Running on Fumes

The main fuel tanks were nearly empty when the crew realized their mistake.

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

Center Tank Switches Overlooked

Boeing 737-400. No damage. No injuries.

Stress, fatigue, inadequate crew coordination, systems differences and a vague checklist were among the safety issues identified by the Australian Transport Safety Bureau (ATSB) in an incident that brought the 737 uncomfortably close to fuel starvation near Swan Hill, Victoria, the morning of Aug. 11, 2007.

The aircraft had departed from Perth, Western Australia, at 0544 local time for a scheduled passenger flight to Sydney, New South Wales. About 2 hours and 40 minutes after takeoff, the aircraft was 50 km (27 nm) northwest of Swan Hill at 31,000 ft when the master caution light and a caution light for low output pressure from the main tank fuel pumps illuminated. The engines were being fed from the main tanks, each of which contained only about 100 kg (220 lb) of fuel while 4,700 kg (10,362 lb) of fuel remained in the center tank.

"The pilot-in-command observed that the center tank fuel pump switches on the forward overhead panel were selected to the 'OFF' position, and he immediately selected them to the 'ON' position," the ATSB report said. With the center tank feeding the engines, the flight was completed without further incident.

The estimated fuel consumption for the flight was 9,900 kg (21,826 lb). On departure from Perth, the aircraft had about 13,700 kg (30,203 lb) of fuel, including about 4,500 kg (9,921 lb) in both the left and right main tanks, and 4,700 kg in the center tank.

The flight crew had completed two previous flights in a 737-800 that had a different fuel system and fuel control panel than the 737-400 assigned to the flight to Sydney. The -400 had a deactivated auxiliary tank in the aft fuselage and an extra set of fuel pump switches, labeled "INOP" and secured in the "OFF" position, on the fuel control panel. "The center tank fuel pump switches on those other 737 aircraft were located in a similar position to the auxiliary tank fuel pump switches on [the incident aircraft]," the report said.

The center tank fuel pumps must be activated before departure when fuel load exceeds 9,000 kg (19,841 lb). There are no annunciations showing the operating status of the center tank pumps; the only indication is switch position.

Checks of the fuel control panel are among the items included in the "Before Start" checklist and in the standard procedures to be conducted at the top of climb. The copilot told investigators that he looked at the panel both times but did not notice that the center tank pump switches were off. "The pilot-in-command did not provide effective monitoring of the actions of the copilot," the report said. "There was no cross-check."

The "Before Start" checklist specified only "pumps on." It did not "distinguish between the various fuel pump selection options," the report said. "[Furthermore,] the checklist procedure

did not require flight crew to touch the switches of the fuel pumps to ensure that they were aware of the position of the switches."

Neither pilot adequately monitored the fuel load during the flight. "Had the copilot or pilot-in-command been monitoring the fuel gauges, they would have realized that the large quantity of fuel in the center tank was not being used," the report said.

The incident occurred on the last day of a four-day trip sequence. Although adequate rest periods were provided, the pilot-in-command did not fully use them and likely was suffering from fatigue related to sleep deprivation, the report said. "The pilot-in-command also was suffering from chronic stress [from an ongoing divorce and financial problems related to the divorce], and it is probable that this stress affected his ability to operate as a pilot-in-command without him being aware of this."

Late Flare Leads to Hard Landing

Airbus A320-321. Substantial damage. No injuries.

The aircraft was en route from London on an unscheduled flight to Kos, Greece, the morning of July 5, 2007. There were 180 passengers and six crewmembers aboard, including a line training captain and a cadet copilot, who had 381 flight hours, including 147 in type.

"During the preflight briefing, the commander decided that the copilot should be the pilot flying (PF) for the sector to Kos, where it would be possible for him to carry out a managed approach to fulfill an outstanding training requirement," said the U.K. Air Accidents Investigation Branch (AAIB) report. "In a managed approach in the A320 aircraft, the flight management guidance system directs the aircraft onto the final approach via the autopilot and autothrottle."

