



PAKISTAN CIVIL AVIATION AUTHORITY
(SAFETY INVESTIGATION BOARD)



FINAL REPORT

SERIOUS INCIDENT OF M/S SCHON AIR CESSNA-172P
AIRCRAFT, REG # AP-BJG FORCED LANDING NEAR
SUPER HIGHWAY AT 064⁰ / 56 NM FROM
JIAP, KARACHI ON 19TH MARCH, 2012

FINAL REPORT

SERIOUS INCIDENT OF FORCED LANDING BY M/S SCHON AIR CESSNA-172P AIRCRAFT, REG # AP-BJG, 56NM NORTHEAST OF KARACHI ON 19TH MARCH 2012

Synopsis

On 19th March 2012, during a training flight while flying from Nawabshah to Karachi, the Captain observed engine partial power loss. The Captain planned diversion to Hyderabad for a safe landing as the aircraft was unable to sustain level flight with the available power. The aircraft made a forced landing near Super Highway at 064⁰ / 56 nm from JIAP, Karachi. Both the cockpit crew remained unhurt and the mishap aircraft did not sustain any apparent structural damage.

Investigation Authority

DG CAA issued notification vide Letter No HQCAA/1901/349/SIB dated 21st March, 2012 attached as Appendix "A" and authorised Safety Investigation Board, PCAA to investigate the accident. No state was requested to appoint accredited representative.

1. Factual Information

1.1 **History of the Flight.** It was a cross country navigation training flight on Karachi – Nawabshah – Karachi sectors.

1.2 **Injuries to Persons.** As a result of this serious incident no injury occurred to any person onboard the aircraft.

1.3 **Damage to Aircraft.** As a result of this serious incident no apparent damage occurred to the aircraft.

1.4 Flight Crew Information.

1.4.1 Instructor Pilot

	:	Captain Omar Kashmiri
• CPL No	:	2499 valid till August, 2012
• Total experience all types	:	1147 Hrs
• Instructional experience	:	761 Hrs
• Cessna-152 / 172 experience	:	974 Hrs

1.4.2 Student Pilot

	:	Haider Ali
• SPL No	:	3747 (Under training for CPL)



1.5 **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 18th March, 2012 (a day before the incident) is appended below:

1.6 **Aircraft**

- Aircraft make : Cessna
- Type of Aircraft : 172P
- Manufacturing Date : 1980
- Serial No : 17276537
- Aircraft Registration : AP-BJG
- Aircraft Hours : 16242.40 FH

1.7 **Engine**

- Engine Type/Model : Lycoming / O-320-D2J
- Engine S No : L-13613-39A
- Engine Hours : 425.50 TSO

Note :- Engine was overhauled at 2400 hrs instead of 2000 hrs with life extension contrary to the Original Equipment Manufacturer (OEM) instructions.

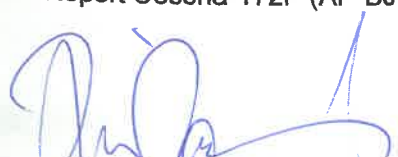
1.8 **Propeller**

- Propeller Type/Model : McCauley/C160/DTM7557
- Propeller S No : EB017
- Propeller Hours : 1178.40 hrs

1.8.1 **Certificate of Airworthiness** (C of A) for the mishap aircraft was issued on 09th March, 2012 with a validity period of one year.

1.9 **Meteorological information.** The general weather was fit to undertake the training flight and no significant weather was reported. The weather report in respect of Karachi, Nawabshah and Hyderabad airports are attached as Appendix "B". The METARs issued by Meteorological Department at JIAP Karachi, Nawabshah and Hyderabad around the time of serious incident on 19th March, 2013 are appended below:

- OPKC 19/0700Z 26017G20 KTS 8000 FEW020 29/17 Q1013.8 RH 47%
- OPKC 19/0800Z 24018G20 KTS 8000 SKC 31/16 Q1012.8 RH 41%
- OPKC 19/0900Z 29009 KTS 8000 SKC 31/17 Q1011.8 RH 40%
- OPKC 19/1000Z 25015 KTS 8000 SKC 32/15 Q1011.1 RH 36%
- OPNH 19/0700Z 22510 KTS 6000 FEW200 36/10 Q1009.2 RH 20%
- OPNH 19/0800Z 22510 KTS 6000 38/10 Q1008.2 RH 15%



