL (Tab CC-5, CC-6).



The primary mission of the 24 SOW is to provide ST forces for rapid global employment to enable airpower success. The 24 SOW is USSOCOM's tactical air/ground integration force and the Air Force's special operations ground force to enable global access, precision strike and personnel recovery operations (Tab CC-5, CC-6).

c. 720th Special Tactics Group

The 720th Special Tactics Group is an integral part of AFSOC and is home-based at Hurlburt Field, FL. The group is comprised of more than 800 ST combat controllers, pararescuemen, special operations weathermen, TACP members and various support personnel (Tab CC-7).



The 720 STG organizes, trains, and equips ST forces worldwide to integrate, synchronize, and/or control the elements of air and space power in the area of operations. It also provides long-range operational and logistics planning, and deploys command and control elements during ST force employment or deployment (Tab CC-7).

d. 17th Special Tactics Squadron

The 17th Special Tactics Squadron is AFSOC's only dedicated TACP squadron and is made up of approximately 60 TACP Airmen and support staff. TACP members with the 17 STS deploy with the 75th Ranger Regiment (Tab CC-8).



STSs are specifically organized, trained, and equipped to execute a myriad of Special Operations missions to enhance air operations deep in enemy territory. They conduct personnel recovery missions, collect intelligence and provide terminal guidance for attacks against valuable enemy targets (Tab CC-7).

e. SC-7 Skyvan III-200

The SC-7 Skyvan III-200 is a 20-seat twin-turboprop aircraft manufactured by Short Brothers & Harland Limited of Belfast, Northern Ireland, United Kingdom, currently registered and owned by SkyVenture Arizona, LLC. The MA was operated by SkyDive Arizona (Tabs U-4, V-10.5, CC-9, FF-3 to FF-6).



f. MC-4 Military Free-Fall Parachute Operations

AFSOC conducts military parachute operations as a means of aerial delivery for both personnel and equipment during peacetime and combat operations. Parachutists must receive formal military training and be authorized to participate in such operations. Once qualified, static line and Military Free-Fall (MFF) parachutists are required to jump once each quarter to maintain proficiency and hazardous duty pay. Parachutists can receive additional training and perform JM duties upon qualification (Tab BB-12).



The MJ was equipped with an MC-4 Ram Air Free-Fall Personnel Parachute System (MC-4) at the time of the mishap (Tabs P-2, S-4, S-18). The MC-4 is the AFSOC High Altitude Low Opening (HALO)/High Altitude High Opening (HAHO) MFF parachute system of record (Tab BB-15)

4. SEQUENCE OF EVENTS

a. Mission

The MFF-CCC conducted at SkyDive Arizona emphasizes HALO and HAHO parachute jump, aircraft exiting, canopy flight patterns, stacking, canopy control (individually and as a working group), approach, and landings using an MC-4 Parachute (Tab BB-28, BB-29 to BB-32). The mishap jump was the 18th MFF jump of the MFF-CCC and the second scheduled jump on the day of the mishap (Tabs K-4, K-14, V-3.5, V-3.9, V-6.7, EE-38). The MJ was the primary JM and team leader for the MFF-CCC scheduled to be conducted at SkyDive Arizona from 17 February 2014 to 28 February 2014 (Tabs K-17, V-3.3, V-3.4, BB-26 to BB-35, EE-38). The MFF-CCC is designed to improve and sustain HALO and HAHO proficiency (Tabs V-3.3, BB-28, BB-31 to BB-32, EE-38).

b. Planning

The MJ briefed the mission as a daytime, combat equipment HALO jump from an altitude of 12,000 feet above ground level (AGL), with a parachute deployment “pull” altitude of 4,000 feet AGL, and a requested release airspeed of 130 knots (kts) indicated airspeed (KIAS) (Tabs K-4, V-8.3, V-8.7, V-16.8). The MJ, acting as the primary JM, would be seated in the MA’s left aft-most seat, closest to the aft cargo door (Tab V-6.17, V-8.2). The flight was scheduled to take approximately 15 minutes between take-off and the planned jump altitude. Given this short amount of time, the MJ modified the standard time warnings by making the “20 minute” warning call on the ground and combining the “10 minute” warning, “don equipment” command, and winds call (Tabs V-3.10, V-3.13, V-3.14, V-8.4, GG-4). While AFMAN 11-411 indicates that the “don equipment (rucksack)” command occurs with the 20-minute warning, it also specifically notes that the “20 minute” command may be given prior to takeoff. (Tab BB-20). [Note that AFMAN 11-411 defines the “20 minute” command as “Stay alert and don equipment as directed” providing some inherent flexibility in the command.] (Tab BB-20). Furthermore, modified and condensed timelines are common in MFF training when using both civilian and military jump platforms (Tab GG-4). The MJ gave all required JM briefings conducted IAW and utilizing the Air Force Manual (AFMAN) 11-411, *Military Free Fall Operations* (Tabs V-3.10, V-3.13, V-3.7, V-8.3, V-8.4, BB-20).

c. Preflight

The MJ’s parachute was inspected and repacked IAW AFI 11-301V1, *Aircrew Flight Equipment Program*, and Technical Order (T.O.) 14D1-2-468-2 (Tabs V-13.3, V-13.4, V-14.3, BB-49 to BB-114). At approximately 0800L on the day of the mishap, the MJ and MC donned parachutes in preparation for their second MFF jump of the day (Tabs K-14, V-1.3, V-3.2, V-3.9, V-6.7, V-6.8, V-6.24, V-6.25, V-7.5, V-8.4, V-15.3, GG-3). Proper wear for all jumpers was confirmed through Jumpmaster Personnel Inspections (JMPI) (Tab V-3.2, V-3.9). The MJ and MC then

loaded the tram and proceeded to the MA (Tab V-6.25, V-10.11). Following a jump rehearsal “dirt dive,” the MC loaded the MA with their rucksacks unattached (Tab V-6.8, V-7.5).

