Applicable Flight Accidents
Azerbaijan Airlines Flight 217


Crashed in the Caspian Sea near Nardaran

18 Passengers 5 Crew with 23 Fatalities

After climbing to 6900ft entered a descending spiral tightening from 500m to 100m

Absence of all three gyroscopes during the climb.

Lack of pitch, roll, and heading performance

**PILOTS Application:** Error Signature - Wind-Direction / Airspeed Relations

TransAsia Airways Flight 235 ATR72-600

Feb 4th 2015
Taipei, Taiwan – Keelung River
53 Passengers 5 Crew – 43 Fatalities 15 Survivors
2 Minutes after takeoff pilots report engine flameout.
Right engine failure alert, Warning sounds for 3s
Crew reduces power in the left engine
Stall Warning Sounds
Crew cuts power in the left engine
Weather was clear and irrelevant

**PILOTS Application**: Decision support system to not turn off Left Engine

[https://www.youtube.com/watch?v=U5yb0awcSDM](https://www.youtube.com/watch?v=U5yb0awcSDM)
Asiana Airlines Flight 214

July 6th 2013

Descent below visual glide-path and impact with seawall.

291 Passengers, 16 Crew, 181 Injured, 3 Fatalities, 304 Survivors

Both engines and tail section separated from the aircraft.

82 Seconds before impact at 1600ft, Autopilot was turned off and throttles set to idle

Final approach speed was 34 knots below the target approach speed of 137 knots

Pilots unaware that the auto-throttle was failing to maintain that speed

**PILOTS Application:** Internal glide-path assistance / Simulation / Stochastic Programs / Airspeed Crosscheck
Asiana Airlines Flight 214 (Cont)

Seven seconds before impact, one pilot increased throttle from idle to 50%

Called for a go-around 1.5 seconds before impact

At the time of impact the airspeed was 106 knots

http://en.wikipedia.org/wiki/Asiana_Airlines_Flight_214
Air Midwest Flight 5481 (US Airways)

January 8th 2003

All 21 aboard perished. Elevator range of motion cut to only 7 degrees out of the full 14

Stalled after take-off due to overloading and maintenance error

After maintenance, turnbuckles controlling tension on the cable to the elevators were incorrect

Pilots did not have sufficient pitch control

In addition the plane was overweight and CG was 5% behind allowable limit

**PILOTS Application:** Weight and Systems check from sensors onboard
Copa Airlines Flight 201

June 6\textsuperscript{th} 1993

Boeing 737-204, 47 perished, 29 minutes after takeoff

Spatial Disorientation due to Instrument malfunction

At 25,000 ft the plane entered a steep dive at an angle of 80 degrees to the right and began to roll

Exceeding the speed of sound at 10,000 ft the plane broke apart

Faulty readings were caused by a short circuit traced to a faulty wiring harness in the Attitude Indic.

Ineffective cross checking procedure done by the pilots where the backup AI was not used

\textbf{PILOTS Application:} Error signatures to cross check Attitude Indicators / Other Instruments
Austral Lineas Aereas Flight 2553

October 10 1997

Similar to Air France 447 – Pitot tube icing

No survivors

Pilots interpreted as a loss of engine power and added power

No improvement to airspeed so they descended which increased the speed to VNE which caused structural damage.

Wing slats were torn off of one wing and the plane became uncontrollable

**PILOTS Application:** Same as with Air France 447 just different scenario
National Airlines Flight 102

April 29th 2013 – Near Camp Bastion in Afghanistan

Stalled after a load shift

Five heavy military vehicles in the cargo hold had shifted and the aircraft stalled

PILOTS Application: Unknown

http://aviation-safety.net/database/record.php?id=20130429-0

https://www.youtube.com/watch?v=y-tMBSJaeRY
Helios Airways Flight 522

August 14\textsuperscript{th} 2005 – Near Greece

121 Fatalities. Lack of Cabin Pressurization and pilot error leading to crew incapacitation due to hypoxia

Cabin Altitude Warning Horn sounded at 12,040 ft and should have stopped the climb

Crew assumed it was only a take-off configuration warning and ignored it

Did not check if the pressurization panel was set to AUTO

Airplane crashed in the mountains near Grammatiko, Greece

**PILOTS Application:** Prevent the climb or strongly advise pilots / Check for AUTO Pressurization / What to do when pilots and crew are incapacitated?
Turkish Airlines Flight 1951

February 25th 2009 – Amsterdam Netherlands

Aircraft had an automated reaction which was triggered by a faulty radio altimeter

Auto-throttle decreased the engine power to idle during approach. Crew noticed too late

Although glide-scope was fast and high, at 200ft the captain’s altimeter changed from 1950 ft to -8ft and the co-pilot’s remained correct.

Although the pilots did try to hold the glide-scope after increasing throttle the auto-throttle decreased it to idle again.

PILOTS Application: Sense the altimeter error using crosschecks
British Airways Flight 38

January 17\textsuperscript{th} 2008 – Boeing 777

From Beijing to London, 47 injuries

Although aware of the outside temperature conditions being -65C to -74C the crew simply monitored the temperature of the fuel

Fuel temp never dropped below -34C which is well above its freezing point

Small quantities of water within the fuel did freeze causing ice on the inside of fuel lines

Ultimately leading to fuel starvation near the final stages of approach

2 miles from touchdown the engines failed to respond to an increase in throttle

\textbf{PILOTS Application}: Check for water in the fuel (If possible) Something to do regardless