

## Case Study: Boeing 777 Smoke Accident

On February 26, 2007 at 1000, a United Airlines Boeing 777-222 experienced a smoke event at London Heathrow Airport, UK. The accident occurred during engine start after pushback from the stand. After the right generator came online an electrical failure occurred in the right main bus. The failure resulted in severe internal arcing and short circuits inside the two main power

contactors of the right main bus. The heat generated during the failure resulted in the contactor casings becoming compromised, causing molten metal droplets to fall down onto the insulation blankets below. The insulation blankets ignited and a fire spread underneath a floor panel to the opposite electrical panel (P205), causing heat and fire damage to structure, cooling ducts and

wiring. The flight crew responded to the bus failure and a burning smell by shutting down the right engine and taxiing to a nearby stand. The Airfield Fire Service attended the aircraft when it arrived on stand and entered the Main Equipment Centre where they discovered significant smoke but no fire. The passengers were evacuated uneventfully via steps.

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## Getting Control of LOC

Front and centre on all new head-up displays being installed in FedEx Express widebodies will be a single number in a large font that appears only when a pilot needs it most - the g-load on the aircraft.

As an aircraft upset recovery aid, the G-meter's simplicity belies the years of analysis, flight-testing and internal funding that went into FedEx's decision to include it.

The specialised HUD symbology is a product of a broader programme within FedEx starting later this year to arm pilots with the knowledge, simulator skills and equipment to detect and recover large swept-wing aircraft from in-flight upsets - situations where an aircraft for whatever reason is pitched, rolled or yawed beyond the normal limits. Upsets require pilots to assess the unusu-

al attitude and recover the aircraft back to normal parameters or otherwise risk a loss-of-control (LOC) accident.

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## Upcoming Tradeshows

**April 20 - 23, 2009**

**Bombardier M&O Conference: Addison, Texas**

**April 21 - 23, 2009**

**CASS: Orlando, Florida**

**May 11 - 14, 2009**

**EBACE: Geneva, Switzerland**

**June 24, 2009**

**NBAA Regional: St. Paul, MN**



*Smoke Signals* is written and produced by Allison Markey, Aviation Safety Specialist Safety Operating Systems

## Case Study: Boeing 777 Smoke Accident cont.

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The investigation identified the following causal factors:

1. An internal failure of the Right Generator Circuit Breaker or Right Bus Tie Breaker contactor on the P200 power panel inside the Main Equipment Centre resulted in severe internal arcing and short-circuits which melted the contactor casings. The root cause of contactor failure could not be determined.
2. The open base of the P200 power panel allowed molten metal droplets from the failed contactors to drop down onto the insulation blankets and ignite them.
3. The aircraft's electrical protection system was not designed to detect and rapidly remove power from a contactor suffering from severe internal arcing and short-circuits.
4. The contactors had internal design features that probably contributed to the uncontained failures.

The fire and smoke in the MEC was caused primarily by ignition of the insulation blankets from hot molten metal droplets falling down from the failed contactors. Some of the floor panel burning and ancillary equipment burning would also have contributed to the smoke.

The flight crew did not become aware of any smoke until some time after the insulation blankets started to burn. The smoke detector in the MEC detected

smoke 42 seconds after the initial electrical failure event and this triggered the 'Equipment Cooling Override' mode. Three minutes and 13 seconds after the failure event the flight crew first noticed an electrical burning smell. It was not until 4 minutes and 30 seconds after the failure event that the flight crew became aware of smoke – this was when the tug driver advised on interphone that there was a lot of smoke coming out of the vents. No smoke was seen in the flight deck until after the APU was shut down – 14 minutes after the failure event. The flight crew's lack of awareness of the significant smoke in the MEC may have delayed their decision to shut down and evacuate the passengers. Their focus was on the bus failure and a perception of an overheat problem; the possibility of a fire in the MEC appeared to have been dismissed. If the aircraft's warning system had provided a 'smoke' warning to the flight crew when smoke was first detected, then the flight crew might have expedited the shut-down and evacuation.