- OPNH 19/0900Z 27012 KTS 6000 40/10 Q1007.8 RH 16%
 - OPNH 19/1000Z 27012 KTS 6000 40/10 Q1006.9 RH 16%
 - OPHY 19/0700Z 22520 KTS 6000 35/10 Q1009.7 RH 21%
 - OPHY 19/0800Z 22514 KTS 6000 37/10 Q1009.1 RH 19%
 - OPHY 19/0900Z 22514 KTS 6000 39/07 Q1008.4 RH 14%
 - OPHY 19/1000Z 22516 KTS 6000 38/05 Q1007.3 RH 13%
- 1.10 **Navigation Aids Availability.** Cessna 172P is equipped with ADF, VOR / DME and ILS equipment for the conduct of its training flight at Schon Air.
- 1.11 **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.
- 1.12 **Flight Register.** The cross country navigation training flight of aircraft was duly recorded and authorized by Schon Air.
- 1.13 **Impact Information.** After the occurrence, the incident site was promptly visited by the investigation team and the available evidences were preserved through digital photography.
- 1.14 **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 19th March, 2012 the 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 evidence of pre / post occurrence air / ground fire was observed.
- 1.16 **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 19th March, 2012 the training flight was scheduled on Karachi - Nawabshah – Karachi sectors. After carrying out pre-flight inspection of the aircraft engine was started and no abnormality was observed in the engine performance parameters on ground. The mishap aircraft took off and proceeded to Nawabshah and the flight remained uneventful. The aircraft departed from Nawabshah at 0905UTC and levelled off at FL064 while proceeding to Karachi via Badil.
- 2.1.2 At about 40 nm out of Nawabshah, the first symptoms of power loss were observed by the Instructor Pilot. The engine rpm was observed between 2300 – 2500 at full power. The Instructor Pilot decided to divert to Hyderabad for making a safe landing. The mishap aircraft was cleared to descent to

FL045. After a little while, further reduction in available power was observed by the Instructor Pilot and the rpm dropped to 1500 – 2000 range, which resulted in inability of aircraft to maintain a level flight. A slow descent rate was maintained to sustain aircraft speed. The loss of power further worsened and the rpm dropped to 1000 – 1600 with constant reduction in altitude.

2.1.3 At 1200 ft AMSL the Instructor Pilot transmitted his intentions to Karachi Control that he would be making a forced landing due to his inability to maintain altitude. The mishap aircraft made a forced landing near Super Highway at 064⁰ / 56 nm from JIAP, Karachi.

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

2.1.5 **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

2.1.7 The Instructor Pilot took the correct actions to recover the engine performance; however, he 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 Instructor Pilot coordinated and planned diversion to Hyderabad Airport for making a safe landing. However, the aircraft engine performance parameters dropped to



such a level where it was not possible to reach Hyderabad Airport. At that stage Instructor Pilot made the decision to force land the aircraft on unprepared level surface in the vicinity of Super Highway and executed a safe forced landing. Both the cockpit crew along with a trainee (student pilot) in the rear compartment remained unhurt. There was also no apparent structural damage to the mishap aircraft.

