

National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594



CEN24MA111

OPERATIONS AND HUMAN PERFORMANCE GROUP FACTUAL REPORT

August 29, 2024

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A. ACCIDENT

Location: Halloran Springs, California
Date: February 9, 2024
Time: 2208 Pacific standard time
0608 Universal coordinated time
Helicopter: N130CZ / EC-130B4

B. OPERATIONS AND HUMAN PERFORMANCE GROUP FACTUAL REPORT

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C. SUMMARY

On February 9, 2024, about 2208 Pacific standard time, an Airbus Helicopters EC 130B4 helicopter, N130CZ, was destroyed when it was involved in an accident near Halloran Springs, California. The two pilots and four passengers were fatally injured. The helicopter was operated by Orbic Air, LLC, as a Title 14 *Code of Federal Regulations* Part 135 on-demand flight.

On Saturday, February 10, 2024, the Operations (Ops) Group Chairman, NTSB group member, Federal Aviation Administration (FAA) representative, and the Party Member for the operator travelled to Barstow, California, to begin the field investigation. On February 11, 2024, the operations group travelled to the accident

site, located near Halloran Springs, California, to gather factual data. On February 12, 2024, the Ops Group Chairman and the NTSB group member travelled to the Orbic Air, Burbank, California and began conducting interviews¹ and gathering electronic copies of documents. On February 13, 2024, the Operations group departed Burbank, California, to travel to their residences/offices and continue the investigation. On February 13, 2024, a Human Performance (HP) Group Chair was assigned to work in concert with the Operations Group. During the interviews, it was explained to the individuals that there would be a need to conduct follow up interviews to allow the FAA and HP an opportunity to conduct their interviews.

On Friday, March 4, 2024, the Ops Group Chairman (Ops Gp Chairman) and the HP Group Chair travelled to Simi Valley, California, to conduct interviews with the next of kin for the pilot in command (PIC) and the Safety Pilot². On Tuesday, March 5, 2024, the Ops Group Chairman, HP Group Chair, the FAA representative, and the Party Member for the operator convened at Orbic Air, Burbank, California, to conduct follow up interviews with personnel from Orbic Air³. On Wednesday, February 6, 2024, the Ops Group Chairman, HP Group Chair, and the FAA representative travelled to Van Nuys, California, to conduct an interview with the FAA Principal Operations Inspector (POI) for Orbic Air⁴. Upon completion of the follow up interviews the members of the investigation team returned to their respective offices. From March 5, 2024, until August 13, 2024, the Ops-HP Group continued to collect factual data.

D. DETAILS OF THE INVESTIGATION

1.0 History of Flight

According to email records⁵, a Flight Operations employee of Orbic Air, coordinated with a broker, for Chief Executive Officer for Continued Airworthiness Maintenance Organization-South Africa (CAMOSA) for two charter flights. As per the final agreement, on February 9, 2024, Orbic Air would conduct a Part 135 charter flight to transport passengers and luggage from the Palm Springs International Airport (PSP), Palm Springs, California, to the Boulder City Municipal Airport (BVU) Boulder City, Nevada. Three days later, Orbic Air would conduct a Part 135 charter flight to pick up the passengers and luggage and transfer them from BVU to PSP. During the email communications the broker initially requested a twin-engine aircraft with an instrument rated pilot. The Flight Operations employee mentioned the addition of a second pilot [safety pilot] for the nighttime VFR flight conditions, which, according to him, was a standard precaution for flights to Las Vegas due to the route

¹ See Attachment 4 to this report.

² See Attachment 16 to this report.

³ See Attachment 4 to this report.

⁴ See Attachment 17 to this report.

⁵ See Attachment 1 to this report.

and timing considerations. According to the final agreement the timeline for the two flights were scheduled as follows.

February 9, 2024	Depart PSP: 1945	Arrive BVU: 2100	Passengers: 4
February 12, 2024	Depart BVU: 0900	Arrive PSP: 1015	Passengers: 4

According to the PIC's fiancé, on the day of the accident, he had planned to attend a family dinner before departing on the charter flight around 2030, but that plan changed when he was asked by the company to travel to the Camarillo Airport (CMA) Camarillo, California, to pick up the accident helicopter⁶ (figure 1), and return it to the Bob Hope Airport (BUR) Burbank, California. The PIC departed his residence around 1405 and travelled by train to CMA. He was accompanied by a company mechanic, who was also a company helicopter pilot (mechanic/pilot)⁷.

⁶ An EC-130B4 helicopter, serial number 4060

⁷ This individual performed duties as a pilot and a mechanic and will be referred to as the mechanic/pilot.



Figure 1. Image of the accident helicopter. Courtesy of the PIC's fiancé.

According to the Director of Maintenance (DoM), the helicopter had been placed into the maintenance facility, about a week and a half before the accident, for routine maintenance that included installation of a Garmin GTN 650 and an upgrade to the transponder, adjustments to the uniball on the swashplate, and replacement of an oil line. The maintenance had been completed and on February 9th, the DoM conducted a test flight, which started about 1615 until 1619 and consisted of one traffic pattern at CMA. He placed an entry into the maintenance logbook⁸ that there were no deficiencies noted. Figure 2 is a Google Earth image with automatic dependent surveillance-broadcast (ADS-B) data overlay of the test flight.



Figure 2. Google Earth image of the test flight.

According to the mechanic/pilot, the PIC spent time on the train flight planning and manifesting for the upcoming charter flight. The two arrived at CMA and both conducted individual preflight inspections of the helicopter. ADS-B data showed the helicopter departed CMA around 1727 under visual flight rules (VFR) day conditions⁹ and arrived at BUR around 1743, while under night conditions. The mechanic/pilot operated the helicopter from CMA to BUR. Figure 3 is a Google Earth image of the flight from CMA to BUR.

⁸ See Attachment 2 to this report.

⁹ According to the US Naval Observatory, sunset occurred at 1734.



Figure 3. Google Earth image of the flight from CMA to BUR.

According to the DoM's text messages, immediately after the flight from CMA to BUR, the PIC texted¹⁰ him to report the radar altimeter was inoperative. The DoM and the mechanic/pilot spoke on the phone multiple times about how to try to correct the radar altimeter problem. At the end of the calls, the DoM did not know the status of the radar altimeter. According to the mechanic/pilot, the two accident pilots *"were right there in the cockpit with him"* and *"they both knew that it [radar altimeter] wasn't working and they both were ready to go."*

According to the PIC's fiancé, while reviewing the PIC's old iPad, she discovered a recent video of someone turning a radar altimeter¹¹ on and off. During the video, the radar altimeter did not appear to turn on when the switch was turned on. According to the Director of Operations, the aircraft seen in the video appeared to be N130CZ.

According to the Flight Follower¹², after the PIC and mechanic/pilot arrived at BUR, the PIC told him that they were having issues with the radar altimeter. The Flight Follower explained to the pilot *"if it's working, I think you're okay, but if it's not working, don't take the flight."* The Flight Follower had no further communications with the two pilots about the radar altimeter and did not know the status of the radar altimeter prior to the departure from BUR, which was around 1822, and did not ask about the radar altimeter during a phone call after the crew arrived at PSP.

¹⁰ See Attachment 5 to this report.

¹¹ See Attachment 3 to this report.

¹² The Flight Follower was also the President of Orbic Air who was assuming the duties of Flight Follower and will be addressed as Flight Follower throughout the remainder of the report.

At 1820, the PIC sent a departure notification text¹³ to the Flight Follower that stated, "*Reposition, 130CZ, KBUR KPSP, Duration: 50 min, Fuel: 3 hr, Souls: 2.*" The Flight Follower acknowledged the notification.