An inspection inside the MEC after the accident revealed extensive heat and fire damage to the P200 power panel which is located to the right of the nose gear wheel well (see Figure 1). The worst affected components of the power panel were the Right Generator Circuit Breaker (RGCB) and Right Bus Tie Breaker (RBTB) contactors, parts of which had melted and vaporised (see Figure 2). There was evidence that molten metal had dripped down onto the insulation blankets

beneath the power panel. There was extensive fire damage to the fire-retardant insulation blankets located behind the power panel and beneath the panel under the floor. Nearby components including a floor panel, equipment cooling system ducting, other wire bundles and some structural frames and stringers in the vicinity were later determined to have suffered sufficient heat damage to require replacement. →



*Above: Fire damage to P200 power panel (cover removed), showing burnt-out RGCB and RBTB contactors (viewed looking forward and to the right)*



*Above: Burnt aircraft structure and insulation blankets located directly below P200 power panel (viewed looking down and aft; the floor panel has been removed)*

*Final Report by AAIB published April 16, 2009*

## Getting Control of LOC cont.

*continued from page 1*

Flight International joined FedEx experimental test pilot Bob Moreau in a Boeing MD-11 simulator on 18 December at the company's headquarters in Memphis, Tennessee, to perform unusual attitude recoveries with the HUD system and discuss the company's unique approach to upset training, a curriculum that may become a standard training tool for FedEx pilots later this year.

FedEx is not alone in its efforts as the industry as a whole is mobilising to reduce LOC accidents, events the Flight Safety Foundation says are the top killers of crews and passengers in the airline industry. A list of LOC accidents between 1998 and 2007 compiled by Boeing reveals that there were 22 that resulted in more than 2,051 fatalities worldwide.

### SPECIAL HAZARD TRAINING

The US Federal Aviation Administration, which had largely stayed on the sidelines on LOC prevention despite a long-standing National Transportation Safety Board recommendation to train crews "to respond to sudden, unusual or unexpected aircraft upsets", proposed early in January making certain "special hazard" LOC training a mandatory element of initial and recurrent simulator training for airline pilots.

The NTSB issued its recommendation in 1996 after the fatal 1994 crash near Pittsburgh International airport of USAir Flight 427, a Boeing 737-300 with 132 on

board that experienced an upset and subsequent LOC initiated by an uncommanded rudder fault.

Although the industry as a whole came together in the aftermath of Flight 427 to develop the Airplane Upset Recovery Training Aid, a workbook and video explaining how swept-wing aircraft should be recovered from upsets that cause unusual attitudes, accidents continue. Several recent high-profile crashes (see table) that claimed all lives on board reveal that pilots in each case did not properly handle low-speed stall scenarios in the high-altitude phases of flight, a finding safety experts say is a symptom of inadequate knowledge and training in relation to swept-wing jets despite having upset recovery training materials available.

Air transport-certificated pilots do not have "the baseline knowledge that we've believed them to have", says John Cox, chief executive of Washington-based Safety Operating Systems and a former airline pilot and top safety official with the Air Line Pilots Association.

The FAA's new rule, expected to be finalised by late 2010, will give carriers five years after that to implement a host of new training requirements for pilots, including upset-recovery scenarios in the simulator.

### PREVENTION TECHNIQUES

Like many airlines, FedEx in the past has voluntarily included some LOC prevention techniques

in the classroom and in the simulator using the industry-developed recovery aid, which was recently updated for the second time to include recovering a large swept-wing aircraft in the high-altitude environment.

Unlike the training aid, which assumes the aircraft is controllable through the primary flight controls, FedEx is leaning toward teaching its 4,700 pilots to be more open minded as to the cause of the upset and method of recovery. "We don't assume a normal aircraft," says Moreau. "A big aircraft doesn't get into those situations unless something is amiss."



