Control Anomaly Catches Crew Unaware

The Citation pilots did not know what went wrong or how to deal with it.

BY MARK LACAGNINA

The following information provides an awareness of problems in the hope that they can be avoided in the future. The information is based on final reports by official investigative authorities on aircraft accidents and incidents.

JETS

High Airspeed Intensified the Problem

Cessna Citation 550. Destroyed. Six fatalities.

The flight crew's "lack of coordination" and "mismanagement of an abnormal flight control situation" were the probable causes of the crash of a Citation II into Lake Michigan on June 4, 2007, said the U.S. National Transportation Safety Board (NTSB) in its final report on the accident.

The board was not able to determine conclusively what caused the flight control problem, however.

The pilots had flown a medical transplant team from Ypsilanti, Michigan, U.S., to Milwaukee to harvest an organ. After about four hours on the ground, the Citation departed from Milwaukee's General Mitchell International Airport at 1557 local time for the return flight to Ypsilanti.

The captain, 59, had about 14,000 flight hours, including 12,000 hours in a variety of transport category airplanes, with 300 hours in the Citation 500/550 series. He was the charter company's chief pilot and check airman.

The first officer, 65, had about 9,200 flight hours, including 420 hours in type, and held a Citation 500/550 type rating. He was a businessman who flew part-time for the charter company.

Marginal visual meteorological conditions (VMC) prevailed when the airplane lifted off from Runway 01L. The departure clearance called for a climb on runway heading to 2,000 ft, followed by a right turn to 050 degrees. Soon after starting the turn, the captain asked the first officer, "Why am I fighting the controls here?"

The first officer replied, "How's your trim set? Is that the way you want it?"

The captain said, "It wants to turn hard left. … Something is wrong with the trim … the rudder trim. … Something is wrong with our rudders, and I don't know what."

He told the first officer to inform air traffic control (ATC) that they were returning to land at Mitchell. Shortly thereafter, the sound of a grunt was recorded by the cockpit voice recorder (CVR), and the captain said, "She's rolling on me. Help me. Help me."

"I am," the first officer said.

The captain asked the first officer to pull the autopilot circuit breakers. The first officer — who was known to have deficient systems knowledge, according to the report — asked where they were located.

The captain did not answer the first officer's question. He declared an emergency, telling ATC that he had a control problem. "I don't know what's wrong," he said.

He told the first officer, "You hold it, I'm going to try to pull circuit breakers." He then said, "We're not … holding it."

"I'm pulling," the first officer said. Five seconds later, at 1600:45, the CVR recording ended.

The Citation was in a 42-degree nose-down attitude and in a 115-degree left bank when it struck the water at about 243 kt. The fragmented wreckage was recovered by divers.

Investigators determined that the control problem might have been related either to inadvertent engagement of the autopilot or to an electric pitch trim anomaly. "Without an FDR [flight data recorder] or image recorder on board, it was not possible to determine the exact cause of the initiating event or the pilots' actions during the accident sequence," the report said.

Noting that the autopilot and yaw damper push buttons are identical and close together on the center pedestal, the report said that if the autopilot had inadvertently been engaged by the first officer when he attempted to select the yaw damper on initial climb, the autopilot would have tried to maintain the climb pitch attitude and the runway heading when the captain leveled off at 2,000 ft and initiated the right turn to the assigned heading.

If the initiating event was a nose-down pitch trim runaway, the pilots would have had to place as much as 140 lb (64 kg) of back pressure on their control columns to counter it. "Although the airplane would have been controllable … it would have required a significant physical effort by both pilots working together to keep the airplane upright," the report said.

When investigators explored these scenarios in a Citation flight simulator, the participating pilots were able to recover only after reducing power and airspeed to reduce the control forces.

"Regardless of the initiating event, if the [accident] pilots had simply maintained a reduced airspeed while they responded to the situation, the aerodynamic forces on the airplane would not have increased significantly," the report concluded. "At reduced airspeeds, the pilots should have been able to maintain control of the airplane long enough to either successfully troubleshoot and resolve the problem or return safely to the airport."

