



PAKISTAN CIVIL AVIATION AUTHORITY
(SAFETY INVESTIGATION BOARD)



FINAL REPORT

SERIOUS INCIDENT OF M/S SCHON AIR CESSNA-172P
AIRCRAFT, REG # AP-BJG NEAR JIAP, KARACHI
ON 25TH NOVEMBER, 2011

FINAL REPORT

INVESTIGATION INTO SERIOUS INCIDENT OF FORCED LANDING BY M/S SCHON AIR CESSNA-172P AIRCRAFT, REG # AP-BJG, NEAR MALIR, JIAP KARACHI ON 25TH NOVEMBER 2011

Synopsis

On 25th November 2011, a Cessna -172P aircraft of M/s Schon Air, reg # AP-BJG was on a cross country navigation training flight on route Karachi-Gharo-Thatta-Sajawal-Karachi. While heading towards Thatta, aircraft experienced power loss. Further navigation to point Sajawal was discontinued and training flight was aborted. Later it was reported by cockpit crew that aircraft is not able to sustain level flight. Subsequently, aircraft forced landed 2 nm South East (inline Rwy-25L) of AP, Karachi in an undulated playing ground at 1625 LT. Both the cockpit crew remained unhurt and the aircraft also did not apparently sustain any serious damage.

Investigation Authority

DG CAA issued notification vide Letter No HQCAA/1901/346/SIB dated 28th November 2011 attached as Appendix "A" and authorised Safety Investigation Board, PCAA to investigate the accident. No state was requested to appoint accredited representative.

Factual Information

1. **History of the Flight.** It was a cross country navigation training flight on Karachi-Gharo-Thatta-Sajawal-Karachi track.
2. **Injuries to Persons.** As a result of this serious incident no injury occurred to any person onboard the aircraft.
3. **Damage to Aircraft.** As a result of this serious incident no apparent damage occurred to the aircraft.
4. **Flight Crew Information.**
 - 4.1 **Instructor Pilot** : **Captain Jibran Shahid**
 - CPL No : 3000 valid till July 2012
 - Total experience all types : 310 Hrs
 - Instructional experience : 60 Hrs
 - On type experience : 200 Hrs



4.2 **Student Pilot**

Mohtashim Ahmed

- SPL No : 3474 (Under training for CPL)

5 **Aircraft Information.** The Cessna-172P aircraft was inducted by Schon Air on 30th August, 2010 from abroad at 15064.8 aircraft hours, 10157.7 Engine hours and 15898.5 Propeller hours. The detailed aircraft and engine related data as on 25th November, 2011 (the day of incident) is appended below:

6 **Aircraft.**

- Aircraft make : Cessna
- Type of Aircraft : 172P
- Manufacturing Date : 1980
- Serial No : 17276537
- Aircraft Registration : AP-BJG
- Aircraft Hours : 16221.20 FH

1.7 **Engine.**

- Engine Type/Model : Lycoming / O-320-D2J
- Engine S No : L-13613-39A
- Engine Hours : 404.30 TSO

1.8 **Propeller.**

- Propeller Type/Model : McCauley/C160/DTM7557
- Propeller S No : EB017
- Propeller Hours : 1157.20 hrs

1.8.1 **Certificate of Airworthiness** (C of A) for this aircraft was issued on 20th January, 2011 and **Certificate of Registration** (C of R) on 18th January, 2011 with a validity period of one year each.

1.9 **Meteorological information.** The general weather was fit to undertake the training flight and no significant weather was reported. The weather reports are attached as Appendix "B". The METARs issued by Meteorological Department at JIAP Karachi around the time of accident are appended below:

- OPKC 25/1000Z 07013G20 KTS 7000 SKC 31/05 Q1012.9 RH 20%
- OPKC 25/1030Z 07010G20 KTS 7000 SKC 30/05 Q1012.6 RH 20%

- OPKC 25/1100Z 07010G20 KTS 7000 SKC 30/05 Q1012.5 RH 20%

- 10 **Navigation Aids Availability.** Cessna 172P is equipped with ADF, VOR / DME and ILS equipment for the conduct of its training flight at Schon Air.
- 11 **Communication Aids Availability.** Cessna 172P aircraft is equipped with VHF radio for its two way radio contact with all concerned and relevant agencies during the conduct of flight.
- 12 **Flight Register.** The cross country navigation training flight of aircraft was duly recorded and authorized by Schon Air.
- 13 **Impact Information.** After the occurrence the incident site was promptly visited by the investigation team. All the available evidences including tyres marks on the surface were preserved through digital photography.
- 14 **Other Damages.** No other apparent damage was observed to the property or any infrastructure on ground.
- 1.1 **Aircrew Medical Examination.** Following the serious incident on 25th November, 2011 at Malir near JIAP, Karachi Blood and Urine samples of both the cockpit crew were collected which did not reveal any abnormality the medical tests reports are attached as Appendix "C".
- 1.15 **Fire.** No pre / post occurrence air / ground fire indications by Captain of aircraft and evidences of same by Investigation Team were observed.
- 1.16 **ATC Tape Extract.** ATC Tape Extracts were retrieved for detailed analysis and are attached as Appendix "D".
- 1.17 **CVR / FDR.** Cessna-172P is not equipped with onboard CVR / DFDR.

