American airlines flight 587 term paper examples

Engineering, Aviation

On November 12, 2001 at 9: 16 eastern standard time, an Airbus A300 belonging to American airlines, which was a regular passenger flight from New York's

John F. Kennedy International airport to Santo Domingo's Las Americas international

Airport in the Dominican Republic crashed in a few moments after take off. The crash

zone was a residential area called Belle Harbor, in neighborhood of Queens in New

York city near John F. Kennedy International airport. Unfortunately in this tragic

accident 265 people were killed including all 251 passengers plus 2 flight crewmembers, 7 flight attendants and 5 people on the ground, no one survived from

this accident. This accident is considered to be the second-deadliest accident within

American borders, after American Airlines Flight 191.

The captain, 42 years old, was hired in July 1985 by American Airlines, holding an

airline transport pilot certificate and Federal Aviation Administration first-class medical

certificate, that had no limitations. He had already received a type rating on

the A300

as a first officer and received a type rating on Boeing 727. In August 1998 he

completed basic operating experience as an A300 captain.

The victims almost had American nationality. 176 passengers, 9 flight crews and 5

people who were killed on the ground. There were also 68 passengers from

Dominican Republic, 3 passengers from Taiwan, 1 passenger from France, 1 from

Haiti, 1 from Israel and 1 from United Kingdom. In memory of the victims a memorial

was constructed in rockaway Park.

Cause

According to reports the vertical stabilizer and rudder of the plane were separated, it

was found in 1 mile north of the wreckage, as it fell in Jamaica bay. The engines were

separated in flight, they were found in north and east of the crash zone. The airplane

lost it's control and landed on top of a house, and a horrible explosion in result.

Flight 587 immediately after Japan airlines Boeing 747-400 took off, on the same

runway. The A300 flew in an area of turbulent air as it flew into larger jet's wake.

The first officer tried to stabilize the airplane with alternative aggressive rudder inputs.

In result the rudder was stressed by the strength of the air flowing against it,

eventually it was snapped off completely, and in result airplane lost it's control and

crashed. Basically the vertical stabilizer is connected by six attaching points to the

fuselage and each point consists of two sets of attachment lugs, one made of

composite material, the other of aluminum, all fixed by a titanium bolt. In this case the

aluminum plugs were intact but not the composite lugs. It convinced the investigators

were not as strong as they were supposed to be and it was a great concern as they

are used in other parts of the aircraft such as wings and engine mounting. The

stabilizers from the accident aircraft and another similar aircraft were examined and

they found out that the strength of the composite materials had not been

compromised

and according to NTSB the material had been failed due to overload of stress beyond

it’s design limit. Though in ten previous incidents where the tails had been stressed over the design limit did not lead to separation of vertical stabilizer during the

flight.

National Transportation Safety Board findings

According to official report of NTSB on October 26, 2004, the rudder was over used

hundreds of people witnessed it. 349 people accounted NTSB about what they saw.

about half (52%) of the witnesses reported that there was a fire an explosion before it

hit the ground. The others reported a wing detach from the airplane, as in fact it was

the vertical stabilizer.

Both engines also were separated before the airplane hit the ground. There were no

evidence of engine pre impact failure or ruptures, the engines’ operation was normal

during all stages including initial ground operations, takeoff and initial climb. According

had lost it’s control and it was followed by separation of the vertical stabilizer.

The primary fire or explosion that the witnesses reported must be regarding to the

engines separation or a fire the initial fuel release.

The reaction of the first officer to wake up turbulence encounter was analyzed too,

several pilots of the American Airlines were interviewed, specifically those who had

experience of flying with the first officer and most of the comments were positive in

general. But two of them had noteworthy accounts about the reaction of the first

officer to wake turbulence encounters. According to one of them in a flight on 1997 in

a turbulence encounter the first officer overreacted to that wake wake turbulence

encounter, as he mentioned the " first officer responded to it by making series of rapid,

alternating full rudder pedal inputs", which were quite aggressive. And finally it

caused uncomfortable movements with side loads on the aircraft.

According to this captain when he asked the first officer about his reaction, the officer

answered that he has used the rudder to balance the wings and also advised him to use the

rudder that way. The mentioned captain also remembers another situation

where during takeoff, first officer had the same reaction with rapid rudder inputs, but

he was not sure if the first officer pushed the pedals till the stop point.

In further investigations it was found out that such series of rapid and alternating

rudder inputs resulted in separation of the vertical stabilizer.

Conclusion

According to NTSB, due to the " unnecessary and excessive" rudder inputs given by

the first officer caused the enormous stress on rudders. Later they stated that the

airplane would have stabilized, if the first officer had stopped making unnecessary

inputs the plane could be stabilized.

This crash was almost American Airline’s fault because their pilot were not trained enough to

know the characteristics of the rudder properly.

Works Cited

Wikipedia contributors. " American Airlines Flight 587." Wikipedia, The Free Encyclopedia. Wikipedia, The Free Encyclopedia, 13 Jun. 2013. Web. 14 Jun. 2013.

NTSB/AAR, comp. In-flight separation of Vertical stabilizer American Airlines Flight 587. Rep. no. 910404. Washington: NTSB, 2004.