



Emergency Vision Assurance System

SMOKE SIGNALS

2nd Quarter 2013

June 2013 // VisionSafe

PILOT REPORTS NEAR CATASTROPHIC SMOKE EVENT

I was functioning as pilot not flying. Once in the terminal area we encountered moderate mixed ice from about 13,000 FT and below. We were established on final to the runway. ATC asked us to slow to 170 KTS. We were already at flaps 9 and we didn't want to add any more flaps, as there was significant ice on the unheated parts of the windscreen. I would estimate 1/2 to 3/4 of an inch, as well as ice accumulation covering about 2/3 of the direct view window. We opted to drop the landing gear instead of lowering flaps to slow. About a minute or two later at 1,800 FT AGL or so we heard and felt a strange vibration that lasted about one second. The Captain and I both said "what was that" and out of the corner of my eye I saw the Engine 2 LP vibration indicator about 2/3 up the gauge and dropping rapidly. I am assuming it was in the amber or red before I saw it. A few seconds later we smelled something odd. A few seconds after that smoke started pouring into the cockpit. We donned our oxygen masks and smoke goggles. We were talking with Tower and I said something to the extent of "[Call sign], emergency, smoke, roll trucks." The Flight Attendant called us, but we were too busy to answer. By this point the smoke was

getting incredibly thick, to the point where we couldn't see the PFD or MFD from a normal seated position. From a normal approach to having smoke so thick we couldn't see anything took about 30 seconds. The Captain and I both realized that we needed to get the plane on the ground immediately and that a go-around was not an option. The Captain flew the aircraft and finished configuring it for landing. The smoke was so thick he had to have his chin over the yoke just to see the PFD. During this time I manually dropped the passenger oxygen masks and tried to press the cabin DUMP button. I pressed this and the MAN button next to it, because I couldn't remember which was which and due to the smoke I couldn't see the buttons. I looked at the EICAS and saw E2 Oil Low pressure. I then heard the EGPWS say "glide slope" and we focused on getting the plane on the ground. Neither of us remembers when the autopilot was disconnected or whether or not it was disconnected intentionally. I divided my time between leaning in to monitor airspeed, glide slope, and localizer deviations and putting my face to the windscreen to look for approach lights, as we were in IMC. The weather was about 3/4 mile visibility with

UP COMING TRADESHOWS

July 15-18
Aug 17-20
Sept 12
Oct. 21-23
Oct. 22-24
Oct 28-20
Nov 6-8

59th Air Safety Forum // Washington, DC
Air Carrier Purchasing Conference // Orlando, FL
NBAA Regional // Chicago, IL
Cargo Facts Symposium // Seattle, WA
National Business Aviation Association // Las Vegas, NV
International Air Safety Summit // Washington, DC
Air Cargo Americas // Miami, FL

2013

PILOT REPORTS CONTINUED...

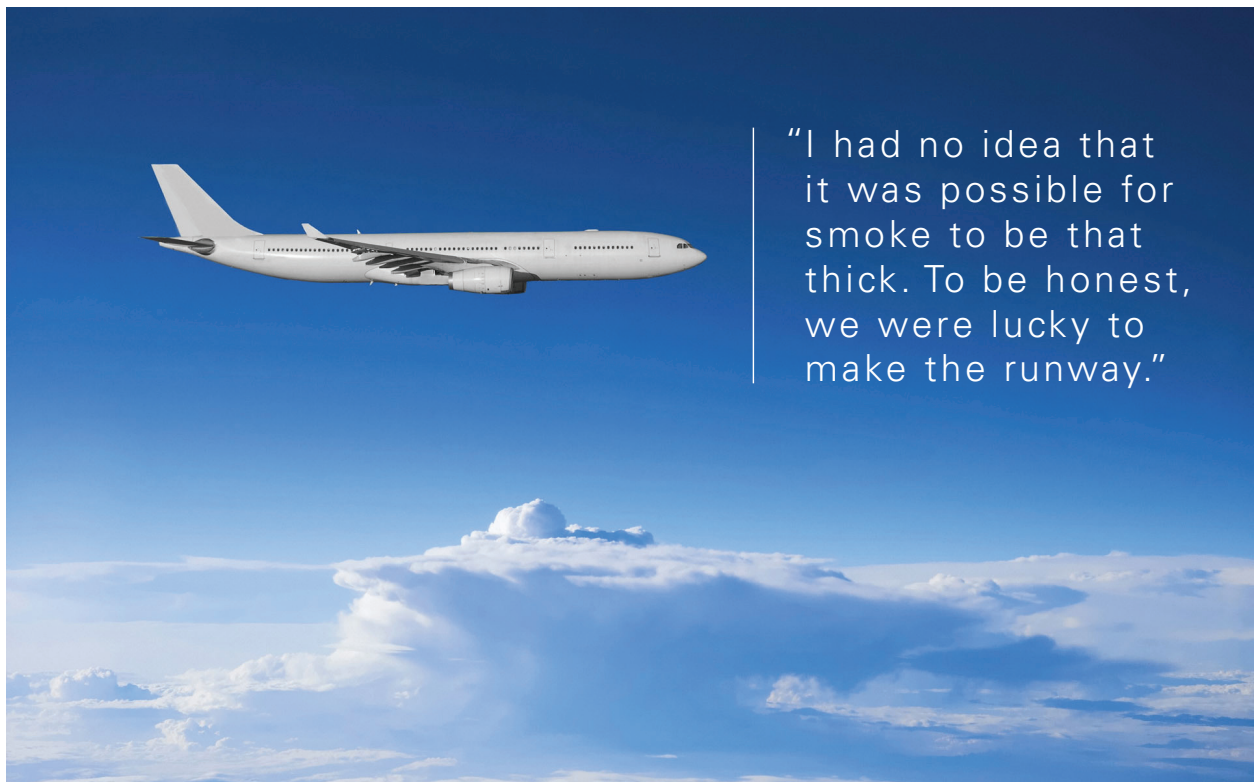
clouds at 300 FT and light snow with freezing fog. I made callouts to the Captain such as “500,” “airspeed,” and so on. I saw the approach lights at about 200 AGL and yelled “approach lights” several times. The Captain did not look up, which was a good idea because there was no way of seeing outside and monitoring airspeed at the same time. I kept yelling AGL altitudes, and then yelled “flare” and assisted with pulling back on the yoke. We touched down firmly, bounced, and the Captain brought the aircraft to a stop. We immediately opened the direct view windows to ventilate the cabin and assessed what was really going on with the aircraft. The three EICAS annunciations I remember are BAGG SMOKE, LAV SMOKE, and E2 OIL PRESS LO. We agreed that there was no engine fire, so we began to run the evacuation checklist. The Captain made a PA “evacuate main cabin door” and the Flight Attendant conducted the evacuation. I made a call to ATC saying that we were evacuating on the runway. When we got off the plane all the passengers were already outside. The Captain followed me and was the last off. By this time a few Airport Operations SUVs were already there