After departure, the crew flew a holding pattern at 10,000 ft for 45 minutes while resolving an engine bleed-air malfunction. "As the fuel remaining following the hold was now insufficient to continue to Kos with the required reserves, a decision was made to divert to Thessaloniki, where the copilot carried out a manual landing without incident," the report said.

After refueling, the copilot remained the PF for the continued flight to Kos. The island airport had visual meteorological conditions (VMC), with surface winds at 10 kt from 300 degrees, variable between 190 and 300 degrees. "Runway 32 was in use, and the crew briefed and prepared to fly the VOR/DME [VHF omnidirectional radio/distance measuring equipment] approach using the autopilot," the report said.

The crew established visual contact with the runway early in the approach, and the copilot disengaged the autopilot at 1,400 ft. The A320 was about 830 ft above ground level (AGL) when the commander told the copilot that the precision approach path indicator lights showed the aircraft above glide path and that he should increase the rate of descent to 1,000 fpm.

The aircraft was at about 80 ft AGL when the wind component changed from a 7 kt crosswind to a 4 kt tail wind. "The copilot's control inputs resulted in a flare insufficient to arrest the aircraft's high rate of descent and prevent the heavy landing," the report said. Rate of descent was 900 fpm and vertical acceleration was 3.15 g (i.e., 3.15 times standard gravitational acceleration) when the A320 touched down on the main landing gear and bounced. The commander took control and completed the landing.

The wind component changed from a 7 kt crosswind to a 4 kt tail wind.

The commander subsequently reported the hard landing, and the operator grounded the aircraft. "Both main landing gear assemblies were replaced before the aircraft returned to service," the report said.

Seat Belt Fittings Fail in Turbulence

Boeing 737-300. No damage. Six minor injuries.

The 737 encountered severe turbulence while descending through 11,400 ft to land in Las Vegas on Feb. 24, 2008. Three passengers, including an infant being held by his mother, sustained minor injuries when their seat belt attachments failed and they struck overhead baggage compartments.

"Two additional passengers and a flight attendant were injured by rough contact with the airplane structure during the turbulence encounter," said the report by the U.S. National

Transportation Safety Board (NTSB). The other 136 occupants were not hurt, and the airplane was landed without further incident.

"Medical personnel met the airplane as requested and treated the injured passengers and flight attendant, classifying their injuries as minor," the report said.

The turbulence encounter had lasted 20 seconds. Recorded flight data showed peak vertical accelerations of –0.8 g and +1.8 g. The seat belt signs were illuminated throughout the flight, and about five minutes before the encounter, the captain advised the flight attendants to clean up the cabin early and to take their seats.

The turbulence encounter had lasted 20 seconds.

Examination of the failed seat belts revealed that the keepers in the D-ring attachments were bent and had allowed the D-rings to unhook from their attachments to the seat frames. Following similar seat belt failures in the 1990s, the U.S. Federal Aviation Administration (FAA) in 2003 issued a special airworthiness information bulletin (SAIB NM-04-37) advising transport category airplane operators to expedite replacement of D-ring-type seat anchors.

The report said that the 737 was among the airplane models listed in the SAIB as possibly having D-ring-type seat anchors but noted that "SAIBs are advisory in nature and compliance is not mandatory." Nevertheless, NTSB concluded that "the failure of the operator to comply with the SAIB" was a contributing factor in the incident.

Pelican Penetrates Cockpit

Bombardier Challenger 604. Substantial damage. No injuries.

The flight crew said that the Challenger was climbing through 8,000 ft at 230 kt when it struck large white birds while departing from Colorado Springs, Colorado, U.S., for a business flight the afternoon of April 8, 2008. One of the pilots told investigators, "At first, there was a loud bang, followed by a moderately loud wind noise."

The crew realized that at least one of the birds had penetrated the cockpit. They declared an emergency and, after performing control and systems checks, returned to Colorado Springs and landed without further incident. None of the five people aboard the airplane was injured.

