

U.S. Department of  
Homeland Security

United States  
Coast Guard



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5830  
13 May 2021

## MEMORANDUM

LACHOWICZ, MICH. Digitally signed by  
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Date: 2021.05.13 14:22:39 -0400

From: Michael R. Lachowicz, CAPT  
Single Investigating Officer

To: Michael F. McAllister, VADM  
DCMS

Subj: MAJOR INCIDENT INVESTIGATION (MII) INTO THE CIRCUMSTANCES  
SURROUNDING THE HARD LANDING OF CG-6599 ON 11 FEBRUARY 2021  
AT NAVAL AIR STATION OCEANA

Ref: (a) Your memo 5830 of 19 February 2021, Convening Order  
(b) Major Incident Investigations Manual, COMDTINST M5830.4 (series)  
(c) Administrative Investigations Manual, COMDTINST M5830.1 (series)  
(d) Safety and Environmental Health Manual, COMDTINST M5100.47 (series)  
(e) Coast Guard Air Operations Manual, COMDTINST 3710.1 (series)

1. **Action of the Convening Authority:** On 19 February 2021, the Deputy Commandant for Mission Support (DCMS) convened a Major Incident Investigation (MII) consisting of a Single Investigating Officer (SIO) from Atlantic Area to examine the circumstances surrounding the hard landing of CG-6599 on 11 February 2021.

### 2. **Executive Summary:**

a. At approximately 1215 on 11 February 2021, an Aviation Logistics Center (ALC) MH-65E aircraft, CG-6599, sustained a hard landing at Naval Air Station (NAS) Oceana. The crew of four consisted of the Mishap Left Seat Pilot (MLSP), Mishap Right Seat Pilot (MRSP), Mishap Basic Aircrewman (MBA), and Mishap Mission Essential Personnel (MMEP). After an uneventful flight from ALC to NAS Oceana, the crew commenced a planned certification flight/compass swing procedure (a Magnetic Sensing Unit /compass calibration) on the airfield's certified compass rose. While completing the calibration evolution, the crew noticed heading deviations and decided to deplane a crew member to allow the crew member to better align the aircraft on the compass rose. The MBA started outside the aircraft for these alignment purposes and was then replaced by the MLSP after a few calibration points. After a few more calibration evolutions, the crew decided to switch again and have the MLSP return and the MBA deplane. While the MLSP was reentering the left seat of the aircraft, with the MBA outside the aircraft's cabin door, the aircraft suddenly became airborne. While the aircraft was airborne, the MBA quickly ran under and away from the aircraft, the MLSP discovered and then dislodged his Search and Rescue (SAR) vest strap from his right leg off the end of the aircraft's left side collective, and the MRSP maneuvered the controls to maintain control of the aircraft, including pushing down on the aircraft's right side collective. Upon release of the aircraft's left collective from the MLSP's SAR vest strap, the downward force on the aircraft's right collective by the

MRSP caused the aircraft to rapidly descend back to the ground causing a hard landing. During this incident, the aircraft was airborne for approximately five seconds.

b. There were no reported personnel injuries sustained from the hard landing. The aircraft's impact onto the ground resulted in the tail of the aircraft hitting the ground, the Right Main Landing Gear being impaled into the airframe, portions of the airframe cracking, tearing and buckling, and damage to the belly of the aircraft. The extent of damage suffered by the aircraft is estimated to be approximately \$3 million.

c. The Single Investigating Officer found by clear and convincing evidence that the cause of the mishap was a result of the MLSP's SAR vest leg strap inadvertently hooking onto and pulling up on the left collective, causing the aircraft to become airborne; the MRSP then responded by pushing down on the right collective and the aircraft abruptly descending once the SAR vest strap pressure was released from the left collective.

