



PAKISTAN CIVIL AVIATION AUTHORITY
(SAFETY & INVESTIGATION BOARD)



ACCIDENT INVESTIGATION REPORT
SERIOUS INCIDENT M/S. SHAHEEN AIR
AIRCRAFT BOEING – 737-200, REG. NO. AP-BJI
ON 11 NOVEMBER 2008 AT
JINNAH INTERNATIONAL AIRPORT, KARACHI

FINAL REPORT

SERIOUS INCIDENT TO SHAHEEN AIR BOEING-737-200, REG. NO. AP-BJI AT JIAP, KARACHI ON 11-11-2008

SYNOPSIS:

Reference Director General Civil Aviation Authority Memorandum No.HQCAA/1901/326/SIB dated 11 November 2008. On 11th November 2008, at 2350 UTC, a scheduled passenger flight No. NL-147, Boeing 737-200, Reg. No. AP-BJI of Shaheen Air executed go-around at Runway 25R Karachi due to partial contact with runway caused by patches of fog and poor visibility conditions. Aircraft was able to land in second approach. On post flight inspection, the ground crew observed dents/severe scratches on the right wing tip lower area. No injury to any passenger, person on ground, or damage to ground equipment was reported. (Pictures attached). Notification of serious incident was sent to concerned states, and agencies in country. DG CAA constituted a team of 3 investigators headed by P SIB as investigation incharge. The report on its completion was to be released as per Rule 279 – 281 of CARs, 94.

1. FACTUAL INFORMATION

- 1.1 **History of the Flight:** Karachi - Lahore - Karachi
- 1.2 **Injuries to Persons:** Nil.
- 1.3 **Damage to Aircraft:** RH wing tip, lower LOGO fairing deeply scratched and RH wing NAV light broken and few parts missing. (Photographs attached).
- 1.4 **Other Damages:** Nil
- 1.5 **Crew Information:**
 - 1.5.1 Capt. Arman (Pilot Flying at the time of occurrence) Indonesian ATPL No. 2856 holder validated by PCAA.
 - 1.5.2 First Officer Shahid Saleem (Pilot Not Flying). CPL No. 2772
- 1.6 **Aircraft Information:** Manufacturer Boeing Company, Aircraft Reg. No. AP-BJI.
- 1.7 **Meteorological Information:** At 2330 UTC (15 prior to incident), the reported ATIS weather was vis 6 km, surface wind light and variable, temperature 20c.
- 1.8 **Flight Recorder / CVR:** Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) were removed for the purpose of analysis and investigation.
- 1.9 **Impact Information:** No impact marks or damage found on runway surface or its surrounding.

Flight Recorders: It was observed that the coating of the CVR magnetic tape had been damaged; hence it could possibly be analysed by manufacturer. The FDR was also not possible to be downloaded in Pakistan; therefore it was down loaded with the help of manufacturer. The read outs were then made available to SIB for analysis of profile of the aircraft during its approach, go around / missed approach and full stop landing. The physical condition of CVR indicated less than required attention being paid to the maintenance of CVRs and its valuable extracts. Non availability of in country FDR downloading capability with the company is indicative of non-adherence to FDM programme.

2. ANALYSIS

2.1 Weather Information

Reported weather condition indicated no abnormality in prevalent weather, neither it was indicated by Aerodrome Weather reports of 2330 UTC. ATC transcript / Radar tape extract indicate visibility deterioration to 3 – 4 kms and onset of smoke / haze patch from link "F" to approach through which nothing was visible, however, all around visibility was observed as better.

2.2 Analysis of Cockpit Voice Recorder (CVR)

The analysis of available CVR data reveals that the CVR could not retain any record pertaining to the incident. Rather, it indicates discussion by Ground / Technical Staff while aircraft being towed for washing at some point and time. Flight Crew were unaware of the incident occurred and thus they disembarked without taking any steps to preserve the CVR. As the incident events are erased after 30 minutes in this particular type of CVR, the engineering too, on observing the damage to aircraft RH wing, did not make enough efforts to preserve the CVR either.

2.3 Analysis of Flight Data Recorder (FDR)

The FDR was sent to BEA, France for extract readouts as the B-732 extract readout down load facility is neither available with Shaheen Air International nor with any other Pakistani Operator. The parameters available for this type of FDR are limited, thus parameters provided by BEA included events frame, Baro Attitude, IAS, Heading (T), Pitch vis-à-vis Control Column Position, Roll vis-à-vis Control Column Position and two engines spooling synchronization. The occurrence has been analysed with available FDR data from Decision Height to incident touch and go landing, go-around/missed approach till achieving a height of 200 ft AGL, and the final landing.