The MA was serviced and preflighted IAW existing SkyDive Arizona guidance (Tab D-2, D-4 to D-10). There were no issues with the MA during preflight, in-flight, or post-flight operations on 21 February 2014 (Tab V-16.5, V-16.8). There is no evidence to suggest the flight plan or preflight procedures were factors in the mishap (Tab V-16.5, V-16.8).

d. Summary of Accident

At approximately 0842L the MA departed the airfield en route to the Drop Zone (DZ) near Eloy, AZ (Tabs K-14, V-16.5). En route to the DZ with the MA approaching 9,700 feet MSL, the MJ stood and gave the “10 minute” warning and winds call, followed by the “don equipment (rucksack)” command as planned (Tabs V-1.4, V-3.10, V-4.15, V-6.25, V-7.5, V-8.4, V-16.5, Z-3, Z-4). The MJ then opened the Plexiglas ventilation door between the aft cargo door and aircraft floor, as allowed by SkyDive Arizona guidance, and sat down on the seat next to the door to don his own rucksack (Tab V-1.3, V-1.4, V-1.5, V-3.4, V-3.5, V-3.8, V-6.8, V-6.17, V-8.9, V-11.4, V-12.4). The cargo door was not opened immediately after opening the ventilation door (Tab V-1.4, 4.11, V-6.8, V-6.13, V-6.14, V-7.5, V-8.4). Testimony indicated that the Plexiglas door was likely opened without also opening the cargo door, at least in part, because the cabin was beginning to get warm and/or because there were fumes (Tab V-4.11 and V-6.8). According to SkyDive Arizona guidance, it was common practice to open the Plexiglas door for ventilation above 1,500 feet AGL (Tab V-3.4, V-8.3, V-11.4, V-16.6, V-16.7). No evidence indicates that there was any requirement to don equipment prior to opening the Plexiglas door, nor any requirement to open the ventilation door in conjunction with the cargo door.

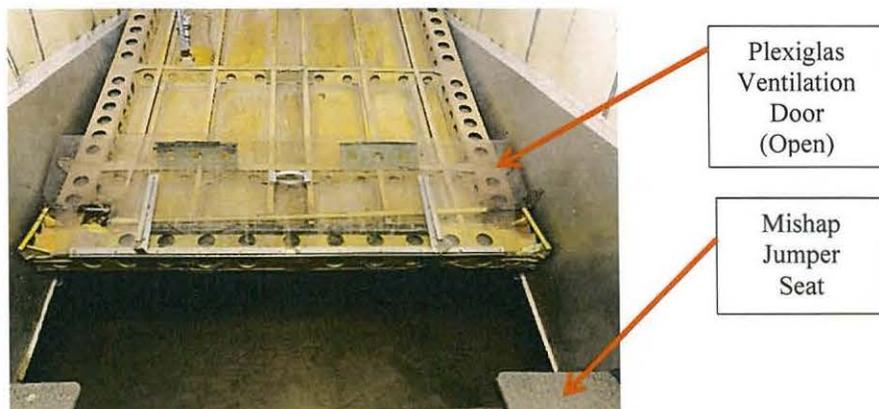


Figure 4.1 Skyvan cargo door with Plexiglas ventilation door (Tab S-4)

At approximately 0853L, the MJ made a comment causing the jumper sitting across the aisle to look up and see what the jumper believed to be the MJ’s reserve parachute ripcord handle partially pulled, and attached to, the MJ’s left rucksack quick-release shackle (Figures 4.2-4.4) (Tab V-6.8, V-6.9, V-6.10, V-6.11, V-6.19, V-6.25, V-6.27). When the MJ landed, however, the quick-release shackle was not attached to the reserve parachute ripcord handle (Tabs V-10.8, S-6). After finding out that the quick-release shackle was not attached to the ripcord handle when the MJ landed, the witness modified his original testimony to allow that the ripcord handle

“could have just been sitting on top of the ruck attachment and not hooked to it” (Tab V-6.9,V-6.11, V-6.15, V-6.16, V-6.25, V-6.26).



Figure 4.2. MC-4 parachute ripcord handles and equipment D-rings



Figure 4.3. Proper Configuration

- Reserve Top Closing
- Reserve Ripcord Handle (lowered)
- Rucksack Quick-release Shackle



Figure 4.4. Reenactment of MJ Configuration Based on Witness Testimony

The reserve top closing flap had popped open above the MJ’s shoulder, but the pilot chute was still contained between the MJ and aircraft inner wall (Tab V-6.8, V-6.9, V-6.10, V-6.15, V-6.19, V-6.25). As the MJ leaned forward, the spring-loaded pilot chute popped up and fell directly through the open ventilation door taking the reserve parachute with it (Tab V-6.8, V-6.9, V-6.13, V-6.16, V-6.19, V-6.20, V-6.21, V-6.25, V-6.26). In roughly two seconds, the MJ was extracted through the ventilation door opening—tearing off his rucksack, damaging the aft cargo door, and killing him instantly when he hit the ventilation door opening. (Tabs V-1.4, V-4.11, V-6.9, V-6.19, V-6.21, V-6.26, V-7.5, V-7.11, V-7.12, V-8.4, V-10.8, S-2, S-5, S-6, U-3, X-3).