### 3. Preliminary Statement:

a. The Deputy Commandant for Mission Support (DCMS), VADM Michael McAllister, convened this Major Incident Investigation (MII) on 19 February 2021 per references (a) through (d). The investigation was convened to inquire into the facts and circumstances surrounding the mishap involving the hard landing and subsequent damage to CG-6599 on 11 February 2021, to prepare a publically releasable report, and to gather and preserve all available evidence for use in litigation, claims, disciplinary actions, administrative proceedings, and for other purposes. A 30 day extension for the investigation was requested and granted on 20 April 2021.

b. The MII consisted of a Single Investigating Officer (SIO), CAPT Michael Lachowicz, and the Legal Advisor was (b) (6), (b) (7)(C) of the Legal Service Command. Administrative assistance was provided by (b) (6), (b) (7)(C). During the course of the investigation, no significant delays were encountered. All participants were cooperative and openly discussed the events that occurred. The mishap aircraft was viewed at NAS Oceana on 24 February 2021. The mishap crew member interviews were conducted at ALC on 2 March 2021. An additional interview of the ALC Operations Officer was conducted on 25 March 2021 via phone.

c. A Mishap Analysis Board (MAB) was convened to investigate safety aspects of this mishap. The MAB President was CAPT Timothy Eason, District Five Response Chief. The MII SIO interacted with the MAB during the course of the investigation in accordance with references (b) and (d). On 9 March 2021, the MAB provided the Mishap Analysis Report Part A, which included factual, non-privileged information.

### 4. Table of Contents:

Section	Page #
1. Action of Convening Authority	1
2. Executive Summary	1
3. Preliminary Statement	2
4. Table of Contents	2
5. Findings of Fact	3
a. Authority and Purpose	3
b. Accident Summary	3

c. Background	4
d. Sequence of Events	4
(1) Mission	4
(2) Planning and Preparation	4
(3) Accident	4
(4) Recovery	6
e. Maintenance	6
f. Airframe Systems	6
g. Weather	7
h. Training and Qualifications	7
i. Medical	9
j. Operations and Supervision	9
k. Human Factor Analysis	9
l. Additional Areas of Concern	9
6. Statement of Opinion	9
7. Attestation	10

## 5. Findings of Fact:

a. Authority and Purpose: As outlined in reference (a), DCMS convened a MII on 19 February 2021 to examine the circumstances surrounding the hard landing of CG-6599 on 11 February 2021 at NAS Oceana.

b. Accident Summary: On 11 February 2021, CG-6599 was completing a Magnetic Sensing Unit (MSU)/compass calibration at NAS Oceana. To better align the aircraft on the compass rose, the MLSP and MBA were taking turns proceeding outside the rotor arc and off the nose of the aircraft to confirm the aircraft's positioning. While the MLSP was reentering the aircraft after a planned switch of personnel, the aircraft suddenly became airborne and climbed to approximately 20 feet in the air. The aircraft yawed as the MLSP fell onto the left seat and the MRSP attempted to maintain control of the aircraft. The MBA, who was outside the aircraft when it became airborne, ran under the aircraft and safely off of the compass rose. The MMEP was in the rear of the aircraft working with the maintenance laptop and equipment; the MMEP was not fastened into a seat. After approximately five seconds of being airborne, the MRSP descended the aircraft to the pavement. The first point of impact was the Right Main Landing



Gear. The aircraft continued to rotate to the right after impact. Once all motion stopped, the Emergency Shutdown Procedures were performed and the remaining crew evacuated the aircraft. Naval crash crew personnel arrived on scene within a few minutes. (Exhibits 1, 2, 3, 4, 5, 6)

c. Background:

(1) Aviation Logistics Center (ALC), located in Elizabeth City, North Carolina, provides centralized logistics support for all Coast Guard aviation missions. As the sole industrial complex for Coast Guard aviation, ALC provides depot level maintenance, engineering, supply, procurement, acquisition and information services.