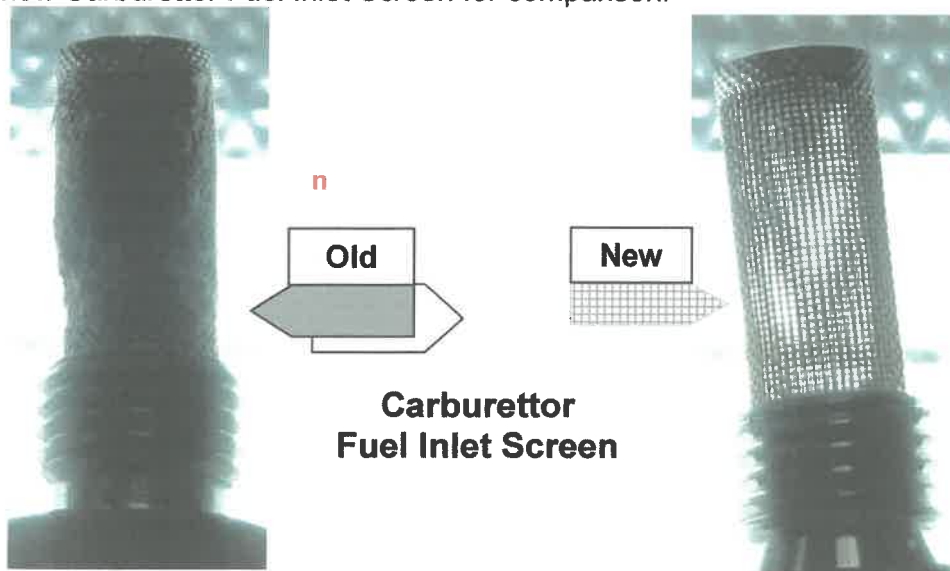
2.2 Technical Analysis

2.2.1 Onsite Aircraft & Engine Inspection. After the aircraft forced landing, the onsite aircraft and engine were thoroughly examined. All the available evidences were recorded. There was no apparent damage to the aircraft and engine.

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.

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 Carburettor Fuel Inlet Screen. Carburettor Fuel Inlet Screen was removed from the Carburettor. It was found in almost completely clogged condition. Further investigation revealed that the Carburettor Fuel Inlet Screen was not removed and inspected during the last overhaul by Schon Air Maintenance Organization considering it to be an integral part of the carburettor contrary to the Original Equipment Manufacturer (OEM) instructions which required its removal, inspection, cleaning and replacement (if found damaged or deteriorated). Reference maintenance procedures for Lycoming engines given in Lycoming Operator's Manual (refer Appendix "D") and carburettor overhaul instructions given in Marvel-Schebler Aircraft Carburetor Overhaul Instructions for models MA-4-5 and MA-4-5AA. The photographs below show the clogged Carburettor Fuel Inlet Screen removed from the carburettor and the new Carburettor Fuel Inlet Screen for comparison.



- 2.2.5 **Defect History.** The scrutiny of aircraft and engine log books was carried out. It was observed that the aircraft experienced a similar occurrence on 25th November, 2011. In that also the aircraft had to force land after experiencing the partial power loss which could not be recovered. The cause of occurrence; however, could not be established in that investigation.
- 2.2.6 **Electrical Plugs.** All electrical plugs were removed, inspected and functionally tested. No anomaly was observed in their physical condition and functional performance.
- 2.2.7 **Scheduled and Unscheduled Maintenance Record.**
- 2.2.8 The aircraft was properly serviced and had no outstanding snag before the flight.
- 2.2.9 Last Check-III (200 hrs / 12 months) was carried out on 30th January, 2012 for "C of A" renewal inspection. The compression checks conducted during the check as per Textron Lycoming Service Instruction No 1191A dated 28th September, 1998. The compression check of cylinders indicated satisfactory status of all the four cylinders.
- 2.2.10 **Fuel Test Results.** The fuel sample taken from the aircraft after the forced landing was subjected to detailed laboratory test. The test result is attached as Appendix "E" which indicated no anomaly. It was, therefore, concluded that the fuel serviced in the aircraft was fit for use.

Observations

- 2.2.11 The last engine overhaul was carried out by Schon Air Maintenance Organization after completing 2400 hrs instead of 2000 hrs by granting life extension as per CAA Pakistan Airworthiness directive vide AWNOT-043.AWXX-4.0, contrary to the OEM recommendations (refer OEM reply attached as Appendix "F").
- 2.2.12 Neither Schon Air Maintenance Organization nor CAA Pakistan Airworthiness consulted the OEM before granting life extension to engine overhaul (400 hrs over and above the 2000 hrs TBO specified by the OEM).
- 2.2.13 Serious anomalies were observed in engine hours record keeping in log book which remained undetected by CAA Pakistan during inspection for C of A renewal in March, 2012.
- 2.2.14 The engine power loss experienced on 25th November, 2011 was not recorded by Schon Air in aircraft and engine log books.
- 2.2.15 CAA Pakistan while carrying out inspection for C of A renewal in March, 2012 could not identify the lapse on the part of operator of not recording the important data related to serious in-flight incident of engine power loss on 25th November, 2011 in the aircraft and engine log books.