ADS-B data showed the helicopter departed BUR around 1822, under VFR night conditions, and arrived at PSP around 1907. The PIC texted an arrival notification to the Flight Follower around 1909 that stated, "*Landed KPSP.*" The Flight Follower acknowledged the text.



Figure 4. Google Earth image of the accident flight from BUR to PSP

According to the PSP fixed base operations (FBO) general manager, the helicopter crew arrived, requested a top-off with Jet A without PRIST, and entered the FBO. Later, a jet aircraft, registration MAUTG arrived with the accident flight passengers. The passengers exited the jet, cleared customs and left the FBO with the helicopter crew. A security video¹⁴ from inside the FBO was consistent with the general manager's account. A fuel receipt¹⁵ showed that the crew purchased 41 gallons of Jet A aviation fuel without PRIST.

According to the Flight Follower, who spoke with the PIC after he and the safety pilot arrived at PSP, one of the passengers had lost his passport and that put the crew on about a 50-minute delay.

¹³ See Attachment 5 to this report.

¹⁴ See Attachment 6 to this report.

¹⁵ See Attachment 7 to this report.

Around 2041, the PIC sent a departure notification to the Flight Follower that stated, *"Charter, 130CZ, KPSP KBVU, Duration: 1hr 55min, Fuel: 3hr, Souls: 6."* Figure 5 is a Google Earth image of the accident flight.

ADS-B data¹⁶ showed that the accident flight departed PSP around 2045 under VFR night conditions and flew a northwesterly heading for about 2 miles before following US Highway 111 to Interstate 10 (I-10) at altitudes varying between 2,500 - 3,000 ft mean sea level (msl). The helicopter continued along I-10, crossed over San Bernadino International Airport (SBD), San Bernadino, California, and then followed I-215 to I-15.

The helicopter followed I-15 toward the destination of BVU. The altitude of the helicopter varied between 3,300 to 5,300 ft msl. ADS-B data was lost while the helicopter was about 24 miles east of Barstow, California, around 2146 (see figure 5). The ADS-B gap was about 47.5 statute miles long. ADS-B data resumed at 2206:46, near the Halloran Springs freeway exit west of the accident location. The last ADS-B data points for the flight tracked east-southeast, gradually descended in altitude, and increased in ground speed. The last ADS-B data point captured the helicopter at 2207:05 about 1,709 ft west of the accident site, about 4,475 ft msl or about 1,188 ft above ground level (agl). The helicopter was equipped with Spidertracks¹⁷ that captured the entire flight and showed that in the area not tracked by ADS-B, the helicopter continued to follow the I-15 freeway from altitudes that ranged from about 4,712 ft to about 2,199 ft (about 1,172 ft agl). The flight route is shown in figures 6 through 10.

¹⁶ See Attachment 8 to this report.

¹⁷ See Attachment 9 to this report.



Figure 3. Google Earth image showing the accident flight and the area of missing ADS-B data.



Figure 4. Google Earth image showing the entire accident flight as captured by Spidertracks.



Figure 5. Google Earth image showing ADS-B in light green, and Spidertracks in dark green and red.



Figure 6. Google Earth Image showing lowest altitude recorded by Spidertracks.

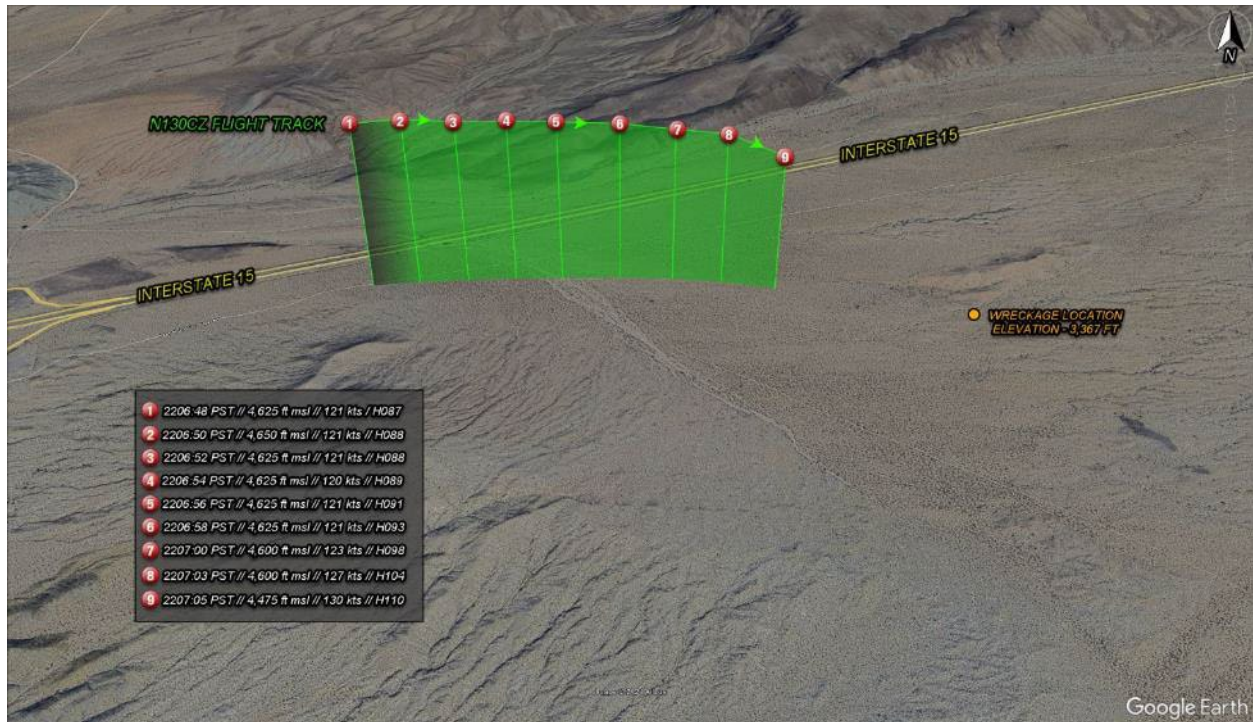


Figure 7. Google Earth image showing the final ADS-B data points along with altitude, groundspeed, and heading.