*Airlines are now training pilots more extensively on "special hazard" LOC prevention in initial and recurrent simulator training.*

As such, the FedEx programme is likely to teach pilots to adopt alternate control strategies, using secondary or tertiary flight-control methods, to regain and retain control of the aircraft. FedEx's 4,700 pilots receive five days of flight training a year, composed of one day of ground school, one day of computer-based training and three days of simulator training.

## Getting Control of LOC cont.

FedEx's assessment in part comes from its own data, including a late 2005 incident where FedEx McDonnell Douglas DC-10 pilots on approach to Minneapolis/St Paul airport experienced an upset caused by the failure of a wing flap mechanism, one of six upsets involving flap or elevator damage over a 20-year span for the carrier.

An internal safety task force that keeps tabs of the carrier's risks decided to launch an advanced manoeuvre - upset recovery training (AM-URT) programme to better understand what types of upsets and advanced recovery techniques could accurately be learned in a simulator, and which might be better suited for a training aircraft. The group also separately recommended that FedEx purchase liquid crystal HUDs and infrared-based enhanced vision systems for its entire fleet by 2015 to boost pilots' situational awareness.

FedEx contracted with aerospace research group Calspan in Buffalo, New York to evaluate the AM-URT with FedEx MD-11 and Airbus A300 line pilots. The test used Calspan's variable stability Bombardier Learjet 25, as well as its aerobatic Beechcraft F33C Bonanza and MD-11 and A300 full-flight simulators.

One key idea that emerged from the two-year study, which involved 20 FedEx line pilots flying in FFS and in aircraft, was that a simulator can deliver positive

transfer of learning for unusual attitude recoveries, events the participants had experienced numerous times during all phases of flight training. The study, however, revealed that negative transfer occurred when exposing pilots to upsets (events that lead to an unusual attitude) that must be recovered, a finding that may be linked to inexperience of pilots with upsets.

The industry was reminded of the dangers of "negative" training in simulators in November 2001 when American Airlines Flight 587, an A300, crashed in New York after the first officer over-controlled rudder inputs in response to wake turbulence and snapped the composite vertical stabiliser off the aircraft.

American, as part of its advanced aircraft manoeuvring programme, had been teaching pilots in the simulator to counter such upsets by using rudder control. Unfortunately, the simulators did not adequately portray "the actual large build-up in sideslip angle and sideloads that would accompany such rudder inputs in an actual airplane", says the NTSB final report on the accident.

FedEx's Moreau says even before AA 587, airlines had begun to question how far to push manoeuvre training in simulators, which lack g-cues pilots would experience in an aircraft.

### OVER CONTROL

One observed impact caused by the lack of g-cues is that pilots tend to over-control and expedite recoveries in the FFS while doing the opposite in an aircraft, an effect FedEx saw in the Calspan studies and in 30° pitch-up manoeuvres in MD-10 and Boeing 747 aircraft.

By adding the G-meter readout on its HUD, however, researchers found pilots were not only much more aggressive in delivering the correct amount of control input in aircraft, but also slowed their control input forces and timing in the FFS, both desired outcomes.

The finding is aiding FedEx as it develops a long-term strategy for LOC prevention, which will ideally include academic training to teach key concepts, in-flight training to provide "real world relevance" and teach critical recovery skills, and FFS training to teach "key type-specific procedures", says Moreau. →

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## AirTran Flight Evacuated at RIC

January 4, 2009

An AirTran flight from Richmond International Airport to Orlando had to be evacuated before takeoff Sunday afternoon due to smoke in the cabin. There were 119 passengers and 5 crew members onboard at the time. Everyone exited the plane and returned to the terminal. No one was hurt.

It appears the smoke was coming from the unit used to power the

plane's air conditioning system. Some oil may have gotten on the unit causing the smoke.