"Examination of the airframe revealed a hole in the airplane's forward fuselage below the cockpit windows," the NTSB report said. "The fuselage skin and forward pressure bulkhead were penetrated and contained bird matter. Bird matter was noted on the cockpit windows, fuselage, vertical and horizontal stabilizers, and in the left engine. The left engine fan blades were damaged, and the spinner was buckled and collapsed."

The birds were identified as American White Pelicans, which have an average weight of 15 lb (7 kg). "The state of Colorado is located in the migratory path of the American White Pelican," the report said. "The birds usually travel from Montana/South Dakota to Mexico, paired up for mating, and travel in flocks of four to 12 birds."

The pilots had received no bird advisories before takeoff. "At the time of the accident, the U.S. Air Force bird avoidance model risk class was moderate for the area," the report said.

Tires Burst on Takeoff

Gates Learjet 36A. Substantial damage. No injuries.

The Learjet was nearing 120 kt on takeoff roll when the crew heard a loud pop during departure from Runway 20 at Newport News/Williamsburg (Virginia, U.S.) International Airport the morning of March 26, 2007. The airplane veered left, and the PF rejected the takeoff, retarding the throttles and applying maximum wheel braking while the pilot monitoring deployed the drag chute.

"The drag chute appeared to be inoperative, and the pilots were unable to stop the airplane on the runway," the NTSB report said. "The airplane continued off the right side, impacted a runway light and came to rest in the grass." The report did not say whether the crew deployed the spoilers during the rejected takeoff or whether the Learjet was equipped with thrust reversers.

Examination of the airplane revealed that the left main landing gear tires had burst, the

landing gear had separated and the left wing spar had been damaged. "Due to severe fragmentation of the tires, the origin of the tire failure could not be identified," the report said. However, airport personnel found rocks and pieces of metal on the runway after the accident. The runway was 6,526 ft (1,989 m) long and 150 ft (46 m) wide.

The report said that the probable cause of the accident was "the failure of the landing gear tires due to [debris] on the runway" and that a contributing factor was the failure of the drag chute. Investigators found that the drag chute strap had separated at the woven loop that attaches it to the airplane.

The airplane manufacturer recommended that drag chutes be deployed on landing at least once every six months, then inspected and repacked. "According to maintenance records, the drag chute [on the accident airplane] was most recently repacked during a routine inspection three months prior to the accident," the report said. "The drag chute had not been deployed prior to or after the inspection."

Mechanic Pinned by Nosewheel

Boeing 777-300. No damage. One serious injury.

The 777 was pushed back from the gate, and the engines were started in preparation for departure from San Francisco International Airport the night of Aug. 16, 2008. A ground crewmember was unable to disconnect the tow bar, and an airline mechanic recommended that the airplane be towed forward to straighten the tug and the nosegear.

After asking the flight crew to release the parking brake, the ground crewmember towed the airplane forward but still had difficulty disconnecting the tow bar. "The mechanic came to check the condition of the tow bar, which he reported was half unhooked," the NTSB report said. "The mechanic tried to disconnect the tow bar by stepping on it."

When the tow bar eventually disconnected, the 777 rolled forward. "The mechanic shouted to the ground agent to 'set the parking brake' and then fell on the ground," the report said. "The airplane continued to roll forward and pinned the mechanic's leg."

The report said that the probable cause of the accident was the ground crewmember's failure to follow standard operating procedures for tow bar disconnection. The procedures include setting the parking brakes in both the airplane and the tug, chocking the wheels, and disconnecting the tow bar first from the tug, then from the airplane.

Fairing Separates in Turbulence

Eclipse 500. Minor damage. No injuries.

The pilots heard a loud bang and a rumble when the very light jet encountered light turbulence in cruise flight at 5,000 ft and 250 kt near Rockford, Illinois, U.S., on July 17, 2008. The airplane, which was on an air taxi positioning flight from Pinedale, Wyoming, was landed at the destination, Chicago Executive Airport, without further incident.