2.3.1 Decision Height to Threshold Crossing Height (50 Ft)

Salient points revealed during the analysis are as follows:

- a. Event is spread over 11 Sec.
- b. Rate of Descent is almost 900 FPM.
- c. Speed is steady between 131-134 Kts.
- d. Pitch and pitch control are consistent and show an increase in pitch attitude for flare out.
- e. Approach Heading +2° RW direction with initiation of roll to the right and further divergence from RW directions by 2°

2.3.2 Threshold Crossing Height 50 ft (Flareout) to Touch & Go

Following are the salient points:

- a. Event is spread over 18 Sec.
- b. Aircraft descends negligibly by 10 – 15 ft and then climbs again by 20 – 30 ft in consistent with pitch command, which shows an increase from 5° to 10°. The Thrust Levers are brought to idle.
- c. Speed reduces from 135 Kts to 120 Kts.
- d. Aircraft goes to heading of 258° i.e. +04° RW Directions and then reverses to 247° i.e. a change of 10° at 30 ft AGL or less.
- e. At about 10 ft (flare out height) the aircraft is rolled right to RW direction.
- f. At the reversal point, pitch up is 11° and roll input 9° when engines are spooled.
- g. Aircraft continuously rolls right and pitches up in consistent with control column input, touches down for 1-2 seconds, and gets airborne again.
- h. Pitch during go around at 10 ft AGL and 123 Kts reached to maximum of 12° and maximum roll of 19.5°. In this short interval of 02 seconds heading change is 8° indicating a continuous heading change of +15° during go-around up to 100 AGL from RW direction. During this short interval, split in engines spool-up is maximum.

2.3.3 Analysis of Incident / Event

At and below Decision Height the aircraft was not aligned with the RW until 50 ft AGL. The long holding at 20 – 30 ft AGL and frequent / abrupt changes in heading indicates not being visual with runway environment and thus making attempts to align with RW direction. The speed reduction and high pitch attitude also adversely affected the visual contact and alignment with the RW. Touch down is at 700-800 FPM rate of descent (normal ROD is 200 – 300 FPM). Maximum pitch and roll is on the initiation of go around at minimum speeds when aircraft is at 10 ft AGL, although, go around is executed before touch down.

2.3.4 Full-stop Landing

From decision height (DH) to Touch Down, the event is spread over 16 sec. From DH to flare out Rate of Descent is 750 FPM and then it reduces to 500 FPM until Touch Down. The approach course is 255° and a constant speed 136 kts. Until initiation of Touch Down where Pitch is about 3.2° and later increases to 4.5° during flare out.

2.4 Operational Analysis

- 2.4.1 As stated by the aircrew, after establishing on ILS localizer and glide slope for runway 25-R at 1000 ft AGL, the First Officer as PF could see the runway 500 ft down from beginning of runway 25-R, but the touch down point was obscured with fog / haze. At 500 ft AGL, PF disconnected the Auto Pilot and continued descent to Decision Attitude (DA 318 feet) on instruments as the touch down point was still not visible. At DA Capt. Arman (PM) took over the controls, became PF and continued the approach as both the pilots could see the runway approach lights. After crossing the runway threshold lights the visibility deteriorated further leaving no visual clue. Quickly both the pilots picked visual contact with runway edge lights, however, by this time the aircraft had drifted to the right half of runway. The Capt, now PF, being unsure of runway, asked FO "where is the centre line", it's on our left FO replied. PF then applied correction and ended up towards left edge. Although late, but correctly analyzing that the situation is not favorable any more for landing, a go round was then initiated.
- 2.4.2 After crossing over the runway approach lights, there was no clue of runway environment left to the pilots because of absence of lights on the prepared undershoots, thus the Capt started flying parallel to the runway and stated to have opened power to maintain air speed. After crossing the runway threshold lights, both pilots picked visual with runway edge lights. Having confirmation from the PM for it to be runway right edge light, Capt started drifting to the left considering left edge lights as runway centre line whereas runway centre line 25R is not illuminated. At this point, FO stated to have advised PF to go round, the Capt also realized the same and a go round was initiated.
- 2.4.3 After initiation of go round the aircraft kept sinking and an un-intended contact (touch down) with the ground was made. During go around the aircraft has banked to the right which is an attempt by PF to come back to centre of runway and partially could be because of asymmetric EPR.
- 2.4.4 Auto pilot was correctly disengaged at 500' on an ILS established approach. At Decision Attitude when unsure of runway, Captain took over the control and violated the procedures by continuing with the approach in partial contact with runway.
- 2.4.5 During approach, pilot flying is to concentrate inside on instruments when reaching DA and pilot monitoring is required to call out "Approaching DA, visual or not with runway." If PF picks visual, he lands otherwise he is to initiate go round. In this case at DA, Capt took over the controls with partial contact with runway / runway environment, and continued further till made a touch and go before executing missed approach.
- 2.4.6 As stated, while initiating go around, the L/G were retracted first and followed by flaps to 15°. Where as the procedure demands that go round should be initiated by leading with the power. Accelerate to V (Ref) +15, attitude 15° climb, and then selecting flaps 15°. Gears are to be raised only on positive climb indication on altimeter.

