FINAL REPORT

AIRBUS A320, REGISTRATION 9M-AHA
FOREIGN OBJECT INGESTION INCIDENT
AT SINGAPORE CHANGI AIRPORT
ON 28 FEBRUARY 2010

AIB/AAI/CAS.063

Air Accident Investigation Bureau of Singapore
Ministry of Transport
Singapore

7 December 2010

The Air Accident Investigation Bureau of Singapore

The Air Accident Investigation Bureau (AAIB) is the air accidents and incidents investigation authority in Singapore responsible to the Ministry of Transport. Its mission is to promote aviation safety through the conduct of independent and objective investigations into air accidents and incidents.

The AAIB conducts the investigations in accordance with the Singapore Air Navigation (Investigation of Accidents and Incidents) Order 2003 and Annex 13 to the Convention on International Civil Aviation, which governs how member States of the International Civil Aviation Organization (ICAO) conduct aircraft accident investigations internationally.

In carrying out the investigations, the AAIB will adhere to ICAO's stated objective, which is as follows:

> *"The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability."*

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SYNOPSIS

At 0654 hours (local time) on 28 February 2010, an Airbus A320, registration 9M-AHA arrived at gate D38 of Singapore Changi Airport. An equipment operator had approached the aircraft before the engines were shut down. He was carrying two safety cones (one in each hand) with the intention of placing the cones to mark the hazard zone around the aircraft. After placing one cone in front of the No. 2 engine, the second cone was sucked out off his hand and was ingested into the engine. There was no injury and no damage to the aircraft.

The occurrence was classified as an incident by the Air Accident Investigation Bureau of Singapore.

1 FACTUAL INFORMATION

All times used in this report are Singapore times. Singapore time is eight hours ahead of Coordinated Universal Time (UTC).

1.1 History of the flight

1.1.1 At 0654 hours on 28 February 2010, an Airbus A320, registration 9M-AHA, taxied to its designated gate at D38 after arrival at Changi Airport.

1.1.2 The aircraft was received by a handling team from the ground handling agent (GHA) of the airline. The team comprised three men, one flight supervisor (FS) and two equipment operators (EO). The FS was the marshaller cum headset man. One equipment operator (EO 1) was responsible for placing the chocks and the other equipment operator (EO 2) for placing the safety cones.

1.1.3 The FS operated the Aircraft Docking Guidance System (ADGS) to guide the aircraft into the parking bay. The aircraft stopped at the correct stop-bar line when the ADGS display indicated "stop". The aircraft engines were on idle and had not been shut down.

1.1.4 Both the EOs approached the aircraft to perform their allocated tasks. Upon seeing the ADGS "stop' display, EO 2 moved towards the No. 2 engine. He was carrying one cone in each hand, with the intention of placing the cones to mark the hazard zone around the engine. After placing one cone in front of the No. 2 engine, the second cone was sucked out of his hand and was ingested into the engine. The ingestion of the cone resulted in a loud "POP" sound. The ingested safety cone was shredded by the engine blades. **(**see **Figure 1)**

Figure 1: Cone ingested into the No. 2 engine

1.1.5 The FS noticed that one safety cone had been placed in front of the No. 2 engine and several pieces of the orange material were scattered

behind the No. 2 engine. The FS then plugged in his headset to establish communications with the flight crew. The FS informed the flight crew that the chocks were in place and gave the thumbs up for the passenger loading bridge operator to dock. The engines were shut down subsequently by the flight crew.

1.1.6 The FS approached the EO 2 to ascertain the situation. After that, the FS informed the flight crew of the situation and requested for the pilot to come down to the tarmac to review the situation.

1.1.7 The FS also informed the GHA's Duty Control Manager (DM). The DM contacted the airport authority.

1.2 Injuries

1.2.1 There was no injury in this incident.

1.3 Damage to aircraft

1.3.1 The No. 2 engine was inspected and tested. No damage or anomaly was found.

1.4 Personnel Information

1.4.1 Flight Supervisor (FS)

Age	:	42
Work experience	:	10 months with GHA

1.4.2 Equipment Operator 1 (EO 1)

Age	:	43
Work experience	:	4 months with GHA

1.4.3 Equipment Operator 2 (EO 2)

Age	:	59
Work experience	:	1 month 16 days with GHA

1.5 Meteorological information

1.5.1 The weather condition was fair and was not a factor in the incident.

1.6 Additional information

1.6.1 Training and qualification

1.6.1.1 The arrival handling crew had completed all training necessary for their assigned tasks. EO 2 had attended the Ramp Safety Course conduced by the GHA on 15 January 2010. The course notes provide guidance to trainees on ramp safety procedures to be observed when working around parked aircraft.

1.6.1.2 In the Ramp Safety Course notes, it is stated:

GENERAL RAMP SAFETY AROUND AIRCRAFT PARKED AT THE STAND

Points to remember:

- *Do not approach an aircraft until the ground engineer gives the 'thumbs up' signal when the aircraft has come to a complete stop, the wheels have been chocked and the engines shut down;*

1.6.1.3 Furthermore, the GHA's work instruction manual states that *"once the anti-collision lights/ aircraft engines are switched off and the 'thumbs up' signal is given by the headset man, all other activities would then commence".*

2 ANALYSIS AND FINDINGS

2.1 EO 1's task was to place the first pair of chocks at the nose gear after the aircraft was marshalled to a complete stop, even though the engines may still be running. After that, the EOs had to wait for the anti-collision lights/ aircraft engine to be switched off and for the thumbs up signal to be given by the headset man before approaching the aircraft and carrying out the rest of their tasks. EO 2 approached the aircraft before the thumbs up clearance from the headset man. This was contrary to GHA's standard operating procedures.

2.2 According to the GHA, EO 2 was aware of the ramp safety procedures when working around parked aircraft, whereby he should wait for the anti-collision lights/ aircraft engine to be switched off and for the thumbs up signal from the headset man before approaching the aircraft. However, he had apparently forgotten about this safety precaution and took the ADGS "stop" display as a signal for clearance to approach the aircraft.

3 SAFETY ACTIONS

In the course of the investigation and arising from discussions with the investigation team, the GHA has taken the following safety actions.

3.1 The GHA conducted refresher training on airside safety for all the handling staff immediately after the incident, paying particular attention to aircraft arrival procedures and safe practices when working around aircraft. Since June 2010, the GHA had instituted recurrent training for their staff. All staff who work at the ramp are required to attend recurrent training once every two years.

3.2 The GHA shared the safety lessons arising from this incident with its ground handling staff.

4 SAFETY RECOMMENDATIONS

4.1 In view of the safety actions already taken by the GHA, no further safety recommendations is proposed.