The report also said that the pilots' actions in response to the control problem were not coordinated. CVR data indicates that the first officer adjusted the trim settings without consulting the captain.

Moreover, the report said, "The first officer's trim inputs aggravated, rather than ameliorated, the situation." For example, a performance study indicated that after the first officer said, "How's that? Any better?" about a minute before impact, the airplane banked steeply and the CVR recorded the sound of the captain grunting.

The report said the accident illustrates that when pilots encounter abnormal flight control forces, "they should prioritize airplane control (airspeed, attitude and configuration) before attempting to identify and eliminate the cause of the flight control problem."

Among recommendations based on the findings of the investigation, NTSB called on the U.S. Federal Aviation Administration to require on-demand operators and fractional ownership operators to provide their pilots with recurrent upset recovery training (*ASW*, 11/09, p. 22).

'At reduced airspeeds, the pilots should have been able to maintain control.'

Speed Brakes Neglected on Go-Around

Boeing 757-200. No damage. No injuries.

The 757 was inbound with 78 passengers and eight crewmembers from Innsbruck, Austria, to London Gatwick Airport, where surface winds the morning of Dec. 13, 2008, were from the southeast at 14 kt, gusting to 26 kt.

"Runway 08R was in use, and aircraft were being radar-vectored to intercept the ILS [instrument landing system] from the south," said the U.K. Air Accidents Investigation Branch (AAIB) report. "The wind at 2,000 ft was 50 kt from the south."

Groundspeed was 190 kt and the aircraft was high as it neared the final approach course, so the commander, who was flying with the autopilot and the autothrottles engaged, deployed the speed brakes.

The autopilot localizer mode was armed too late to capture the localizer from the south, so the commander disengaged the autoflight systems and hand-flew the aircraft onto the final approach course. He then re-engaged the autopilot but not the autothrottles.

The stick shaker activated and the autopilot automatically disengaged.

The landing gear was extended — and the speed brakes were still deployed — when the crew selected the flap 20 setting. Shortly thereafter, the stick shaker activated and the autopilot automatically disengaged.

"The commander immediately lowered the aircraft's nose and increased engine thrust," the report said. "The airspeed increased and the stick shaker stopped, but the crew decided that the best [course] of action was to go around."

The aircraft was descending through 1,000 ft when the go-around was initiated. The commander selected the takeoff/go-around mode, but neither pilot checked to ensure that the speed brakes were retracted, as required for a go-around.

The commander became confused and disoriented because the aircraft's attitude and performance did not appear normal, the report said. Moreover, the flight director pitch bars had inexplicably disappeared from the primary flight displays. The commander transferred control to the copilot, who appeared to have better situational awareness, and subsequently noticed that the speed brakes were deployed. He retracted them, and the crew completed the go-around and a second approach to a landing without further incident.

The report noted that the 757 training manual recommends that the pilot flying "keep his hand on the speed brake lever whenever the speed brakes are used in flight; this will preclude leaving the speed brake extended."

Tires Burst Under Heavy Braking

Raytheon 390 Premier I. Substantial damage. One minor injury.

The aircraft encountered continuous turbulence during a charter flight from Jodhpur, India, to Udaipur the morning of March 19, 2008. Surface winds at the destination were from 230 degrees at 10 kt. During a visual approach to Runway 26, the "FLAP FAIL" annunciator illuminated, and the pilots were unable to extend the flaps.

"Subsequently, the pilots carried out the checklist for a flap-less landing," said the report by India's Directorate General of Civil Aviation (DGAC). "However, the pilot approached with a higher speed." The airspeed recommended by the checklist is reference landing speed (V_{REF}) plus 20 kt, or 135 kt at the aircraft's landing weight. Airspeed on short final approach, however, was 149 kt.

"At about 20 to 30 ft above the ground, the pilot stated [that the aircraft] experienced a sudden downdraft [and then] touched down heavily on the runway," the report said. "The touchdown was on the centerline, just before the touchdown zone."

