

NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of October 18, 2016
(Information subject to editing)

**Crash During Nonprecision Instrument Approach to Landing, Execuflight Flight 1526,
British Aerospace HS 125-700A, N237WR
Akron, Ohio, November 10, 2015
NTSB/AAR-16/03**

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing to reflect changes adopted during the Board meeting.

EXECUTIVE SUMMARY

On November 10, 2015, about 1453 eastern standard time, Execuflight flight 1526, a British Aerospace HS 125-700A (Hawker 700A), N237WR, departed controlled flight while on a nonprecision localizer approach to runway 25 at Akron Fulton International Airport (AKR) and impacted a four-unit apartment building in Akron, Ohio. The captain, first officer, and seven passengers died; no one on the ground was injured. The airplane was destroyed by impact forces and postcrash fire. The airplane was registered to Rais Group International NC LLC and operated by Execuflight under the provisions of 14 *Code of Federal Regulations (CFR)* Part 135 as an on-demand charter flight. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed. The flight departed from Dayton-Wright Brothers Airport, Dayton, Ohio, about 1413 and was destined for AKR.

Contrary to Execuflight's informal practice of the captain acting as pilot flying on flights carrying revenue passengers, the first officer was the pilot flying, and the captain was the pilot monitoring. While en route, the flight crew began preparing for the approach into AKR. Although company standard operating procedures (SOPs) specified that the pilot flying was to brief the approach, the captain agreed to the first officer's request that the captain brief the approach. The ensuing approach briefing was unstructured, inconsistent, and incomplete, and the approach checklist was not completed. As a result, the captain and first officer did not have a shared understanding of how the approach was to be conducted.

As the airplane neared AKR, the approach controller instructed the flight to reduce speed because it was following a slower airplane on the approach. To reduce speed, the first officer began configuring the airplane for landing, lowering the landing gear and likely extending the flaps to 25° (the airplane was not equipped with a flight data recorder, nor was it required to be). When the flight was about 4 nautical miles from the final approach fix (FAF), the approach controller cleared the flight for the localizer 25 approach and instructed the flight to maintain 3,000 ft mean sea level

(msl) until established on the localizer. The airplane was already established on the localizer when the approach clearance was issued and could have descended to the FAF minimum crossing altitude of 2,300 ft msl. However, the first officer did not initiate a descent, the captain failed to notice, and the airplane remained level at 3,000 ft msl.

As the first officer continued to slow the airplane from about 150 to 125 knots, the captain made several comments about the decaying speed, which was well below the proper approach speed with 25° flaps of 144 knots. The first officer's speed reduction placed the airplane in danger of an aerodynamic stall if the speed continued to decay, but the first officer apparently did not realize it. The first officer's lack of awareness and his difficulty flying the airplane to standards should have prompted the captain to take control of the airplane or call for a missed approach, but he did not do so.

Before the airplane reached the FAF, the first officer requested 45° flaps and reduced power, and the airplane began to descend. The first officer's use of flaps 45° was contrary to Execuflight's Hawker 700A nonprecision approach profile, which required the airplane to be flown at flaps 25° until after descending to the minimum descent altitude (MDA) and landing was assured; however, the captain did not question the first officer's decision to conduct the approach with flaps 45°. The airplane crossed the FAF at an altitude of about 2,700 ft msl, which was 400 ft higher than the published minimum crossing altitude of 2,300 ft msl. Because the airplane was high on the approach, it was out of position to use a normal descent rate of 1,000 feet per minute (fpm) to the MDA. The airplane's rate of descent quickly increased to 2,000 fpm, likely due to the first officer attempting to salvage the approach by increasing the rate of descent, exacerbated by the increased drag resulting from the improper flaps 45° configuration.

The captain instructed the first officer not to descend so rapidly but did not attempt to take control of the airplane even though he was responsible for safety of the flight. As the airplane continued to descend on the approach, the captain did not make the required callouts regarding approaching and reaching the MDA, and the first officer did not arrest the descent at the MDA. When the airplane reached the MDA, which was about 500 ft above the touchdown zone elevation, the point at which Execuflight's procedures dictated that the approach must be stabilized, the airspeed was 11 knots below the minimum required airspeed of 124 knots, and the airplane was improperly configured with 45° flaps. The captain should have determined that the approach was unstabilized and initiated a missed approach, but he did not do so.