(2) Naval Air Station (NAS) Oceana, located in Norfolk, Virginia, is the Navy's East Coast Master Jet Base, home to F/A-18 Super Hornets. The primary mission of NAS Oceana is a shore-based integrator; providing the facilities, equipment, and personnel to train and deploy the Navy's Atlantic Fleet strike fighter squadrons.

d. Sequence of Events:

(1) Mission: ALC's flight schedule assigned CG-6599 and a crew of four, MLSP, MRSP, MBA, and MMEP, to complete a certification flight/compass swing at KNTU (airport identifier for NAS Oceana) on 11 February 2021. (Exhibit 1)

(2) Planning/Pre-flight:

(a) The mishap crew completed pre-flight planning/activities for their event at ALC in the morning, including an in-depth discussion (immediately preceding the flight) of the current/projected weather conditions for the day, specifically, ceiling levels and icing conditions. After discussing detailed weather information as a crew and with the ALC Operations Officer, the parties determined that the mission could be safely completed within aviation standards. (Exhibits 2, 3, 4, 5, 7)

(b) Mission planning and operational risk management procedures were completed prior to the flight. (Exhibits 2, 3)

(c) Further pre-flight coordination took place between the MBA and the MMEP where the members discussed the maintenance gear that would be needed: laptop computers, cables, newly released software updates, and the appropriate maintenance procedure cards. (Exhibits 4, 5)

(d) The mishap crew further briefed the calibration test plan upon the arrival to NAS Oceana. (Exhibits 2, 3, 5)

(3) Accident:

(a) CG-6599 conducted a routine flight from ALC to NAS Oceana at approximately 1110. After a 20 minute flight, they conducted the RNAV 5 approach to the airfield. Upon landing at approximately 1130, they taxied to the compass rose on the airfield. (Exhibits 2, 3, 4, 5)

(b) Upon arrival to the compass rose, the MMEP set up the maintenance laptop and confirmed the procedures to complete the Standby Flight Instrument Magnetic Sensing Unit



Calibration, referencing the certified compass rose. The Maintenance Procedure Card (MPC) the crew referenced was 342900.0 (revision date 06/17/20). (Exhibits 5, 6)

(c) Commencing the 12 calibration points to complete the data capture and test procedures, the MRSP lined the aircraft up on heading 360°. After the aircraft heading stabilized, the crew commenced the data capture per the MPC. Once the software indicated an acceptable data capture, the crew maneuvered the aircraft to heading 030°. This sequence continued in 30 degree intervals for a few iterations. The crew noticed discrepancies between the Embedded GPS Inertial Navigation Unit System (EGI) and the Magnetic Sensing Unit (MSU) readings. The crew decided to deplane the MBA to visually line up the aircraft on the compass rose to validate heading accuracies. (Exhibits 2, 3, 4, 5)

(d) Standing off the nose of the aircraft, the MBA signaled to align the aircraft on the compass rose and the crew continued the procedure. Once at heading 120°, and after approximately 15 minutes, the crew made the decision to bring the MBA back into the aircraft and let the MLSP conduct the alignment. This decision was made for the purpose of providing a secondary verification of the aircraft alignment on the compass rose (as they continued to get some variances on the heading information) and the meteorological conditions (cold temperature outside). When the MLSP arrived in front of the aircraft, the MLSP noticed that CG-6599 was no longer centered on the compass rose. The crew decided to taxi out of the compass rose and realign on heading 120°. After completing another data capture, the aircraft moved over to 150°. The crew then decided to complete another crew swap where the MLSP would return to the aircraft and the MBA would head back out to visually align the aircraft. (Exhibits 3, 4)

(e) As the MLSP returned to the aircraft, the MBA stepped out of the Cabin Sliding Door on the right side of the aircraft. The MLSP stepped up into the left side of the aircraft with the right foot while grabbing the strap inside the door of the aircraft with the left hand. While stepping up into the aircraft, the aircraft engines spooled up and the aircraft became airborne. (Exhibits 2, 3, 4, 5)

(f) The MLSP felt "pressure on their upper right leg" and noticed that the SAR vest leg strap was caught on the front /left portion of the collective. The MLSP fell onto the seat on their right side and began trying to free the SAR vest strap off the collective with their right hand while still holding onto the aircraft with their left hand. (Exhibit 2)

(g) Simultaneously, the MRSP had been guarding the controls with the left hand on the collective and right hand on the cyclic. The MRSP noticed a change in engine RPMs and a decrease in the rotor blade RPMs as the aircraft became airborne and yawed. Unaware that the MLSP's SAR vest strap snagged on the collective and unsure of the possibility of a mechanical malfunction, the MRSP maneuvered the aircraft controls to maintain "wings level" to avoid a "roll over" due to the sudden lift and yawing of the aircraft. (Exhibits 3, 8)

