Preliminary Report 001/2015

SERIOUS INCIDENT

Aircraft Type and Registration:	Boeing 777-3DZER, A7-BAC
No & Type of Engines:	2 x General Electric GE90-115B
Year of Manufacture:	2008 (Serial no: 36010/731)
Owner:	Fraiha Leasing Limited
Location	Miami International Airport, USA
Date & Time (UTC):	16 September 2015 at 0033 hrs UTC
Type of Flight:	Commercial Air Transport
Persons on Board:	Crew - 20 Passengers - 259
Injuries:	Crew – Nil Passengers – Nil
Nature of Damage:	Damage to the pressure vessel, airframe damage and damage to the left undercarriage.
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	38 years
Flying experience:	
Commander	9,154 hrs (996 on type)
First Officer	7,600 hrs (234 on type)

The Investigation

The QCAA was notified of the event on 16 September 2015 at 1715 hrs (UTC) and an investigation was initiated.

This initial report contains facts which have been determined up to the time of issue. It is published to inform the aviation industry and the public of the general circumstances of the event and may be subject to alteration or correction if additional evidence becomes available.

The sole objective of this investigation is the prevention of future accidents and incidents. It is not the purpose of this investigation to apportion blame or liability.

Accordingly, it would be inappropriate for this report to be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

Figure 1 - The accident aircraft

Preliminary information

The aircraft was operating a planned flight from Miami, USA to Doha, State of Qatar. The flight crew comprised four pilots who were all in the flight deck during the departure. The operating crew consisted of one commander PF and a first officer PNF. The relief crew consisted of a captain and a first officer.

The weather at Miami at the time of the departure was generally light northeasterly winds with good visibility, although there had been recent rain at the airport, temperature was 29° C with scattered broken cloud at 2,900 ft., sunset occurred at 1925 hrs. local time.

The operating crew calculated the take-off performance figures for Runway 09, using the On-board Performance Tool (OPT) contained within the Electronic Flight Bag (EFB) using a take-off weight of 342,000 kg. The OPT offered the crew only one option for Runway 09, which was '09#T1' as displayed by the OPT. This was understood by the crews to mean Runway 09 full length, although the performance data had been pre-modified by a temporary NOTAM. The OPT also displayed the information that intersection departures were not permissible for this runway. An optimum performance take-off thrust calculation was selected on the OPT which generated an assumed temperature take-off thrust of 36°C. The commander printed off this information, for his reference, and his first officer wrote '09/(T1)#' on his personal notepad.

Pushback was recorded on the Operational Flight Plan as commencing at 0012 hrs UTC, shortly after sunset. This was 2012 hrs local time in Miami and 0212 hrs in Qatar where the crew were based.

After pushback and engine start, which the crew described as normal, the aircraft was taxied, in accordance with its taxi instructions. During the taxi, the crew conducted a take-off review as per the company SOP's, the SOP's did not require any reference to where on the runway the take-off roll would commence. The aircraft then joined taxiway S. Taxiway S parallels Runway 09 and is the taxiway from which the aircraft was expected to join the runway. At this point the commander was using his EFB, selected to the airport diagram plate, to assist with his navigation around

the airfield. He had the screen 'zoomed in', so he could clearly see the names of the taxiways as he passed them, although the scale selected, the size of his screen and the position of the chart, meant he was unable to see where he was in relation to the runway threshold. (Figure 2).

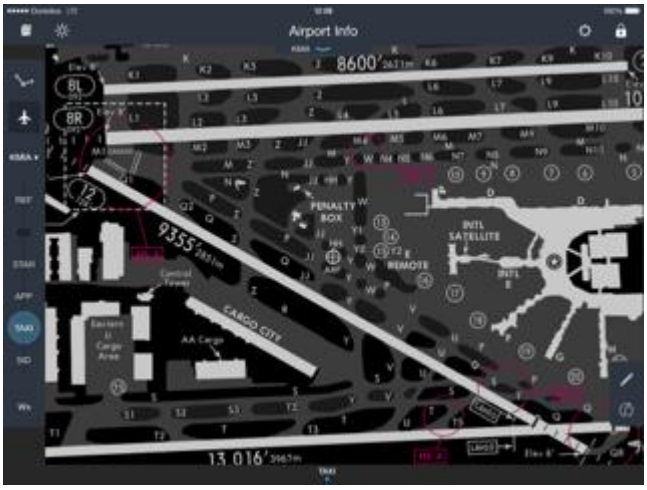

Figure 2 - Screen shot of airport information chart, as displayed on the commanders EFB

The relief captain had been following the aircraft's progress along the cleared route, using his tablet computer. As the aircraft entered taxiway S, he put his tablet away as he believed it was just a straight route to the runway.

