

Fumbled Numbers

Calculations using the A340's landing weight, rather than its takeoff weight, led to a 'sluggish' departure.

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

Late Change Disrupted Preflight

Airbus A340-600. No damage. No injuries.

The pilot flying noticed that the A340's acceleration was slower than it should have been for the takeoff from London Heathrow Airport, but he did not believe that it was particularly abnormal. "He described the rotation as 'slightly sluggish and nose heavy' and noticed that after rotation, the aircraft settled at a speed below V_{LS} [the lowest selectable speed providing an appropriate margin above the stall speed], which prompted him to reduce the aircraft pitch attitude in order to accelerate," said the report on the Dec. 12, 2009, incident by the U.K. Air Accidents Investigation Branch (AAIB).

The climb rate, 500 to 600 fpm, also was sluggish. "The flaps were retracted on schedule, and the aircraft continued its climb," the report said. "At no time was full takeoff thrust selected. Later in the climb, the crew looked again at the TODC [takeoff data calculation] and realized their error." They had used the estimated *landing* weight of the aircraft, rather than its takeoff weight, to calculate takeoff performance and reference speeds.

Following the sluggish departure, the A340, which had 282 passengers and 16 crewmembers

aboard, was flown to the destination without further incident. Nevertheless, the AAIB determined that the flight crew's faulty calculations and the aircraft's sluggish departure constituted a serious incident that occurred despite the aircraft operator's "robust" standard operating procedures (SOPs) for calculating and cross-checking takeoff performance.

"The operator used a system whereby the aircraft's takeoff performance would be calculated off-aircraft," the report said. The system involved preflight transfer of data between the flight crew and a centralized computer via the aircraft communications addressing and reporting system (ACARS). As part of the procedure, the crew would send the aircraft's takeoff weight to the computer, along with a request for a takeoff data calculation, while completing the loadsheet and initializing the aircraft's multi-function control and display unit.

"The SOPs required the loadsheet procedures to be led by the commander and checked by the copilot, and the TODC procedures to be led by the copilot and checked by the commander," the report said. "Nine independent cross-checks were built into the procedures, including a requirement for the actual takeoff weight to be written on the TODC printout alongside the takeoff weight used for the calculation to provide a gross error check."

In this case, however, the flight crew's preflight preparations were disrupted by a late change to the A340's zero fuel weight, and the procedures involved in completing the loadsheet and calculating takeoff performance were

conducted out of order. The report said that the disruption of the preflight procedures, plus time pressure on the crew, likely were factors when the crew inadvertently included the aircraft's expected landing weight of 236.0 tonnes (519,200 lb), rather than its actual takeoff weight of 322.5 tonnes (709,500 lb), in their takeoff data calculation request. Noting that the expected landing weight, 236.0 tonnes, was within the normal range of takeoff weights for the smaller A340-300 model that the crew also flew, the report said, "The operator considered that this might have been why the crew was not alerted to the error."

The report also said that the cross-checks conducted by the crew were not effective in detecting the error. Based on the erroneous takeoff weight provided by the crew, the centralized computer calculated a rotation speed, V_R , of 143 kt and a takeoff safety speed, V_2 , of 151 kt. The correct values for the aircraft's actual takeoff weight were about 15 kt higher: 157 kt for V_R and 167 kt for V_2 . The flexible thrust setting provided for the takeoff also was lower than it should have been.

The operator subsequently initiated a review of its loadsheet and takeoff performance calculation procedures. However, the report said, "Adding more cross-checks to the SOPs would probably complicate the procedures with no guarantee that a recurrence of a similar event would be prevented. The pre-departure phase of a flight is a dynamic environment where time pressure and interruptions can create conditions where diligent crews can perform robust procedures incorrectly."

Based on its investigations of this incident and a previous incident involving a takeoff performance calculation error (ASW, 12/09-1/10, p. 58), the AAIB repeated recommendations that the European Aviation Safety Agency develop specifications for takeoff performance monitoring systems that would alert flight crews of inadequate performance for the aircraft configuration and airport conditions, and that the agency require the systems aboard transport category aircraft.