(h) The aircraft ascended approximately 20 feet into the air for approximately five seconds. (Exhibit 8)

(i) After a few seconds, the MLSP was able to free the SAR vest leg strap off the collective. (Exhibit 2)

(j) The aircraft then immediately and quickly descended to the pavement onto the compass rose at NAS Oceana. (Exhibits 3, 8)

(4) Recovery:

(a) After all motion stopped on the aircraft, the crew completed the Emergency Shutdown of the aircraft (with the exception of the rotor brake), evacuated, and met outside of the aircraft. The NAS Oceana fire/crash crew responded to the scene within a minute. It was determined that only hydraulic fluid was located under the aircraft and no risk of fire was determined. (Exhibits 2, 3, 4, 5)

(b) The crew contacted the ALC Operations Officer and maintenance personnel. (Exhibits 2, 4)

(c) Navy safety, medical, and command cadre arrived on scene within a few minutes. (Exhibits 2, 3, 4, 5)

e. Maintenance:

(1) CG-6599 was manufactured by Aerospatiale Helicopter and was accepted to ALC on 12 August 2020 for an MH-65E conversion. (Exhibit 9)

(2) The aircraft had 4741 hours on the airframe at the time of the incident. There were no previous mishaps that caused any significant structural or other damage to this airframe. All applicable Time Compliance Technical Orders (TCTO) were completed upon the aircraft. (Exhibit 9)

(3) Weight and balance on the aircraft was completed on 5 February 2021 and found to be within standards. (Exhibit 9)

(4) CG-6599 maintenance records review showed normal discrepancies and corrective actions at the time of the incident. (Exhibits 10, 11, 12)

f. Airframe Systems:

(1) The airframe sustained the following structural damage: right hand (RH) chine bay compartments and structural frames, RH removable panel and window assembly, RH well and trunnion fitting, RH landing gear assembly, actuator, and tail cone assembly. Further damage was noted in the RH chine bay, hydraulic lines, tail rotor flight controls, associated mixing unit and bellcranks. (Exhibit 13)

(2) The yaw parallel servo was crushed by the associated flight controls. All RH chine bay formers and the nine degree frame fittings were twisted. The sliding door was also damaged and would not slide fully open. (Exhibit 13)

(3) Inside the cabin, the STA X 4630 support doubler was found sheared and STA X 4630 demonstrated buckling and twisting. The main transmission deck fitting showed damage and was slightly bent. RH side panel displayed a large area of twisting damage and the right hand trunnion fitting was pulled inward. The inner wall of the RH tire was found punctured. Damage was present on STA X 4880 and STA X 5915. The tail cone was also deformed. (Exhibit 13)

(4) The fenestron assembly displayed damage from the tail rotor blades striking the shroud in two locations. The tail skid fairing was also damaged. The main rotor head would not

rotate when manual force was applied at the rotor head assembly, with main rotor blades removed. The horizontal stabilizer and both vertical fins were damaged. (Exhibit 13)

(5) The left hand gear assembly actuator extension rod sheared near the Main Landing Gear strut. On the belly of the aircraft, the fuel jettison nozzle and multiple antennae were sheared. (Exhibit 13)

(6) The aircraft property damage estimate was \$2,962,010. (Exhibit 13)

g. Weather: The event took place during the day during Instrument Meteorological Conditions (IMC). (Exhibit 14)

(1) Clouds: Overcast 500 feet

(2) Temperature: 7° C

(3) Pressure: 30.12 in Hg

(4) Wind: 020/11 knots

(5) Visibility: 5 miles

h. Training and Qualifications: All members of CG-6599 were current and qualified. (Exhibit 15) See Tables 1 through 3 below for an outline of the MLSP, MRSP, and MAB's qualifications and flight hour break-down. (Exhibit 16)