The crew applied heavy wheel braking but did not extend the spoilers. Both main landing gear tires burst, and the aircraft veered off the right side of the 7,500-ft (2,286-m) runway about 2,200 ft (671 m) from the approach threshold and struck the airport boundary wall. The copilot sustained minor injuries; the pilot and five passengers were not hurt.

The report did not provide information on the likely causes of the flap-extension system failure.

Ninety-Tonne Takeoff Error

Airbus A330-243. No damage. No injuries.

While preparing for a flight from Montego Bay, Jamaica, to an undisclosed location in the United Kingdom the night of Oct. 28, 2008, the A330 flight crew was unable to locate the aircraft's performance manual, which had been improperly stowed among navigation charts, the AAIB report said.

The commander used a mobile telephone to call the airline's dispatch office in the United Kingdom and to request takeoff performance data calculations.

According to airline procedure, such calculations must be derived independently by both flight crewmembers working with different dispatchers. The pilots provide information including the aircraft's takeoff weight, airport weather conditions and runway data. The dispatchers enter the information into an Airbus computer system, which calculates takeoff speeds (V_1, V_R and V_2), permitted takeoff thrust reduction and the "green dot speed" — that is, the target airspeed to be used if the takeoff is continued after an engine failure. The pilots then compare and cross-check the data received from the dispatchers.

The report noted that pilots of Airbus aircraft typically perform a "gross error check" by

comparing the green dot speed calculated by the manufacturer's computer system with the value independently calculated by the on-board flight management guidance system (FMGS).

However, the incident pilots were not given a green dot speed; for unknown reasons, the computer function that enables this calculation had been disabled at the airline's dispatch office.

Moreover, although two dispatchers were on duty, only one was in the dispatch office when the commander called. "Only he processed the data," the report said. "He did, however, speak with both pilots and confirmed the input data and performance data with each."

Nevertheless, a substantial discrepancy went unnoticed: The A330's load sheet showed a takeoff weight of 210,183 kg (463,369 lb), but the performance calculations were based on an erroneous takeoff weight of 120,800 kg (266,316 lb). Investigators were unable to determine how the mistake was made, in part because the telephone conversations between the pilots and the dispatcher were not recorded, and the CVR data subsequently were overwritten.

The calculations provided to the pilots included 114 kt for both V_1 and V_R (the correct figures were 136 kt and 140 kt, respectively) and an FMGS data entry — an artificial outside air temperature — that resulted in a reduced takeoff thrust setting that was lower than the correct setting for the autothrottle system.

Although the takeoff speeds and the thrust setting were lower than normal, "the crew were unable to explain why they did not recognize that the figures they used were outside the expected range," the report said.

There were 318 passengers and 13 crewmembers aboard the A330 when the pilots began the takeoff from Sangster International Airport's 2,663-m (8,737-ft) Runway 07 at 2326 local time.

"The aircraft appeared to accelerate normally, and the copilot made the standard calls as the aircraft passed through 100 kt and then V_1/V_R," the report said. "The commander was surprised by how close the calls had followed on from each other. … He pulled back on his sidestick and pitched the aircraft to about 10 degrees nose-up but stated that the aircraft 'did not feel right' and instinctively selected TOGA [takeoff/go-around] power.

"The aircraft then became airborne and climbed away. … By 50 ft radio altitude, the aircraft had covered an estimated distance of approximately 2,500 m [8,202 ft] since the start of the takeoff roll."

The flight continued to the destination without further incident.

Citing the findings of the investigation of this incident and those of other incidents and accidents involving erroneous takeoff performance calculations (*ASW*, 10/06, p. 16, and *ASW*, 9/08, p. 28), the AAIB recommended that the European Aviation Safety Agency develop specifications for takeoff performance monitoring systems and require installation of the systems aboard transport category aircraft.

Deicing Fluid Fouls Cabin

Boeing 737-800. No damage. No injuries.

The flight crew saw a 'gray cloud' in the cockpit.