Tail Strike Prompts Turnaround

Boeing 737-800. Minor damage. No injuries.

The flight crew felt a "bump" when the tail skid assembly grazed the runway during rotation for takeoff from Dublin (Ireland) Airport the morning of Sept. 11, 2008. They completed the "After Takeoff" checklist, and the commander transferred control to the copilot so that he could assess the situation. "This assessment took some time," said the incident report by the Irish Air Accident Investigation Unit. Noting that the crew continued the climb, the report said that it would have been more appropriate to level at a safe low altitude, in part to prevent the cabin from pressurizing while troubleshooting the problem.

The commander contacted a cabin service attendant who confirmed that a tail strike had occurred. He then resumed control of the aircraft, leveled at 12,000 ft and called for the "Tailstrike on Takeoff" non-normal checklist, which required depressurizing the cabin due to possible structural damage. "As the aircraft was not above 14,000 ft, the passenger oxygen system did not deploy automatically," the report said. The cabin service supervisor told the flight crew that the passenger oxygen masks had not deployed, and the crew attempted to deploy the masks manually. However, three passenger service units did not open and release the nine masks they housed.

The flight crew declared an emergency and received clearance to return to Dublin. They landed the 737 without further incident after being airborne for 21 minutes. After a visual inspection by airport fire services personnel, the aircraft was taxied to a stand, where all 148 passengers disembarked. One passenger requested and received medical assistance, but none of the passengers required hospitalization, the report said.

Damage from the tail strike was confined to scrapes on the tail skid assembly shoe, and the aircraft remained serviceable. The report noted that, because of their longer fuselages, the 737-800 and -900 are more susceptible to tail strikes than earlier models. Another factor that increased the tail strike risk was the aft loading

The AAIB repeated recommendations for takeoff performance monitoring systems.

of the incident aircraft. While the aircraft was being prepared for the flight, the outbound passengers had boarded through the rear doors and had taken mostly rear seats while an inbound passenger in a wheelchair was assisted in disembarking through a front exit. The report noted, however, that the aircraft was within center-of-gravity limits.

Investigators were unable to determine why the three passenger service units (PSUs) had failed to open. “The manufacturer has had few reports of PSU compartment doors not deploying correctly during decompression events,” the report said. “Usually, these are confined to a single PSU. ... One known cause is an incorrectly stowed oxygen mask.” Noting that a PSU compartment door can be opened by inserting a small pointed object into one of the holes adjacent to the door-test stop, the report said that some passengers tried to open the doors by striking them with their fists. Cabin service specialists moved the affected passengers to seats with deployed oxygen masks.

The report said that many passengers had become anxious and upset during the incident. “Depressurization normally produces a mist due to condensation. This, coupled with the unusual odor of the chemical oxygen generators functioning, can be alarming to passengers.”

Four-Engine Flameout on Landing

British Aerospace 146-200. No damage. No injuries.

After the aircraft touched down on the runway at George, South Africa, the morning of March 19, 2009, the no. 1 engine flamed out and the no. 3 engine spooled down to a “hung” state, in which high-pressure rotor speed stabilized below the normal ground idle speed. The flight crew taxied the aircraft to the apron and noticed, after shut-down, that the thrust modulation system (TMS) lights for the no. 1 and no. 3 engines remained illuminated, which was not normal, said the report by the South African Civil Aviation Authority.

The crew reported the problem with the TMS — which trims, or synchronizes, engine speeds — to company maintenance personnel,

who then performed unspecified maintenance. “After the maintenance was completed, the flight crew performed engine ground runs to satisfy themselves of the serviceability status,” the report said. “All four engines started normally, and the engine runs were done up to maximum takeoff power (MTO) without experiencing any further abnormalities. ... The captain also simulated an approach and landing scenario by running the engines up to MTO and selecting the TMS to synchronize but at the same time also retarding the thrust levers. The TMS was assessed as operating normally.”

