

THE 20 MINUTES FACTOR

On **July 28, 2011**, about 04:10, Asiana Airlines flight 991 (Boeing 747-400F, HL7604), a scheduled cargo flight from Incheon International Airport, Republic of Korea, to Shanghai Pudong International Airport, China, crashed into international waters about 130 km west of Jeju International Airport. About 03.54 the flight crew reported a cargo fire to Shanghai Area Control Center near waypoint SADLI on airway A593 and attempted to divert to Jeju International Airport. The two pilots were fatally injured, and the aircraft was destroyed.

The flight crashed 1 hour 8 minutes after takeoff or **about 18 minutes** after the emergency declaration when trying to divert to Jeju Airport under the control of Shanghai ACC. (para 1.1 "history of flight" , page 3)

As per accident report (AR AIB /AAR1105):

- 03.54:23 - Aircraft requested emergency descent due to fire on board;
- 04.10:15 - The First Officer stated, "*Altitude control is not available due to heavy vibration, going to ditch... ah.*" Afterwards, there was no communication between ATC and flight 991.

Now if we consider the time elapsed between the fire on board declaration and the crash, the Asiana accident is the third event where we can have confirmation of the "20 minutes factor".

On **2 September 1998** Swissair 111 (MD11, HB-IWF) crashed after an electrical fire in its cockpit. It was a scheduled passenger flight from JFK to Geneva and all 229 people on board died.

At 22:10 Atlantic Time (01:10 UTC), cruising at FL330 (approximately 33,000 feet), the flight crew detected an odor in the cockpit and determined it to be smoke from the air conditioning system, a situation easily remedied by closing the air conditioning vent, which a flight attendant carried on. Four minutes later, the odor returned and now smoke was visible; the pilots began to consider diverting to a nearby airport. The aircraft struck the ocean at 22:31 AT (01:31 UTC) at an estimated speed of 345 mph (555 km/h, 154 m/s, or 299 knots) and with a force of 350g, causing the aircraft to disintegrate into millions of pieces.

As per Accident Report (Report N. A98H0003):

- 01.10 - Crew detected odor in the cockpit;
- 01.31 - Aircraft crashed into the Ocean.

21 minutes had elapsed from the smoke detection to the crash.

On **3 September 2010** a United Parcel Service (UPS) Boeing 747-400 (N571UP) flying the route between Dubai International Airport and Cologne Bonn Airport developed an in-flight fire, with the fumes and subsequent crash resulting in the death of the two crewmembers. The UPS Airlines Flight 6 was a cargo flight and this was the first fatal air crash for the carrier.

The initial climb out from Dubai was uneventful. The crew flew the aircraft manually to an altitude of 11,300 feet, then engaged the Auto Pilot for the climb to the selected cruise altitude of 32,000 feet.

The flight checked in with Bahrain ATC at 15:11 on the climb to FL320. Bahrain ATC confirms to the crew that they were on the radar at 15:11:32, the crew acknowledge the radar contact. There were no indications of any abnormalities.

Passing over the BALUS waypoint, the aircraft transitioned from the UAE Flight Information Region into the Bahrain FIR.

One minute after passing the BALUS waypoint, approaching the top of climb, as the aircraft was climbing to the selected cruise altitude of 32,000 feet, the Fire Warning Master Warning Light illuminated and the Audible Alarm sounded, warning the crew of a fire indication on the Main Deck Fire (15.12:58):

As per accident report (AAIS Case reference 13/2010):

- 15:17:18 - CAPT: UPS six we are full... the cockpit is full of smoke, attempting to turn to flight to one thirty please have... standing by in Dubai
- 15:35:12 – CVR - PF: Mayday, Mayday. UPS6, can anyone hear me?
- 15:41:35 - CVR - Data Ends

Time elapsed from fire indication warning (15:13) to the complete loss of control (15:35):
22 minutes.

Three separate accidents involving widebody aircraft, each with its own distinct chain of events, but for all of them the average time of 20 minutes elapsed from the smoke alarm to the loss of control $(18+21+22 / 3 = 20)$ seems to coincide.