Air Tran Boeing 717



## Smoke Events

The next pages chronologically outline news stories of smoke events which occurred during the 1st Quarter of 2009. Many are taken from news facilities worldwide and from aviation safety reporting networks. Daily Smoke Briefs are distributed by EVASWorldwide through email. To sign up for Daily Smoke Briefs, go to [www.evasworldwide.com](http://www.evasworldwide.com)

## 2 Air Canada Smoke Events

January 14, 2009

An Air Canada Airbus A321-200, registration C-GITY performing flight AC-133 from Toronto Pearson, ON to Calgary, AB (Canada) with 179 people on board, was about 30 minutes before Calgary, when the crew noticed an avionics smoke odour in the cockpit. No emergency was declared and no priority requested. The airplane landed safely.

January 16, 2009

An Air Canada Jazz Canadair CRJ-200ER, registration C-FDJA performing flight QK-460 from Vancouver, BC to Fort McMurray, AB (Canada) with 43 people on board, was climbing about 90nm north of Vancouver, when the crew received a cargo smoke warning shortly followed by a cargo fan fail message. The crew completed the according checklists, discharged the fire

suppression system into the cargo hold, declared an emergency and returned to Vancouver, where the airplane landed safely on runway 26R amid emergency services. The cargo smoke warning ceased after about 5 minutes.

## Eagle flight makes emergency landing in Killeen

January 5, 2009

American Eagle flight 3505 made an emergency landing Monday afternoon in Killeen after pilots reported smoke in the cockpit.

Andrea Huguely, a spokesperson for American, says there were 50 people aboard the Embraer 145 regional jet, including crew members, aboard flight 3505 enroute from Dallas to Killeen.

The pilots declared an emergency as a precaution, Huguely said. She says the captain reported "smoky haze" in the cockpit. The aircraft landed safely at 12:30 p.m. The flight taxied to the gate and passengers deplaned as usual.

The aircraft was taken out of service pending inspection.

Industry data suggests that in-flight fire remains the fourth leading cause of air carrier fatalities worldwide. On average in North America, there are three diversions due to smoke every day according to the FAA. It is estimated that over 100 smoke events occur worldwide per month. Smoke/Fire/Fumes is a subject the industry continues to combat.

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## Emergency landing for Virgin Atlantic jet

January 12, 2009

A Virgin Atlantic flight from London to Chicago made an emergency landing in Ireland because of smoke behind the cockpit, airline officials said. Some 20 minutes after take-off, the pilot of the Airbus A340 requested landing permission at

Shannon International Airport, The Telegraph reported. All 156 people disembarked as the airline arranged for overnight accommodations, said Paul Charles, the company's director of communications. He said there was no fire, but preliminary investigation showed two wires in the galley behind the

cockpit appeared to have shorted. The aircraft was grounded until Airbus officials could examine it. The passengers were scheduled to continue on to Chicago Monday aboard an Aer Lingus flight, the newspaper said.

## Smoke in the Cockpit

January 15, 2009

A Regional 1 Airlines de Havilland Dash 8-100, registration C-GZTC performing flight TSH-1850 from Calgary, AB to Fort MacKay, AB (Canada), had just levelled off at FL240 after departure from Calgary, when the flight crew smelled smoke and shortly thereafter saw smoke. The cabin crew confirmed seeing smoke in the cabin, too. The crew requested to descend and return to Calgary. While at 11000 feet the crew turned off both bleed air valves, which brought the smoke to dissipate. An eventless landing followed.

## Galley fire & smoke in Casablanca

January 19, 2009

A Tuifly Nordic AB Boeing 757-200, registration SE-RFP performing flight 6B-723 from Copenhagen (Denmark) to Boa Vista (Cape Verde) with 239 passengers, diverted to Casablanca (Morocco) after a fire broke out in one of the galleys. Flight attendants were able to extinguish the fire quickly emptying two extinguishers, the flight crew still decided to divert as a precaution.

The airplane was checked out and was able to continue the journey after about two hours on the ground. The return flight 6B-724 reached Copenhagen with a delay of 2:20 hours.

TuiFly Nordic AB stated, that an electrical short circuit in one of the rear galley ovens caused emission of smoke in a limited area.