The aircraft was released to service, and 19 passengers boarded for the return flight to Cape Town, 400 km (216 nm) east of George. En route, the captain noticed that the no. 2 engine TMS was not functioning properly. When the thrust levers were set to flight idle on downwind at Cape Town, the no. 2 engine high-pressure rotor speed (N_2) stabilized at 50 percent, while the other three engines settled at the normal 60 percent. When ground idle was selected shortly after touchdown, all four engines flamed out. “The aircraft had enough momentum to roll forward on the runway and vacated onto a taxiway,” the report said.

Maintenance personnel advised the captain to restart the engines and taxi the BAe 146 to the apron. “The captain restarted the engines and saw them spooling up to 17 percent, only,” the report said. “According to the captain, it appeared as though there was no fuel flow to the engines.” He shut them down and had the aircraft towed to the apron, where the passengers disembarked normally.

Investigators found that another flight crew had reported the TMS as faulty after a flight two days earlier. Maintenance personnel decided to defer the defect and temporarily deactivate the TMS according to provisions of the minimum equipment list (MEL). They pulled the three primary circuit breakers, as required to deactivate the system, but also pulled the four TMS actuator-centering circuit breakers, which was specifically prohibited by the aircraft maintenance manual.

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Before the incident flight, the TMS computer and control-display unit were replaced, the three primary circuit breakers were reset, and the deferred defect was cleared from the MEL. However, the four actuator-centering circuit breakers were not reset during this maintenance or during the subsequent maintenance performed at George. As a result, when the TMS disengaged automatically, as designed, during final approach, any actuators that had been retracted by the system did not automatically center, causing the engines to run down below normal speed when ground idle was selected.

Collision With a Tractor

Cessna Citation 550. Substantial damage. No injuries.

The airport traffic controller cleared the Citation flight crew to land when the airplane was about 8 nm (15 km) from the runway at Reading, Pennsylvania, U.S., the afternoon of Aug. 3, 2008. The controller then cleared the operator of a tractor with retractable “bat-wing” mowing attachments to cross the 6,350-ft (1,935-m) active runway at an intersection about 2,600 ft (792 m) from the approach threshold, said the report by the U.S. National Transportation Safety Board (NTSB).

The controller, who was coordinating both ground and local aircraft operations, then turned his attention to an aircraft that was being taxied to its hangar, and he did not see the Citation touch down or the tractor begin crossing the runway from left to right, as viewed from the approach end.

As the tractor neared the intersection, the mowing attachment on its left side began to drop. “The operator grabbed the control lever to raise the wing to the ‘up’ position and looked to the left to ensure it was latched,” the report said. “As he looked [away from the approach end of the runway], the tractor proceeded onto the runway.” The operator told investigators that he saw a “white blur” as the tractor’s front window was smashed.

The Citation had touched down about 1,000 ft (305 m) from the approach threshold. The captain said that he saw the tractor enter the

runway and steered right in an unsuccessful attempt to avoid it. The airplane had decelerated to about 80 kt when its left wing struck the tractor, which was slightly left of the runway centerline. About 10 ft (3 m) of the wing separated during the collision. Neither the pilots nor the tractor operator was injured.

The report said that the probable cause of the accident was “the air traffic controller’s failure to properly monitor the runway environment” and that a contributing factor was “the tractor operator’s failure to scan the active runway prior to crossing.”

The report also noted that “Federal Aviation Administration publications do not adequately address the need for ground vehicle operators to visually confirm that active runways/approaches are clear prior to crossing [a runway] with air traffic control authorization.”

TURBOPROPS

Prop Start Lock Overlooked

Cessna 441. Substantial damage. No injuries.