The flight crew had not configured the 737 for deicing before ground crewmembers began deicing operations after the airplane was pushed back from the gate at Seattle-Tacoma International Airport the morning of Dec. 24, 2008. The auxiliary power unit was operating and the engine bleed air valves were open, allowing deicing fluid to enter the air supply lines for the cabin and cockpit, the NTSB report said.

The cabin crew reported fumes in the cabin, and the flight crew saw a "gray cloud" in the cockpit, the report said. After telling the ground crew to discontinue deicing operations, the flight crew completed the smoke removal checklist, started the engines and taxied the 737 back to the gate, where the 135 passengers and six crewmembers disembarked via the airbridge.

"The captain reported that he did not clear the ground deicing crew to start their deicing operations," the report said. "The driver of the primary deicing vehicle reported that he informed the flight crew of the fluid types, freeze points and concentrations. He added that there was a lot of 'radio chatter' and the bucket operator began deicing operations 'after we received no objections' from the flight crew."

Tow Bar Snaps During Pushback

British Aerospace RJ85. Substantial damage. No injuries.

All four engines were operating at idle power while the aircraft was pushed back from the stand at Dublin (Ireland) Airport the evening of March 2, 2009. The tug driver stopped the pushback on a taxiway and then began to pull the aircraft forward.

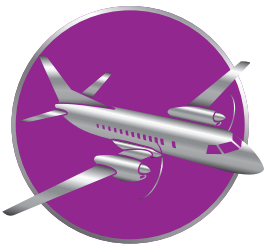
"This pull forward was not in a straight line but in an arc," said the report by Ireland's Air Accident Investigation Unit. "This was carried out on his [the tug driver's] own initiative with the probable intention of a minor realignment of the aircraft nosewheel back onto the taxi line."

The tug driver perceived that the aircraft, which weighed 34,300 kg (75,618 lb), was pushing the tug on the wet taxiway, which had a slight downhill slope. "He braked, but the aircraft continued forward," the report said. "The tug jackknifed, and the tow bar broke (the shear pins did not shear). The aircraft continued forward under its own inertia and struck the tug."

The 48 passengers and five crewmembers disembarked through the aft cabin door. Examination of the aircraft revealed substantial damage to the fuselage skin, frames and substructure on the lower right side of the nose.

The report noted that the tug, which weighed 5,750 kg (12,676 lb), had markings indicating that it was to be used "for pushback only."

Among postaccident revisions to the airline's ground-handling procedures was a requirement that only one engine can be started at the stand and that the other engines can be started only after the pushback operation is completed and the aircraft's brakes are set.



TURBOPROPS

Icing Suspected in Approach Stall

Gulfstream Commander 690C. Destroyed. Three fatalities.

Moderate icing conditions were forecast along the business airplane's route of flight from Denver to Wray, Colorado, U.S., the morning of Jan. 15, 2009. Wray Municipal Airport is uncontrolled and has no weather-reporting facilities. While en route, the pilot received from ATC the current weather conditions at the two closest weather-reporting stations.

Akron, Colorado, which is 52 nm (96 km) west of Wray, had 4 mi (6 km) visibility in mist and a 100-ft overcast ceiling. Imperial, Kansas, 42 nm (78 km) northeast, had 3 mi (4,800 m) visibility in light snow and a 1,600-ft overcast.

The pilot requested and received clearance from ATC to conduct the global positioning system (GPS) area navigation approach to Runway 17 at Wray.

Several witnesses saw the Commander emerge from low clouds north-northeast of the airport. "Shortly thereafter, the airplane pitched down to a near-vertical attitude and began to rotate," the NTSB report said. "The airplane impacted the ground nose-first, and a fire erupted."

Investigators determined that the airplane was 560 lb (254 kg) over gross weight and that the center of gravity was at or just forward of the forward limit.

NTSB determined that the probable cause of the accident was an aerodynamic stall resulting from "the pilot's failure to maintain aircraft control during the approach" and that icing conditions were a contributing factor.

Near the time of the accident, a Beech King Air pilot reported that, despite frequent operation of the deicing boots, his airplane had accumulated a significant amount of ice while flying in the area. "In a follow-up telephone conversation with the pilot, he characterized the ice that day as 'sticky' and hard to get rid of," the report said.

