



پاکستان سول ایوی ایشن اتھارٹی

PAKISTAN CIVIL AVIATION AUTHORITY
(SAFETY & INVESTIGATION BOARD)



INVESTIGATION REPORT
SERIOUS INCIDENT – M/S. SHAHEEN AIR
AIRCRAFT BOEING – 737-200, REG. NO. AP-BIK
ON 8 FEBRUARY 2010
PESHAWAR INTERNATIONAL AIRPORT, PESHAWAR

INVESTIGATION REPORT

SERIOUS INCIDENT TO M/S SHAHEEN AIR BOEING-737-200 FLIGHT NO. NL-757, REG. AP-BIK AT PESHAWAR AIRPORT ON 8 FEB 2010

SYNOPSIS: On 8 February 2010 at 0845 LT, Shaheen Air International Aircraft Flight No. NL-757, B-737-200, Reg. No. AP-BIK, sector Abu Dhabi – Peshawar (AUH – PSH), made approach for landing at Runway 35, Peshawar Airport. After landing, aircraft maintained runway centre line till close to end of Rwy. However, close to last 1000 feet of Rwy length, aircraft skidded to left onto unprepared ground. Runway conditions were wet and slippery due to rain. All passengers on board remained unhurt and disembarked through stairs. No. 2 & 3 tyres of the aircraft got burst, and mud was inserted into wheel wells. Crash and Rescue facilities were made available on time.

The investigation has been conducted under Director General Civil Aviation Authority Memorandum No. HQCAA/1901/334/SIB dated 11 February 2010. Besides, three member CAA investigation team, Accredited Representatives from NTSB-USA and BEA-France were also co-opted as per ICAO Annex-13 SARPs.

1. FACTUAL INFORMATION

1.1 **History of the Flight:** Scheduled Flight from Abu Dhabi – Peshawar (AUH – PSH).

1.2 **Injuries to Persons:** There was no injury reported to any person.

1.3 **Damage to Aircraft:** The damages were observed as follows:

1.3.1 Wheel # 2 and 3 completely ruptured.

1.3.2 Traces of Mud insertion in both the engines and all the three wheel wells.

1.3.3 Apparent stresses on main landing gears due to side-ways skidding and then sudden stop in un-prepared soft / wet ground.

1.4 **Other Damages:** Left edge of overrun surface was scrapped / damaged. Additionally, aircraft arresting net assembly of BAK-12 Barrier installed at Rwy-17 end got damaged beyond recovery.



1.5 **Crew Information:** Detail of crew members is as under:

(a) **Capt Tariq Hassan, ATPL1312:**

a. Total Flying Exp 6200 hrs,

b. Total Command Exp 4500 hrs; Command hrs on Type 300 hrs

(b) **FO Rafiuzzaman Khan, ATPL999:**

a. Total Flying Exp 9050 hrs,

b. Total Command Exp 7800 hrs,

- 1.6 **Aircraft Information:** Aircraft information is as follows:
- 1.6.1 Manufacturer : Boeing Company
 - 1.6.2 Aircraft Reg. No. : AP-BIK
 - 1.6.3 Model No. : 737-200
- 1.7 **Meteorological Information:** A westerly weather spell affected the most parts of the country including Peshawar from 5 Feb 2010 to 9 Feb 2010, which caused continuous light precipitation for many hours and the visibility also remained very poor. Current weather was available on ATIS on 126.7 VHF. The details of actual weather reported by Metrological Centre, PAF Base Peshawar at the time of incident was obtained for analysis.
- 1.8 **WRECKAGE & IMPACT INFORMATION:** After landing, close to last 1000 feet of Runway length, aircraft skidded to left on un prepared ground, runway being wet and slippery due to rain.
- 1.9 **Medical and Pathological Information:** Following the incident on 8th Feb 2010, necessary Lab tests were carried out at Peshawar. Blood and Urine samples of both, the Captain and First Officer were taken by Aga Khan Lab. The medical reports were declared 'Negative with no detection / abnormalities' by Aero Medical Centre, HQCAA.
- 1.10 **Fire:** No fire or smoke indications were observed during and after landing.
- 1.11 **FDR / CVR:** Flight Data Recorder (FDR) Part No. S603-100-00, Serial No. 00242 of FAIRCHILD MODEL and Cockpit Voice Recorder (CVR) Part No. 93-A100-30, Serial No. 3401 were removed by Airworthiness Surveyor in coordination with SIB.
- 1.12 CVR being unserviceable, could not be read out. FDR was sent to Bureau d'Enquetes et d'Analyses (BEA), France for download and analysis. FDR was in good condition, therefore read out was performed using the manufacture equipment L3Com ROSE. Both the Flight Recorders were sent back to SAI.
- 1.13 **Aircraft Recovery:** The aircraft was pulled out of soft and completely water stagnated surface with the assistance of local military services, and was parked on main civil apron. After necessary maintenance, aircraft flew (non-revenue) for detailed maintenance at Karachi base. The details of Recovery Plan was also submitted to this effect.
- 1.14 **Test & Research**
- 1.14.1 **Flight Data Recorder:** FDR Part No. S603-100-00, Serial No. 00242 was sent to BEA, France for taking the readout. The FDR data contained 28 parameters; however, the FDR data for several critical parameters were either not recorded or erroneous. Parameters that were not recorded on the FDR included brake pressures, throttle levers, stabilizer position, drift angle, gross weight, flap deflection, glide-slope / localizer deviation, latitude/longitude, and wind direction and magnitude. Parameters that were recorded but appeared erroneous included wheel and rudder deflection
 - 1.14.2 **Cockpit Voice Recorder:** Analysis of CVR Part No. 93-A100-30, Serial No. 3401 of subject incident could not be done due Erase Coil Assembly melted and tape entangled / stuck.