Surface winds were variable at 3 kt when the pilot initiated a takeoff from a 5,000-ft (1,524-m) runway at Thurgood Marshall Airport in Baltimore the afternoon of Aug. 20, 2008. The pilot said that the airplane began drifting left as it accelerated, and he increased power from the left engine to compensate. The 441 continued drifting left, and the pilot rejected the takeoff when the left main landing gear rolled off the edge of the runway.

“The airplane continued to veer to the left, completely departed the paved surface and struck an earthen mound in the grass,” the NTSB report said. “The nose landing gear fractured, and the airplane came to rest approximately 2,500 ft [762 m] beyond the start of the takeoff roll.” None of the four people aboard the 441 was injured.

Examination of the airplane revealed that the left propeller start lock had not been disengaged before takeoff. Start locks engage automatically when the engines are shut down and the propeller levers are moved to the reverse setting. They



prevent the propeller blades from feathering during shut-down and hold the blades in low pitch to minimize propeller drag and resultant high engine turbine temperatures during subsequent hot starts.

The pilot had 2,485 flight hours, including 1,473 hours in the 441. His inadvertent attempt to take off with the left propeller start lock engaged resulted in an asymmetric thrust condition. “Although there were no discrete annunciators to advise of start lock status, the airplane information manual provided means to recognize and correct when the start locks were not disengaged” before taxi and takeoff, the report said.

Gear Doors Snare Ground Crewman

Bombardier Q400. No damage. One minor injury.

As the aircraft was pushed back from the stand at Isle of Man Airport the morning of Sept. 3, 2009, the commander did not start the engines right away because air traffic control (ATC) had informed him that the departure would be delayed. Then, at the same time the ground crew told the commander to engage the parking brake, ATC told him that there would be no delay.

“He confirmed that the brakes were set, cleared the ground crew to remove the tow bar and received clearance from the ground crew supervisor to start the right engine,” the AAIB report said. “He instructed the copilot to start that engine, which caused the forward nosewheel undercarriage (landing gear) doors to close, trapping the ground crewman who was attempting to remove the tow bar. ... The commander immediately shut down the right engine, pulled the landing gear door release handle and exercised the elevator to dissipate the hydraulic pressure. The ground crewman was able to release himself with the assistance of his colleague and was taken to hospital with minor injuries [to his right arm and chest].”

The forward nose landing gear doors had been opened — and left open, per normal procedure before the first flight of the day — by company engineers who performed the preflight inspection. The doors remain open until the no-

2 hydraulic system is pressurized during engine start, which normally is performed during push-back, according to the report.

After the incident, the company issued a bulletin instructing pilots to ensure that no one is near the nosewheel bay during engine start; the bulletin also instructed ground crewmembers to ensure that the forward nose gear doors are fully closed before disconnecting the tow bar.

Attendant Suffers Anxiety Attack

Saab 340B. No damage. No injuries.

The airplane was at 20,000 ft, en route with 30 passengers and three crewmembers from Detroit to Marquette, Michigan, the night of July 30, 2009, when the flight crew heard several knocks on the flight deck door. The captain responded with an interphone call that was answered by a passenger who said that the flight attendant had become incoherent and was performing “numerous unusual activities,” the NTSB report said.

“The captain advised the passenger to assist the flight attendant to a seat and to stow the service cart that was blocking the aisle,” the report said. He then told ATC that he was diverting the flight to Traverse City because of a medical emergency.

“Prior to landing, the captain coordinated with a passenger to ensure that all passengers were seated and using their seat belts,” the report said. “The flight made an uneventful landing and was met by paramedics and local law enforcement [personnel].”

Records of the flight attendant’s post-incident examination and treatment noted a diagnosis of “acute anxiety/delirium of uncertain etiology [cause], resolved while in the emergency room.” The treatment records, as well as a pre-employment medical-history questionnaire, indicated no pre-existing medical or psychiatric conditions.

“According to federal regulations, a single flight attendant was required for the incident flight,” the report said. “In addition, there are no medical standards for flight attendants currently stipulated by federal regulations.”

