

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	Boeing 767-39H, G-OOAN
<b>No &amp; Type of Engines:</b>	2 General Electric Co CF6-80C2B7F turbofan engines
<b>Year of Manufacture:</b>	1993
<b>Date &amp; Time (UTC):</b>	13 December 2008 at 1017 hrs
<b>Location:</b>	Runway 23L, Manchester Airport
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)
<b>Persons on Board:</b>	Crew - 11                      Passengers - 254
<b>Injuries:</b>	Crew - None                      Passengers - None
<b>Nature of Damage:</b>	Thin layer of paint scraped from tailskid
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence
<b>Commander's Age:</b>	46 years
<b>Commander's Flying Experience:</b>	11,534 hours (of which 3,926 were on type) Last 90 days - 135 hours Last 28 days - 61 hours
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further enquires by the AAIB

**Synopsis**

The aircraft was scheduled to fly from Manchester Airport to Montego Bay, Jamaica. During the takeoff roll, the  $V_1$  call was delayed by the commander, who was the pilot not flying, by about 10-15 kt due to a "sluggish" acceleration, as he thought the aircraft might be heavier than calculated. During the rotation the TAILSKID message illuminated momentarily indicating that the aircraft had suffered a tailstrike during the takeoff. The commander applied full power and shortly afterwards the stick shaker activated briefly. The aircraft continued to climb away and accelerate before the flaps were retracted and the after-takeoff check list completed. The Quick Reference Handbook (QRH) was subsequently actioned, fuel dumped and

the aircraft returned to Manchester for an overweight landing without further incident.

The zero fuel weight (ZFW) had been incorrectly entered into the operator's Computer Take Off Programme<sup>1</sup> (CTOP) instead of the takeoff weight (TOW). This generated significantly slower takeoff speeds than required for the actual weight of the aircraft.

**History of the flight**

The aircraft was scheduled to fly from Manchester Airport, to Montego Bay, Jamaica. The operating crew

**Footnote**

<sup>1</sup> The CTOP is a computer based programme used by the crew to calculate the takeoff speeds.

were based at London Gatwick Airport and the co-pilot was the pilot flying. At the time, there was work in progress (WIP) on some of the taxiways at Manchester Airport.

Prior to boarding the aircraft, the crew telephoned the handling agent and passed the trip information required to complete the loadsheet. Once on the aircraft, the dispatcher asked for the figures that had been telephoned through earlier. Before the loadsheet arrived at the aircraft, the crew entered all the required information into the CTOP with the exception of the TOW; this was required from the load sheet. The load sheet arrived at the standard time of departure. The incorrect TOW was then entered into the CTOP and the calculated takeoff speeds and thrust reduction then entered into the Flight Management Computer. The aircraft pushed back 15 minutes late.

As the aircraft taxied out it started raining heavily. Due to the ambient temperature engine anti-ice was now required to be selected ON for takeoff. The co-pilot re-calculated the takeoff speeds, using the CTOP, whilst taxiing, and advised the commander there was no change to the speeds.

During the takeoff roll, the commander delayed the  $V_1$  call by about 10-15 kt due to a "sluggish" acceleration, as he thought the aircraft might be heavier than calculated. When the aircraft was rotated the co-pilot did so slowly. During the rotation the TAILSKID message on the Engine Instrument and Crew Alerting System (EICAS) illuminated momentarily indicating that the aircraft had suffered a tailstrike during the takeoff. The commander applied full power and shortly after that the stick shaker activated briefly. The co-pilot responded by reducing the aircraft's pitch while still maintaining a positive rate of climb.

The aircraft continued to climb away safely and accelerate before the flaps were retracted and the after-takeoff checklist completed. ATC were informed and advised the flightcrew that no debris had been discovered on the runway. The QRH checklist for TAILSKID message was actioned, fuel was dumped and the aircraft returned to Manchester for an overweight landing without further incident.

The aircraft sustained minor damage to the paint on the tail skid. After engineering checks, lasting 20 minutes, the aircraft was declared fully serviceable.

### **Pilots' comments**

The commander commented that he had flown about six empty sectors in a Boeing 767 prior to this flight. As such the slow takeoff speeds did not trigger an alert to him. Also, as he was not based at Manchester he was particularly attentive to the taxi routing due to the WIP. This diversion of his attention was compounded while the co-pilot checked the takeoff speeds. He commented that the delay in pushing back led to a time pressure which may also have distracted him from noticing the unusual takeoff speeds.

The co-pilot concurred with the commander's comments about the attention required during the taxi out to the runway. After landing he checked the CTOP and immediately realised that the ZFW had been entered as the TOW. He commented that the aircraft's Flight Management Computer would have correctly calculated the TOW by independently summing the ZFW and fuel onboard data entries. This would have at least ensured that the flap manoeuvring speeds were correct.

### **Takeoff speeds**

When the ZFW was entered into the CTOP, the calculated speeds were equal to the ones the crew used

during the incident. These were about 20 kt less than those produced if the correct TOW was entered. Table 1 shows the incident and correct speeds.

	Data entered into the CTOP	Actual data
Take off weight (kg)	117,951	172,351
$V_1$ (kt)	124	143
$V_R$ (kt)	133	154
$V_2$ (kt)	138	160

**Table 1**

### Safety actions

As a result of this incident the crew received additional training on the CTOP and successfully completed a line check. The operator also issued the following notice to all its pilots:

**‘Subject: [All] Computerised Takeoff Performance**

#### Operational Changes

*With immediate effect both pilots, when conducting the performance calculation, must independently extract the ATOM [Actual Take Off Mass] from the loadsheet. Masses written on the OFP [Operational Flight Plan] must not be used as this introduces the potential for error. There are no other changes to the CDU [Control Display Unit] Preflight Procedure, loadsheet checking and performance calculation procedures.*

*Clearly it remains good practice for both pilots to check the loadsheet for gross errors.’*

### Operations Manual Amendment

*OMA 8.20.2.6 Before Start Procedure will be amended as follows at the next revision cycle:*

#### *Computerised Takeoff Performance (C-TOP)*

*General procedures and instructions for use of C-TOP are contained in OMB [Operations Manual Part B] Section 4.*

*Following completion of the CDU Preflight Procedure, the OFP and the loadsheet should be readily accessible to both pilots. Both pilots should independently extract the ATOM from the loadsheet and perform the C-TOP calculation. PF should call out any further assumptions made e.g. surface wind, runway conditions, use of anti-ice etc.’*

### Supporting Information

*A recent incident has highlighted the potential for error whilst conducting the performance calculation using the CTOP/LPC programme. Inadvertently the crew used the ZFM [Zero Fuel Mass], rather than the ATOM, to calculate the takeoff performance. This oversight was influenced by other factors on this occasion, all of which induced pressure on the crew.*

*On occasions procedures, however carefully written, can break down. Pilots are encouraged to review relevant pre-flight procedures in OMA and OMB.*

*Commercial/time pressures are often present in our day to day operation; however, these must not be allowed to compromise safety. Our Pilot Skills List gives guidance on how to manage these issues.’*