2. ANALYSIS

- 2.1 **Aircraft Wreckage Analysis:** After the occurrence the survey of incident site was conducted, the important signs / rubbing marks of tyres on the runway and other related evidences were preserved through digital photography. However, it was revealed that the damages to the wheels were due to subsequent skidding on un prepared ground.
- 2.2 **Document / System Analysis :** Hydraulic system A and Brakes have been the repeatedly reported snags. However, at the time of incident no such snag was observed. If Hydraulic system 'A' had any fault, then ground spoilers, inboard flight spoilers, ailerons, leading edge flaps and slats, trailing edge flaps landing gear, nose wheel steering, elevators, rudder would have been also reported.
- 2.3 During the inspection of the aircraft after incident, brake assemblies were inspected for wear limits and were found well within limits (1 inch, 1 inch, 0.8 inch and 1.2 inch for wheel # 1 wheel # 2, wheel # 3 and wheel # 4 respectively). As per maintenance history, 'NO' nose wheel steering and anti skid defects were reported by the aicrew. The technical analysis of documents and systems, therefore, revealed no technical malfunction attributing to the occurrence.
- 2.4 **Ops Analysis:** The following is a chronology of events based on FDR data, and time references are based on recorded TCC time of the FDR. It was not possible to turn TCC into UTC time because there is no parameter about the date or time in this recorder.

COMPUTER TIME IN SEC.	CHRONOLOGY OF EVENTS
389 742	Recorded IAS start to increase.
390 784	Electric Altitude parameter is "alive" and the first value recorder is 135 ft.
390 840	Aircraft reach its cruise altitude at FL 270.
397 720	Aircraft begin its descent after about 2 h 20min of flight.
399 073	Aircraft reaches 2 600 ft, IAS is about 155 kt.
399198	Pitch is increasing; the altitude reaches a min of 1728 ft and start to increase.
399 205	Pitch reaches a maximum of 12.8o Nose Up.
399 255	Altitude reaches 1867 ft and the aircraft resume its descent.
399 281	Aircraft touches down at about 150 kt and Vertical Acceleration reach 1.4 G.
-	Engine Frequency 1 and 2 parameters start to increase which probably means that the reversers are selected and deployed.
399 300	Aircraft starts turning left (heading start to decrease from 352o) and Vertical Acceleration starts to be very noisy.
399 310	Heading reach a minimum of 315o and start to increase again.
399 318	Aircraft stops. Longitudinal Acceleration is stable at -0.168 G, Vertical Acceleration is stable at 1.03 G.

- 2.4.1 SAI flight NL-757 was cleared for VOR approach for RWY-35 at Peshawar. The visibility was less than 800 meters with low clouds and continued precipitation for many hours including the previous night. The runway conditions were wet with standing water at some points. Preceding aircraft had reported runway braking action to be Normal-Poor. Aircrew had listened to Islamabad weather on corresponding ATIS which also reported similar weather. Aircrew, however, did not en-route check Lahore weather. All this while the First Officer remained reliant to Captain's decision. There appeared to be a hesitation in considering diversion to Lahore which lay just abeam / enroute from Abu Dhabi to Peshawar.