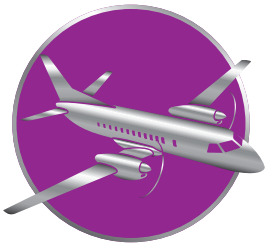
Examination of the airplane revealed that the left wing fairing had separated. Three screws in the forward edge of the fairing were missing, and all of the screws in the curved section of the fairing had pulled through the fairing and remained attached to the underlying structure.

The wing fairing is constructed of carbon fiber with a foam core. The screw holes in the fairing have countersunk recesses into which grommets are glued. The NTSB report said that the screws and grommets used for the fairing are smaller than those used in other parts of the airplane.

Three screws in the forward edge of the fairing were missing.

The wing fairings on the incident airplane had been removed several times by the operator's maintenance personnel to facilitate work on the fuel system and autopilot system. "The operator reported that the metal grommets begin to loosen when the fairing is repetitively removed," the report said. "The operator stated that they had not submitted FAA service difficulty [reports] regarding grommet-to-fairing separation."

The report said that the probable cause of the incident was "improper installation of the forward edge of the [wing fairing]" and that a contributing factor was "the use of small-head screws and grommets in securing the fairing."



TURBOPROPS

'Outdated' Blades Trash Engine

Beech 1900D. Substantial damage. No injuries.

The aircraft was departing from the airport in Jabiru, Northern Territory, Australia, for a charter flight the morning of Feb. 11, 2008, when the left propeller automatically feathered and the left engine failed at about 600 ft AGL. Witnesses on the ground saw flames coming from the left engine, and the passenger aboard the 1900 told the pilots that "white chunks of metal" were coming out of the exhaust system, said the ATSB report.

The pilots completed a single-engine circuit of the airport and landed the aircraft without further incident.

Examination of the aircraft revealed catastrophic internal damage to the left engine power turbine section. "The initiator of the damage was the release of a power turbine second-stage blade," the report said. Metallurgical inspections showed that the blade had failed because of high-cycle fatigue cracking at its root.

The engine manufacturer, Pratt & Whitney Canada, had issued a service bulletin (SB 14172R1) in 1994 calling for replacement of the second-stage turbine blades in PT6A-67D engines with strengthened blades that also provide more blade-tip clearance. The blade replacement was required during the next overhaul of the power turbine section.

However, the report said that when the incident aircraft's left engine power turbine section was overhauled in May 2005, "outdated" turbine blades were installed, and compliance with the SB was incorrectly noted in the engine's records. This notation resulted in noncompliance with a requirement to inspect the outdated blades every 1,500 hours.

"The involvement of an overseas overhaul facility contributed to the inability of the investigation to establish why the pre-SB blades were installed … and the reason for the incorrect annotation in the engine's documents," the report said.

Aft Loading Leads to Tail Strike

Saab 340B. Minor damage. No injuries.

The aircraft was scheduled for a flight from Glasgow, Scotland, to Benbecula with 10 passengers, three crewmembers, 660 kg (1,455 lb) of newspapers in the cargo compartments and another 150 kg (331 lb) of newspapers in three "seat converters" at the rear of the passenger compartment.

Before the 340's scheduled departure the morning of Jan. 17, 2009, the airline's central load control facility in Manchester, England, determined that the load sheet required revision, moving some passengers forward and offloading 24 kg (53 lb) of newspapers from the aft cargo compartment, to bring the center of gravity (CG) within limits.

The central load control facility sent the revised load sheet to the airline's dispatch office in Glasgow about 30 minutes before the scheduled departure time. "However, no flight release message was sent from [the central load control facility] to Glasgow, as required," the AAIB report said. "The dispatcher was therefore not aware of the need to move the passengers."

As a result, the aircraft's CG was about 14 index units aft of the aft limit for takeoff and landing, although the original load sheet provided to the flight crew showed the CG about 6 index units forward of the aft limit.

The commander and the copilot, the PF, did not recognize the situation during takeoff or cruise. However, after touching down at Benbecula, the copilot was unable to lower the aircraft's nose, even when he moved his control column full forward. "The commander attempted to lower the aircraft nose using a combination of propeller reverse thrust and wheel brakes," said the report, noting that the reverse thrust likely exacerbated the problem.