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Nose Gear Jams in Wheel Well

De Havilland Dash 8-300. Substantial damage. No injuries.

When the flight crew extended the landing gear on approach to Philadelphia International Airport the morning of Nov. 16, 2008, they saw indications that the nose landing gear was not properly configured for landing. They conducted a go-around and flew the Dash 8 to an area where they could troubleshoot the problem.

“The first officer transferred airplane control to the captain and performed the alternate landing gear extension checklist,” the report said. “However, the anomalous indications remained, and the nose landing gear remained retracted.” The crew flew the airplane past the airport control tower, and controllers confirmed that the nose gear doors were open but that the gear itself was not in sight. After several more attempts to lower the gear in consultation with airline maintenance personnel, the crew landed the airplane.

“During the landing, and after the airplane’s main landing gear touched down, the captain held the nose of the airplane off the runway until the slowest speed possible,” the report said. “After the nose contacted the runway, the airplane slid on it for about 525 ft [160 m] before coming to a stop. There was no fire. The [35] passengers deplaned via the main cabin door and were taken to the terminal by a bus.”

Examination of the Dash 8 revealed that the nosewheel steering links had been overloaded and had fractured, allowing the nosewheels to rotate and to become wedged in the wheel well during the approach to Philadelphia. “Hardness testing satisfied the manufacturer’s minimum requirements, and no determination could be made as to when the overload occurred,” the report said.

PISTON AIRPLANES

Pinched Wire Causes Trim Runaway

Piper Seneca II. Substantial damage. No injuries.

The pilot said that the Seneca pitched down rapidly when he used the electric pitch-trim switch on his control yoke to establish a climb attitude shortly after taking off from Fort

Worth, Texas, U.S., the morning of Nov. 17, 2009. “Despite his application of full-up elevator to arrest the descent, the airplane continued to descend,” the NTSB report said. “The pilot was forced to make a landing in an open field.”

Examination of the airplane showed that the pitch trim was in the full nose-down position and that the original trim switch had recently been replaced during an overhaul of the autopilot. “The switch wiring was not the original wiring and did not correspond to the original color codes on the wires,” the report said. “One of the wires was pinched and pressing on the switch wafer stack; according to a representative of the manufacturer, [this] could have resulted in an [electrical short and a] runaway trim condition.”

Overrun on a Short, Wet Gravel Strip

Cessna 207A. Substantial damage. Two minor injuries.

The pilot did not calculate the single-engine airplane’s weight and balance before attempting to depart from Kongiganak, Alaska, U.S., for a scheduled commuter flight to Bethel the afternoon of Aug. 22, 2008. He told investigators that the tail struck the ground as he was loading the five passengers and “numerous” bags for the flight, but that the tail stayed off the ground after he and his “very large” front-seat passenger boarded.

“The pilot noted that [the airplane] was at or near gross weight but didn’t have an exact weight of the airplane at the time he attempted to take off,” the report said. He said that the Cessna accelerated slowly and decelerated each time it encountered one of the numerous puddles on the wet, 1,885-ft (575-m) gravel runway.

“About 3/4 down the runway, the airplane lifted off but would not climb,” the report said. “The airplane flew over the end of the runway in ground effect ... and began to sink. The pilot stated that he added another 10 degrees of flap to the 20 degrees he already had and pulled back on the control wheel to cushion the collision with the tundra.” Two passengers sustained minor injuries in the crash.



Vmc Roll Downs Air Tanker

Lockheed P2V-7. Destroyed. Three fatalities.

The Neptune had 2,070 gal (7,835 L) of retardant aboard when it took off from Reno, Nevada, U.S., the afternoon of Sept. 1, 2008, to fight a wildfire. Witnesses on the ground saw a fireball emerge from the left auxiliary jet engine shortly after the landing gear was retracted about 200 ft above the ground. The captain told the copilot, the pilot flying, “We got a fire over here.” The copilot replied that he was holding full right aileron.