The characteristics of the MC-4 equipment attachment D-rings, which are similar in appearance, feel, and location to the lower portion of the ripcord handles, make it relatively easy to either (1) attach equipment inadvertently to a ripcord handle instead of the D-ring, or (2) catch equipment inadvertently on a ripcord handle while attempting to attach equipment to the D-ring (see Figures 4.2, 4.3 and 4.4) (Tab GG-6, GG-7). This is exacerbated by wearing gloves, decreasing tactile feedback, and is more pronounced with the reserve ripcord handle, which is inboard of the left lift web, in line of sight from the parachutist's perspective (compare Figures 11.2 and 11.3) (Tab GG-7). At the time of the mishap, the MJ was seated, hooking up his rucksack and wearing Neumann Skydiving tackified gloves (Tabs V-1.4, X-3).

The dimensions of the ventilation door opening are 77.5 inches by 20.5 inches, looking down at the opening (Figures 4.5 and 4.6). The space narrows to about 77.5 inches by 17 inches looking straight down due to the angle of the aircraft frame and a step bar mounted below the floor (Figure 4.6). The space is only about 2 inches high if an observer looks at the space from the floor and directly aft, in the direction of force imparted by a trailing parachute (Figure 4.7).



Figure 4.5 (Tab Z-13)



Figure 4.6 (Tab Z-12)



Figure 4.7 (Tab Z-14)

When the MJ departed the MA, the MA experienced an un-commanded pitch down followed by a pitch up (Tabs V-3.10, V-16.5, Z-3 to Z-5). The MP regained aircraft control, located the MJ under canopy and began circling (Tab V-3.11, V-16.5, V-16.6). The MP advised the MC to take their seats, and along with the MC3 and the Drop Zone Safety Officer (DZSO), began to coordinate local emergency medical response to the MJ's predicted landing site (Tab V-3.11, V-15.6, V-16.5, V-16.6).

e. Egress and Aircrew Flight Equipment

The reserve parachute deployed as designed IAW T.O. 14D1-2-468-2 (Tab BB-49). Reserve parachutes are packed to open quickly, in less than two hundred feet (Tab BB-16). The MJ's reserve parachute would have deployed in about 0.73 seconds with a recorded aircraft speed of 105 kts, which is similar to freefall velocity (Tabs V-16.6, GG-5).

f. Impact

The MC saw that the MJ was motionless with his head down (Tab V-3.11, V-10.7, V-15.6, V-16.6). The MP and MC continued to coordinate emergency response from the MA while the MJ was still under canopy (Tab V-3.11, V-10.8, V-15.3, V-16.5). The MJ landed under a fully inflated, uncontrolled reserve parachute at approximately 0905L, southeast of Eloy, AZ (Tab V-3.11, V-7.12, V-8.4, V-15.3, V-17.3, V-17.7). His rucksack landed separately with the left quick-release shackle still attached to the rucksack and open (Figure 4.8), indicating it had not been connected to either the D-ring or the reserve ripcord handle, or had been released at some point during the extraction sequence (Tabs S-6, V-10.8). The right side rucksack hardware—the equipment lowering line ejector snap and right quick-release shackle—were torn off the MJ's rucksack during the extraction and remained attached to the parachute's right equipment attachment D-ring (Figure 4.9, Tab S-8).



Figure 4.8. Left Quick-Release Shackle
(Tab S-6)

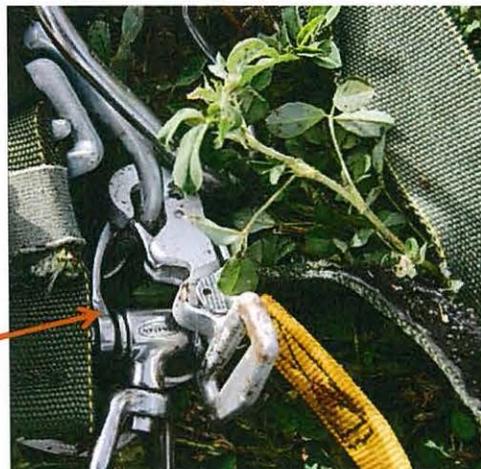


Figure 4.9. Lowering Line &
Right Quick Release Shackle
(Tab S-8)

Rucksack
Quick-release
Shackle

g. Search and Rescue

Three Army medics, an Air Force Rigger, and the DZSO, arrived at the MJ's landing location by 0907L, made an initial assessment of the MJ's condition, and cut the MJ out of his parachute (Tab V-13.6, V-15.6, V-16.6, V-17.4). The Army medics immediately attempted to provide emergency trauma care and resuscitative medical treatment without successfully reviving the MJ (Tab V-7.12, V-11.8, V-15.3, V-16.6, V-17.4). Local civilian emergency medical services (EMS) arrived within two minutes, assumed control of the scene, and declared the MJ dead at 0924L (Tab V-7.12, V-10.8, V-11.8, V-15.3, V-17.4).

h. Recovery of Remains

Pima County Forensic Science Center under coordination with the Eloy Police Department, assumed control of the deceased MJ and performed an autopsy (Tab X-3 to X-4). The cause of death was determined to be blunt force trauma (Tab X-3 to X-4).