The tour operator Star Tours had reported earlier, that a small fire in the galley was put out by the use of two fire extinguishers.

## Southwest emergency due to smoke

January 18, 2009

A Southwest Airlines Boeing 737-700, flight WN-295 from Sacramento, CA to Burbank, CA (USA), returned to Sacramento after the crew declared emergency reporting a smell of smoke. The airplane landed safely 26 minutes after liftoff and was evacuated. Four passengers were attended medically, however no injuries occurred.

No traces of fire were found.

Airport officials told, that following a two hour search a permitted small container of pepper spray was found in the checked luggage, supposedly being the source of the smell.

### United passengers report smoke

January 15, 2009

The crew of a United Airlines Airbus A320-200, registration N427UA performing flight UA-195 from Philadelphia, PA to Los Angeles, CA (USA), declared emergency and diverted to Las Vegas, NV after passengers reported to have smelled smoke. The airplane landed safely, no traces of fire or smoke were found.

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## Cockpit smoke: Boeing 737

January 29, 2009

The crew of a Canadian North Boeing 737-200, registration C-GFPW performing flight 5T-444 from Edmonton, AB to Yellowknife, NT (Canada) with 42 people on board, saw smoke within the cockpit which they identified to come from the window heating system. They decided to return to Edmonton as a precaution and landed without further incident. Maintenance determined, that the wiring to the captain's #2 sliding window was at fault. The captain's window had been removed and a pane been replaced. Canadian North believes, that during reinstallation of the window the wiring was not routed correctly.

## Smoke in the Lavatory

January 31, 2009

An Air Canada Jazz Canadair CRJ-705, registration C-GJAZ performing flight QK-8320 from Vancouver, BC to Calgary, AB (Canada) with 45 people on board, had just taken off Vancouver, when the crew smelled an odour and received a smoke indication for the aft lavatory. Flight attendants told the flight crew, that the smoke detector in the aft lavatory had activated, they could smell smoke and could see smoke. The pilots decided to return to Vancouver, where the airplane landed safely about 10 minutes after departure. The crew did not declare emergency, however emergency services met the aircraft after landing.

## Southwest emergency diversion in Jacksonville, FL

January 2009

A Southwest passenger plane en route to Washington, DC from Orlando had to make an emergency landing in Jacksonville after the pilot noticed smoke in the cockpit.

Flight 3726 made an emergency landing at Jacksonville International Airport around 2:45 Saturday afternoon.

One-hundred-six people were on board.

The Jacksonville Fire and Rescue staged at the end of the runway as a precaution.

All passengers taken off the plane. No one was hurt.

JAX's Spokesperson, Michael Stewart, says Southwest Airlines is handling the investigation now.

"Fire rescue has already looked at the plane, they could not find anything, so this is now a logistics issue with Southwest and

their maintenance, and now they will handle the passengers going forward."



## Fire extinguished, flight diverted

January 29, 2009

A small fire on an Xtra Airways charter jet caused it to be diverted to Bush Intercontinental Airport today.

The flight was heading to Laredo from Alexandria, La., when the fire was reported about 10 a.m., said Marlene McClinton, spokeswoman for the Houston Airport System.

The fire was extinguished quickly and the jet landed safely with no reported injuries, she said.

### **American Eagle returns to AMA**

January 2009

A twin-turboprop (SF-340) American Eagle plane with 12 passengers and crew members aboard returned to Amarillo and made a safe landing about 1:30 p.m. The crew reported the smell of smoke in the cockpit shortly after take-off for Dallas-Fort Worth.

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## FedEx: Fire alert

February 6, 2009

A FedEx Boeing 727-200, freight flight FX-2327 from Billings, MT to Springfield, MO (USA) with 3 crew, diverted to Denver, CO after a smoke detector in the cargo bays raised fire alert. The airplane landed safely on runway 35L, emergency services could not find any trace of smoke or fire.

The airplane was subsequently towed off the runway. NTSB investigators have arrived on the scene and are going through all cargo containers on board to identify the source of the alert.