The nose did not lower until airspeed decreased to approximately 40 kt. Examination of the 340 revealed that the tail had struck the runway, resulting in abrasion to the fuselage skin and the attachment bracket for the "pogo stick," a device used to support the aircraft's tail during loading.

Flight Control Lock Overlooked

De Havilland DHC-6. Substantial damage. One fatality.

A witness who watched the Twin Otter being taxied to the runway at Hyannis, Massachusetts, U.S., the morning of June 18, 2008, told investigators that he "found it strange that the airplane did not stop and rev up its engines before takeoff, as he thought airplanes normally did, but instead taxied on the taxiway parallel to the runway and then made a 180-degree turn onto the runway without stopping."

The NTSB report said that the pilot was more than one hour late in initiating the charter flight to Nantucket, Massachusetts, because of a delay in arrival of the cargo at Hyannis.

The Twin Otter entered a steep left bank shortly after lifting off the runway. "The bank steepened, and the airplane descended and impacted the ground," the report said. "Post-accident examination of the wreckage revealed that the pilot's four-point restraint was not fastened and that at least a portion of the cockpit flight control lock remained installed on the control column. One of the pre-takeoff checklist items was 'flight controls unlocked, full travel.'"

The report noted that the airplane manufacturer in 1979 issued SB 6/383, introducing a new control lock that deflects the elevators down to minimize the possibility of the airplane becoming airborne with the lock installed. The next year, the manufacturer issued SB 6/391, recommending installation of a warning flag on the control lock. The SBs later were consolidated.

The accident airplane had not received the modifications. Transport Canada in 1990 issued an airworthiness directive requiring compliance with the SBs. The FAA issued a similar directive after the accident.

PISTON AIRPLANES

Turbocharger Fails on Takeoff

Piper Chieftain. Substantial damage. One serious injury, two minor injuries.

The Chieftain was near its maximum takeoff weight when it departed from Aniak, Alaska, U.S., for a commuter flight to Shageluk the afternoon of Aug. 4, 2008. The pilot said that the airplane was at about 200 ft AGL when the left engine lost power. Witnesses on the ground saw smoke emerging from the engine.

"The pilot indicated that he feathered the left engine but that the airplane was descending and he elected to make an emergency landing on a gravel bar about 0.5 mi [0.8 km] from the airport," the NTSB report said.

The nosegear collapsed on landing, and the fuselage and wings were damaged. One passenger was seriously injured, and two passengers sustained minor injuries; four passengers and the pilot escaped injury.

Tests of the left engine revealed that it could not produce manifold pressure above atmospheric pressure. However, after the turbocharger was replaced, the engine produced full rated power. Examination of the original turbocharger showed that one of the turbine shaft bearings had failed and that the turbine shaft and blades were damaged.

Passenger Retracts Gear on Landing

Beech Baron. Substantial damage. No injuries.

The Baron, which was for sale, departed from Jersey, Channel Islands, for a flight to Guernsey the morning of Aug. 4, 2008, with the commander in the right front seat and a prospective buyer in the left seat. The AAIB report said that the prospective buyer was an experienced pilot but was not current in type.

"The departure was normal, and some general handling was carried out by the pilot in the left seat before he handed control back to the aircraft commander for landing," the report said.

After touchdown and before the commander applied wheel braking, the prospective buyer offered to raise the flaps. "Before the commander could prevent him from doing so, the pilot in the left seat inadvertently selected the landing gear handle instead of the flap lever and moved it to the 'UP' position," the report said. "The commander immediately returned it to the 'DOWN' position, but the retraction cycle had commenced, and the aircraft sank onto the runway."

The landing gear handle in older Barons is on the right side of the center pedestal and the

flap lever is on the left side. The commander told investigators that the prospective buyer likely assumed that the flap lever was in the same place in the Baron as it was in the aircraft that he normally flew.

Attitude Indicator Malfunctions

Cessna P337H Skymaster. Destroyed. Two fatalities.