As they taxied along S the commander decided that the aircraft could depart from the runway intersection T1. He could not recall why he made that decision, but believed it may have been because the printed information displayed 'Runway 09#T1' in a compelling way. The printed information contained no reference to the fact intersection departures were not permissible from this runway (Figure 3), and contained the message 'No NOTAM data found'.

```
          Page 1/1
TAKE-OFF PERFORMANCE 15SEP15 23:25:17

AIRPORT   : KMIA / MIAMI INTL
RUNWAY    : 09#T1
CONDITION : WET
WIND      : 050/9 KT
OAT       : 29 C
QNH       : 30.06 IN HG
No NOTAM data found.
```

Figure 3 - Printout of the On-board Performance Tool data

The commander requested the operating first officer to advise ATC that they were able to depart from intersection T1. The first officer glanced at his notes and saw he had written '09/(T1)#', which made him believe that this was an acceptable line-up point for take-off, he called ATC advising them that they were able to take T1 for departure from Runway 09.

As this was not what relief crew recalled had been briefed, they queried T1. The commander made a hand gesture and said something which he thought was seeking reassurance from the crew that everything was OK. The operating first officer confirmed that he was content with T1, but the relief crew interpreted the commander's communication as him confirming he was content with a T1 departure so, thinking they had missed the operating pilots recalculating the take-off performance from T1 and did not voice any further concerns. At the time of this inter-crew exchange an aircraft landed on Runway 09. This aircraft landed close to their position and reassured them that T1 was close to the start of the runway. The touchdown point on Runway 09 was however displaced 411m from the threshold. From interviews with both crews, it was apparent that in the dark conditions, none of them had situational awareness of where T1 was in relation to the start of runway.

The aircraft was then cleared to line-up with another aircraft reported on final approach, requiring an expeditious departure. The crew reported that as they lined up they were not visual with the end of the runway nor were they aware they had approximately 1,000m of runway behind them. The available take-off distance from T1 is approximately 2,610m.

During the take-off roll, as the aircraft approached V1 the crew became aware that something was not right, and they recalled the aircraft entering the alternating red and white runway centreline lights which indicated they had approximately 900 m of runway remaining. The commander assessed the speed of the aircraft, the rate of acceleration and the runway remaining and concluded the safest course of action was to continue. He recalled as he rotated the aircraft entered the red runway centreline lights (indicating only 300 m of runway remaining.)

None of the crew, including the cabin crew were aware that the aircraft made contact with the Runway 27 approach lights as it got airborne, and the aircraft continued uneventfully to Doha, a flight time of 13.5 hours. There were no abnormal cabin pressurisation indications during the flight.

Recorded Data

The Cockpit Voice Recorder (CVR), Flight Data Recorder (FDR) and Quick Access Recorder (QAR) were successfully downloaded. Figure 4 shows certain take off parameters as well as a calculation of ground roll distance (from the groundspeed recorded on the QAR).