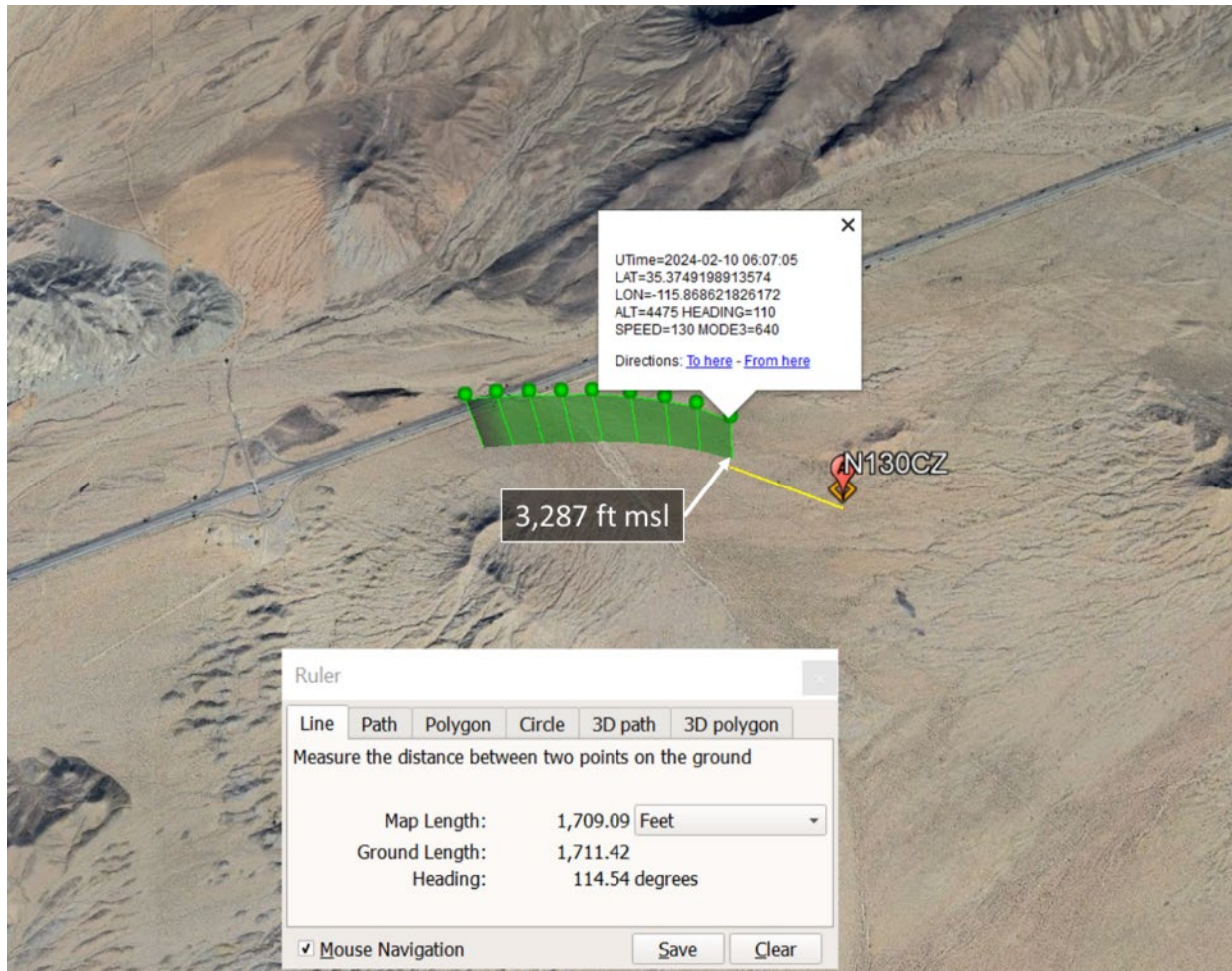


Figure 8. Google Earth image showing the last ADS-B data point. 1,709 ft west of the accident site at an elevation of about 1,188 ft agl.

After the flight departed, the Flight Follower tracked the flight via the Spidertracks application (app) on his cell phone. According to the Flight Follower, around 2206, he noticed that the Spidertracks helicopter icon was near Halloran Springs Road and would not update the helicopter's location, despite multiple attempts to "refresh". A review of the Emergency Response Plan's (ERP) event record¹⁸ showed that around 2212, he reported that the "Tracking not refreshing". Around 2220 to 2222, he contacted the DoM and the Safety Manager who observed the same thing on their apps. From 2228 to about 2230 he made attempts to call the PIC and the safety pilot. Around 2240 he called the California Highway Patrol (CHP). CHP confirmed an event occurred but would not elaborate on the details. Around 2305, he contacted a representative from the FAA who referred him to Oakland Center [Oakland Air Route Traffic Control Center (ARTCC)]; however, ARTCC had not been tracking the helicopter. Around 0038, on February 10, 2024, he received confirmation from the CHP that an event had occurred and was provided with enough information to

¹⁸ See Attachment 10 to this report.

conclude that the event was not survivable. He tasked the safety manager to make notifications to family members of the pilots that an event occurred. Calls were documented around 0239, and 0242. According to the Safety Manager, he informed the families of the following:

- The helicopter's tracker had gone offline.
- They had no contact with the pilots.
- They did not have anything confirmed one way or the other.
- They were trying to reach law enforcement, but law enforcement would not give details other than to confirm that an accident had occurred.
- When it was confirmed that it was an accident, but could get no additional information, they encouraged the families to contact local law enforcement to try to get information as a family member.

About 0406, he deployed an employee¹⁹ from Las Vegas to go out to Halloran Springs. The employee arrived in the area but was not allowed to go to the site. He handed out some of his contact cards to law enforcement and departed. Around 0750, he contacted the passenger's point of contact.

2.0 Site Survey

The accident occurred in the Mojave Desert, about 1.6 miles northeast of the Halloran Springs Exit off I-15. The terrain was composed of rolling hills with sparse vegetation of about 4 ft to 6 ft in height. A review of the surrounding area revealed that the Halloran Wash was located north of and ran paralleled to I-15. Topographic features show that the terrain north and south of the wash increased in elevation, in addition to the elevation generally increasing from west to east. Figures 11 and 12 show the Halloran Wash and elevation changes.

¹⁹ Orbic Air's Part 133 Chief Pilot

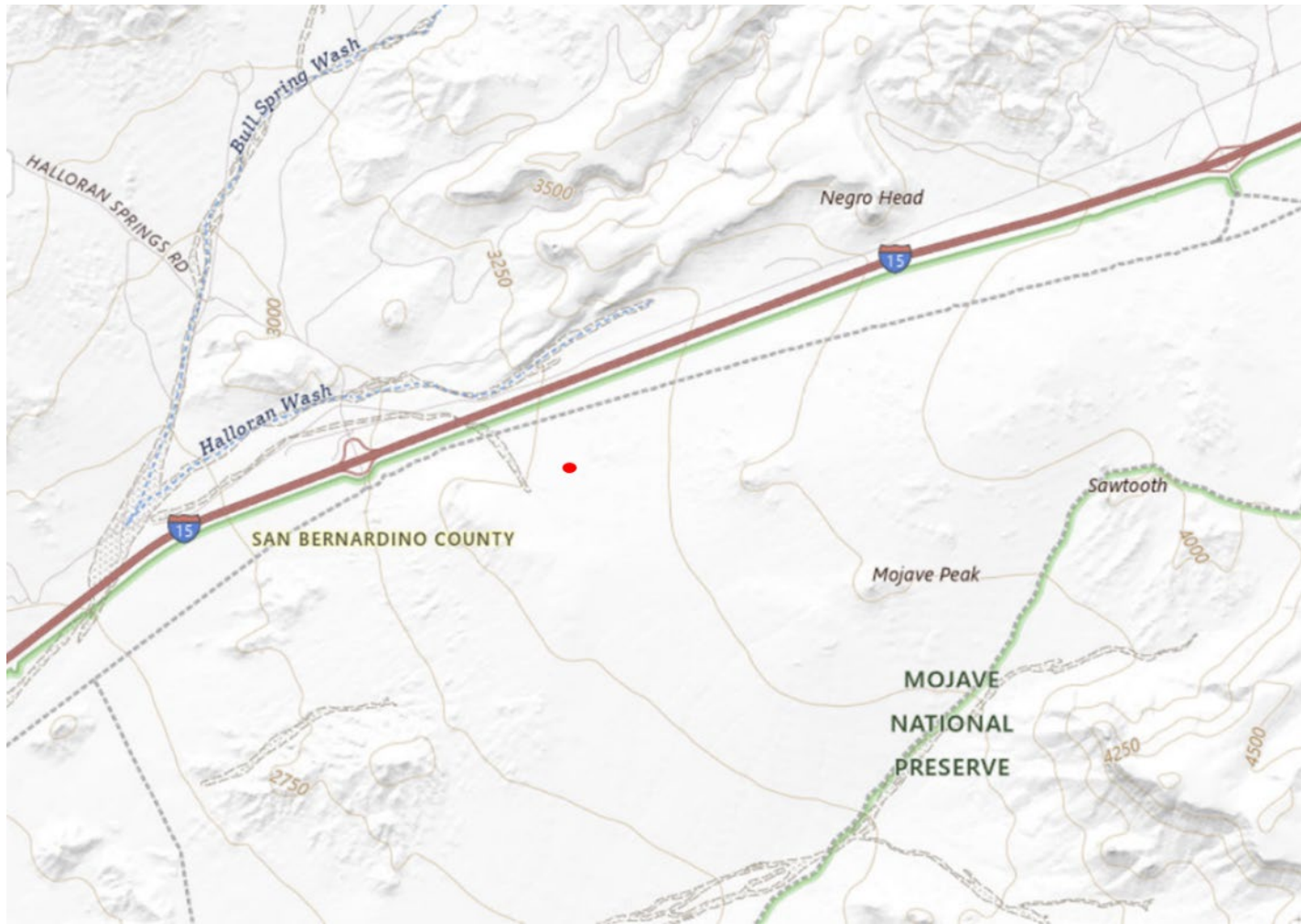


Figure 9. Topographic map showing elevation contour lines. The red dot is the approximate location of the wreckage.