## DHL: Rejected takeoff

February 10, 2009

A DHL Air UK Boeing 757-200, registration G-BIKZ performing freight flight QY-4762 from Hamburg Fuhlsbüttel to Leipzig (Germany), rejected takeoff from Hamburg around 22:00 local (21:00Z) due to a fire alert in one of the cargo holds.

Emergency services deployed in full force and unloaded the airplane, but could not find any trace of fire or smoke. It is therefore currently assumed, that the smoke detector triggered due to a technical malfunction.

## Defence aircraft makes emergency landing

January 28, 2009

An aeroplane carrying Australian Defence Force personnel to the Middle East was forced to make an emergency landing at Darwin Airport in the early hours of this morning.

A problem with an onboard air-conditioning system is thought to have caused the smoke that forced the A330 to make the landing 40 minutes into an eight-hour flight.

The Portuguese-registered plane, operated by private contractor Strategic Aviation, is contracted by the Australian Defence Force to carry passengers and cargo to overseas assignments.

The private contractor operating the flight, Strategic Aviation, says the crew noticed a strong smell coming from the air-conditioning system and the problem is now being investigated.

Eighteen months ago former

Strategic Aviation employees told the ABC's 7:30 Report that the company put profit before safety and claimed it had breached airline safety training rules.

Strategic Aviation strenuously denied those allegations and defended its record.

## Emergency landing in Charlottesville

February 5, 2009

An emergency landing Thursday afternoon at the Charlottesville-Albemarle airport ended without incident.

Shortly after 2:00 pm, officials got word that a United Airlines flight from Chicago to Richmond would be making an unscheduled stop at CHO because of smoke in the cockpit.

The plane landed safely, and the 30 passengers on board were evacuated from the plane.

Jason Burch, the CHO Public Information Officer says, "At this point, mechanics will come in. They will conduct an inspection and find what faulty part probably caused the smoke."

### Trans States, smoke in the cabin

February 10, 2009

The crew of a Trans States Airlines Embraer ERJ-145, registration N842HK performing flight (United) AX-8090 from Washington Dulles, DC to Saint Louis, MO (USA) with 37 passengers, declared emergency reporting smoke in the cabin and diverted to Louisville, KY, where the airplane landed safely on runway 17L 34 minutes later.

## Air Canada Jazz, smoke smell

February 17, 2009

When the crew of an Air Canada Jazz de Havilland Dash 8-300, registration C-FRUZ performing flight QK-8170 from Calgary, AB to Edmonton, AB (Canada) with 42 people on board, boarded the airplane, maintenance personnel had already fired up the APU in order to warm up the aircraft. The flight crew found the cabin extremely hot, the duct temperature was around 100 degrees.

There was a smell of smoke paired with a light haze in the cabin. The APU was shut down and checked by maintenance prior to passengers boarding the airplane, no fault was found and the airplane was released. After departure while climbing through 10000 feet the crew noticed a smoke master warning for the baggage compartment, which extinguished after a few seconds. The cabin crew checked

out the baggage compartment, but did not see or smell any smoke. A few minutes later the smoke warning illuminated again. The crew decided to return to Calgary, even though they didn't see or smell any smoke.

The Canadian TSB concluded their report about the incident: "When the aircraft was deplaned the groomers commented that it smelled like smoke."

## Embraer Smoke in Cockpit

February 21, 2009

A Cirrus Airlines Embraer ERJ-170 on behalf of Lufthansa, registration D-ALIA performing flight C9-1145/LH-1145 from Muenster to Frankfurt/Main (Germany) with 40 passengers, returned to Muenster after smoke was noticed in both cabin and cockpit. The landing 7 minutes after takeoff was safe.

Emergency services found no trace of a fire. The aircraft reentered service the following day.

The airline reported, that the smoke turned out to have been steam out of a malfunctioning air conditioning system.