and the passengers were on the side of the runway. We asked if anybody was hurt, and everybody seemed OK initially. The Fire Department came and secured the aircraft and also popped the overwing emergency exits. We were then transported to the Airport Operation’s facility where we debriefed. We had smoke in cabin/cockpit, ice, low visibility, possibility of engine 2 failing, lack of time to coordinate a desirable response. This is the type of scenario that no simulator event could have ever prepared us for. I had no idea that it was possible for smoke to be that thick. To be honest, we were lucky to make the runway. Monday morning quarterbacking tells me we could have done things differently, but in a situation this extreme I don’t think what you do matters as long as you keep everybody alive.

Synopsis

Following an apparent engine malfunction on final, an EMB145 filled with smoke so thick the flight crew could not see the instruments. Even with ice encrusted wind-screens, they were able to land then successfully evacuate the aircraft.

Source: FAA ASRS report



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EVAS: 17 YEARS AFTER VALUJET FLIGHT 592

Where are we?

This year marks 17 years since the tragic crash of ValuJet Flight 592 into the Florida everglades. In the years following this aviation accident measures have been taken and technology made available to mitigate such catastrophes. ValuJet Flight 592 was caused by igniting, improperly stored, oxygen generators which lead to an in-flight fire. In the final minutes, the cockpit was so full of smoke that the flight crew could no longer see their instruments. There were no survivors; all 110 souls perished.

Since the accident much has been done to mitigate the risk of a similar event occurring. The obvious was to enforce more stringent regulation for packaging and storing of hazardous materials. The Federal Aviation Administration (FAA) came under scrutiny for their not mandating smoke detection and fire suppression systems in cargo holds of passenger airliners. By 2001 such regulation required the retrofit and installation of fire detection systems and fire suppression systems in all class D cargo holds. However, all of these changes are a moot point if flight crews cannot see their instruments or out of the cockpit.

A significant issue during an in-flight fire event is the smoke caused by the fire. Smoke in the flight deck can

adversely affect the flight crew's ability to perform the necessary task. These tasks can include manually flight the airplane, performing the appropriate checklists, navigating to an airport, and landing. Adequate vision is essential to accomplishing these tasks. A pilot without adequate visual capability is essentially incapacitated. IFALPA (International Federation of Airline Pilots' Associations) recognized this fact and passed a Policy in 2005 to address it:

"Flight crews should be provided with a system, whose elements are complementary and optimized to provide the maximum probability of detecting and suppressing any in-flight fire."

One technology that exists to ensure vision assurance is EVAS. EVAS provides the pilot with the ability to see critical flight instruments regardless of the density of smoke in the cockpit. It has the additional advantage of providing clear vision to the windshield, checklists, and approach charts. This is accomplished by filtering smoke out of the



EVAS CONTINUED...

air that inflates a transparent vision unit custom made for each airplane type. It is also independent of aircraft systems due to its having an internal battery and blower.

Utilizing this existing technology to improve visibility when there is smoke in the flight deck would likely increase the effectiveness of the pilots, not only with the pilot flying task but also with the pilot monitoring tasks.

An international document published by the Royal Aeronautical Society for smoke and fire in transport aircraft states the following recommendations:

1. In any case of possible fire or smoke in the aircraft, the smoke and firefighting operating procedures should reflect the need to prepare to land the aircraft expeditiously, within a time frame that will minimize the possibility of an in-flight fire being ignited or sustained.

2. The flight crew should be provided with equipment, systems or procedures to assure their ability to see and perform their emergency and normal checklists, and be assured of their ability to see-to-land the aircraft.

3. Flight crew should be provided with sufficient breathable air for the duration of the flight after a fire or smoke has been detected.

4. Flight crews are considered incapacitated if their vision is impaired to a point where they can no longer see primary instruments, checklist, or outside in the direction of flight.

5. Flight crews are also considered incapacitated if they do not have sufficient breathable air to sustain operation."

Author: Ms. Allison Markey



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