Figure 10. Google Earth image showing the features of the terrain surrounding the wreckage. The broken yellow arrows point in the direction of the rising terrain.

3.0 Recording Devices

The wreckage contained personal electronic devices (PED) that consisted of the following:

- Apple iPad Mini 6 (S/N: THH4D2QJFC)
- Apple iPad Mini 5 (S/N: DMPZT76ZLM93)
- Apple iPhone 11 Pro Max (S/N: Unknown)
- Apple iPhone 12 Pro Max (S/N: Unknown)
- Samsung Galaxy Z Fold 4 (S/N: RFCW3021G3J)
- Microsoft Surface Pro 7 (S/N: 074278701753)

The PEDs were shipped to the National Transportation Safety Board's Recorders Laboratory for further examination²⁰. According to the Recorder's Laboratory, "All devices were rendered inoperable due to impact and heat damage sustained during the accident event. The motherboard from each device was evaluated and the damage precluded any recovery efforts, therefore, no data were recovered."

4.0 Helicopter Information for Operations

For details of the helicopter, see the Airworthiness Factual Report.

²⁰ See Attachment 11 to this report.

The company's Operations Specifications (Ops Spec)²¹ stated in part: *"The certificate holder is not authorized and shall not: Reference paragraph A160, conduct Part 135 rotorcraft operations without the radio altimeter equipment required by 14 CFR Part 135.160(a), under a deviation as provided in §135.160(b) and in accordance with the limitations and provisions of LODA A160."*

The company Ops Spec paragraph D095 authorized the company to use an FAA-approved Minimum Equipment List (MEL); however, Paragraph D095 only listed the R-44-II as aircraft authorized to use an FAA-approved MEL. According to the Director of Operations, the company had applied for an MEL for the C-130-B4 and were waiting on final approval from the FAA.

The Master Minimum Equipment List (MMEL)²² for the Airbus Helicopters C-130-B4, stated in part: *"3444-01 Radio Altimeter System. (O) Procedures for the crew to ensure alternate procedures are established and used, night operations is not performed with NVG's; no night off-airport landings or landings at un-improved areas; for flight at night, the pilot must evaluate terrain and obstacles along the route and fly at such an altitude so as to ensure all terrain and obstacles along the route of flight are cleared vertically by no less than 500 feet; flight at night is not conducted over water or terrain without surface lights, and pilot is aware of potential degraded AP performance on ILS/GS or LPV vertical."*

5.0 Pilot (PIC) Information

According to the PIC's last annual resume, dated April 4, 2023, his date of hire was March 15, 2021, and his date of hire for Part 135 operations was September 8, 2022²³. He resided in Simi Valley, California, with his fiancé. According to her, the PIC loved working for the company and had no negative things to say about the company. He was well rested and told her that he would be returning in the morning of the following day, around 0130 to 0200.

5.1 PIC's Certificates Held at the Time of the Accident.

The PIC held a first-class medical certificate, issued on December 27, 2023. The PIC had a limitation of "must use corrective lens(es) to meet vision standards at all required distances."

The PIC held a commercial pilot's certificate issued on October 27, 2020. He was rated for rotorcraft-helicopter and instrument helicopter. He was English

²¹ See Attachment 20 to this report.

²² See Attachment 24 to this report.

²³ See Attachment 12A to this report.

proficient. The PIC also held an instructor certificate issued on November 12, 2022. He was rated for instructor rotorcraft-helicopter, and instrument helicopter.

5.2 PIC's Training and Proficiency Checks

According to the PIC's training records, he had a Record of Training Form for the Robinson R-44 helicopter, for recurrent training (135.351). He had a base month of September. The curriculum segments were completed and graded satisfactory on October 24, 2023, and signed off by the Check Airman on October 24, 2023.

The PIC had a second Record of Training Form for the EC-130-B4 for transition training (135.345). His base month was July. The required curriculum segments were completed and graded as satisfactory on July 10, 2023, and signed off by the Chief Pilot / Instructor Pilot on July 10, 2023.

5.3 PIC's Flight Times

The PIC logged his flight time on the ForeFlight app. ForeFlight records show an experience report from November 3, 2018, to March 7, 2024²⁴. A review of the PIC's digital logbook revealed that he had logged 1,997.3 flight hours, 1,902.8 hours PIC, 132.2 hours night, and 46.2 hours in the EC-130 helicopter.

According to the PIC's last annual resume, dated April 4, 2023, he reported the following:

Total Time	1445.0	Cross Country	541.4	Instruments	117.0
Rotorcraft	1445.0	Total Night	114.0	Hood	48.8
Piston	1438.8	Night X/C	71.0	Actual Inst	0
Turbine	6.2	Simulator	69.4		

A review of the PIC's Duty Logs revealed the following.

Time	Total	Night	Instrument
90 Days	109.2	11.6	0.0
30 Days	39.8	1.9	0.0
7 Days	6.9	0.3	0.0
1 Day	2.5	2.4	0.0

5.4 PIC's On-Duty and Off-Duty History

The PIC's duty periods for the month of February are detailed below. All other days of the month were off duty.

²⁴ Date of the ForeFlight report

Date	Time In	Time Out	Total Hours
February 1, 2024	0945	1815	8.0
February 2, 2024	0900	1900	9.5
February 7, 2024	0745	1800	9.75
February 8, 2024	0900	1700	7.5
February 9, 2024	1405	2208	8.1

5.5 PIC's Recent Activities

The PIC's recent activities were documented through cellular telephone records, interviews, and company records. On February 6, 2024, the pilot awoke about 0525 to make his fiancé lunch. His fiancé texted him at 0555 when she arrived at work but did not hear back until 0717; she assumed he went back to sleep. He was off duty and spent the day, from about 0730 until 1430, visiting with family in Camarillo. His activities between 1430 when he returned home until he left that evening to return to Camarillo for dinner were unknown. He returned home from dinner about 2000. When he went to bed was unknown.

On February 7, he awoke about 0525 again to make his fiancé lunch. He messaged her at 0700 to say he was awake and headed to work soon. He was on duty from 0745 until 1800. There was cellular telephone activity between 1016 and 1141 and between 1634 and 1718. He messaged his fiancé at 1754 that he was off of work. He arrived home about 2000, and they were in bed shortly after 2000.

On February 8, he awoke about 0620 to make his fiancé lunch. He was on duty from 0900 until 1700. There was cellular activity between 1438 and 1755. He was in bed about 2030 and fell asleep watching TV.