Control Lost in Low Visibility

Beech King Air C90. Destroyed. Two fatalities.

Loss of control during a sudden maneuver to avoid an obstruction likely caused the King Air to strike terrain during a visual approach in low visibility the morning of Oct. 29, 2008, said the report by India's DGAC.

The aircraft was operated by the Punjab state government. The pilots were conducting a short positioning flight from Chandigarh to Ludhiana. The report said that neither pilot had previously flown to Ludhiana or had proper endorsement

to fly the King Air. The pilot-in-command, who was in the right seat during the flight, had not received required familiarization training; and there was no record to verify the copilot's claim of 50 flight hours in type.

Visibility was 1,500 m (less than 1 mi) in haze and smoke, and the flight crew was given a special visual flight rules clearance to the airport, which had no instrument approach procedure. "They were estimating their position based on GPS," the report said.

The crew spotted Ludhiana's Runway 12 too late to land during the first visual approach and initiated a go-around. However, instead of complying with procedure requiring an initial climb to 1,000 ft above ground level (AGL), they leveled at about 300 ft AGL and then descended while circling to the right of the runway in an apparent effort to maintain visual contact with the runway.

The report said that the aircraft was at about 100 ft AGL when the crew likely saw an unmarked tower ahead and lost control while trying to avoid it. The King Air was banked steeply left when it struck terrain and burned.

PISTON AIRPLANES

Disorientation Leads to Control Loss

Beech 58 Baron. Substantial damage. One fatality.

Night VMC prevailed when the pilot departed from Cleveland's Burke Lakefront Airport for a positioning flight on Jan. 16, 2008. After taking off to the southwest, the pilot initiated a right climbing turn over Lake Erie.

"The moon and city associated with the airport were south of his flight path," the NTSB report said. "The maneuvering of the aircraft and lack of outside visual references soon after takeoff made the situation conducive to spatial disorientation."

The airport traffic controller saw the Baron descend during the right turn and strike the water. Examination of the aircraft revealed no pre-impact anomalies and verified that both engines were producing high power when the crash occurred.

Investigators found that the 68-year-old pilot had been using a potentially sedating muscle relaxant for back pain. "He had heart disease identified during the autopsy that may have increased his risk of sudden cardiac death," the report said. "However, the investigation could not conclusively identify that the pilot was impaired."

NTSB concluded that spatial disorientation was the probable cause of the accident.

Turbulence Triggers Breakup

Rockwell Aero Commander 500S. Destroyed. Two fatalities.

Night instrument meteorological conditions prevailed for the business flight from Essendon to Shepparton, both in Victoria, Australia, on July 31, 2007. ATC radar and radio contact with the aircraft were lost when it was about 25 nm (46 km) north-northwest of Essendon at 7,000 ft over the Great Dividing Range.

"The wreckage was found in the area of the last radar position, and both occupants had been fatally injured," said the report by the Australian Transport Safety Bureau. "At the time, special weather reports for severe turbulence and severe mountain waves were current for that area." Local residents said that surface wind velocity was 50 kt.

Investigators calculated that the Commander's true airspeed was about 165 kt when radio and radar contact were lost; the aircraft's weight-adjusted maneuvering speed was about 131 kt. "Flight through an area of severe turbulence at speeds at or above the aircraft's maneuvering speed increases the risk of aircraft structural failure," the report said.

Examination of the wreckage indicated that the Commander likely broke up while it was in level cruise flight. "The breakup most likely resulted from an encounter with localized and intense turbulence or from an elevator control input, or from a combination of both," the report said.

Leak Prevents Gear Extension

Cessna 421C. Substantial damage. No injuries.

At the conclusion of a business flight the night of Oct. 29, 2008, the pilot received no indication that the left main landing gear was down and locked on approach to Falcon Field in Mesa, Arizona, U.S. He made several

unsuccessful attempts to extend the gear using the normal procedure.