Table 1: Mishap Left Seat Pilot (MLSP) (Exhibit 16)				
<b>MAR Discrete Title</b>	Mishap Left Seat Pilot (MLSP)			
<b>Crew Position/Duty</b>	Pilot in Command (PIC)			
<b>Pilot Flying Pilot Monitoring</b>	PM			
<b>Seat Occupied</b>	Left Pilot			
<b>Injury Classification/Severity</b>	None			
<b>Current Designation</b>	Aircraft Commander (AC)			
<b>Qualifications</b>	Aircraft Commander (AC)			
<b>Specialized Experience (if applicable)</b>	Aeronautical Engineering			
<b>Months at Parent Command</b>	13			
<b>Other Relevant Training</b>	ATC Mobile reviewed this member's training record			
<b>Date of Last Flight Before Mishap</b>	10-Feb-21			
<b>Crew Experience</b>	<b>Total</b>	<b>Prev 30 Days</b>	<b>Prev 60 Days</b>	<b>Prev 90 Days</b>
<b>Total Flight Hours</b>	4591.4	4.9	5.9	40.6
<b>Flight Hours in Type/System</b>	1334.3	4.9	5.9	40.6

Table 2: Mishap Right Seat Pilot (MRSP) (Exhibit 16)				
MAR Discrete Title	Mishap Right Seat Pilot (MRSP)			
Crew Position/Duty	Copilot (CP)			
Pilot Flying Pilot Monitoring	PF			
Seat Occupied	Right Pilot			
Injury Classification/Severity	None			
Current Designation	AC			
Qualifications	Instructor Pilot (IP), Flight Examiner (FE)			
Specialized Experience (if applicable)	Aeronautical Engineering			
Months at Parent Command	18			
Other Relevant Training	ATC Mobile reviewed this member's training record			
Date of Last Flight Before Mishap	10-Feb-21			
Crew Experience	Total	Prev 30 Days	Prev 60 Days	Prev 90 Days
Total Flight Hours	5257.3	11.1	25.8	35.7
Flight Hours in Type/System	4953.3	11.1	25.8	35.7

Table 3: Mishap Basic Aircrew (MBA) (Exhibit 16)				
MAR Discrete Title	Mishap Aircrew (MBA)			
Crew Position/Duty	Aircrew			
Seat Occupied	Outside the Aircraft			
Injury Classification/Severity	None			
Current Designation	Basic Aircrew (BA)			
Qualifications	None			
Months at Parent Command	7			
Other Relevant Training	ATC Mobile reviewed this member's training record			
Date of Last Flight Before Mishap	10-Feb-21			
Crew Experience	Total	Prev 30 Days	Prev 60 Days	Prev 90 Days
Total Flight Hours	761.3	4.3	16.2	16.2
Flight Hours in Type/System	761.3	4.3	16.2	16.2



i. Medical:

(1) A 72 hour work/rest analysis was completed on the crew of CG-6599. The assessment found no fatigue or other concerns that would have decremented the crew's ability to operate the aircraft on 11 February 2021. (Exhibit 17)

(2) Each member had a current flight physical and was fit to fly. (Exhibits 18, 19)

j. Operations and Supervision:

(1) The crew of CG-6599 consisted of senior flight crew members with many operational flight hours as outlined in the above tables.

(2) The MLSP had previously flown the MH65 at two different Air Stations over the span of about six years, was a MH 60 Assistant Engineering Officer for approximately two years, and completed a postgraduate program. The MLSP reported to ALC and transitioned back to flying the MH65 in March 2020. (Exhibit 2)

(3) The MRSP was a prior active duty pilot in the Coast Guard covering a 27 year career and held the following command positions at various Air Stations: Engineering Officer, Executive Officer, and Commanding Officer. Since retiring in 2019, the MRSP flew MH65s as a contractor. (Exhibit 3)

(4) The MBA is currently serving in a fourth aviation assignment with prior positions including: Basic Aircrewman, Flight Mechanic, Flight Mechanic Instructor, and Maintenance Resource Management Instructor. (Exhibit 4)

(5) The MMEP had a 31 year active duty career serving in numerous Air Stations from a junior enlisted member to a Chief Warrant Officer, including being a technical expert in the MH65. The MMEP has worked as a contractor with MH65s since 2016. (Exhibit 5)

(6) The scheduled flight for CG-6599 on 11 February 2021 was a routine scheduled flight that had been briefed and cleared between the crew and the ALC Operations Officer. (Exhibits 1, 2, 3, 4, 5, 7)

k. Human Factors Analysis: The DOD Human Factors Analysis Classification System (HFACS) was used to assess factors and/or issues which may have influenced the mishap. This model presents a systematic, multidimensional approach to error analysis and mishap prevention.