On February 9, the day of the accident, he awoke about 0620. He told his fiancé that he went back to bed from about 0730 until 0900. He brought his fiancé coffee at work and spent time with his fiancé's mom from about 1130 until 1405. There was a text message exchange between the PIC and safety pilot at 1208 indicating excitement that they were flying together. He left for Orbic about 1405. He took the train from Burbank to Camarillo to pick up the accident helicopter; he messaged his fiancé at 1639 that he arrived in Camarillo. A photo of the accident helicopter and a video of inoperative radar altimeter were located on an iPad at his home that had synced with an Apple device the PIC had with him; the time stamps were 1658 and 1731, respectively. Between 1734 and 1746, he messaged with the DoM about the radar altimeter not working. He messaged his fiancé that he landed in Burbank at 1800, was departing Burbank at 1805 and landed in Palm Springs at 1914. He messaged her again at 1943 that the passengers were arriving soon and at 1948, that the passengers had landed and were clearing customs. He unintentionally dialed his fiancé's mom at 2032. There was no other outgoing cellular telephone activity recorded prior to the accident.

He was reportedly a good sleeper, typically got 8 hours of sleep per night, and did not have any difficulties falling asleep or staying asleep.

5.6 Medical and Pathological Information

An autopsy of the PIC was conducted by the San Bernadino County Sheriff's Department, Coroner Division, San Bernadino, California. The cause of death was multiple blunt force injuries, instantaneously.

Toxicology testing performed by the FAA Forensic Sciences Laboratory identified no evidence of impairing substances.

6.0 Safety Pilot

The safety pilot was employed by the operator as a Pilot in Command. According to his annual resume, dated April 4, 2023, his date of hire was October 17, 2022, but did not list a Part 135 hire date²⁵. According to the Pilot Duty Assignment (FAR 135 Pilot Record), he was assigned to operate as a Part 135 PIC in the Robinson R-44 helicopter.

The safety pilot's duty aboard the accident helicopter was as a safety pilot. According to the Director of Operations, there are two situations when a safety pilot or a second pilot is used. The first is when the customer requests, and the second was, in most cases we [Orbic Air] do that on our own, depending on the flight, and this flight [the accident flight] was one of them. The Director of Operations indicated that during night desert flights, they would use a safety pilot. According to the Director of Operations:

- The safety pilot was "a second set of eyes, a second head to make sure that the flight is going according to plan."
- The safety pilot was on the accident flight for safety reasons.
- The safety pilot position is not documented in any manual (Operations Specifications, General Operations Manual, or training manual).
- The risk assessment did not mention a safety pilot but did include a minus 1 value when a second pilot is included in the flight.
- The safety pilot normally sits in the instructor seat, the middle seat for the EC-130.
- To comply with CFR 135, the safety pilot is non-flying, not expected to manipulate the flight controls.

²⁵ See Attachment 12B to this report.

- The only thing the safety pilot is allowed to do is change the radios [frequencies].
- During an emergency, the safety pilot would not take the controls unless it was discussed on their own [between the PIC and the Safety Pilot].
- The safety pilot is not there to take over or anything because they are not the PIC, so there is no expectation of them intervening in that sense.
- There was a method of isolating the pilot and safety pilot's communication from the passengers.

According to the President of Orbic Air:

- Orbic Air could use a second EC-130 rated pilot in leu of a safety pilot.
- It would not cost the company more money to use a second pilot in the leu of a safety pilot.
- The safety pilot could help with navigating, changing radios [frequencies] but not manipulate the flight controls.
- The customer requested a second pilot.
- The accident safety pilot had some training in the EC-130 but was not qualified for flying the EC-130 for the operator in a Part 135 role.
- Because the safety pilot was not rated to fly the EC-130, he was not expected to manipulate the flight controls or share the flying duties.
- If there was a medical emergency with the pilot, the safety pilot, if qualified in the helicopter, could act to meet the needs of the emergency.
- The safety pilot sits in the center seat.

According to the Chief Pilot:

- He has flown with a safety pilot.
- He usually does most of the work himself, but it is nice to have them help with the passengers.
- While enroute the safety pilot can dial in a frequency, and they are an extra set of eyes to look for traffic.
- He briefs the safety pilot on the safety pilot's responsibilities.
- He has served as a safety pilot.
- The safety pilot sits in the center seat.
- Sometimes the company uses a second qualified pilot, but he didn't know the details of why it [the accident flight] ended up that way.
- He agreed that the safety pilot is ready to fly the helicopter but, because he is not Part 135, he would not be legal to fly.
- The safety pilot [if not rated in the helicopter] cannot touch the controls [during a part 135 flight]

- The company does use a qualified second pilot sometimes, and he was not aware of why the accident flight used a non-qualified pilot to go.
- The accident safety pilot was expected to be the next pilot to get qualified in the EC-130.
- The safety pilot could have flown the Part 91 legs and would have received additional exposure on the flight.

According to the Safety Manager for Orbic Air:

- The safety pilot sat in the middle seat.
- The [PIC] briefing to the safety pilot would just be anything that you are watching out for, obstacles, and weather.
- The safety pilot is only there to help monitor and in emergency situations, otherwise they do not touch the controls and basically help with the passengers.

6.1 Safety Pilot's Certificates Held at the Time of the Accident

The safety pilot held a first-class medical certificate, dated July 19, 2023. There were no limitations noted on the medical certificate.

A records review revealed that, about the time of the accident, the safety pilot held a commercial pilot certificate with ratings for rotorcraft-helicopter and instrument -helicopter, with a limit for English proficient. The safety pilot also held a flight instructor certificate, issued on August 8, 2023, with ratings for rotorcraft-helicopter and instrument helicopter.

6.2 Safety Pilot's Training and Proficiency Checks

According to the safety pilot's training records, he had a Record of Training form for the Robinson R-44 helicopter, for initial training (135.331 and .345). The pilot had a base month of May. The curriculum segments were completed and graded satisfactory on May 10 through 16, 2023 and signed off by the instructor on May 16, 2023.

The safety pilot's single-line entry form revealed that he completed aircraft ground, basic indoctrination, aircraft ground, general emergency, hazmat, all written tests, aircraft flight, and initial 135 check for the R-44, during the month of May 2023.

The safety pilot passed his Part 135.293 proficiency check on May 17, 2023. The grade slip revealed the pilot was graded satisfactory in inadvertent IMC recovery and unusual attitude recovery.

The safety pilot's single-line entry form recorded his satisfactory completion of the following:

- Aircraft ground
- Basic indoctrination
- Aircraft ground
- General emergency
- Hazmat
- All written tests
- Aircraft flight
- Initial Part 135 check, R-44

6.3 Safety Pilot's Flight Times

The safety pilot logged his flight time on the ForeFlight app. ForeFlight records show an experience report from January 4, 2021, to March 7, 2024²⁶. The records show that from January 4, 2021, until August 30, 2022, the safety pilot had a total time of 211.7 flight hours experience, 146.8 hours as PIC, 51.4 hours night, and no hours logged in the EC-130. All this time was accrued while in Cedar City, Utah, while undergoing helicopter flight training.

According to the safety pilot's annual resume, dated April 4, 2023, he accrued the following:

Total Time	500.4	Cross Country	132.3	Instruments	50.3
Rotorcraft	500.4	Total Night	70.9	Hood	50.3
Piston	464.1	Night X/C	48.9	Actual Inst	0
Turbine	25.8	Simulator	0.3		

A review of the safety pilot's Duty Logs revealed the following.

Time	Total	Night	Instrument
90 Days	124.4	13.5	0.0
30 Days	44.5	3.8	0.0
7 Days	9.1	2.5	0.0
1 Day	2.2	2.2	0.0

²⁶ Date of the ForeFlight report request.

6.4 Safety Pilot's On-Duty and Off-Duty History

The safety pilot's duty periods for the month of February are detailed below. All other days of the month were off duty.