5. MAINTENANCE

The MA was owned by SkyVenture Arizona, LLC, and operated by SkyDive Arizona on the day of the mishap (Tabs U-4, V-10.5). According to 14 Code of Federal Regulations (CFR) 119.1(e)(6), parachute operations conducted as nonstop flights within a 25-mile radius of the departure airport are exempt from the rules pertaining to commercial operators and are allowed to operate under 14 CFR Part 91. SkyDive Arizona operates as a Part 91 carrier (Tab V-18.5, V-18.6, V-18.7).

a. Forms Documentation

The MA was maintained by the contractor, SkyDive Arizona (Tabs U-4, V-10.5). There were no Air Force Technical Order (AFTO) 781 forms applicable to this mishap (Tab D-3). The MA air time and engineering records were reviewed. Historical records showed no recurring maintenance issues (Tab D-4 to D-10).

b. Inspections

All applicable aircraft inspections were reviewed and up to date. In addition, SkyDive Arizona received a biennial paratroop carrier inspection on 10 February 2014, IAW Department of Defense Instruction (DoDI) 4500.53 (Tab FF-7). There is no evidence to suggest these inspections were a factor in this mishap (Tab D-4 to D-10).

c. Maintenance Procedures

A review of all maintenance procedures confirmed that they were performed IAW with prescribed air time and engineering requirements applicable to the MA. There is no evidence maintenance procedures were a factor in this mishap (Tab D-4 to D-10).

d. Maintenance Personnel and Supervision

The AIB reviewed the qualifications of the maintenance personnel who performed maintenance on the MA. All personnel involved in servicing and inspecting the MA prior to the mishap were qualified to perform maintenance on the MA. There is no evidence maintenance personnel and supervision were a factor in this mishap (Tab U-9).

e. Fuel, Hydraulic, and Oil Inspection Analyses

Not applicable.

f. Unscheduled Maintenance

No unscheduled maintenance actions were performed on the MA since the performance of the preflight inspection (Tab D-4 to D-10). There is no evidence unscheduled maintenance was a factor in this mishap.

6. AIRCRAFT AND PARACHUTE SYSTEMS

a. Mishap Aircraft

A post-flight inspection of the MA by the MP determined that all structures and systems were operating properly as designed; however, damage to the aft cargo door was identified (Tab V-16.6). The MA aft cargo door and Plexiglas ventilation door were serviceable immediately prior to the mishap (Tabs D-2, D-4 to D-10, V-16.5, V-16.8).

The MA sustained damage to the aft cargo door and the Plexiglas ventilation door (see Figure 6.1) during the mishap (Tabs S-2, U-3).



Figure 6.1. Damage to MA's aft cargo door. (Tab S-2)

b. Mishap Parachute

The MJ was equipped with an MC-4 Ram Air Free-Fall Personnel Parachute System at the time of the mishap (Tab P-2). The equipment was in good operating condition and maintained properly at the time of the mishap jump (Tabs K-6, K-8 to K-12, V-13.3, V-14.3, V-14.4, DD-23 to DD-27). There is no evidence to indicate that any damage predates the accident (Tabs K-6, K-8, K-9, K-10, K-11, K-12, V-13.3, V-14.3, V-14.4, DD-23 to DD-27). The MC-4 parachute, suspension lines, harness, altimeter and rucksack were severely damaged during the mishap (Tab P-2). The total estimated value of this property is \$5,308 (Tab P-2). No irregularities or discrepancies were noted when reviewing applicable technical data and official guidance (Tabs K-6, K-8 to K-12, DD-23 to DD-27). There is no evidence to suggest aircrew flight equipment/rigger personnel procedures, practices, performances or training concerns related to the accident were a factor in this mishap (Tab EE-5 to EE-25).

7. WEATHER

a. Forecast Weather

Forecasted weather was clear and winds were light out of the southeast. (Tab F-2). There is no evidence to suggest that weather was a factor in this mishap.

b. Observed Weather

Observed weather data was taken from the Casa Grande Municipal Airport 13 miles Northwest of Eloy, AZ (Tab F-2 to F-5). This weather station was constantly analyzing weather conditions and records the weather every 20 minutes in a Meteorological Report (METAR) format (Tab F-2 to F-5). Near Eloy, Arizona, at 0855L, the winds were calm at 0 kts, there were clear skies with no cloud layers and 10 miles visibility (Tab F-2 to F-5). The temperature was 10°C (50°F), dew point was -10°C (14°F), and the barometric pressure was 30.06 inches Mercury (Hg) (Tab F-2 to F-5).

c. Space Environment

Not applicable.

d. Conclusion

Observed weather, cloud ceilings and visibility were well above the minimums required by AFI 11-410 to conduct MFF operations (Tab BB-47). The mishap flight was conducted within prescribed operational weather limitations (Tab K-4).