## Smoke evacuation

February 13, 2009

A Cimber Air Aerospatiale ATR-72-500, registration OY-CIN performing flight QI-332 from Karup to Copenhagen Kastrup (Denmark) with 19 people on board, was evacuated right before departure due to smoke in the cockpit.

Emergency services could not find any trace of fire.

OY-CIN did have several difficulties with its air conditioning system recently, so the current suspect is another fault in the air conditioning system.

## Northwest flight diverted to Grand Rapids

February 2009

A commuter plane operated by Northwest Airlines was diverted to Gerald R. Ford International Airport after the pilot reported smoke in the cockpit.

Flight 2125, a Northwest Airlink flight operated by Northwest subsidiary Pinnacle Aviation, had taken off from Minneapolis and was headed for Cleveland when it landed in Grand Rapids about 6 p.m. Sunday.

The 39 passengers were immediately transferred to another flight to continue on to Cleveland.

Airport spokesman Phil Johnson tells The Grand Rapids Press that the airport experiences "a number of diversions throughout the year."

### American Eagle smoke alert

February 26, 2009

The crew of an American Eagle Embraer ERJ-145, registration N613AE performing flight MQ-3890 from Cedar Rapids, IA to Dallas Ft. Worth, TX (USA), declared emergency after a smoke detector went off in the cargo department and passengers reported smelling smoke shortly before touch down. The airplane landed safely and was checked out by emergency services.

## Atlantic Southeast Fire

February 28, 2009

An Atlantic Southeast Airlines Canadair CRJ-200 on behalf of Delta Airlines, flight EV-5563/DL-5563 from Tallahassee, FL to Atlanta, GA (USA), was being prepared for departure at gate B3 in Tallahassee with the crew on board and the passenger luggage already loaded. The 47 passengers were still awaiting boarding, the crew working a checklist, when the flight crew noticed heat behind them and saw smoke coming from the wall between cockpit and galley. Emergency services responded to the emergency call and were able to quickly extinguish the fire. No injuries occurred.

## Alitalia: Thick smoke!

March 13, 2009

An Air One/Alitalia Airbus A330-200, registration EI-DIR performing flight AP-629/AZ-629 from Chicago O'Hare, IL (USA) to Rome Fiumicino (Italy) with 240 passengers, returned to O'Hare Airport after thick smoke entered cockpit and cabin after liftoff. The crew performed a safe overweight landing 5 minutes after liftoff.

Alitalia (merged with Air One) reported, that the airplane had problems with its air conditioning system causing relatively thick smoke entering the cockpit and cabin as the airplane climbed through 3000 feet.

## Delta: Smoke over the Atlantic

February 28, 2009

A Delta Airlines Boeing 757-200, registration N727TW performing flight DL-122 (departing Feb 27th) from New York JFK, NY (USA) to Shannon (Ireland), was enroute overhead the Atlantic south of Greenland (N55 W46) at FL390, when the crew declared emergency reporting smoke in the cockpit and requested to turn back to Gander. The airplane descended to 9500 feet and proceeded to Gander. 13 minutes after the initial call the crew requested all available emergency services for arrival in Gander. 41 minutes after the initial call the crew reported, that the situation had stabilized on board. The airplane landed safely in Gander 1:13 hours after the emergency call.

## Emergency Landing

March 6, 2009

An Austrian Airlines (AUA) Boeing 737-800 bound for Sofia in Bulgaria made an emergency landing at Vienna International Airport (VIA) this afternoon (Fri).

AUA spokeswoman Livia Dandrea-Böhm said the pilot had turned back a few minutes after taking off at VIA because of smoke in the aircraft's cabin.

## Singapore Airlines Boeing 747: Fire alert

March 2, 2009

The crew of a Singapore Airlines Boeing 747-400 freighter, registration 9V-SFK performing freight flight SQ-7344 from Nairobi (Kenya) to Amsterdam (Netherlands), declared emergency reporting a fire alert and automatic activation of the cargo fire suppression system and diverted to Munich (Germany). The aircraft landed safely, the crew remained on board, the fire brigades checked the aircraft out, but it remained unclear whether there had been any fire. The airplane was subsequently towed off the northern runway.