Date	Time In	Time Out	Total Hours
February 2, 2024	1130	1830	7.0
February 3, 2024	0900	1830	9.5
February 6, 2024	1000	1430	4.5
February 9, 2024	1400	2208	8.2

6.5 Safety Pilot's Recent Activities

The safety pilot's recent activities were documented through cellular telephone records, interviews, and company records. On February 6, 2024, the safety pilot worked from 1000 until 1430; no flight time was reported. He was off duty on February 7 and 8. On his days off, he would run errands and do household activities. Limited cellular telephone data was available. On February 7, there were voice calls between 1344 and 1346, and on February 8, there were voice calls between 1753 and 1756. He would typically go to his room about 2200-2300 and watch TV or be on his cell phone. His sleep and wake times were unknown. He did not have any difficulties falling asleep or staying asleep. His parents thought the time he went to sleep would vary based on whether he worked late or had to be up early.

On February 9, the day of the accident, his wake time was unknown. His mom sent him a message around 1000 letting him know breakfast was ready. After breakfast, his brother came to the house, and he spent time with family. He messaged with the PIC at 1208, and his mom thought he left for work about 1400. There were voice calls at 1401, 1733 and 1751. He messaged his mom in the afternoon that the flight was moved back to 2000, and he would not be as late getting home. There was no other outgoing cellular telephone activity recorded prior to the accident.

6.6 Medical and Pathological

An autopsy of the safety pilot was conducted by the San Bernadino County Sheriff's Department, Coroner Division, San Bernadino, California. The cause of death was multiple blunt force injuries, instantaneously.

Toxicology testing performed by the FAA Forensic Sciences Laboratory on the safety pilot's blood identified no evidence of impairing substances.

7.0 Mission Planning

Orbic Air used the Gyronimo software for mission planning. According to the Director of Operations, the pilot needed three things before departing on a flight; the load manifest, the risk assessment, and the weight and balance. The load manifest and weight and balance are addressed in this section. The flight risk assessment will be addressed in a separate section.

The pilot created three load manifests²⁷ on February 9, 2024. One was created at 1614, that included a common weight of 180 pounds for each passenger. One was created at 1750 with unique weights for each passenger, and one at 1802 that was identical to the 1750 load manifest.

7.1 Minimum Altitudes

The GOM stated, in part: "18.14. Minimum Altitudes.

Except when necessary for takeoff and landing, no person may operate under VFR:

(b) A helicopter over a congested area at an altitude less than 300 feet above the surface."

8.0 Weather, Weather Requirements, Weather Briefing

8.1 Weather

See the Meteorological Factual Report for CEN24MA111

8.2 Weather Requirements

The Company General Operations Manual (GOM)²⁸ stated in part,

"18.13. VFR Weather Minimums.

18.13.1. No pilot may operate an airplane under VFR conditions in uncontrolled airspace when the ceiling is less than 1,000 feet unless flight visibility is at least 2 miles.

18.13.2. No pilot may operate a helicopter under VFR in Class G airspace, or within the lateral boundaries of the surface area of Class

²⁷ See Attachment 13 to this report.

²⁸ See Attachment 21 to this report.

B, Class C, Class D, or Class E airspace designated for an airport unless the visibility is at least:

- 1. During the day - 1/2 mile; or*
- 2. At night - 1 mile.*

18.13.3. Additional Weather Minimums.

(a) Charter Flights: Day: 500' ceilings and 1 mile visibility.

Night: 500' ceilings and 2 miles visibility.

18.13.4. No pilot may operate a helicopter unless that person has visual surface reference or, at night, visual surface light reference, sufficiently to safely control the helicopter.

Note: These minimums are mandatory and are set for the safety of passengers and crewmembers. Pilots have the authority to increase these minimums when weather, visibility, aircraft or human factors dictate."

8.3 Weather Briefing

The Orbic Air Operations Specifications stated in part,

"a. The certificate holder conducting Part 135 operations is authorized to use weather reporting facilities operated by the U.S. National Weather Service or a source approved by the U.S. National Weather Service.

b. The administrator approves the certificate holder to use the following sources for aviation weather information.

The National Weather Service (NWS) or a source approved by the NWS (within the 48 contiguous United States and the District of Columbia)

c. The certificate holder is approved to use an Enhanced Weather Information System (EWINS) to obtain and disseminate aviation weather for the control of flight operations.

d. In accordance with §135.213(b) the certificate holder is authorized a deviation to §135.213(a) in accordance with A005 of these operations specifications and Table 2 of this operations specifications."

According to the Director of Operations, the pilots are allowed to use anything that is provided by the National Weather Service (NWS). He stated that the company pilots use sites like ForeFlight and SkyVector, and others.

No paper copies or electronic copies of a weather brief were recovered. In an email dated February 26, 2024, from the ForeFlight Pilot Support Team, it stated, "there were no filed flight plans for N130CZ through ForeFlight on or around February 8 or 9, 2024. There was no weather imagery viewed in the account [PIC's account] on or around February 8 or 9, 2024." According to ForeFlight, "a briefing record will only be created if you initiate the preflight briefing by tapping the Briefing button at the top of the Flights view. Only viewing weather information on the Maps or Flights views will not provide the necessary record."

A review of the GOM revealed that the pilot had no requirement to show products of a weather briefing. The Director of Operations indicated that the risk assessment was proof that the pilot had received a weather briefing.

According to the Flight Follower, prior to their departure, he spoke with the safety pilot and asked him if he had checked the weather. The safety pilot told him yes, in general, but would take a deeper dive into it [weather]. He spoke with the PIC, and he reported that the weather was looking good and that the ceilings were all high. The Flight Follower briefly looked at weather and didn't see anything [of concern]. He was not aware of any adverse weather, and everything he looked at showed VFR conditions.

On the Flight Risk Assessment Tool (FRAT)²⁹ The PIC had selected the following:

- Item 43 Ceiling (use lowest along route): > 1000' higher than policy minimums for a value of 0
- Item 46 Visibility (use lowest along route): >5 miles greater than policy minimum vis for a value of 0
- Item 49 Winds (use highest along route): Light winds for a value of 0
- Item 52 Convective Activity: no convective activity for a value of 0
- Item 55 Forecast Conditions: Weather conditions stable-no change forecast for a value of 0
- Item 61 Fog Conditions: not present for fog, for a value of 0
- Item 64 Icing: No icing conditions, for a value of 0

9.0 Flight Time Limitations and Rest Requirements

According to the Director of Operations, the company follows the Federal Aviation Regulations (FARs) to remain in compliance with flight time and rest requirements for the company pilots.

²⁹ See Attachment 14 to this report.

10.0 Inadvertent Instrument Meteorological Conditions (IIMC) Training

The Orbic Air Instructor Training Guide, Section 8³⁰, "Emergency Maneuvers" contained data for conducting unusual attitude recovery, and inadvertent IMC procedures. Both complete maneuvers are an attachment to this report.

The Unusual Attitude procedure stated in part,

"Standards:

- A. Altitude: Return to specified +100 feet*
- B. Airspeed: Return to cruise +10 knots*
- C. Heading: Return to Specified +10°*
- D. Power: Establish Proper Power Setting and Pitch Attitude Change to Return to and then Maintain Cruise Airspeed and Altitude.*
- E. Trim: +1/2 Ball*
- F. Attitude: Both Nose High and Nose Low*
- G. Instrument Cross-Check Interpretation: Proper with Appropriate Pitch, Bank, Power, Trim."*

The Inadvertent IIMC Procedures stated in part,

Standards:

If inadvertent IMC is encountered the pilot will:

- 1. Make the transition to instrument flight immediately.
- 2. Initiate a climb immediately to a desired altitude.
- 3. Without error, execute an IFR recovery

The company GOM stated in part,

"19.1. Procedures for inadvertent IMC

a) Maintain aircraft control.

b) Level wings on the artificial horizon.

c) Maintain heading.

d) Only turn to avoid known obstacles.

e) Adjust torque to best rate of climb. Use "GO-AROUND" mode if equipped and airspeed is sufficient.