“At no point did either pilot call for the jettisoning of the retardant load, as required by company standard operating procedures, or verbally enunciate the jet engine fire emergency checklist,” the NTSB report said. “Recorded data showed that the airplane’s airspeed then decayed below the minimum air control speed [V_{MC}].” The airplane rolled steeply left and descended to the ground, killing the pilots and the flight mechanic.

Examination of the air tanker revealed that a fatigue-induced fracture of the 11th-stage compressor disk in the left jet engine had caused the compressor section to fail catastrophically.

HELICOPTERS

Tail Rotor Pitch Link Fails

Eurocopter AS 350-BA. Substantial damage. No injuries.

The pilot was returning to Rosehill, New South Wales, after transporting six passengers to Fitzroy Falls the afternoon of Sept. 19, 2008, when he felt a minor vibration in the anti-torque pedals. “Approximately five minutes after the onset of the vibration, it became violent,” said the report by the Australian Transport Safety Bureau. “The pilot entered autorotation, declared a mayday and conducted a run-on landing on the Casula High School oval [athletic field].”

Examination of the helicopter revealed that a tail rotor pitch change link, which had accumulated 2,130 hours of service, had failed, resulting in lateral movement of the tail rotor and damage to the tail boom. “The pitch link had fractured from fatigue cracking that was the result of stresses induced in the link by excessive play in the heavily

worn spherical bearing,” the report said. “It was probable that bearing wear outside of maintenance manual limits existed but was not detected during the most recent after-last-flight inspection.”

Wasp Nests Block Fuel Flow

Bell 47G-2A. Substantial damage. No injuries.

The pilot topped off the fuel tanks before departing from Rensselaer, Indiana, U.S., for a personal flight to Greenville, Michigan, the afternoon of Aug. 11, 2009. The engine lost power about two hours into the flight, and the pilot performed an autorotative landing in a field near Covert, Michigan. The tail boom was damaged when the tail rotor struck a wooden post during the landing.

The power loss had been caused by fuel starvation, the NTSB report said. “Inspection of the helicopter revealed that the left fuel tank was empty and the right fuel tank was full. The right tank fuel vent was completely blocked by mud dauber debris, along with the remains of two mud daubers. The left fuel tank vent was partially blocked by mud dauber debris. Both tanks feed to a central line which provides fuel to the engine.”

Boulder Struck During Clearing Turn

Aerospatiale AS 350-B2. Substantial damage. No injuries.

After dropping off six passengers at a helipad near the Colorado River and escorting them to a trail head the morning of Aug. 27, 2009, the pilot restarted the engine to pick up another load of passengers waiting at the top of Grand Canyon, Arizona, U.S. “Boulders had been situated around the perimeter of the helipad by the operator to assist in marking its location,” the NTSB report said. “The pilot stated that seconds after becoming airborne, and as he was maneuvering during a left clearing turn to depart the area, the helicopter’s tail rotor impacted a perimeter boulder.”

The helicopter pitched nose-down and yawed left and right, shuddering violently. “The pilot immediately descended from a hover and landed with the helicopter remaining upright,” the report said. 🌀