About 14 seconds after the airplane descended below the MDA, the captain instructed the first officer to level off. As a result of the increased drag due to the improper flaps 45° configuration and the low airspeed, the airplane entered a stalled condition when the first officer attempted to arrest the descent. About 7 seconds after the captain's instruction to level off, the cockpit voice recorder (CVR) recorded the first sounds of impact.

The National Transportation Safety Board (NTSB) identified the following safety issues as a result of this accident investigation:

- **Lack of a requirement for flight data monitoring programs for 14 CFR Part 135 operators.** Execuflight had no means to monitor the daily operation of its airplanes, identify operational deficiencies (such as noncompliance with SOPs), and correct those

deficiencies before an accident occurred. In addition to this accident, the NTSB has investigated many other Part 135 accidents in which the operator lacked the means to monitor routine flight operations. Absent continual surveillance of an operation through en route inspections by company check airmen, the only means an operator can use to consistently and proactively monitor its line operations is through comprehensive data collection over the entirety of its operation, which can be accomplished through flight data monitoring.

- **Lack of a requirement for safety management system (SMS) programs for 14 CFR Part 135 operators.** Execuflight lacked an SMS, which has been recognized in the industry as an effective way to establish and reinforce a positive safety culture and identify deviations from SOPs so that they can be corrected. This accident is one of many Part 135 accidents and incidents in which the NTSB has determined that inadequate operational safety oversight played a role. These accidents may have been prevented if an SMS had been in place.
- **Lack of a Hawker 700- and 800-series nonprecision approach procedure that meets stabilized approach criteria and defines “landing assured.”** The step-down technique for executing nonprecision approaches taught to the flight crew required level off at the MDA and a flap configuration change at the point of “landing assured.” Since many nonprecision approaches, such as the AKR localizer 25 approach, have MDAs about 400 to 500 ft above ground level (agl), the step-down technique entails a configuration change below 1,000 ft agl. Configuration changes below 1,000 ft agl are contrary to one of the criteria for a stabilized approach provided in Federal Aviation Administration (FAA) Advisory Circular (AC) 120-71A, “Standard Operating Procedures for Flight Deck Crewmembers.” Additionally, there is no definition of “landing assured,” and Hawker simulator instructors provided varying definitions, some of which appeared to conflict with the federal regulation regarding descending below the MDA.
- **Lack of a requirement for flight crew training on the continuous descent final approach technique.** FAA AC 120-108, “Continuous Descent Final Approach [CDFA],” describes and recommends the use of the CDFa technique in lieu of the step-down type of nonprecision approach that Execuflight pilots were trained to conduct, which can lead to unstabilized approaches because of multiple thrust, pitch, and altitude adjustments inside the FAF. While the FAA has indicated that it favors the use of CDFa, the technique is only in guidance material (AC 120-108), and operators are not required to incorporate the information into their manuals. Execuflight training guidance did not specify the use of CDFa on nonprecision approaches. Although several CAE Simuflite instructors indicated that they may teach CDFa as a technique, there was no formal instruction on CDFa, and no formal instruction on using the CDFa technique was provided to Execuflight pilots before the accident.
- **Inaccuracy of data entered into weight-and-balance software.** At the time of the accident, Execuflight pilots primarily computed their airplane’s weight and balance with a software program, which required that the airplane’s basic operating weight first

be entered as a default weight. Because an incorrect basic operating weight was entered into the program, the accident flight crew underestimated the airplane's takeoff weight. Although the incorrect information did not adversely affect the airplane's performance, this error highlights the importance of ensuring that software program data are current and accurate.

- **Inadequate FAA surveillance of 14 CFR Part 135 operators.** The FAA principal operations inspector assigned to Execuflight relied primarily on Part 135 pilot-in-command line checks flown locally to conduct his operational oversight. However, line checks flown locally do not constitute the same evaluation of the operator within the total operational environment of the air transportation system as en route inspections during normal line operations. The FAA considers en route inspections its most effective method of accomplishing its air transportation surveillance objectives and responsibilities but does not require inspectors of Part 135 operators to accomplish this critical surveillance activity.
- **Inadequate CVR maintenance procedures.** The 30-minute tape recovered from the airplane's CVR was not damaged; however, the quality of all recorded channels was poor, due in large part to electrical interference, likely from the aircraft's alternating current generator. Had an adequate functional test of the CVR been performed with the engines running or by downloading and reviewing CVR content from an actual flight, the CVR quality issue may have been detected and corrected.