³⁰ See Attachment 22 to this report.

f) Climb to an altitude that will avoid obstacles.

g) Adjust airspeed to best rate of climb Airspeed.

h) Turn off landing/taxi, Nightstun, lights, Strobe and/or anti-collision lights to avoid spatial disorientation.

i) Set transponder to emergency code 7700.

j) Contact ATC facility on emergency Frequency or appropriate frequency and declare an emergency. Request assistance."

11.0 Company Training Program

Orbic Air's training program was detailed in the Orbic Air Training Program Manual.

A review of the PIC's training records revealed the PIC was trained in accordance with the company's FAA approved Training Program to operate the EC-130-B4 for the Part 135 charter flight.

A review of the safety pilot's training records revealed that he was not trained to operate the EC-130-B4 for Part 135 operations; however, while the duties of a safety pilot were not detailed in company doctrine, all management personnel exercising operational control understood that the safety pilot, while seated with access to flight controls, was not authorized to manipulate the controls while the helicopter was operating as a Part 135 flight.

12.0 Company Information

12.1 Orbic Air's Company History

Orbic Air is a privately owned company operating under certificate number 1OBA505M. The rotorcraft on-demand operations certificate was issued on April 21, 2022. The company's main office was located at the Bob Hope Airport (BUR) Burbank, California. The office at BUR provided the pilots a private place to conduct business. According to the president, the company employed 15 employees, including 3 pilots.

FAA oversight of Orbic Air's certificate was performed by the Van Nuys Flight Standards District Office (FSDO). The FAA authorized Orbic Air to conduct day/night, visual flight rules only (VFR) passenger flights in the EC-130-B4 and R-44-II helicopters listed on the FAA Operations Specifications (Ops Spec). The company had one AS-350-B3 helicopter, one EC-130-B4 helicopter, one R-22 helicopter and four R-44-II helicopters. For the company's Part 133 certificate, they had one UH-60.

12.2 Organizational Structure

Company management consisted of:

1. President
2. Director of Operations
3. Chief Pilot
4. Director of Maintenance

12.3 Organizational Format

Company Organization Flow Chart

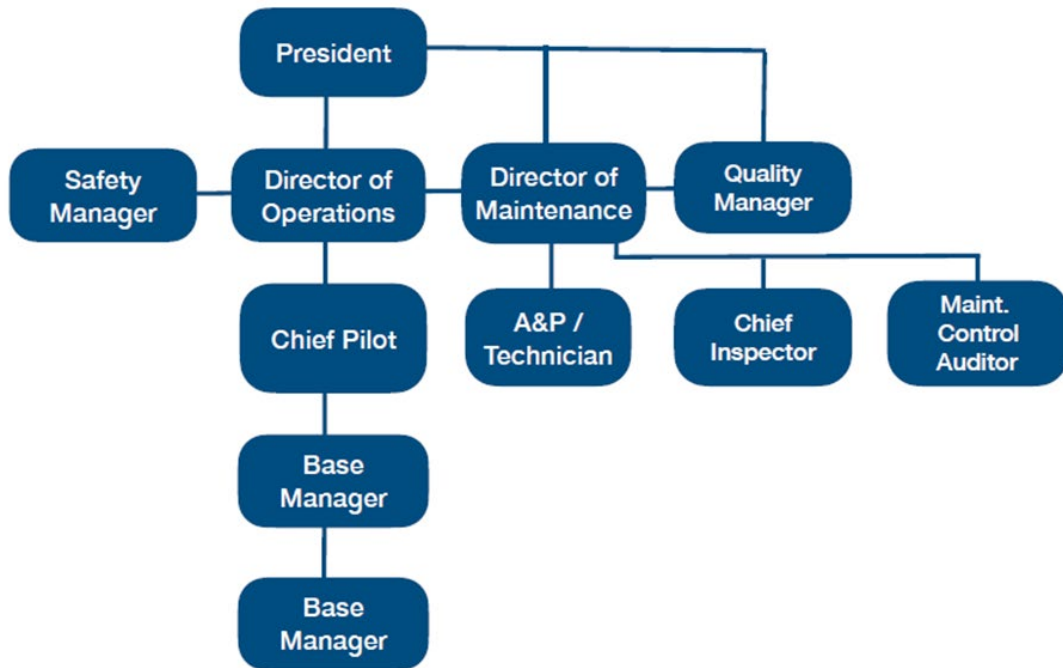


Figure 11. Orbic Air's Organizational Flow Chart. Courtesy of Orbic Air.

12.4 Operational Control

Operational control was detailed in the company Ops Spec paragraph A008.

Operational Control was further detailed in the GOM Section A. The following management personnel are listed in the GOM as having operational control:

- President
- Director of Operations

- Chief Pilot
- Director of Maintenance. Has operational control with respect to the maintenance of the aircraft. Not operational control with respect to flight.

12.5 Flight Follower

The Flight Follower Training Manual stated in part, *"The persons delegated to exercise active operational control are termed Flight Followers."*

Flight Follower duties and responsibilities were detailed in the GOM, Section A, which stated in part,

"Flight Followers are employees of ORBIC AIR, LLC. Flight Followers will have the responsibility of Operational Control. To perform the functions of Flight Follower, he/she shall be qualified and trained before accepting this responsibility. Therefore, all flight Followers must complete the Company Flight Follower Training Course. ORBIC AIR, LLC shall maintain current records for each Flight Follower, which shows compliance with FAR's relating to proficiency, and required training."

A records review revealed that the Orbic Air President received the required training to perform the Flight Follower duty. A copy of the President's Flight Follower training is an attachment.

Flight Follower duties included in part,

"A. No aircraft will be released unless it is in airworthy condition. However, an aircraft may be released with inoperative or missing components in accordance with the Minimum Equipment List.

C. The Flight Follower is responsible for solutions to operational problems, caused by cancellations, delays, diversions, and mechanical interruptions.

G. All aircraft departing a station for the purpose of revenue flight, must be authorized by an approved Flight Follower.

I. No flight may depart unless both the PIC and the Flight Follower are thoroughly familiar with the reported and forecast weather and considering all factors and conditions. The Flight Follower will notify the pilot which flight legs are Part 135 using the Flight Release form. The PIC will review the following information immediately prior to each flight:

1) All available weather reports and forecasts or subsequent changes thereto affecting the proposed flight.

3) All *SIGNMETs* or convective *SIGMETs* affecting the proposed route of flight.

4) *Advisories of all anticipated adverse changes in the weather phenomena affecting the proposed flight.*

5) *All inoperative or missing components on the aircraft to be flown and any restrictions that may apply IAW the MEL.*

9) *Forecasts or reported icing conditions that exist, including the intensity thereof."*

12.6 Flight Release Procedures

The Flight Release section stated in part, *"The person with operational control will:*

b) Assign an aircraft that is listed in Op Spec D085 and is airworthy;"

12.7 Flight Locating

The GOM stated in part, *"Within a flight locating system the air carrier is not required to be able to establish direct radio contact with a flight while enroute. The flight follower must, however, concur with the PIC that a flight can be conducted safely before the flight may be initiated. This requirement necessitates a suitable means of communication between the flight follower and the PIC at each point of departure. GPS technology tracking (i.e. Spidertracks), improves the accuracy and reliability of the flight following process."*

Orbic Air used Spidertracks and text messaging between the PIC and the Flight Follower to aid in flight locating. The Spidertracks route is included in the History of Flight section of this report. See Attachment 5 to this report for the text messages between the PIC and the Flight Follower.