- 2.4.7 On second approach once again the Capt took over controls at DA and continued approach as runway approach lights were visible with touch down zone still obscured, however managed to land the aircraft. Under existing visibility conditions, there should not have been a second approach on same runway. Rather second approach if at all, could have been attempted on 25L or 07 R/L.
- 2.4.8 Pilot Flying (PF) in first place should not have gone below decision altitude, where he had to execute a go around with partial visual contact with the runway, and secondly there should not have been a subsequent approach / landing on the same runway. Rather it should have been a diversion. In next forty minutes, only one aircraft could land, whereas three aircraft executed missed approach from finals due to poor visibility and diverted to alternate airfields.

2.5 Observations

- 2.5.1 Analysis of the past two years' incidents of SAI aircraft indicates that out of investigated incidents, all were being operated by captains of other nationalities.
- 2.5.2 CVR could not be preserved by aircrew and could not be maintained by Engineering Department.
- 2.5.3 As mentioned in Daily Incident Occurrence & Un-serviceability Report (DIOUR) of 11 – 12 November 2008, that Karachi Radar at 11342LT received a telephone call from Subedar Rehmat from Malir Cantt. choki that a piece of metal sheet, suspected of the aircraft has been found. Required inspection was undertaken through Airside Inspectors. During the inspection Airside Inspector reported a scratch mark at right side with wing tip light found broken on M/s. SAI, aircraft AP-BJI B737 parked at washing bay. Shaheen Operation was contacted, who reported that during landing starboard wing tip of SAI-147 hit the runway surface, resulted breakage of starboard light and scratch at lower portion of wing tip. Later on Malir Cantt Choki was contacted and no person with name of Rehmat was available. Pilot / Operator of M/s. SAI did not inform ATC about the incident. No visible mark of scratches on the runway was observed during runway inspection.

2.6 Accident investigation support by Operator

- 2.6.1 Adequate help from operator was extended throughout the period of investigation. Recommendations made in 'Interim Report' have been implemented by the operator, except FDR / CVR down loading capability which remains awaited.

3. CONCLUSION

Flight continued below DA in partial contact with runway with Captain on control. After 100 ft RA, the aircraft had crossed runway threshold and suddenly, the visibility reduced because of a patch of fog / haze. He flew the aircraft to the left of runway below 50 ft RA. As he realized the aircraft already close to REIL (LH side), he decided to go round, attempted to come back on centre of runway by banking 19.5° to right at 10 ft AGL with pitch angle 12° at 123 kts. While in momentary right bank of 19.5° aircraft right wing tip brushed with ground.

- 3.1 **Cause of Occurrence :** Delayed execution of go around by aircrew, lack of adherence to SOPs and in adequate CRM

4. FINDINGS

- 4.1 Aircrew had adequate rest before the flight.
- 4.2 Visibility reported before descend was 6 KM. There was no observation made by incident aircrew on visibility during approach. However, Aircrew "stated" to have sighted a patch of haze obstructing the complete view of runway.

- 4.3 ATC observation was visibility 3 – 4 kms, but there was no intimation of deterioration in visibility by ATC.
- 4.4 Auto pilot was disengaged at 500' AGL, on an ILS established approach.
- 4.5 First Officer was pilot flying for the sector. At Decision Attitude (DA 218 feet AGL) captain took over control and became Pilot Flying and continued approach below DH in partial contact with runway.
- 4.6 Frequent / unsteady change in headings indicates unsure of runway 25R and visual contact.
- 4.7 The Captain was unsure of runway environment / layout (centre line Vs rwy edge lights) at the time of making approach and misjudged edge lights to be runway centre line.
- 4.8 Missed approach / go-around was initiated below the DA, and aircraft made a uncontrolled touch and go. Aircrew (Captain) displayed delayed as well as incorrect decision making.
- 4.9 After an intentional touch and go, aircraft achieved bank angle equal to 19.5° right, pitch angle of 12° up, IAS 123 kts at just 10 feet above the ground.
- 4.10 Bank angle of 19.5° at 10 feet was enough for right wing tip to touch the surface.
- 4.11 The Captain as pilot flying was unaware of the possibility of wing tip touching the surface therefore did not report the incident.
- 4.12 Similar visibility conditions prevailed for next several minutes but incident aircraft did not divert from Karachi Airfield. Rather attempted second approach on same runway.
- 4.13 Aircraft landed on subsequent approach. Whereas, there was no significant change in the visibility conditions.

5. SAFETY RECOMMENDATIONS

- 5.1 SAI to review their operations / maintenance procedures to ensure serviceability of CVRs and FDRs, and availability of possible read outs for monitoring (FDM).
- 5.2 SAI to employ all necessary measures to ensure adherence to the procedures of FOM/SOPs by aircrew on LVP and decision to go to alternate.
- 5.3 DFS, CAA as well SAI to provide practice of similar situations during Simulator training / checks and evaluate decision making of Captains in such situations.
- 5.4 Airline policy for employing aircrew from other countries and their recurrent training scheme may be studied / reviewed to address the observations made in this investigation.
- 5.5 Simulator checks of foreign aircrew be accomplished under the supervision of Company / PCAA Flight Inspectors.