"The pilot attempted to extend the gear using the emergency procedure, and he was similarly unsuccessful," said the NTSB report.

The pilot landed the airplane with the left main gear partially extended. The 421 veered off the runway and slid to a stop. "Belly skin was punctured, and several ribs were bent upward," the report said. None of the five people aboard the airplane was injured.

Examination of the 421 revealed that an aluminum hydraulic line had ruptured beneath a clamp, allowing hydraulic fluid to leak. The report noted that the airplane had 4,113 airframe hours.

HELICOPTERS

Short Causes Engine Deceleration

Eurocopter EC 130B4. Substantial damage. No injuries.

Soon after slowing the helicopter to 30 kt to give his air tour passengers a view of waterfalls, the pilot heard the main rotor low speed warning horn and saw instrument indications confirming that main rotor speed was decreasing.

"He entered into an autorotation to make a forced landing and tried to regain engine torque and rotor speed but was unsuccessful, and the low rotor horn sounded again," the NTSB report said. "The helicopter came down in trees, with the main rotor blades contacting the treetops."

None of the six people aboard the helicopter was hurt in the accident, which occurred in Lahaina, Hawaii, U.S., the morning of Jan. 5, 2006.

Initial examination of the helicopter revealed damaged insulation and electrical shorts in the wiring harness for the digital engine control unit and the ancillary control unit. "Further examination and testing revealed the insulation breakdown was a result of wire damage due to a tight bend in the harness," the report said.

The wiring harness was longer than necessary and had been bent tightly to facilitate its installation during the manufacture of the helicopter, the report said. The helicopter — the first EC 130B4 delivered to a customer — had been in service more than 4,800 hours.

The helicopter had received a lightning strike in August 2004, but "no evidence of lightning strike damage was found in any of the wiring" during the investigation of the air tour accident, the report said.

Tarpaulin Fouls Main Rotors

Aerospatiale SA 315B. Substantial damage. No injuries.

The helicopter was carrying construction materials for a television relay antenna to a temporary helibase in Obonai, Japan, the afternoon of Oct. 23, 2008. The pilot said that during initial approach, he saw a pile of folded blue tarpaulins about 4 m (13 ft) from the helipad and, before continuing the approach, visually confirmed that timber had been placed on the tarpaulins to secure them.

The report by the Japan Transport Safety Board said that the timber placed on the tarpaulins was not heavy enough to secure them properly.

As the pilot brought the helicopter to a hover slightly above the helipad, several tarpaulins were blown into the air by its downwash, and one tarpaulin was "sucked into its rotor disc," the report said. The pilot felt the helicopter begin to vibrate and yaw left as it touched down. He shut down the engine and applied the rotor brake.

None of the three people aboard the helicopter was hurt. Examination of the aircraft revealed that one of the three main rotor blades was damaged, some tail boom truss tubes were broken, the tail boom and tail rotor drive shaft were bent, and the left shock strut was broken.

Control Lost in Clouds

Robinson R44. Substantial damage. Two serious injuries.

The commercial pilot and his flight instructor discontinued an instrument training flight because of turbulence the night of Jan. 8, 2009. The commercial pilot was flying the R44 back to Bountiful, Utah, U.S., under visual flight rules when the helicopter entered clouds.

The pilot became spatially disoriented and lost control of the helicopter. "The flight instructor took the controls and attempted to regain control but was unable to do so before the helicopter impacted the ground," said the NTSB report.