- 2.4.2 Eye witnesses and ATC observations indicated that aircraft was not visual with the runway environment till very late. It sought landing clearance at short finals, and on inquiry by ATC announced "field insight" only at the end. The observation also indicated late touchdown between 3000-4000 feet almost short of Fire Station situated at link-C. Link-C is 4805 ft down the runway. As stated by ATC, the aircraft also called "under control" after landing.
- 2.4.3 The FDR data shows that during the approach, the airplane finally turned right onto the runway heading of 353 degrees, and then levelled off at approximately 500 feet above the ground. The airplane flew at that altitude for approximately 50-55 seconds before descending further for landing. Flying at constant altitude of 500 feet on finals is also indicative of being unsure of runway or runway environment. The aircraft could not maintain stabilized approach on finals and was able to steer runway heading for only 12-14 seconds, and ended up higher on short finals.
- 2.4.4 The aircraft touched down at airspeed of 150 knots ahead of designated touchdown zone. The Engine Pressure Ratio (EPR) increased after touchdown, indicating the use of reverse thrust. During reverse thrust operation, the left EPR was on average 0.2 higher than the right EPR.
- 2.4.5 After touchdown, aircraft was able to maintain runway heading and centre line. During the deceleration, as the airspeed decreased below 100 knots, the airplane heading began to deviate to the left. No opposing pedal inputs were made until approximately 12 seconds later when a large right pedal input was made at an airspeed of 50 knots, and a heading of 330 degrees. The airplane reached a heading of 315 degrees (38 degrees left of runway heading) before turning back towards the runway centre line.
- 2.4.6 The airplane reached a maximum longitudinal deceleration of 0.33 g's before slowly decreasing to approximately 0.27 g's as the reversers were stowed at an airspeed less than 50 knots. As the heading approached the runway heading, perturbations in the acceleration data indicate the airplane departed the paved surface at an airspeed well below 50 knots. Due to the lack of data, the reason for the overrun could not be determined.
- 2.4.7 During the visit to the incident runway, it was noticed that aircraft was at centre line till the end of RWY-35 and it skidded at overrun area just after crossing the net barrier installed between the prepared surface and overrun area.
- 2.4.8 Though, aircraft announced "under control", however, as the aircraft commenced to turn right, the aircraft developed skid away from the intended turn, crossed over the overrun area and continued off the runway. Reaching overrun area and skidding could not have happened at normal taxi speed.

3. CONCLUSION

- 3.1 There has been a history of Hydraulic system 'A' and Brake related malfunctions, yet no particular un serviceability could be isolated. Both the aircrew were well aware of prevailing weather conditions at Peshawar and alternates and decided to continue for planned destination Peshawar, portraying failure of CRM. Despite unstable approach under no contact with runway, aircrew continued for landing and ended up high on speed and long on touch down over wet runway having Normal-Poor braking action. Non standard approach resulted into normal than higher speed at the end of runway. Application of rudder at higher speed on slippery runway caused aircraft to skid.
- 3.2 **Cause of occurrence.** Deviation from established procedures / FCOM in inclement weather coupled with lack of CRM resulted in runway excursion.

4. FINDINGS

- 4.1 Aircraft was found airworthy of the flight.
- 4.2 Though, the weather at Peshawar at the time of landing was marginal (RVR around 1.0 Km), timely decision to divert to alternate should have been considered.
- 4.3 Aircrew was well aware of the prevalent weather conditions.
- 4.4 Due to some unknown reason, weather for AllAP, Lahore was not considered for planning possible diversion.
- 4.5 The runway was wet with standing water at some places on the runway surface.
- 4.6 Runway braking action was reported to be poor – normal at the time of incident.
- 4.7 Flight craft was not on stabilized approach for landing.
- 4.8 Flight crew continued for landing with insufficient clues about runway position.
- 4.9 The touchdown occurred after the touchdown zone and higher speeds.
- 4.10 Though thrust reversers were used but aircraft could not be brought under control before end of runway.
- 4.11 Flight craft maintained centre line till the end of RWY 35 and it skidded at overrun area just after crossing a net barrier installed between the prepared surface and overrun area.
- 4.12 Inducing right turn at higher than taxi speeds caused skid away from the intended turn.
- 4.13 Implementation of CRM is not reflected by actions.
- 4.14 Soft unprepared ground helped in stopping the aircraft earlier.

5. SAFETY RECOMMENDATIONS

- 5.1 Airline to emphasise on flight crew to obtain latest weather reports for destination and alternates as early as possible.
- 5.2 Adherence of established procedures be ensured through effective training.
- 5.3 Implementation of CRM be ensured.
- 5.4 Flight crew be encouraged to divert to primary or secondary airfields in such like weather conditions, rather than trying to salvage potentially risky attempt to land at planned destination.