During his preflight briefing the morning of June 15, 2008, the pilot was told that instrument meteorological conditions (IMC) prevailed along the route from Millinocket, Maine, U.S., to Caldwell, New Jersey. The pilot filed an instrument flight rules (IFR) flight plan but did not activate the flight plan before departing in VMC.

"The pilot subsequently informed air traffic control [ATC] that he was experiencing a problem with the airplane's artificial horizon and that he wanted to try to conduct the flight under VFR [visual flight rules]," the NTSB report said.

However, about 15 minutes later, the pilot requested and received clearance from ATC to conduct the flight under IFR at 8,000 ft. The Skymaster was in IMC with light to moderate precipitation when radio contact was lost. Recorded ATC radar data showed that the airplane's heading varied from southwest to northwest and then to southeast. The Skymaster was descending through 7,200 ft when radar contact was lost. It struck the Atlantic Ocean at high speed and was not recovered.

The report said that the probable cause of the accident was "the pilot's improper decision to continue the flight in IMC after experiencing an attitude indicator malfunction."

HELICOPTERS

Visual References Lost in Whiteout

Bell 206B-3 JetRanger. Destroyed. One fatality.

Weather conditions were fluctuating between VMC and IMC when the JetRanger was landed on Réservoir Gouin, Quebec, Canada, the morning of March 19, 2008, to retrieve a company Cessna 206 that had been stuck in soft snow and slush on the frozen reservoir for more than a week.

Neither of the two pilots aboard the helicopter held an instrument rating. One pilot took off uneventfully in the airplane and flew it to Alma, about 120 nm (222 km) east. "The weather at the time was estimated at 1 1/2 mi [2,400 m] visibility in light snow showers, ceiling 200 ft AGL," said the report by the Transportation Safety Board of Canada.

The other pilot departed in the JetRanger shortly thereafter. The helicopter struck the reservoir at a high rate of descent 1.2 nm (2.2 km) from the takeoff point. "It is likely that the pilot lost control of the helicopter while flying in whiteout conditions over the vast snow-covered frozen surface of Réservoir Gouin," the report said.

Rotor Blade Strikes Ramp Worker

Kaman K-1200. Substantial damage. One fatality.

The pilot had started the engine in preparation for a positioning flight from Santa Clarita, California, U.S., to Los Angeles the morning of Dec. 17, 2008. The engine was at flight idle when the ground crewman, a company maintenance technician, disconnected the external power unit cable from the helicopter.

The pilot said that as the ground crewman walked away from the helicopter, which was facing toward the north-northwest, the Kaman was struck by a gust of about 15 kt from the east-southeast. He felt the right side of the helicopter lifting off the ground. "The pilot applied full right cyclic to counter the up-lifting condition; however, the wind gust continued lifting the helicopter to the left and nose-down until the aircraft came to rest inverted," the NTSB report said.

As the helicopter rolled over, the main rotor blades struck a fueling truck and separated. One of the blades struck and killed the ground crewman. The pilot was not injured.

Noting that the K-1200 flight manual says that the maximum velocity for a right quartering tail wind is 17 to 25 kt for takeoff and landing, the report said, "The winds at the accident site most likely exceeded the maximum wind allowed."