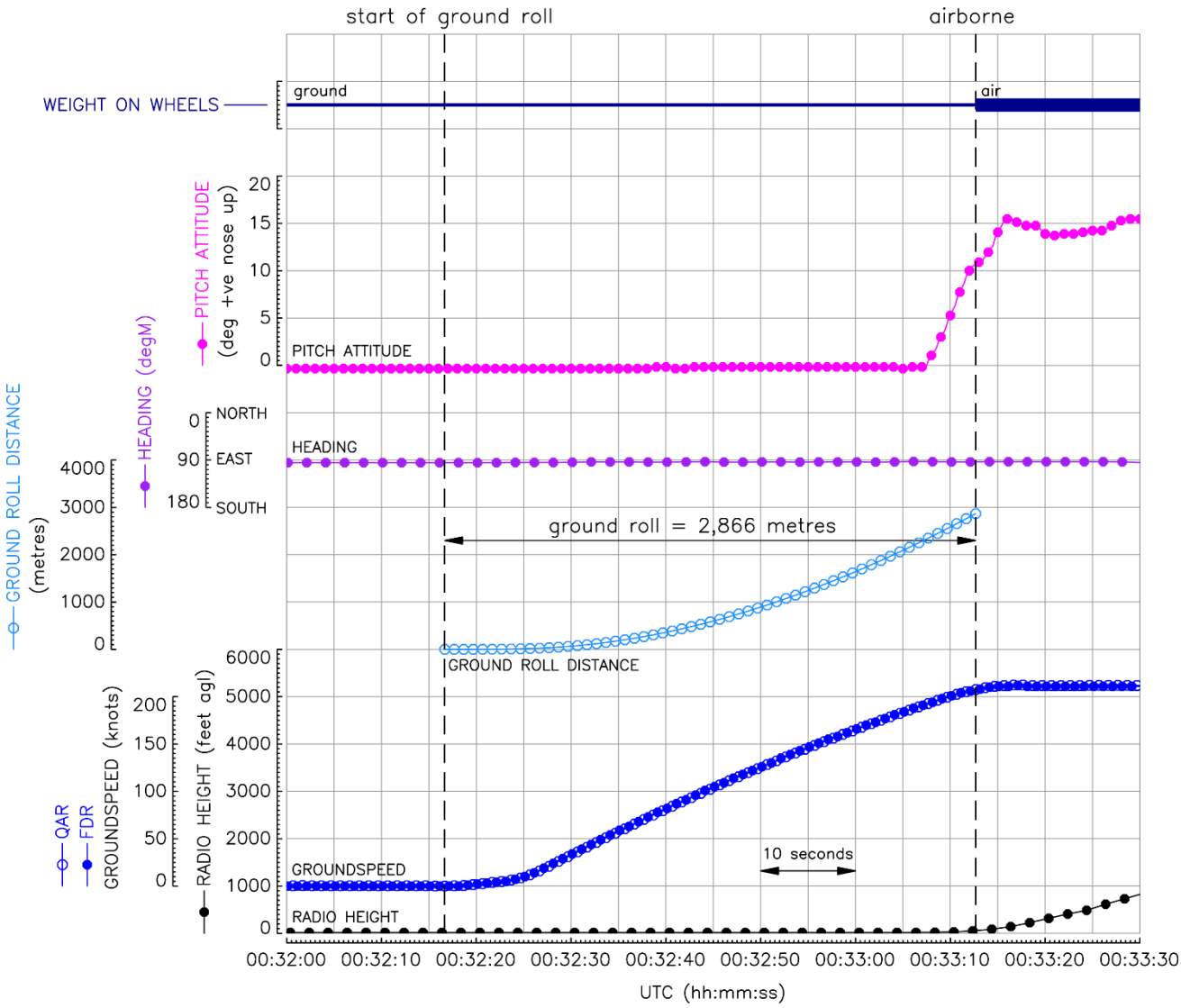

Figure 4 – Take-off data

The recorded data indicates the ground roll was approximately 2,866m long and that the aircraft was still on the ground as it left the runway (Figure 5). Airport security cameras recorded the aircraft then coming into contact with some of the approach lights for Runway 27.

Figure 5 - Yellow line indicates the aircraft senses it is on the ground

Figure 6 shows the position of the aft outflow valve[1] on the previous flight, and its position on the flight to Doha after the collision with the approach lights. It can be seen that the valve is more closed on the return flight compensating for what was found to be a puncture in the pressure vessel.

