
Runway excursion while taxiing, Airbus A340-311, G-VSKY

Micro-summary: This Airbus A340-311 partially skidded off the runway while taxiing.

Event Date: 2003-01-30 at 2326 UTC

Investigative Body: Aircraft Accident Investigation Board (AAIB), United Kingdom

Investigative Body's Web Site: <http://www.aaib.dft.gov/uk/>

Note: Reprinted by kind permission of the AAIB.

Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
 2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
 3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.
 4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.
-

Airbus A340-311, G-VSKY

AAIB Bulletin No: 7/2003	Ref: EW/G2003/01/08	Category: 1.1
INCIDENT		
Aircraft Type and Registration:	Airbus A340-311, G-VSKY	
No & Type of Engines:	4 CFM56-5C2 turbofan engines	
Year of Manufacture:	1993	
Date & Time (UTC):	30 January 2003 at 2326 hrs	
Location:	London (Heathrow) Airport	
Type of Flight:	Public Transport	
Persons on Board:	Crew - 14	Passengers - 130
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	50 years	
Commander's Flying Experience:	15,764 hours (of which 5,865 were on type)	
	Last 90 days - 244.5 hours	
	Last 28 days - 75 hours	
Information Source:	AAIB Field Investigation	

Synopsis

The aircraft was manoeuvring to line-up on Runway 27R and taxiing at a speed of approximately 6 kt when it started to slide on ice and snow. The application of asymmetric thrust failed to prevent the right main landing gear from leaving the paved surface. Subsequent disembarkation of the passengers was delayed for two and a half hours whilst de-icing equipment was provided and the taxiway de-iced. There is currently no requirement to measure or assess the taxiway surface friction conditions and no such measurements were made before or after the incident. A safety recommendation relating to guidance material dealing with contamination of aerodrome surfaces has been made as a result of this incident.

History of the flight

The crew were scheduled to fly from London (Heathrow) to Newark (USA). The commander was the handling pilot for the flight and, because of the poor weather conditions at Heathrow, he had completed a comprehensive briefing on cold weather operations during pre-flight planning. When the crew arrived at the aircraft the first officer completed the external checks and reported to the commander that the ramp was very slippery. The aircraft was de-iced and the crew requested clearance to start and push back. The aircraft, which pushed back from its stand at 2308 hrs, had an All Up Weight (AUW) of 204,464 kgs.

The aircraft was cleared to taxi to the holding point for Runway 27R. Whilst taxiing the crew noted that although the centreline markings were clear the edges of the taxiway were contaminated with ice and snow. When the aircraft reached Block 137 the commander positioned it on an easterly heading and parked there until cleared to enter the runway. He did not move forward into Block 133 since there was a Boeing 737 holding ahead in Block 134 and he wanted to avoid the loose snow being thrown back by that aircraft's jet efflux.

When cleared to line up on Runway 27R the commander taxied the aircraft forward and then attempted to follow the taxiway to the left. He estimated that the speed of the aircraft was about 3-5 kt during this manoeuvre. As it entered the turn both pilots were aware that the rear of the aircraft had begun to slide. The commander was not aware of the nose wheel sliding, however, he recalled applying a small amount of power to both of the right engines in an attempt to correct the slide. He did not apply the brakes since, with no anti skid available below a groundspeed of 10 kt, the brakes would probably have locked. Because of the surface conditions he was unable to arrest the slide, which was being assisted by a strong northerly wind. Having almost completed the turn the right main landing gear left the paved surface and sank into the soft grass to a depth of approximately 50 centimetres. Because the aircraft was now in a right wing low attitude the flight crew shut down the right hand engines.

The crew contacted ATC who dispatched the airfield operations team and the rescue and fire fighting services to inspect the aircraft. When the fire crews arrived they parked their appliances some distance away from the aircraft because of concerns about stopping in the icy conditions. Once contact had been established with the fire crew, via the ground intercom, the crew handed the gear pins through the direct vision (DV) cockpit windows and they were installed in the right main gear. The auxiliary power unit (APU) was started and the remaining engines were shut down.

