

TerranearPMC Safety Share

Week of August 10, 2015 – The Concorde Plane Disaster

I can remember a few times in my life when I was at JFK and getting ready to taxi to/from my gate when the pilot would call everyone's attention to look out the window to catch a glimpse of the famous Concorde plane parked at a gate. For years, since its maiden voyage in January 1976 (there were actually two simultaneous Concorde flights: one taking off from London and the other from Paris), the Concorde was the pinnacle of commercial air travel. With a takeoff speed of 250 mph and a cruising speed of 1350 mph (more than twice the speed of sound) a typical London to New York crossing would take a little less than three and a half hours as opposed to about eight hours for a subsonic flight.

It happened 15 years ago (July, 2000) when Air France flight 4590, a charter destined for New York's JFK from Paris hit disaster. As it neared takeoff speed, the Concorde struck a thin metal strip on the runway, causing one of its tires to burst. The strip had fallen from the underside of a Continental Airlines DC-10 that had departed minutes earlier, bound for Houston. Chunks of the burst tire impacting the Concorde's wing at tremendous velocity, resulting in a powerful shock wave within the wing's fuel tank that ultimately punctured it. Gases from the engines then ignited leaking fuel, touching off a huge fire. The crew wrestled the crippled jet into the air, but lost control moments later, slamming into a hotel. All 109 passengers and crew perished, as did four people on the ground.

For years it was thought that this metal strip on the runway was the direct cause of the crash. But after years of investigation, this initial cause-effect action has been refuted. There's no denying the Concorde jet ran over a piece of metal that caused a tire explosion and a resultant fire. But while the fire was visually dramatic (caught on camera), and trailed behind the plane in a hellish rooster tail, it is now believed that even though this caused severe damage to the number 2 engine, such damage was very much survivable, and would have most likely burned itself out in a matter of a few minutes. Not only was it survivable, but it was probably avoidable as well, had it not been for a chain of errors and oversights.

The plane went down not because of any fire, directly, but because of three combined factors: 1); the plane was traveling too slowly, 2); the plane was several tons overweight and beyond its aft center of gravity limit, and 3); two of its four engines were damaged or erroneously shut down.

The first factor; the plane was flying too slowly: As it turns out the Concorde's pilot had pulled the jet into the air to avoid skidding sideways off the runway and colliding with another plane; a nearby 747. It had veered to the left, with a jammed wheel, because the Concorde's undercarriage had locked askew. When the pilot pulled back on the control column to raise the nose and take to the air (a process that pilots call "rotation"), the plane's airspeed was only 188 knots, 11 knots below the minimum recommended velocity required for this maneuver. But the pilot had no choice: the plane was about to leave the tarmac altogether and plough into the soft and bumpy grass at its side. That might have ripped off the landing gear, leaving Concorde to overturn and blow up on its own. If not, the 747 lay straight ahead (it was inside this 747 where the video of the Concorde fire was



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recorded). So the pilot made a split-second decision to take to the air; although he knew he was travelling too slowly.

Nevertheless, *under normal circumstances* there was still enough speed to climb away safely; however, he no longer had enough power. One engine had been badly damaged due to an intake of foreign material. Not only pieces of exploded tire, but debris from a runway edge light had affected the plane which the jet had run over during the skid. Meanwhile, a second engine was shut down completely by the cockpit flight engineer. According to expert information, this action should not have been performed during such an event or altitude; that is, when the remaining thrust from that engine was desperately needed for survival.

Meanwhile, the plane was an estimated six tons above its maximum allowable weight based on wind conditions at the time of the crash. At proper weight, the jet would have become airborne prior to the point when it ran over the metal strip. This caused the plane's center of gravity to be transferred too far to the rear. So even before the blowout, the Concorde was already pushing the envelope.

About a week prior to the fatal flight, the plane went into the hangar where maintenance was performed. However, a part known as a *spacer* (which keeps other plane parts in proper position) was inadvertently not replaced. After the crash, the spacer was found in the Air France workshop. This caused the front wheels of the undercarriage to be misaligned with the rear, jamming aircraft components from functioning properly.

This disaster occurred in 2000. Then came September 11, 2001 and air travel security increased the maintenance costs to operate the supersonic airliner. Next, there was an economic recession where the price of fuel skyrocketed. These events caused continued to service of the Concorde to be cost prohibitive; and so ended an era of supersonic commercial air travel.

Apparently, the Concorde airline disaster was not as simple as a piece of metal causing the most prestigious airline company to cease operations. It was the result of a number of events that, because they occurred within a specific time frame, while being coupled with world politics and global financial strife, a synergistic effect actually placed the stranglehold on the Concorde operators: British Airways and Air France. Maybe if maintenance was performed more diligently or the aircraft was not overloaded or the remaining engines were not erroneously shut down, or the 747 was not positioned precariously close to the runway, the Concorde would still be in service, and 109 lives along with their family and friends would not have been so negatively affected. Accident investigations have shown that disasters are never the result of a single event; rather they are the consequence of a series of events. When we work in the field and we notice something is not right or we witness a near-miss, this represents an opportunity for us to correct something. Maybe an accident would not happen this time, but under slightly different circumstances, at another time, by taking a proactive stance, we can prevent an occurrence by simply removing a contributing factor.

Knowledge is realizing that the street is one-way; wisdom is looking both directions anyway

Douglas Adams (English writer, humorist, and dramatist)