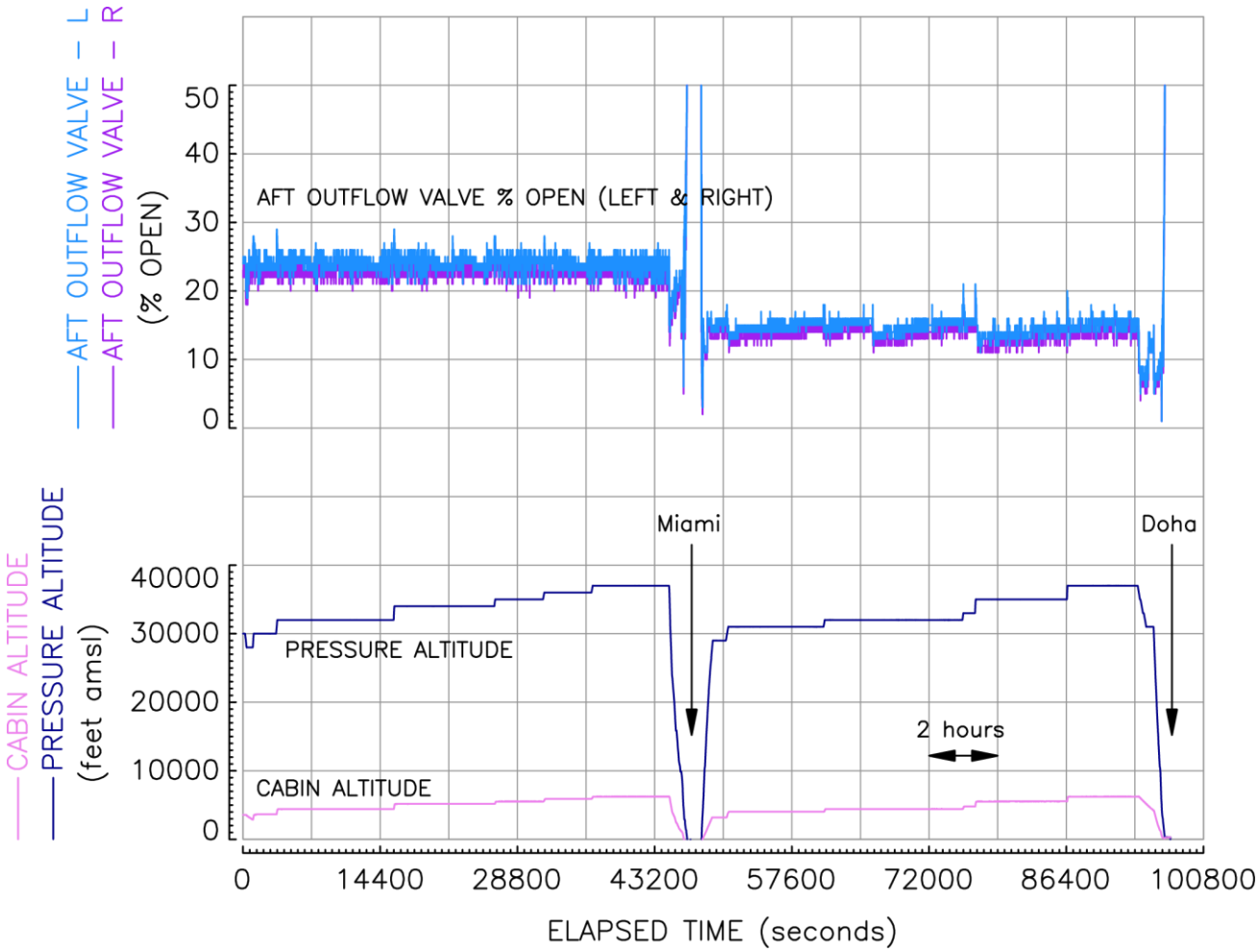

Figure 6 - Aft outflow valve position

Damage

The damage to the aircraft comprised of a 46 cm tear in the fuselage behind the rear cargo door (Figure 7) which breached the pressure vessel. There were numerous dents and scratches in the external airframe with 18 square meters of damaged skin. There were 90 external individual areas of damage requiring assessment and rectification, there was also some damage to a metal guard on the left landing gear.

[1] The outflow valve regulates the release of air from the cabin to maintain the selected cabin pressure

Figure 7 - Damage to the hull behind the rear cargo door and to an approach light

Damage was also found at Miami International airport to three of the Runway 27 approach lights.

Further investigation

The investigation continues. A final report will be published in due course.