The passengers now had to be disembarked, however, before coaches could be brought to the aircraft it was evident that the taxiway required de-icing. It took approximately one hour to get the de-icing equipment in place and a further hour and a half to de-ice the taxiway. Whilst this was in progress the flight crew noted that every departing aircraft created a "blizzard of snow" which was then blown by the northerly wind back over the holding area depositing yet more snow and ice.

Recorded data

Data from the quick access recorder were analysed and found to support the commander's recollection of events. Having been parked on a true heading of 115° the aircraft moved forward for approximately 10 seconds whilst gently accelerating to 4 kt. The nose wheel was used to initiate a turn to the left and 10 seconds later the nose wheel had reached full deflection and this was maintained for the final 20 seconds of aircraft movement. During this time there was a brief and slight increase in power on the right hand engines. The maximum speed recorded during the manoeuvre was 6 kt.

Meteorological data

Between 0700 hrs and 1850 hrs on the day of the accident the recorded surface wind was 350°/25-35 kt with the visibility between 1,000 metres and 4,000 metres in blowing snow and a temperature of generally zero degrees. From 1850 hrs the visibility improved to 10 km, with scattered cloud at 1,200 feet.

The aerodrome meteorological report (METAR) issued at 2320 hrs recorded a surface wind of 340°/18 kt gusting to 28 kt with a visibility greater than 10 km, few clouds at 2,200 feet, scattered cloud at 6,000 feet, a temperature of -0° C and a dew point of -5° C.

Ground operations

Runway 27R had been de-iced and made available to ATC for operations at 2225 hrs; there had been previous reports that the runway surface was slippery. The de-icing, which had started at the holding

points, included the runway and the 'high speed turn offs'. The taxiways were also de-iced three times during the day. The snow plan log entry concerning this showed that the last de-icing took place at 1930 hrs. There are, however, several miles of taxiway at Heathrow and the entry of only one time in the log did not truly reflect the time at which the holding areas, such as Blocks 137, 134 and 133 had been de-iced. It would therefore have been difficult for staff to make an assessment of when to inspect or de-ice the surfaces again.

Photographs taken immediately after the incident showed the extent of the ice on the taxiway surfaces in the holding area. The hazardous nature of the surface was confirmed by the action of the rescue and fire service teams who parked their appliances remote from the aircraft and also by the need to extensively de-ice the area before allowing the passengers and coaches onto the taxiway.

Appendix 3D of Civil Aviation Publication (CAP) 168, titled '*Licensing of Aerodromes*', details the procedures for dealing with winter contamination of aerodrome surfaces. The clearance of such contaminants (ice, snow, slush and associated standing water) and the measurements and reporting of surface conditions are the responsibility of the airfield authority. Paragraph 4 of the CAP also specifies the following operational priorities for the clearance of the movement areas:

- (i) One main runway, including rapid exits.
- (ii) Appropriate run up areas.
- (iii) Aprons.
- (iv) Essential associated taxiways, priority being given to those presenting gradient difficulties.

There is a requirement in the CAP for the 'measurement and/or assessment, and promulgation of runway surface friction conditions' however, there is currently no requirement to apply the same criteria to taxiways. Thus no such measurements were made before or after this incident. Flight crew are not able to assess accurately the braking action of a surface, particularly those in large heavy aircraft, and cannot therefore be relied upon to report hazardous conditions. Therefore no one is charged with assessing the suitability of a taxiway for operation in icy conditions. Moreover, when considering the use of taxiways in icy conditions it is not only taxiways with gradients that can present hazards for the safe operation of aircraft, but also those that require significant turning manoeuvres to be carried out. It is therefore recommended that:

Safety Recommendation 2003-51

The CAA review the current guidance material for dealing with winter contamination of aerodrome surfaces detailed in CAP 168 with a view to ensuring that conditions on all aerodrome manoeuvring areas are fit for use by aircraft.