Singapore Airlines said, that the airplane carried flowers, mangos, other fruit and vegetables. The emanations by the mangos caused the smoke detectors to trigger, resulting in a false alert.

### Continental Smoke Alert

March 11, 2009

A Continental Airlines Boeing 757-200, registration N19130 performing flight CO-145 from Madrid (Spain) to Newark, NJ (USA), diverted to Hartford, CT (USA) after a smoke detector in a lavatory raised alert. The aircraft landed safely, all passengers disembarked the airplane.

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## American Eagle: passengers smell smoke

February 26, 2009

American Eagle flight 3890 out of Cedar Rapids, Iowa, made a safe emergency landing at Dallas / Fort Worth International Airport just after 1 p.m. on Thursday, after smoke was detected.

Fire sensors went off and passengers smelled smoke, a witness said.

Fire trucks surrounded the plane once it landed.

Officials said the sensor indicated

smoke in the cargo department, said witness Jamie Morrison, who works as a producer for CNN.

A light indicating a problem went off 300 feet from the runway, the pilot told passengers.

The crew is now restarting engines to carry out tests, Morrison said.

American Airlines flight 2461 also issued an alert on Thursday after smoke was reported and landed safely at the airport.



American Eagle Embraer 145

## Emirates Flight Makes Emergency Landing

March 6, 2009

An Emirates flight with 120 passengers on board was forced to return to Perth International Airport today after the crew called an in-flight emergency to air traffic control.

The crew of the Dubai-bound Airbus A340 made the call about 7.50am. The plane landed safely at the airport about 8.45am.

A Radio 6PR source earlier reported that smoke was seen escaping

from the cabin. But, a passenger on the plane told WAtoday.com. au there was no smoke visible inside the jet.

The passengers on Flight EK425 disembarked about 9am. Emergency services workers and several police officers then boarded the plane. It is has been parked away from the main terminal while it is being examined by engineers.

The flight had left Perth for Dubai

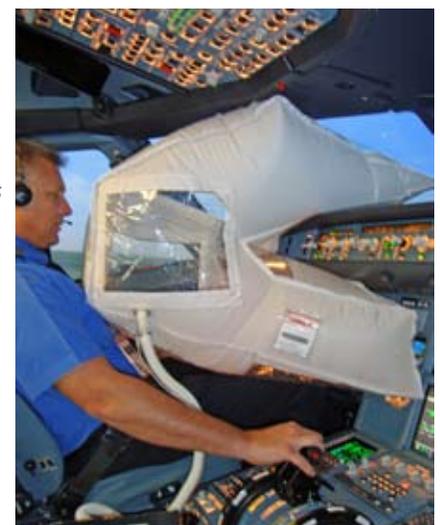
at 6.01am, and was the only Emirates flight scheduled to depart Perth this morning.

Westralia Airports Corporation spokesman Malcolm Bradshaw said emergency vehicles and fire crews had been alerted when the airport's emergency system was activated, but were not required to respond to an emergency.

## SAFITA

The Royal Aeronautical Society recently endorsed a Specialist Paper, "Smoke, Fire and Fumes in Transport Aircraft (SAFITA)," authored by Captain John Cox, FRAeS, (Fellow of the Royal Air Society). The Specialist Paper shows the risks and layers of mitigation of Smoke/Fire/Fumes (S/F/F) in transport aircraft and what can be done to improve safety and decrease risk. Captain Cox remarks, "the ongoing acceptance and interest in SAFITA validates the industry's recognition of S/F/F being a significant issue in commercial aviation." In addition to its significance, SAFITA has proposed a list of recommendations on how the industry can combat smoke. SAFITA is available for download at [www.safeopsys.com](http://www.safeopsys.com) or at the EVASWorldwide booth at NBAA.

EVAS deployed in Airbus A320 simulator at the Jet Blue training facility, Orlando, Florida



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