(1) AE 101 Unintended Operation of Equipment: The MLSP's SAR vest strap inadvertently catching on the collective represents an action which was not intended. This action moved the flight controls causing the aircraft to become airborne.

l. Additional Areas of Concern: None

6. **Statement of Opinion**:

a. Cause of the Mishap: I find by clear and convincing evidence that this mishap was caused by the series of events which occurred as a result of the MLSP's right SAR vest leg strap catching and pulling up on the aircraft's left collective. This inadvertent action caused an increase in collective pitch that caused the aircraft to become airborne. The MRSP, unaware of

the strap catching the left collective, altered from guarding the controls to quickly maneuvering the aircraft in an attempt to maintain controlled flight. The MRSP pushed down on the right collective among other actions to control the aircraft, including the yawing. Due to the sudden and large collective pitch increase, the aircraft yawed and over torqued the main gear box. The aircraft reached an altitude of approximately 20 feet into the air. As the MLSP struggled to free the SAR vest strap from the collective, the MRSP continued to try to keep the aircraft wings level and get the aircraft back to the ground. Once the MLSP cleared the SAR vest strap from the left collective, the MRSP's action of pushing down on the right collective caused a rapid decent. The aircraft impacted the ground on its Right Main Landing Gear. The incident occurred within approximately five seconds from the time the aircraft left the ground until impact. There were no indications that the mishap was caused due to a weather, personnel medical, or mechanical related issue or concern.

b. Substantially Contributory Factors: None.

7. **Attestation:** The Findings of Fact and the Statement of Opinion are those of the investigating officer and do not constitute an official determination by the U.S. Coast Guard concerning this mishap.

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Enclosures: (1) Evidence Inventory  
(2) MII Witness List  
(3) Acronyms and Abbreviations

Exhibits: (1) ALC Flight Schedule – 11 February 2021  
(2) Interview, Mishap Left Seat Pilot, 2 March 2021  
(3) Interview, Mishap Right Seat Pilot, 2 March 2021  
(4) Interview, Mishap Basic Aircrew, 2 March 2021  
(5) Interview, Mishap Mission Essential Personnel, 2 March 2021  
(6) Maintenance Procedure Card MH-65, 342900.0  
(7) Interview, ALC Operations Officer, 25 March 2021  
(8) CG-6599 Flight Mishap Simulation  
(9) CG-6599 Maintenance Information  
(10) CG-6599 ALMIS Maintenance Records  
(11) CG-6599 ALMIS Special Inspections  
(12) CG-6599 ALMIS Yellow Sheet  
(13) CG-6599 Itemized Damage Assessment  
(14) Weather Information – 11 February 2021  
(15) Statement of Crew Training Status from ATC Mobile  
(16) CG-6599 Aircrew Information  
(17) CG-6599 Aircrew 72 Hour Histories  
(18) Statement of Crew Medical Status from ALC Flight Surgeon  
(19) Medical Certificate for Mishap Right Seat Pilot

Acronyms and Abbreviations:

- ALC – Aviation Logistics Center
- ALMIS – Aviation Logistics Information Management System
- ATC – Aviation Training Center
- DCMS – Deputy Commandant for Mission Support
- EGI – Embedded GPS Inertial
- KNTU – Airport Identifier for NAS Oceana
- MAB – Mishap Analysis Board
- MBA – Mishap Basic Airman
- MII – Major Incident Investigation
- MLSP – Mishap Left Seat Pilot
- MMEP – Mishap Mission Essential Personnel
- MPC – Maintenance Procedure Card
- MRSP – Mishap Right Seat Pilot
- MSU – Magnetic Sensing Unit
- NAS – Naval Air Station
- RH – Right Hand
- RNAV – Area Navigation
- SAR – Search and Rescue
- SIO – Single Investigating Officer
- TCTO – Time Compliance Technical Order