8. CREW QUALIFICATIONS

The MJ was a qualified and current MFF-JM, and was qualified and current in all planned and executed events in the MFF-CCC on the day of the mishap (Tab EE-26 to EE-38). He graduated from the U.S. Army Airborne course on 30 September 2005, U.S. Army Military Free-Fall Course on 1 May 2008, the U.S. Army Static Line Jumpmaster Course on 27 May 2010, and U.S. Army Military Free-Fall (HALO) Jumpmaster Course on 27 January 2012 (Tabs G-17, G-18, EE-27). He was placed on hazardous duty orders by Headquarters USSOCOM on 3 January 2006 to perform HALO parachute duties (Tab G-16). Prior to 21 February 2014, the MJ had most recently performed primary JM duties on 17 MFF jumps from 17 February 2014 to 21 February 2014 (Tabs G-14, G-15, EE-38). There is no evidence to suggest crew qualifications were a factor in this mishap.

MJ's parachute duty experience at the time of the mishap is as follows (Tab EE-26 to EE-38):

Jump History

Static Line Jumps	Static Line Jumpmaster Jumps
95	14
Military Free Fall Jumps	Military Free Fall Jumpmaster Jumps
213	34

9. MEDICAL

a. Qualifications

At the time of the mishap, the MJ and the MC were medically qualified for flight duty without medical restrictions (Tab X-3). The MP was a contract pilot for SkyDive Arizona with a valid Federal Aviation Administration Class I medical certification at the time of the mishap (Tab V-16.3). There is no evidence to suggest physical and medical qualifications were a factor in the mishap.

b. Health

The MJ and all members of the MC were in good health and had no performance-limiting conditions or illnesses prior to the mishap. (Tabs V-1.5, V-1.6, V-3.12, V-4.5, V-5.3, V-6.6, V-7.6, V-8.5, V-8.6, V-9.3, X-3) There was no evidence that any medical condition or illness contributed to the mishap.

c. Pathology

Autopsy results showed the MJ died of injuries sustained from blunt force (Tab X-3).

Blood and urine alcohol and toxicology screening tests conducted on the MJ by the Armed Forces Medical Examiner were both negative. This testing included ethanol, amphetamine, antidepressants, antihistamines, barbiturates, benzodiazepines, cannabinoids, chloroquine, cocaine, dextromethorphan, lidocaine, narcotic analgesics, opiates, phencyclidine, phenothiazines, sympathomimetic amines, verapamil, and designer cathinones (bath salts) by gas chromatography or immunoassay. Additional drugs of abuse testing of the MJ's blood and urine was performed by the Pima County Forensic Science Center and was negative (Tab X-3).

The alcohol and toxicology screening tests conducted on relevant members of the MC following the mishap results were reviewed and all were negative. This testing included ethanol, amphetamine, barbiturates, benzodiazepines, cannabinoids, cocaine, opiates, and phencyclidine, by chromatography or immunoassay (Tab X-3).

d. Lifestyle

There was no evidence to suggest lifestyle was a factor in the mishap (Tabs V-6.6, V-6.24, V-7.6, V-9.3, X-3).

e. Crew Rest and Crew Duty Time

The MJ and all members of the MC had adequate crew rest on the day of the mishap. There is no evidence to indicate that crew rest or fatigue was a factor in the mishap (Tab V-1.6, V-3.12, V-5.3, V-6.6, V-7.6, V-8.6, V-9.3).

10. OPERATIONS AND SUPERVISION

a. Operations

The MC felt well rested and did not feel rushed (Tab V-1.6, V-3.14, V-3.12, V-4.16, V-5.3, V-6.6, V-7.6, V-8.6, V-9.3, V-13.4, V-14.3). The MFF-CCC schedule was not excessively demanding and the MJ, acting in his capacity as primary JM and team lead, had reduced the schedule after evaluating the MC's skills earlier in the week and assessing a need for additional training in basic canopy control and landing (Tabs K-17, V-3.3, V-3.16, V-4.19, V-6.3). There is no indication that operations tempo was a factor at the time of the mishap.

b. Supervision

The AFSOC Military Free-Fall Training contract required SkyDive Arizona to provide the required aircraft, pilot, instructors and drop zone for 720 STG personnel (Tab BB-26 to BB-39). A primary and alternate contracting officer representative (COR) was appointed on 5 August 2013. The primary COR was a master static line and free-fall jumpmaster with 13 years of military free-fall experience, including 11 years as a military free-fall jumpmaster (Tab BB-40 to BB-43). The alternate COR was a master static line and free-fall jumpmaster with 17 years of military free-fall experience, including 7 years as a military free-fall jumpmaster (Tab BB-40 to BB-43).

A USSOCOM team inspected and certified SkyDive Arizona on 10 February 2014, IAW DoDI 4500.53. The inspection was documented using the Department of Defense (DoD) Intrastate Contract Aviation Paratroop Survey Checklist and Air Mobility Command (AMC) Form 228; no safety concern or discrepancies were identified (Tabs U-5 to U-8, V-18.7, FF-7).

The MJ led the MFF-CCC as primary jumpmaster and team lead (Tab K-17). The team had appropriate waivers for parachute repacking and the use of night vision goggles (Tab DD-6, DD-7, DD-9, DD-10).