Preliminary Reports, October–November 2009

Date	Location	Aircraft Type	Aircraft Damage	Injuries
Oct. 1	Lacco Yavero, Peru	Aerospatiale AS 350B3	destroyed	3 fatal
The helicopter crashed in the jungle during a survey flight.				
Oct. 6	Aurora, Texas, U.S.	Beech King Air B100	destroyed	4 serious
The King Air crashed in a field after both engines lost power.				
Oct. 15	San José de Ocoa, Dominican Republic	Eurocopter EC 120B	destroyed	3 fatal
The helicopter was being flown in heavy rain when it crashed into a mountain.				
Oct. 16	Kangerlussuaq, Greenland	Piaggio P180 Avanti	substantial	1 serious
The pilot made a forced landing on an ice sheet following fuel exhaustion during a ferry flight from Keflavik, Iceland.				
Oct. 16.	Weert, Netherlands	Pilatus PC-12NG	destroyed	2 fatal
Witnesses saw smoke coming from the engine on takeoff from Budel Airport. The PC-12 then descended and crashed in a field.				
Oct. 17	Manila, Philippines	Douglas DC-3C	destroyed	4 fatal
The DC-3 struck an abandoned warehouse soon after the pilot reported engine problems during takeoff for a cargo flight.				
Oct. 21	Sharjah, United Arab Emirates	Boeing 707-300C	destroyed	6 fatal
Witnesses saw the freighter enter a steep right bank after takeoff and descend into an open field.				
Oct. 22	Bonaire, Netherlands Antilles	Britten-Norman Islander	destroyed	1 fatal, 9 none
The pilot was not able to exit the airplane after ditching it following an engine failure on approach. The passengers were rescued by boaters.				
Oct. 26	Minsk, Belarus	Raytheon Hawker 800	destroyed	3 fatal
The Hawker crashed in a wooded area during the crew's second night approach with 2,000 m (1 1/4 mi) visibility and a 200-ft ceiling. The airport's instrument approach systems reportedly were not in service.				
Oct. 26	Benavides, Texas, U.S.	Beech King Air B100	destroyed	4 fatal
Radio and radar contact were lost soon after the pilot reported difficulty maintaining control in severe turbulence at 25,000 ft. The wreckage later was found in a rural area.				
Nov. 1	Mirnyj, Russia	Ilyushin 76M	destroyed	11 fatal
The aircraft crashed shortly after taking off for a positioning flight to Irkutsk.				
Nov. 2	Mulia, Indonesia	Antonov An-28	destroyed	4 fatal
The An-28 crashed into a mountain while descending during a police-supply flight.				
Nov. 5	Fort Pierce, Florida, U.S.	Grumman Albatross	substantial	1 minor, 2 none
The airplane struck terrain while returning to the airport after the left engine failed on takeoff.				
Nov. 6	Cat Lake, Ontario, Canada	Cessna 310R	destroyed	3 fatal
The 310 struck terrain during a night charter flight.				
Nov. 9	Nairobi, Kenya	Beech 1900D	destroyed	2 fatal
The airplane struck the perimeter fence and crashed while returning to the airport after the crew reported a problem on departure for a cargo flight.				
Nov. 9	Greer, South Carolina, U.S.	Beech King Air B200	substantial	3 serious
The King Air struck terrain on approach after both engines flamed out due to fuel exhaustion during a post-maintenance test flight.				
Nov. 12	Kigali, Rwanda	Canadair CRJ100ER	destroyed	NA
After returning to the airport due to a problem on takeoff, one or both engines accelerated at the stand, and the airplane struck the terminal building. One of the 10 passengers was killed; another passenger and both pilots were injured.				
Nov. 14	Doyle, California, U.S.	Aerospatiale AS 350BA	destroyed	3 fatal
Night visual meteorological conditions prevailed when the emergency medical services (EMS) helicopter struck terrain while returning to its base after transporting a medical patient to Reno, Nevada.				
Nov. 19	Norfolk Island, Australia	Israel Industries 1124A	destroyed	6 none
After fuel ran low during three unsuccessful approaches in adverse weather, the EMS flight crew ditched the Westwind in the ocean.				
Nov. 28	Shanghai, China	McDonnell Douglas MD-11F	destroyed	3 fatal, 4 NA
The tail struck the runway shortly before the freighter stalled and crashed on takeoff.				
Nov. 29	Lyall Harbour, British Columbia, Canada	de Havilland Beaver	destroyed	6 fatal, 2 NA
The floatplane crashed while taking off in adverse weather conditions for a scheduled flight to Vancouver.				

NA = not available

This information, gathered from various government and media sources, is subject to change as the investigations of the accidents and incidents are completed.