13.0 Safety Management System (SMS)

Orbic Air used an SMS developed by PRISM Solutions. The SMS was not a part of the FAA voluntary SMS program. Orbic Air's SMS was detailed in the Orbic Air Safety Management System Manual³¹ and was reviewed and approved by the Company President.

³¹ See Attachment 23 to this report.

13.1 Orbic Air Policy Statement

Orbic Air's Policy Statement stated in part, *"Just culture is a policy in which front-line and others are not punished for actions, omissions, or decisions taken by them which are commensurate with their experience or training, but where gross negligence and willful violations are not tolerated."*

13.2 Emergency Preparedness and Response

The company used the Orbic Emergency Response Plan (ERP) in reacting to the accident.

13.3 Internal Audits.

The SMS Program stated in part, *"Orbic Air shall monitor organizational performance utilizing a proactive internal evaluation program..."*

According to the Safety Manager, the PRISM system was fairly new to the company, and they have a few internal audits. He stated that he had gone to one of the week-long training courses and was still figuring things out. He reported that the internal audits that were done did not reveal anything significant. A memorandum dated January 2024, contained a section titled SAFETY TOPICS. The meeting addressed the SMS program and explained that the SMS program was not a one-man job. It further detailed that everyone in the meeting *"will need to assist with the management of safety standards, respond to HazReps and or Risk Assessments when they are assigned to you; and also conduct internal evaluations when I assign them to you."*

13.4 External Audits.

External audits were performed by Blade Air Mobility, New York, New York³². According to a memorandum dated, 3/30/2022, Blade conducted an onsite audit on 1/2/2020 and two Zoom audits on 10/4/2019, and 2/7/2022. The audits examined the areas that included generally, operations, maintenance, Safety Management Systems, flight emergency procedures, and flight tracking. Blade reported all examined areas received a pass/go rating with no issues to report and spoke favorably of the owner and the company.

13.5 Safety Training and Meetings

According to the Safety Manager, the PRISM SMS provided on-line safety training for the company. A review of the SMS manual revealed the safety training

³² See Attachment 19 to this report.

was specifically tailored for the duty position of the individual. The Safety Topics meeting dated January 2024 (detailed below) stated the following, *"Internal Audits" or internal evaluations are to be conducted monthly by the safety officer as appointed by the director of operations. Though evaluations have been conducted, proper logging and filing of the evaluations to the SMS Library has been insufficient. The Safety officer and Director of Operations, along with the Company President, will set a Safety Performance Target to ensure a minimum of 1 evaluation is conducted Monthly and filed to the SMS Library. The Safety Committee will discuss the efficiency of this SPT at each monthly meeting over the next 6 months to ensure the target has been met. Internal evaluations are to be filed in the SMS library."*

Three documents were provided that included minutes for SAFETY TOPICS.

- May 2023. Safety Topics. One entry requiring all to check their email for notifications from PRISM. Some training or important safety information may be sent and require a "read and sign" acknowledgement.
- January 2024. The Safety Topic section listed and detailed the minutes of the safety meeting. A Hazard Report was submitted that stated, *"The company's SMS is not working effectively. Employees don't use it, no internal audits, and no monthly safety meeting."* The Hazard Report was addressed as follows, *"An "all staff" text message is used for company communications as needed regarding all Orbic Air part 91 and 135 operations in lieu of formal communication on a monthly basis. Safety committee will continue to discuss important "urgent" topics as needed with the text messages or in person meeting, and safety office will ensure to distribute monthly committee meeting minutes. The Safety Officer and President will conduct a follow up evaluation on the effectiveness of communication standards in 3 months."*
- June 11, 2024. Safety Topics. Detailed minutes of the safety topics were included.

13.6 Flight Risk Analysis Tool (FRAT) and Flight Risk Analysis (FRA)

The PIC used PRISM to generate a flight risk analysis (FRA) for the accident flight. A copy of the accident FRA is an attachment to this report. As stated earlier in this report, mission planning was conducted using the Gyronimo system. A feature of Gyronimo was a FRAT. According to the Director of Operations, the company switched to the PRISM FRAT to comply with their firefighting operational requirements. The Director of Operations ensured that the exact same parameters were used with both FRATS. According to the Safety Manager, the Gyronimo FRAT

did not save a copy for history and required printing and filing, and that was one reason why the company switched to PRISIM.

According to the Safety Manager, the FRAT is a requirement for all Part 133 and 135 flights, and if management sees a high risk for a Part 91 flight, they will direct the pilot to complete a FRAT for that leg. When asked about the upcoming return flight from BVU to BUR, the Safety Manager indicated that it would have been a high-risk flight [night over the desert] and the PIC would have done a new FRA for that flight before departure [using a PED]. According to the Director of Operations, the FRA is required for all Part 135 flights and not for Part 91.

The Safety Manager explained that the FRA values for the accident flight did not rise to the level termed "elevated." Had the FRA values become elevated; an email is automatically sent to management as an alert which would then require risk mitigation.

14.0 Personal Electronic Device (PED) Use for Company flights

A review of the GOM did not reveal data pertaining to usage of PEDs, nor did it address the FAA AC-120-76D "Authorization for Use of Electronic Flight Bags". *AC-120-76D stated in part, ". It is intended for all operators conducting flight operations under Title 14 of the Code of Federal Regulations (14 CFR) part 91 subpart K (part 91K), 121, 125, or 135 who want to replace required paper information or utilize other select applications as part of EFB functionality. This AC sets forth an acceptable means, but not the only means, to obtain Federal Aviation Administration (FAA) authorization for the operational use of EFBs utilizing both portable devices or installed equipment evaluated by the operator as their means to display operating information with an equivalent level of accessibility, usability, and reliability to the means they replace."*

The Director of Operations indicated that the use of a personal iPad was allowed for company flights. He reported that the company did not issue iPads, the use of one was not a company requirement, and the helicopter was equipped with navigational instruments and had the paper maps that are required. The Director of Operations stated that the accident pilots could update their weather brief by using ForeFlight, indicating that the pilots likely were using an iPad with ForeFlight during the accident flight. As noted earlier in this report, there were several PEDs onboard the helicopter during the accident flight. Additionally, it was determined that the PIC and the Safety Pilot were known to use an iPad with ForeFlight.

The accident helicopter was equipped with a Garmin 430 and was recently equipped³³ with a Garmin 650 for navigation. The Director of Operations indicated

³³ The Garmin 650 was installed during the last maintenance, just prior to being picked up by the PIC

that he wasn't aware if the company pilots relied on their iPads with ForeFlight over the installed navigational equipment of the aircraft.

Submitted by:

Fabian Salazar
Operations Group Chairman

Katherine Wilson
Human Performance
Group Chair

Attachments

1. Contract emails
2. Maintenance Write-up for Operational Flight
3. Video of the Radar Altimeter
4. Orbic Air Personnel Interviews
5. Text Messages
6. Video of Crew at PSP FBO
7. Signature Aviation Documents
8. ADS-B KMZ and Excell Files
9. Spidertracks KML and Excel Files
10. Emergency Response Plan and Program Log
11. Personal Electronic Device Exam Report
12. PIC and Safety Pilot's Files
13. Load Manifest
14. Flight Risk Assessment Tool
15. President's Flight Follower Training Record
16. Next of Kin Interview Summaries
17. FAA POI Interview Transcript
18. Safety Meetings
19. External Audits
20. Operations Specifications Excerpt
21. General Operation Manual Excerpts
22. General Training Manual Excerpts
23. Safety Management System Excerpts
24. Master Minimum Equipment List Excerpt