FINDINGS

1. The flight crew was properly certificated and qualified in accordance with federal regulations and company requirements. No evidence was found indicating that the flight crew's performance was affected by toxins, alcohol or other drugs, or medical conditions.
2. Postaccident examination of the airplane found no evidence of any preimpact structural, engine, or system failures.
3. The air traffic controllers' handling of the flight was not a factor in this accident.
4. As a result of the flight crew's failure to complete the approach briefing and the Approach checklist as per standard operating procedures, the captain and first officer did not have a shared understanding of how the approach was to be conducted.
5. Before the airplane reached the final approach fix, when the first officer reduced airspeed and placed the airplane in danger of encountering a stall, the captain should have taken control of the airplane or called for a missed approach, but he did not do so.
6. When the airplane reached the minimum descent altitude, the approach was not stabilized, and the captain should have called for a missed approach according to standard operating procedures, but he did not do so.

7. When attempting to arrest the airplane's descent, the first officer did not appropriately manage pitch and thrust control inputs to counter the increased drag from the 45° flap setting, which resulted in an aerodynamic stall.
8. The captain's failure to enforce adherence to standard operating procedures and his mismanagement of the approach placed the airplane in an unsafe situation that ultimately resulted in the loss of control.
9. The impact forces of the accident were survivable for some occupants, but the immediate and rapidly spreading postcrash fire likely precluded the possibility of escape.
10. Operational flight data monitoring programs could provide 14 *Code of Federal Regulations* Part 135 operators with objective information regarding the manner in which their pilots conduct flights, and a periodic review of such information could assist operators in detecting and correcting unsafe deviations from company standard operating procedures.
11. Because Execufight did not fully evaluate information it had concerning the first officer's significant training difficulties at his previous employer, the company missed an opportunity to determine if the first officer was fully capable of operating its airplanes safely.
12. The flight crew did not demonstrate effective crew resource management during the accident flight.
13. Deficiencies in Execufight's crew resource management (CRM) training program, including the cursory review of CRM topics, the lack of appropriate evaluation of CRM examinations, and the lack of continual reinforcement of CRM principles, resulted in the flight crew receiving inadequate CRM training.
14. Although the flight crew's multiple deviations from standard operating procedures (SOPs) concerning weight and balance on each flight of the 2-day trip likely did not directly contribute to the accident, these deviations represent a pattern of routine disregard for SOPs.
15. Execufight's management had multiple opportunities to identify and correct the flight crew's routine disregard for standard operating procedures regarding preflight planning but failed to do so.
16. Execufight's casual attitude towards compliance with standards illustrates a disregard for operational safety, an attitude that likely led its pilots to believe that strict adherence to standard operating procedures was not required.
17. Safety management system programs can benefit all 14 *Code of Federal Regulations* Part 135 operators because they require the operators to incorporate formal system safety methods into their internal oversight programs.

18. The captain's degraded performance during the flight was consistent with the effects of fatigue, but insufficient evidence exists about his normal sleep needs to determine whether he was fatigued at the time of the accident.
19. As a result of circadian disruption and Execuflight's improper crew scheduling that did not provide the first officer with adequate rest for his preceding trip, the first officer was likely experiencing fatigue; however, the extent to which fatigue contributed to his deficient performance on the accident flight could not be determined.
20. The nonprecision approach procedure that many Hawker 700- and 800-series pilots are trained on does not meet the stabilized approach criteria published in Advisory Circular 120-71A.
21. Many Hawker 700- and 800-series pilots are receiving inconsistent training regarding the meaning of "landing assured" that may conflict with the language of 14 *Code of Federal Regulations* 91.175(c)(1).
22. Despite the guidance in Advisory Circular 120-108, many operators do not train their flight crews how to perform a continuous descent final approach (CDFA) and to use a CDFA whenever possible.
23. Execuflight failed to ensure that correct weight-and-balance information was on board the airplane and entered into the company's weight-and-balance software, which resulted in the flight crew underestimating the airplane's takeoff weight on each flight of the 2-day trip.
24. The Federal Aviation Administration failed to provide adequate oversight of Execuflight's pilot training, maintenance, and operations.
25. This accident again shows that Federal Aviation Administration guidance for principal operations inspectors regarding conducting 14 *Code of Federal Regulations* Part 135 pilot-in-command line checks on flights other than in regular revenue service is not effective in identifying pilots who are not complying with standard operating procedures.
26. This accident illustrates that the Federal Aviation Administration's Surveillance Priority Index was ineffective in identifying 14 *Code of Federal Regulations* Part 135 operators in need of increased surveillance.
27. The implementation of the Safety Assurance System represents an opportunity to develop and use oversight procedures to identify and correct problems with failures of 14 *Code of Federal Regulations* Part 135 operators to use standard operating procedures.
28. Had an adequate functional test of the cockpit voice recorder (CVR) installed on the accident airplane been performed with the engines running or by downloading and reviewing CVR content from an actual flight, the poor quality of the CVR recording may have been detected and corrected.