Preliminary Reports, July 2009

Date	Location	Aircraft Type	Aircraft Damage	Injuries
July 2	Breckenridge, Colorado, U.S.	Bell 206L-1	substantial	1 serious, 1 minor
The LongRanger was transporting an external load of cargo to a mine at 12,925 ft when it began to rotate, landed hard and rolled over.				
July 3	Maranhão, Brazil	Piper Seneca II	substantial	2 serious
The Seneca crashed short of the runway during an attempt to return to the airport after an engine failed on departure for a cargo flight.				
July 4	Baganara Island, Guyana	Britten-Norman Islander	minor	10 none
The pilot performed an emergency landing after one engine failed during a charter flight.				
July 5	Great Barrier Island, New Zealand	Britten-Norman Trislander	substantial	11 NA
The Trislander was departing on a scheduled flight when the no. 3 propeller separated and struck the fuselage. Two passengers were injured by debris.				
July 5	Raphine, Virginia, U.S.	Pilatus PC-12/45	destroyed	4 fatal
The pilot reportedly lost control of the airplane in IMC at about 31,000 ft after telling ATC, "I lost my panel."				
July 6	Biak, Papua, Indonesia	Boeing 737-400	minor	111 none
The flight crew landed the 737 without further incident after a nosewheel separated on takeoff.				
July 8	near Port Richey, Florida, U.S.	Cessna 421C	destroyed	5 fatal
The airplane descended into the Gulf of Mexico shortly after the pilot told ATC that it had encountered severe turbulence and was "upside-down."				
July 9	Richmond, British Columbia, Canada	Piper Chieftain	destroyed	2 fatal
The Chieftain was on a night cargo flight when it crashed into an auto mall on approach to Vancouver International Airport.				
July 9	Amarnath Caves, India	Aerospatiale SA 350	destroyed	1 fatal, 5 serious
One person on the ground was killed when the helicopter crashed on approach to a landing pad.				
July 10	Kinmen Island, Taiwan	MBB/Kawasaki BK-117	destroyed	2 fatal, 1 NA
The air ambulance struck the sea during a night approach. The patient and copilot drowned; the pilot was rescued.				
July 10	Fort Myers, Florida, U.S.	Airbus A320-232	none	2 serious, 2 minor, 149 none
The seat belt sign was on when the A320 encountered turbulence while descending through 12,000 ft. One of the seriously injured passengers did not have her seat belt fastened; the other was in a lavatory.				
July 13	Yakutat, Alaska, U.S.	Beech G18S	substantial	1 none
The cargo airplane veered off the runway after encountering a gust on touchdown.				
July 13	Charleston, West Virginia, U.S.	Boeing 737-300	substantial	131 none
The 737 was at 30,000 ft, en route from Nashville, Tennessee, to Baltimore, when a small section of upper rear fuselage skin ruptured, causing a rapid decompression. The airplane was landed without further incident at Charleston.				
July 15	Qazvin, Iran	Tupolev 154M	destroyed	168 fatal
The airplane was at 34,000 ft, en route from Tehran to Yerevan, Armenia, when it turned 270 degrees, entered a rapid descent and crashed in an open field.				
July 17	Nunavik, Quebec, Canada	Bell 206L	destroyed	2 fatal
The helicopter crashed in a ravine during a positioning flight from Kangirsuk to Kangiqsujuaq.				
July 17	Willow Creek, California, U.S.	Croman SH-3H	substantial	1 serious, 1 minor
The firefighting helicopter was uploading water when it struck the tank and rolled over.				
July 22	Franklin, Pennsylvania, U.S.	Hughes 369	substantial	1 fatal
The helicopter crashed after its external load became entangled in a tree.				
July 23	Boonsboro, Maryland, U.S.	Robinson R44	destroyed	4 fatal
Night IMC prevailed when the helicopter struck power lines while flying over a highway.				
July 24	Mashhad, Iran	Ilyushin 62M	destroyed	16 fatal, 137 NA
VMC prevailed when the airplane overran the runway on landing and struck a wall.				
July 31	Parma, Italy	Boeing 737-800	none	189 none
The flight crew rejected the takeoff at 105 kt when they saw a bird-control vehicle on the runway.				

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.