Preliminary Reports, July 2010

Date	Location	Aircraft Type	Aircraft Damage	Injuries
July 3	Hong Kong, China	Agusta-Bell A139	destroyed	13 NA
The helicopter was ditched in Victoria Harbour after a tail rotor problem occurred on takeoff. No fatalities were reported.				
July 4	Alpine, Texas, U.S.	Cessna 421B	destroyed	5 fatal
Dark night visual meteorological conditions (VMC) prevailed when the emergency medical services (EMS) airplane crashed in an open field shortly after takeoff.				
July 6	Orange, New South Wales, Australia	Gippsland GA-8 Airvan	destroyed	1 minor
The cargo airplane crashed after clipping the top of a hangar on landing.				
July 7	Piedras Negras, Mexico	Piper Cheyenne II	destroyed	7 fatal
The Cheyenne stalled and crashed during a flood-inspection flight.				
July 10	Tulsa, Oklahoma, U.S.	Cessna 421A	destroyed	3 fatal
The airplane struck terrain on approach after its fuel supply was exhausted during a business flight.				
July 13	St. Ignace, Michigan, U.S.	Beech 58 Baron	destroyed	4 fatal, 1 serious
The airplane crashed on a highway during a departure that followed two rejected takeoffs.				
July 15	Brac Island, Croatia	Cessna Citation 550	substantial	5 none
The Citation overran the 1,440-m (4,725-ft) runway on landing and struck a ditch.				
July 16	Chute-des-Passes, Quebec, Canada	de Havilland Beaver	destroyed	4 fatal, 1 serious, 1 none
The floatplane struck a mountain in fog shortly after departing on a charter flight.				
July 17	Cairo, Egypt	Boeing 747-300M	substantial	22 none
The flight crew rejected the takeoff after an uncontained failure of the no. 4 engine.				
July 18	Rankin Inlet, Nunavut, Canada	Aero Commander 500S	substantial	3 none
The airplane crashed in a swamp after both engines lost power on takeoff.				
July 20	Kansas City, Missouri, U.S.	Boeing 777-200	none	1 serious, 21 minor, 244 none
The flight from Washington to Los Angeles was diverted to Denver after an encounter with severe turbulence at 34,000 ft.				
July 22	Kingfisher, Oklahoma, U.S.	Eurocopter AS 350-B2	destroyed	2 fatal, 1 serious
VMC prevailed when the helicopter struck terrain during an EMS positioning flight.				
July 22	Cleburne, Texas, U.S.	Piper AeroStar 601P	substantial	1 minor
The pilot landed the AeroStar in a plowed field after both engines lost power on takeoff.				
July 23	Gahbühel, Austria	Bell 204B	destroyed	1 fatal
The helicopter crashed while transporting an external load of concrete to a construction site.				
July 23	Elk Lake, Ontario, Canada	Bell 206B	destroyed	2 fatal
The helicopter crashed after striking a communications tower.				
July 23	Ward Cove, Alaska, U.S.	de Havilland Beaver	substantial	1 fatal
Instrument meteorological conditions prevailed when the cargo airplane struck terrain while holding for a special visual flight rules clearance into Ketchikan's Class E airspace.				
July 24	La Grande, Quebec, Canada	de Havilland Beaver	destroyed	2 fatal, 3 serious
The Beaver stalled and crashed after an engine problem occurred on takeoff.				
July 25	Chichibu, Japan	Eurocopter AS 365-N3	destroyed	5 fatal, 2 none
The EMS helicopter crashed after two crewmembers were lowered to the ground to assist mountain climbers.				
July 27	Riyadh, Saudi Arabia	Boeing MD-11F	destroyed	2 serious
The MD-11 touched down hard and veered off the runway. Preliminary reports varied on whether the crew reported a cargo fire on approach or the fire broke out after the hard landing.				
July 27	Oshkosh, Wisconsin, U.S.	Raytheon Premier I	destroyed	2 serious
The airplane struck terrain after it apparently stalled while being maneuvered to land.				
July 28	Conakry, Guinea	Boeing 737-700	substantial	10 serious, 87 none
The 737 overran the runway while landing in heavy rain.				
July 28	Islamabad, Pakistan	Airbus A321-200	destroyed	152 fatal
The A321 crashed while being positioned for a second approach in monsoon rains.				
July 28	Tucson, Arizona, U.S.	Aerospatiale AS 350-B3	destroyed	3 fatal
The helicopter descended rapidly and crashed on a street during an EMS positioning flight.				
July 31	Lytton, British Columbia, Canada	Convair 580	destroyed	2 fatal
The air tanker crashed during a forest fire-fighting mission.				

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.