3. Findings

3.1 Operational

- 3.1.1 The training flight was duly authorized by the former Schon Air Management on the day of occurrence.
- 3.1.2 The weather was fit to undertake the said training flight on the day of occurrence.
- 3.1.3 The cockpit crew was qualified as per existing rules and regulations in vogue for the conduct of said training flight.
- 3.1.4 On 19th March, 2012 the aircraft departed from Nawabshah at 0905UTC and levelled off at FL064 while proceeding to Karachi via Badil.
- 3.1.5 At about 40 nm out of Nawabshah, the first symptoms of power loss were observed by the Instructor Pilot.
- 3.1.6 The power was observed between 2300 – 2500 rpm at full power. The Instructor Pilot decided to divert to Hyderabad for making a safe landing.
- 3.1.7 The mishap aircraft was cleared to descent to FL045.
- 3.1.8 After a little while, further reduction in available power was observed by the Instructor Pilot and the rpm dropped to 1500 – 2000 range, which resulted in inability of aircraft to maintain a level flight. A slow descent rate was maintained to sustain aircraft speed.
- 3.1.9 The engine oil temperature and pressure were found in normal limits.
- 3.1.10 The loss of power further worsened and the rpm was observed dropping to 1000 – 1600 with constant reduction in altitude.
- 3.1.11 At 1200 ft AMSL the Instructor Pilot transmitted his intentions to Karachi Control that he would be making a forced landing due to his inability to maintain constant altitude.
- 3.1.12 The instructor Pilot successfully and safely executed the forced landed of mishap aircraft near Super Highway at 0640 / 56 nm from JIAP, Karachi.
- 3.1.13 The Instructor Pilot carried out correctly all the recommended remedial checklist actions for handling power loss situation in air.
- 3.1.14 Instructor Pilot handled the abnormal partial power situation professionally and successfully executed the forced landing without any physical injury to cockpit crew along with trainee student in the rear compartment or damage to the aircraft structure on 064⁰ / 56 nm from JIAP, Karachi.



3.2 Technical

- 3.2.1 The aircraft was properly serviced and had no outstanding snag before the flight on 19th March, 2012.
- 3.2.2 The fuel and oil were fit for use on aircraft.
- 3.2.3 There was no fuel or oil starvation during the mishap training flight.
- 3.2.4 There was no discontinuity in the electrical supply system.
- 3.2.5 The compression check of all the four cylinders conducted after the serious incident confirmed satisfactory performance of the cylinders.
- 3.2.6 Carburettor Fuel Inlet Screen was found completely clogged.
- 3.2.7 Carburettor Fuel Inlet Screen was not removed and inspected during the last overhaul by Schon Air Maintenance Organization contrary to the OEM instructions.
- 3.2.8 After replacement of the old Carburettor Fuel Inlet Screen with a new one, the engine ground run was performed in which all parameters were found within limits.
- 3.2.9 No abnormality with any other system / sub-systems of the aircraft or engine was observed.

4. Conclusion

- 4.1 The Instructor Pilot carried out all the desired checklist actions correctly and took the right decision of diverting to Hyderabad Airport (nearest available airport) after encountering the partial power loss abnormality. Due to the continuous degradation in engine performance parameters, the Instructor Pilot executed a successful forced landing in the near vicinity of Super Highway at 064⁰ / 56 nm from JIAP, Karachi.
- 4.2 During the detailed investigation, Fuel Inlet Screen of the Carburettor was found completely clogged which resulted into insufficient fuel supply from carburettor to the engine and caused the partial power loss.

5. Finalization

- 5.1 **Cause of Occurrence.** Non conformance of the OEM instructions by Schon Air Maintenance Organization resulted in failure to carry out inspection of Carburettor Fuel Inlet Screen during the last overhaul which got clogged in subsequent operational service and caused the serious incident of partial power loss.

6. Safety Recommendations

- 6.1 All general aviation maintenance organizations and operators are to ensure strict compliance of the OEM instructions.



- 6.2 All general aviation maintenance organizations and operators are to ensure inspection of the Carburettor Fuel Inlet Screen as per the schedule inspections specified by the OEM.
- 6.3 All general aviation maintenance organizations and operators are to ensure the correct aircraft and engine hours' record keeping in respective log books.
- 6.4 CAA Pakistan is to ensure strict compliance of OEM instructions by all general aviation maintenance organizations and operators.
- 6.5 CAA Pakistan is to study and review Airworthiness Notice Awnot-043.AWXX-4.0 regarding engines' TBO life extensions to make it in line with the instructions of respective OEMs.
- 6.6 CAA Pakistan is to ensure that the decision regarding extension in life cycle to any aircraft or engine component conforms to the OEM instructions. Any change in the same be effected after seeking advice from the OEM.
- 6.7 CAA Pakistan is to ensure correct aircraft and engine hours' record keeping in log books by all general aviation maintenance organizations and operators.