Smoke, Fire and Fumes Events in the United States and Canada, May–July 2009

Date	Flight Phase	Airport	Classification	Sub-classification	Aircraft	Operator
May 1, 2009	Descent	Pensacola, Florida (PNS)	Descent to arrival airport, landing	Smoke in cabin	B-737	Delta Air Lines
While the airplane was descending through 10,000 ft, a flight attendant reported smoke in the cabin. The flight crew turned off the right air conditioning pack, the smoke dissipated, and an uneventful landing followed.						
May 2, 2009	Unknown	Unknown	Unscheduled landing	Smoke in forward galley area	B-757	United Airlines
The first officer and a flight attendant detected a burning insulation smell in the forward galley area. Circuit breakers were pulled.						
May 9, 2009	Cruise	Detroit (DTW)	Landing at destination	Smoke in galley oven	B-757	Northwest Airlines
The aft galley oven emitted smoke. The crew identified smoke coming from the fan/heating element area of the oven.						
May 15, 2009	Cruise	Unknown	Unscheduled landing	Burning smell in cabin	EMB-145	Continental Express Airlines
The crew reported an electrical burning smell and burning rubber odor upon completion of the climbout.						
May 16, 2009	Cruise	Charlotte, North Carolina (CLT)	Diversion, unscheduled landing	Electrical/burning smell in cockpit	B-757	Allegheny Airlines
During cruise, the crew reported a strong electrical/burning smell in cockpit. They conducted the quick reference handbook checklist and turned off both recirculating fans.						
May 18, 2009	Cruise	Las Vegas (LAS)	Diversion, unscheduled landing	Electrical/burning smell in cockpit	DC-9	Allegiant Air
During cruise, the crew reported a strong electrical/burning smell in the mid-cabin. They diverted to Las Vegas and landed without incident.						
May 23, 2009	Climbout	Philadelphia (PHL)	Diversion, unscheduled landing	Burning smell in cabin	ERJ 170	Unknown
On climbout from PHL, the crew received a bleed leak warning and noticed a smell of burning rubber in the cabin. They declared an emergency and diverted to Norfolk (Virginia) International Airport.						
May 27, 2009	Taxi	Unknown	After landing	Smoke in cabin	EMB 120	Great Lakes Aviation
After landing, the pilots reported that smoke filled the cabin and activated an aural alarm. The pilots shut off the air conditioning packs, and the smoke dissipated.						
May 29, 2009	Climbout	Unknown	Return to airport, unscheduled landing	Odor/smoke in cabin	CL-600	Express Airlines
During climbout, the smoke warning light for the aft lavatory illuminated. The flight crew donned oxygen masks. The cabin crew reported an odor in the cabin; an emergency was declared and the aircraft was returned for landing.						
May 30, 2009	Climbout	Fort Lauderdale, Florida (FLL)	Return to airport, unscheduled landing	Odor/smoke in cabin and cockpit	ERJ 190	JetBlue Airways
On the climbout from FLL, the flight crew noticed a smell of burnt oil in the cockpit and cabin. They declared an emergency and returned to FLL.						
June 11, 2009	Takeoff	Unknown	Return to airport, unscheduled landing	Odor/smoke in cabin and cockpit	EMB 145	American Eagle Airlines
On takeoff, the crew reported cabin and cockpit smoke/fumes with lavatory smoke indication on the engine indicating and crew alerting system. They returned to the departure airport.						
June 12, 2009	Cruise	Waterloo, Iowa (ALO)	Diversion, unscheduled landing	Electrical smoke in cabin	B-757	Northwest Airlines
In cruise, the crew noticed electrical smoke in the cabin. They diverted to ALO and made an uneventful landing.						
June 16, 2009	Cruise	Unknown	Diversion, unscheduled landing	Burning odor in cockpit	MD-10	FedEx
In cruise at 34,000 ft, the crew heard a thumping noise from the radome or avionics area. Almost immediately, a burning odor was detected in the cockpit. The flight was diverted and landed.						
July 13, 2009	Cruise	Unknown	Diversion, unscheduled landing	Smoke in cabin	CL-600	Express Airlines
In cruise at 31,000 ft, the crew heard a pop and saw sparks from the area above the flight attendant jumpseat. They declared an emergency and landed at an alternate airport.						
July 25, 2009	Climbout	Boston (BOS)	Return to airport, unscheduled landing	Odor/smoke in cabin and cockpit	B-757	American Airlines
During climbout, the crew reported smoke in the cabin and cockpit. They declared an emergency and returned to BOS.						

Source: Safety Operating Systems