SkyDive Arizona provided the MC an initial orientation and safety briefings for the MFF-CCC upon arrival (Tab V-1.3, V-11.3, V-11.4). These briefings included instruction on the operation of the Plexiglas ventilation door, and the restriction on opening the ventilation door below 1,500 feet AGL (Tab V-1.3, V-3.4, V-4.5, V-4.6, V-6.4, V-6.5, V-8.3, V-11.4, V-16.6). Testimony varied as to the extent the hazard of an inadvertently deployed pilot chute departing through the

ventilation door was identified or addressed by either civil or military personnel. (Tab V-3.6, V-3.16, V-4.6, V-4.13, V-7.3, V-7.4, V-7.6, V-7.7, V-8.5, V-10.4, V-10.5, V-11.4, V-12.4). Safety briefings did not include specific discussion on the potential hazard of opening the ventilation door, without also opening the aft cargo door and prior to the point when all jumpers were prepared to depart the aircraft (Tab V-3.6, V-3.16, V-4.6, V-4.13, V-7.3, V-7.4, V-7.6, V-7.7, V-8.5, V-10.4, V-10.5, V-11.4, V-12.4). Additionally, SkyDive Arizona provided a civilian operations office, two instructors and a DZSO to facilitate and provide supplemental instruction for the MC during training (Tab BB-29 to BB-35). The MA was operated by a licensed pilot provided by SkyDive Arizona (Tabs V-16.3, BB-29 to BB-35).

11. HUMAN FACTORS

a. Introduction

A human factor is any environmental, technological, physiological, psychological, psychosocial or psychobehavioral factor a human being experiences that contributes to or influences his performance during a task. The DoD Human Factors Analysis and Classification System (HFACS) is the framework created to analyze potential human factors that can play a role in DoD mishaps. The framework is divided into four main categories: Acts, Preconditions, Supervision and Organizational Influences. It is further subdivided using the nanocode taxonomy described in AFI 91-204, *Safety Investigations and Reports*, 12 February 2014, Attachment 6, which contains the human factors that were assessed by the AIB to identify potentially relevant factors (Tab BB-4 to BB-7).

b. Acts

Acts are those factors that are most closely tied to the mishap, and can be described as active failures or actions committed by the operator that result in human error or unsafe situations. Skill-Based Errors are factors in a mishap when errors occur in the operator's execution of a routine, highly practiced task relating to procedure, training, or proficiency and result in an unsafe situation (Tab BB-4).

Inadvertent Operation (AE101) is a factor when an individual's movements inadvertently activate or deactivate equipment, controls or switches when there is no intent to operate the control or device. This action may be noticed or unnoticed by the individual (Tab BB-4). In this mishap, the MJ unintentionally dislodged his reserve parachute ripcord handle while attempting to attach his rucksack to the left main lift web equipment attachment D-ring leading to an inadvertent pilot chute deployment while still in the MA (Tab V-6.8, V-6.9, V-6.19, V-6.25).

Instrumentation and Sensory Feedback Systems (PE202) is a factor when instrument factors such as design, reliability, lighting, location, symbology or size are inadequate and create an unsafe situation. This includes Night Vision Devices, Heads-Up Displays, off-bore-site and helmet-mounted display systems and inadequacies in auditory or tactile situational awareness or warning systems such as aural voice warnings or stick shakers (Tab BB-5).

The characteristics of the MC-4 equipment attachment D-rings, which are similar in appearance, feel, and location to the lower portion of the ripcord handles, make it relatively easy to either (1) attach equipment inadvertently to a ripcord handle instead of the D-ring, or (2) catch equipment inadvertently on ripcord handle while attempting to attach equipment to the D-ring (see Figures 11.1, 11.2 and 11.3) (Tab GG-6, GG-7). Inadvertent attachments to the ripcord handles are a recognized hazard within the MFF community and have been known to occur (Tabs V-6.9, GG-6). This is exacerbated by wearing gloves, decreasing tactile feedback, and is more pronounced with the reserve ripcord handle, which is inboard of the left lift web, in line of sight from the parachutist's perspective (compare Figures 11.2 and 11.3) (Tab GG-7). At the time of the mishap, the MJ was seated, hooking up his rucksack and wearing Neumann Skydiving tackified gloves (Tabs V-1.4, X-3).



Figure 11.1. Note proximity of the equipment D-rings to the lower portion of the ripcord handles.



Figure 11.2. From a parachutist's point of view (looking down and left) the reserve ripcord handle is in line with the D-ring. (Yellow arrow indicates sightline)

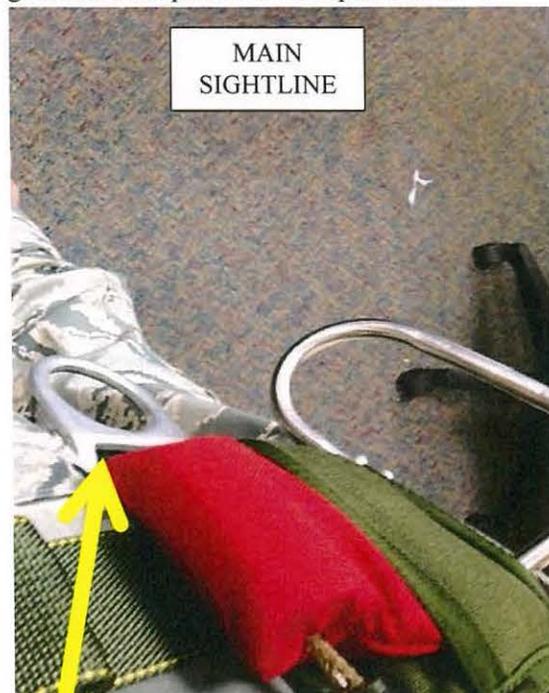


Figure 11.3. From a parachutist's point of view (looking down and right) there is space between the main ripcord handle and D-ring. (Yellow arrow indicates sightline)

c. Organizational Influences

None.

12. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Publically Available Directives and Publications Relevant to the Mishap

- (1) DoDI 4500.53, Department of Defense Instruction, *DoD Commercial Air Transportation Quality and Safety Review Program*, 5 October 2010, Incorporating Change 1, December 2, 2010.
- (2) Department of Defense Intrastate Contract Aviation Paratroop Survey Checklist, 15 August 2003.
- (3) Army Regulation 59-4/OPNAVINST 4630.24/Air Force Joint Publication (AFJ) 13-210(I)/MCO 13480.1D, *Joint Airdrop Inspection Records, Malfunction/Incident Investigations and Activity Reporting*, 23 June 2009.
- (4) Army TM 10-1670-287-23&P/Air Force T.O. 14D1-2-468-2/Marine Corps TM 09011A-23&P/Navy NAVAIR 13-1-38, *Unit and Direct Support Maintenance Manual for MC-4 Ram Air Free-Fall Personnel Parachute System, NSN 1670-01-306-2100*, 30 July 2003.
- (5) AFI 11-410, *Personnel Parachute Operations*, 4 August 2008.
- (6) AFI 90-802, *Risk Management*, 11 February 2013.
- (7) AFI 91-204, *Safety Investigations and Reports*, 12 February 2014.
- (8) AMC Form 228, *AMC Cockpit Mission Observer Program (Commercial Air Carrier Operational Checkride)*, December 1993 Version.

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

The following T.O.'s are not publically available and are subject to the Arms Export Control Act of 1976, labeled FOR OFFICIAL USE ONLY, or distribution is authorized to U.S. Government agencies and their contractors only.

- (1) USSOCOM MANUAL 350-3, *Special Operations Forces Baseline Interoperable Airborne Operations (Parachuting) Training Standards*, 20 June 2011.
- (2) USSOCOM Directive 350-8, *Commercial Aviation Oversight Procedures*, 5 October 2010.
- (3) ATTP 3-18.11 (FM 3-05.211)/AFMAN 11-411(I)/NTTP 3-05.26M, *Special Forces Military Free-Fall Operations*, October 2011.
- (4) 720th Special Tactics Operators Guide Volume I-VI, February 2013.

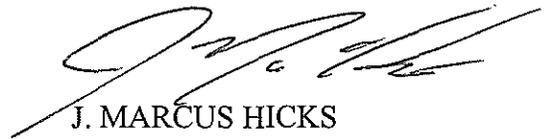
c. Suspected Deviations from Directives or Publications

There were no known or suspected deviations from directives or publications. However, the MJ, acting as the primary JM, elected to move the “don equipment (rucksack)” command from the standard 20-minute to the 10-minute warning due to the fact that the flight was scheduled to take approximately 15 minutes between take-off and the planned jump altitude. While AFMAN 11-411 indicates that the “don equipment (rucksack)” command occurs with the 20-minute warning, it also specifically notes that the “20 minute” command may be given prior to takeoff (Tab BB-20). [Note that AFMAN 11-411 defines the “20 minute” command as “Stay alert and don equipment as directed” providing some inherent flexibility in the command.] (Tab BB-20). Furthermore, modified and condensed timelines are common in MFF training when using both civilian and military jump platforms (Tab GG-4). Additionally, there is no evidence that the MC felt rushed during the Canopy Control Course (Tab V-3.14, V-4.16). There is also no evidence to indicate that the compressed “don equipment (rucksack)” call was a factor in the mishap.

13. ADDITIONAL AREAS OF CONCERN

None.

9 December 2014



J. MARCUS HICKS
Major General, USAF
President, Accident Investigation Board

STATEMENT OF OPINION

SC-7 SKYVAN III-200, T/N N46LH
ELOY, ARIZONA
21 FEBRUARY 2014

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

1. OPINION SUMMARY

On 21 February 2014, at approximately 0853 local time (L), a Tactical Air Control Party Military Free-Fall (MFF) Jumpmaster died during an inadvertent parachute extraction from a contracted SC-7 Skyvan III-200, tail number (T/N) N46LH. The mishap jumper was using an MC-4 Ram Air Free-Fall Personnel Parachute System, leading an MFF Canopy-Control Course conducted at SkyDive Arizona in Eloy, Arizona (AZ). The mishap jumper (MJ) was a member of the 17th Special Tactics Squadron, Air Force Special Operations Command, assigned to Fort Benning, Georgia.

En route to the drop zone with the mishap aircraft (MA) approaching 9,700 feet mean sea level, the MJ stood and gave the “10 minute” warning and winds call, followed by the “don equipment (rucksack)” command. The MJ opened the Plexiglas ventilation door between the aft cargo door and aircraft floor and sat down on the seat next to the door to don his own rucksack.