2 Analyses

2.1 Operational Analysis

- 2.1.1 **Chronology of Incident Events.** On 25th November 2011, the training flight was scheduled for "CFR X-CTY" from Karachi to Gharo-Thatta-Sujawal and back to Karachi at 1500 LT. The pre flight inspection indicated full fuel onboard (i.e. 50 Gallons usable; 25 in each tank). Takeoff was accomplished from RWY 07R at 1505 LT, and the aircraft proceeded direct to Gharo climbing to FL055 as cleared by ATC. On reaching FL 055 approximately 15 N.M. out of Karachi, the aircraft was levelled off cruising at 90 KIAS, 2300 RPM and lean Fuel-Air mixture.
- 2.1.2 About 2 nm short of Thatta, slight loss of power was suspected. Within a minute, RPM was observed fluctuating within 200-300 RPM loss on tachometer. Fuel-Air mixture was adjusted to full Rich position but power loss continued. Engine Oil Temperature and Pressure gauges were showing within their normal operating limits. Aircraft cruise checklist was consulted, and as a



precautionary step, further flight to Sajawal was discontinued. An immediate diversion back to Karachi was initiated with information to JIAP ATC.

- 1.3 While heading back straight for RWY-25L, the aircraft was able to maintain allotted FL055. However, after Ghara, the aircraft started to lose height gradually. Being unable to sustain flyable speed with ROD, the aircraft was forced landed 2 nm short of runway in a playing field.

- 1.4 **Check-list actions.** Prescribed procedures for such a situation are as follows:

1.5 **Engine Failure / Power Loss during Flight.**

- Airspeed. : 60 KIAS
- Fuel Selector : On Both
- Mixture : Rich
- Throttle : Open
- Carburettor Heat : On
- Primer : In and Locked
- Magnetos : Check Both

2.1.6 **Emergency Landing without Power.**

- Seat, Seat belt, Shoulder Harness – Secured
- Airspeed (flaps up) : 65 KIAS
- Landing Site : Determine
- Mixture : Rich
- Fuel Selector Valve : Open
- Ignition Switch : Off
- Flaps : As Required
- Master Switch : Off
- Doors: : Unlatch
- Touch Down : Slightly tail low
- Brakes : Apply



- 1.7 **Post Forced Landing Event.** A large and uncontrolled mob of locals surrounded the aircraft and even tried to move the aircraft with the intentions of hiding it. The situation was controlled by timely intervention of Rangers and local Police. Yet thousands of people remained at the forced landing site till very late night. Finally, the wings of the aircraft were dismantled and aircraft was brought back on trailer in the late hours of night.
- 1.8 At 1603:30 hrs, on the onset of impending power loss situation close to Thatta, as precautionary measures, the Instructor Pilot {Pilot in command (PIC)} took over the controls of aircraft from Student Pilot (SP), turned back towards JIAP Karachi and asked for descend clearance. PIC also briefed SP to remain attentive to the situation. (Pilot in command) PIC then followed checklist actions to handle the abnormal situation.
- 1.9 From Thatta a direct course of 280° was maintained to proceed to JIAP Karachi Rwy-25L. The throttle was opened and maintained at full position, but still slight power loss was observed by PIC along with rpm fluctuations between 200-300 and audible engine rough running.
- 1.10 While checking engine controls, PIC applied Carburettor heat which did improve the situation but power loss continued. It was also observed that the Carburettor heat lever was not working completely.
- 1.11 To rule out the possibility of Magneto malfunction, magnetos were also checked, but indication on Tachometer showed continuous more than 500 rpm loss. In order to avoid further RPM drop, the switch was selected back to "Both" position. Same RPM drop was experienced on left magneto as well.
- 2.1.12 Considering any fuel blockage in fuel lines, PIC changed selection of fuel tanks from "Both" to Left and Right, but changing position did not restore lost RPM or assisted in reduction of rpm fluctuation. The Position of Fuel tanks was selected back to "Both". However, the power available was not sufficient to maintain level flight.
- 2.1.13 PIC informed approach radar of its engine malfunction and requested priority landing through runway 25L/R. The runway in use was 07L/R, however runway 25L/R was approved on pilot discretion with shortest possible radar vectors and descend clearance to 2000 ft. While recovering back to JIAP, Karachi PIC started looking for suitable field all the way for possible forced landing.
- 2.1.14 From abeam Gharo, aircraft started losing its assigned Flight Level. PIC maintained Gliding Speed of 65 KIAS which initially gave rate of descent between 500-700 fpm and subsequently it kept increasing. PIC tuned ATIS on 126.70 MHz to listen Karachi aerodrome information and ADF Karachi was also utilized to approach directly.
- 2.1.15 At 7 - 8 NM short of runway 25 L/R, power loss increased significantly with engine rpm fluctuations ranging between 1100 to 1600 RPM. ATC Tower was informed and permission to descend to circuit altitude (1100 Feet AMSL) was obtained. However, loss of power could not be restored to sustain level flight



any more. While crossing 900 Feet AMSL, PIC decided to force land the aircraft in the play ground area, as it was not possible to clear Malir Cantt residential areas and reach runway. PIC informed ATC Tower accordingly.