PROBABLE CAUSE

The NTSB determines that the probable cause of this accident was the flight crew's mismanagement of the approach and multiple deviations from company SOPs, which placed the airplane in an unsafe situation and led to an unstabilized approach, a descent below MDA without visual contact with the runway environment, and an aerodynamic stall. Contributing to the accident were Execuflyt's casual attitude toward compliance with standards; its inadequate hiring, training, and operational oversight of the flight crew; the company's lack of a formal safety program; and the FAA's insufficient oversight of the company's training program and flight operations.

RECOMMENDATIONS

As a result of this investigation, the National Transportation Safety Board makes the following safety recommendations:

To the Federal Aviation Administration:

1. Require all 14 *Code of Federal Regulations* Part 135 operators to install flight data recording devices capable of supporting a flight data monitoring program. (A-16-XX)
2. After the action in Safety Recommendation [1] is completed, require all 14 *Code of Federal Regulations* Part 135 operators to establish a structured flight data monitoring program that reviews all available data sources to identify deviations from established norms and procedures and other potential safety issues. (A-16-XX)
3. Require all 14 *Code of Federal Regulations* Part 135 operators to establish safety management system programs. (A-16-XX)
4. In conjunction with Textron Aviation and Hawker 700- and 800-series training centers, develop and incorporate into Hawker 700- and 800-series pilot training programs a nonprecision approach procedure that aligns with the stabilized approach criteria outlined in Advisory Circular 120-71A and eliminates configuration changes at low altitudes. (A-16-XX)
5. In conjunction with Textron Aviation and Hawker 700- and 800-series training centers, develop and incorporate into Hawker 700- and 800-series pilot training programs a definition of the term "landing assured" that aligns with the language of 14 *Code of Federal Regulations* 91.175(c)(1). (A-16-XX)
6. Require 14 *Code of Federal Regulations* (CFR) Part 121, 135, and 91 subpart K operators and 14 CFR Part 142 training centers to train flight crews in the performance and use of the continuous descent final approach technique as their primary means for conducting nonprecision approaches. (A-16-XX)

7. Issue a Safety Alert for Operators describing the circumstances of this accident and reminding operators to ensure that current and accurate information is entered into weight-and-balance software programs used in their operations. (A-16-XX)
8. Review the Safety Assurance System and develop and implement procedures needed to identify 14 *Code of Federal Regulations* Part 135 operators that do not comply with standard operating procedures. (A-16-XX)
9. Review the problems with the quality of the cockpit voice recorder (CVR) data in this accident to (1) determine why the problems were not detected and corrected before the accident, despite the requirements in Federal Aviation Administration Order 8900.1 and the guidance in Safety Alert for Operators 06019, and (2) determine if the procedures in Advisory Circular 20-186 would have ensured that the CVR problems were identified and corrected before the accident, and if not, revise AC 20-186 to ensure that such problems will be identified and corrected. (A-16-XX)

To Textron Aviation:

10. Work with the Federal Aviation Administration and Hawker 700- and 800-series training centers to develop and incorporate into Hawker 700- and 800-series pilot training programs a nonprecision approach procedure that aligns with the stabilized approach criteria outlined in Advisory Circular 120-71A and eliminates configuration changes at low altitudes. (A-16-XX)
11. Work with the Federal Aviation Administration and Hawker 700- and 800-series training centers to develop and incorporate into Hawker 700- and 800-series pilot training programs a definition of the term “landing assured” that aligns with the language of 14 *Code of Federal Regulations* 91.175(c)(1). (A-16-XX)

To Hawker 700- and 800-series training centers:

12. Work with the Federal Aviation Administration and Textron Aviation to develop and incorporate into Hawker 700- and 800-series pilot training programs a nonprecision approach procedure that aligns with the stabilized approach criteria outlined in Advisory Circular 120-71A and eliminates configuration changes at low altitudes. (A-16-XX)
13. Work with the Federal Aviation Administration and Textron Aviation to develop and incorporate into Hawker 700- and 800-series pilot training programs a definition of the term “landing assured” that aligns with the language of 14 *Code of Federal Regulations* 91.175(c)(1). (A-16-XX)