At approximately 0853L, the MJ made a comment causing the jumper sitting across the aisle to look up and see the MJ’s reserve parachute ripcord handle partially dislodged and attached to, or overlaid on, the MJ’s rucksack quick-release shackle. The reserve parachute top closing flap had popped open above the MJ’s shoulder, but the pilot chute was still contained between the MJ and aircraft inner wall. As the MJ leaned forward, the spring-loaded pilot chute popped up and fell directly through the open ventilation door taking the reserve parachute with it. In roughly two seconds, the MJ was extracted through the ventilation door opening—tearing off his rucksack, damaging the aft cargo door, and killing him instantly.

The MJ landed under a fully inflated reserve parachute at about 0905L, southeast of Eloy, AZ. Both military and civilian emergency responders were immediately on scene, but local EMS declared the MJ dead at 0924L. No other individuals were injured or killed in the mishap. The MA was the only private property damaged during the mishap.

I find, by clear and convincing evidence, the mishap was caused by the MJ inadvertently pulling his reserve parachute ripcord while donning his rucksack in close proximity to the open ventilation door, which was of sufficient size for a parachute to pass through, but not large enough for safe passage of a person.

Additionally, I find, by a preponderance of evidence, one factor that substantially contributed to the mishap. This factor consists of the opening of the ventilation door without also immediately opening the cargo door, and prior to the time when all jumpers were prepared to depart the aircraft. The opening of the ventilation door in this manner did not violate either military or civilian guidance, but I find by a preponderance of the evidence that it substantially contributed to the mishap.

I developed my opinion by analyzing factual data from Department of Defense Instructions, United States Special Operations Command Directives, Air Force Manuals, Instructions and Technical Orders, witness testimony, technical analysis of post-mishap parachute system components and information provided by subject matter experts.

2. CAUSE

I find, by clear and convincing evidence, the mishap was caused by the MJ inadvertently pulling his reserve parachute ripcord while donning his rucksack in close proximity to the open ventilation door, which was of sufficient size for a parachute to pass through, but not large enough for safe passage of a person. The common practice of opening the Plexiglas ventilation door for ventilation above 1,500 feet in altitude was consistent with both civil- and military-parachute communities using the SC-7 Skyvan for the training involved in this mishap and similar training, so it was a community-wide unsafe practice rather than an individual error that created the unsafe situation.

While it remains impossible to reconstruct positively how the MJ pulled his ripcord, a mishap crewmember sitting across the aisle from the MJ noticed that the ripcord became dislodged after the MJ gave the “don equipment” command and sat down. The crewmember also indicated that the MJ’s quick-release shackle was either attached to his reserve ripcord handle or the ripcord handle was overlaid upon the quick-release shackle. The crewmember’s observations combined with the characteristics of the MC-4 equipment attachment D-rings, which are similar in appearance, feel, and location to the lower portion of the ripcord handles, support the likelihood that the MJ dislodged his ripcord by attaching or catching the quick-release shackle onto the ripcord handle, rather than the D-ring. This likelihood is further pronounced with the reserve ripcord handle because the reserve handle is inboard of the left lift web, in line of sight from the parachutist’s perspective, making it easier to inadvertently catch the quick-release shackle on the ripcord handle (compare Figures 11.2 and 11.3). At the time of the mishap, the MJ was wearing Neumann Skydiving tackified gloves, which would have decreased tactile feel.

Whether the MJ inadvertently attached his rucksack to the ripcord handle, snagged it on equipment, or inadvertently grabbed it does not change the fact that somehow his reserve ripcord handle was pulled. With the ripcord pulled, the spring-loaded pilot chute popped the MC-4 top closing flap up, but remained inside the pack against the inner wall of the aircraft until the MJ leaned forward allowing it to pop up, only to fall or be pulled out of the ventilation opening. Designed to open quickly, the reserve parachute would have fully inflated in less than a second at recorded airspeed, giving the MJ or his teammates no time to react. The force of the inflated canopy was sufficient to extract the MJ through the narrow ventilation door opening—tearing off his rucksack, damaging the aft cargo door, and killing him instantly.

3. SUBSTANTIALLY CONTRIBUTING FACTOR

Opening of the Ventilation Door

The MJ opened the ventilation door without also immediately opening the cargo door, and prior to the time when all jumpers were prepared to depart the aircraft. This was a permissible decision that did not violate either military or civilian guidance. However, this created a situation in which an opening, insufficient to allow safe passage of a person, existed in the aircraft when the MJ sat down to don his own rucksack. As testimony varied on whether the hazard of an inadvertently deployed pilot chute departing through the ventilation door was briefed as a safety hazard, it appears the personnel interviewed largely failed to identify or underestimated the risk of opening the ventilation door without immediately opening the cargo door, especially prior to the time when all jumpers were prepared to depart the aircraft. This practice creates an opening of sufficient size for a parachute to pass through, but not large enough for safe passage of a person.

4. CONCLUSION

I find, by clear and convincing evidence, the mishap was caused by the MJ inadvertently pulling his reserve parachute ripcord while donning his rucksack in close proximity to the open ventilation door, which was of sufficient size for a parachute to pass through, but not large enough for safe passage of a person.

Additionally, I find, by a preponderance of evidence, one factor that substantially contributed to the mishap. This factor consisted of the opening of the ventilation door without also immediately opening the cargo door, and prior to the time when all jumpers were prepared to depart the aircraft. The opening of the ventilation door in this manner did not violate either military or civilian guidance, but I find by a preponderance of the evidence that it substantially contributed to the mishap.

9 December 2014



J. MARCUS HICKS
Major General, USAF
President, Accident Investigation Board

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