1.16 It was noted that the request for descent close to Thatta was made by the cockpit crew at 1603:45 hrs after observing first indication of power loss. However, PIC informed ATC of having "some engine problem" and requested for "priority" at 1610:45 hrs.

1.17 The cockpit crew took the correct actions to recover the aircraft engine performance; however, they could not recover the engine performance parameters to satisfactory level which resulted in non-sustenance of flight at desired altitude and the aircraft lost altitude continuously. The cockpit crew made a decision to force land the aircraft in play ground area when they were sure of not making the runway at JIAP, Karachi and made a successful force landing. The decision of force landing is considered delayed and late by PIC, as it could have been detrimental to the safety of aircraft and persons onboard.

2 Technical Analysis

2.1 **Onsite Aircraft & Engine Inspection.** After the aircraft forced landing, the onsite aircraft and engine were thoroughly examined with a view to record all the available evidences which could have directly or indirectly contributed towards causation of serious incident. There was no apparent damage to the aircraft and engine. It was stated by the PIC that the engine had been switched off prior to touch down.

2.2.2 **Availability of Fuel and Oil.** Both the wing tanks were inspected and sufficient quantity of fuel was found available in the tanks. Similarly, oil dipstick level was found up to the required level. Samples of fuel and oil were collected for subsequent lab testing.

2.2.3 **Inspection of Engine.** Detailed examination of engine was conducted. It did not reveal any anomaly related to integrity of engine controls (throttle and mixture) or electrical supply system. All control cables, electrical leads, linkages and connections were found properly installed and secured.

2.2.4 **Defect History.** The scrutiny of aircraft and engine log books revealed only a few minor defects since the induction of this aircraft. One such defect was related to engine performance. According to which; on 14th November 2011 after take-off at 300 ft AGL, the aircraft experienced sudden vibrations along with oil temperature drop from mid to lower green arc. The vibrations remained for 6 to 8 seconds and disappeared when the power was reduced to around 2300 rpm. After carrying out the inspection of essential structural and engine related components / parts, the engine was given ground run and all parameters were found within limits. The defect was not repeated in subsequent flights.

2.2.5 No other engine related significant anomaly was observed in the defect history.



2.6 **Electrical Plugs.** All electrical plugs were removed, inspected and functionally tested. No anomaly was observed in their physical condition and functional performance.

2.7 **Scheduled and Unscheduled Maintenance Record.**

2.8 The aircraft was properly serviced and had no outstanding snag before the flight.

2.9 Last Check-III (200 hrs / 12 months) was carried out on 2nd November, 2011 at 16188.30 hours. Compression Checks were conducted during that check and subsequently after the serious incident on 2^{5th} November, 2011 as per **Textron Lycoming Service Instruction No 1191A Dated 28th September, 1998.**

2.10 The compression checks indicated that pressure reading for all the four cylinders were equal and above 70 psi, indicating satisfactory results which are appended below:

Date	Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
22 Nov 2011 (During Check-III)	76/80	78/80	78/80	78/80
On 26 Nov 2011 (Post incident)	76/80	78/80	72/80	76/80

2.2.11 **Fuel and Oil Test Results.** The fuel and oil samples taken from the aircraft and engine immediately after the forced landing and from the source were subjected to detailed lab test. The test results, attached as Appendix "E" and "F" indicated no anomaly. It was, therefore, concluded that the fuel and oil used for servicing the aircraft and engine were fit for aviation use.

3. **Findings**

3.1 The aircraft was properly serviced and had no outstanding snag before the flight on 25th November, 2011.

3.2 The fuel and oil were fit for use on aircraft.

3.3 There was no fuel or oil starvation during the flight.

3.4 There was no discontinuity in the electrical supply system.



The compression checks of all four cylinders conducted after the accident indicated satisfactory results.

After finding no abnormality with any of the aircraft or engine system / sub-systems, the engine ground run was performed in which all parameters including Magnetos' timings were found within limits and no other abnormality with the engine performance was observed.

Functional check flight conducted after finding satisfactory engine performance during the detailed investigation process was also found satisfactory.

- 8 Flight crew was qualified as per existing rules and was authorized for the flight.
- 9 Aircraft developed partial power loss in air, which could not be verified on ground during the investigation process.
- 10 Flight crew executed correct checklist actions for handling power loss situation in air.
- 11 Aircraft was forced landed with engine switched off.

Conclusion

- 1 The PIC carried out all the desired checklist actions and took correct decision of immediate recovery back to JIAP, Karachi. The PIC after experiencing further loss of power executed a successful forced landing in play ground area near Malir, Cantt 2 nm short of runway 25L/R. During the detailed investigation, no anomaly related to aircraft or engine systems / sub-systems could be found which could have directly or indirectly caused the occurrence.

Finalization

- 4.2 **Cause of Occurrence.** The cause of occurrence could not be determined as all suspected systems / sub-systems were found operating satisfactorily during the process of investigation.

5. Safety Recommendations

Nil

