Annex G

AIR INCIDENTS

1. Introduction

Annex G details examples of air incidents demonstrating the influence of probabilities and affects of contributory factors. The examples of incidents may offer an appreciation of the significance and importance of the actions at work when dealing with aviation safety.

The diagram below illustrates how, when all the contributory factors line up, no matter how improbable, very often it is a series of improbabilities, which results in the most tragic of accidents.

2. Example A - Girona Airport, Spain - 14 September 1999 at 2147 hrs

History of Flight

The aircraft was operating a holiday charter flight from Cardiff Airport, UK, to Girona Airport, Spain. The commander was the pilot flying (PF) for the approach and landing phase of the 2 hour flight. On arrival in the Girona CTR (Control Zone) at around 2120 hours, the aircraft routed to the GRN VOR (radio navigation aid) and, because of the wind direction and the fact that the runway was wet, the crew elected to fly a VOR/DME procedure to Runway 02. Flight conditions were turbulent. There was thunderstorm activity in the area at the time and the Girona Meteorological Report (METAR) for 2130 hours included: 'Surface wind 350/6 kt, visibility 4 km, thunderstorm with heavy rain, cloud 3-4 octas at 1,500 feet, 1-2 octas cumulonimbus at 3,000 feet, 5-7 octas at 4,000 feet, temperature 20°C/ dewpoint 20°C, QNH 1010 mb, remarks recent rain.'

Upon becoming visual the aircraft was not adequately aligned with the runway and a change in wind direction now favoured the reciprocal runway so a missed approach was carried out. The aircraft was positioned for an ILS (Instrument Landing System) approach to Runway 20. The autopilot and autothrottle were engaged throughout the flight until a decision to land had been made. Twenty seconds prior to touchdown the surface wind reported by Air Traffic Control (ATC) was 150°/6 kt (6 kt from 150 degrees). The commander saw the runway lights at about 500 feet agl (above ground level) and made the decision to land at the decision height of 251 feet (altitude 720 feet). At some point after this he lost outside visual references. Two automatic audio cautions of excessive sink rate were given by the Ground Proximity Warning System (GPWS) just before touchdown. Information from the Flight Data Recorder (FDR) showed that the aircraft contacted the runway very hard in a 2° nose down attitude with an airspeed of 141
kt, bounced and touched down again approximately 140 metres further on. Both the FDR and CVR (Cockpit Voice Recorder) recordings stopped shortly after the second touchdown. Reception of the ILS signal continued up to the point at which the recorders stopped. Interruptions of the electrical power supply to the airport and the surrounding area were reported at around the time of the accident; the airport emergency supply established within the required time interval1. (See [http://www.fomento.es/NR/rdonlyres/88971AA3-A440-4E12-A167-63114D2D1DCB/2433/1999_054_A_texto_ENG.pdf](http://www.fomento.es/NR/rdonlyres/88971AA3-A440-4E12-A167-63114D2D1DCB/2433/1999_054_A_texto_ENG.pdf))

3 Example B - Runway 09R London Heathrow Airport FOD Incident 10th January 2001

History of Flight

The aircraft, was operating a scheduled service from London Heathrow to Kansai Airport, Japan. It departed Stand M26 at 1822 hrs and taxied to Runway 09R for departure. The weather was fine with a visibility of more than 10km, broken cloud at 2,000 feet, surface wind of 0450°/15kt and a temperature of +6°C.

The aircraft took off at 1846 hrs at a take off weight of 810,000 lb. During the take off roll, after V1 but before rotate speed, the crew heard a loud bang with associated vibration. The take off was continued and just after the landing gear had been retracted the crew noticed an Engine Indicating and Crew Alerting System (EICAS) message for 'tyre pressure'. Further investigation of the landing gear system revealed that the left body gear right forward tyre pressure was zero. The remaining tyre pressures were normal.

The crew contacted their company who in turn asked Heathrow ATC for an inspection of the runway. At 1918 hrs Runway 09R was closed and an inspection carried out by the Airfield Operation Safety Unit (AOSU). However, the flight crew received no further information from ATC in response to their original request. Therefore, with no other abnormal flight deck indications, the crew elected to continue their flight to Japan where they landed without further incident. After landing a large metallic piece (14 cm x 8 cm) of runway light fitting was found embedded in the lower fuselage. The following damage was also noted:

- Left body gear right forward tyre burst
- Right body gear left aft tyre damaged
- Left body gear inboard strut damaged and door rod broken
- APU duct support bracket in wheel well damaged and associated APU duct dented
- Lower fuselage body fairing damaged with a crack in a body fairing support frame
- Aft cargo door skin dented
- Hydraulic return line in wheel well dented

After the occurrence the tyre manufacturer reported on the damage to the left body gear right forward tyre. They found that a 'foreign object' approximately 17 cm in length had penetrated 12 of the 18 plies of the tyre at the shoulder rib area causing the carcass cords to break due to shear force.

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1 CIAIAC Technical Report A054/1999 Accident of Boeing 757-200 G-BYAG at Girona Airport 14th September 1999
Airfield procedures

ATC carried out a routine runway inspection of Runway 09R between 1554 hrs and 1617 hrs on the day of the occurrence. The runway was inspected again at 1918 hrs as a result of the report from the crew of JA 8071. Initial inspection identified that one of the flush mounted green turn off light fittings, located close to the runway centre line, and its associated seating ring were missing from Block 81. On further inspection an amount of debris from the disintegrated fitting together with tyre debris was found and removed. The hole left by the light fitting was temporarily repaired and the runway re-opened by 1942 hrs. A more durable repair was carried out that night.

The initial response by the AOSU team was to focus on the serviceability of the runway rather than the report by the crew. The possibility of other light fittings having failed was not considered and no formal feedback to ATC was given. ATC, however, considered that their communication to AOSU was sufficiently clear to prompt a positive feedback. The result was that information regarding the broken runway light and the repair to the runway were passed to ATC but no positive reporting on the presence of tyre debris or missing parts of the seating ring were transmitted to the crew of JA 8071.

After the damage had been discovered on the aircraft's arrival in Japan the operator notified the airport operator. On the morning following the occurrence another international airline notified the airport that one of their aircraft, having departed from Heathrow at 1829 hrs on the previous day had arrived in Hong Kong with damage to two wheels and the landing gear.

Follow up action by the airport operator

The parent company of the airport operator conducted an investigation. They examined every aspect surrounding the occurrence, including communication procedures, the design, inspection and maintenance of light fittings and monitoring procedures. Other airports within the group and the Airport Operators Association were informed of the occurrence. (See http://www.aaiib.gov.uk/cms_resources/dft_avsafety_pdf_501279.pdf)