FINAL INVESTIGATION REPORT

SERIOUS INCIDENT OF PAKISTAN INTERNATIONAL AIRLINES FLIGHT PIA 398 AIRBUS A320-214 AIRCRAFT REG. NO. AP-BLU AT SIALKOT INTERNATIONAL AIRPORT ON 12TH FEBRUARY, 2018

Dated: 28th March, 2023

SCOPE

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ABBREVIATIONS

AAIB	Aircraft Accident Investigation Board
ATC	Air Traffic Control
AIIAP	Allama Iqbal International Airport, Lahore
AP	Auto Pilot
A/THR	Auto Thrust
ATPL	Air Transport Pilot License
CAA	Civil Aviation Authority
CB	Cumulonimbus
CPL	Commercial Pilot License
CRM	Crew Resource Management
FCTM	Flight Crew Training Manual
FD	Flight Director
FL	Flight Level
FO	First Officer
ft	Feet
hPa	Hectopascal
hrs	Hours
ILS	Instrument Landing System
JIAP	Jinnah International Airport, Karachi
L/G	Landing Gear
LOC	Localizer
MOR	Mandatory Occurrence Report
NM	Nautical Miles
PCAA	Pakistan Civil Aviation Authority
PF	Pilot Flying
PIA	Pakistan International Airlines
PM	Pilot Monitoring
QNH	Atmospheric Pressure (Q) at Nautical Height
R/W	Runway
SIAP	Sialkot International Airport, Sialkot
SOP	Standard Operating Procedure
TSRA	Thunderstorm Rain
UTC	Universal Time Coordinated
VHF	Very High Frequency

INFORMATION ON NOTIFICATION

This serious incident was reported to AAIB Pakistan, by Pakistan Civil Aviation Authority (PCAA) and General Manager Safety & Quality Assurance Pakistan International Airlines (PIA). Ministry of Aviation, Government of Pakistan issued Notification on 05th March, 2018 constituting an investigation team to investigate this serious incident. The investigation has been conducted by AAIB, Pakistan.

SYNOPSIS

Pakistan International Airlines (PIA) flight PIA 398 aircraft Airbus A320-214 Reg. No. AP-BLU was a scheduled passenger flight from Jinnah International Airport (JIAP), Karachi to Sialkot International Airport (SIAP), Sialkot. While approaching SIAP, Sialkot for landing, the aircraft encountered weather radar failure, which was subsequently recovered upon recycling the system. The aircraft executed Go-Around and decided to divert to Allama Iqbal International Airport (AIIAP), Lahore. During climb out, a Lightning Strike was encountered. While approaching AIIAP, Lahore multiple system failures were encountered and the aircraft diverted to JIAP, Karachi.

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SECTION 1 - FACTUAL INFORMATION

1.1. History of the Flight

1.1.1. On 12th February, 2018 at 22:13:00 Universal Time Coordinated (UTC), PIA Airbus A320-214 aircraft Reg. No. AP-BLU, took off from JIAP, Karachi, Pakistan to perform a regular commercial passenger flight (PIA 398) to SIAP, Sialkot, Pakistan. The enroute flight was uneventful. Accordingly, all corresponding timings are mentioned in UTC.

1.1.2. At 23:26:00, PIA 398 informed SIAP Tower that they are out of FL150 for FL110 and asked for further descent. SIAP Tower cleared PIA 398 to descend to 6,000 ft on QNH 1015 hPa. At this time, PIA 398 was at 48 NM from SIAP, Sialkot.

1.1.3. At 23:31:00, PIA 398 was 22 NM short of SIAP, Sialkot and was descending through 7,300 ft, when it was cleared by SIAP Tower to turn directly for 10 NM finals for R/W 04 and descend to 3,200 ft. Once PIA 398 was passing through 5,000 ft, it asked SIAP Tower for cloud base. Sialkot Tower informed PIA 398 that there were scattered Clouds at 4,000 ft and Cumulonimbus (CB) Clouds at 3,000 ft overhead SIAP, Sialkot.

1.1.4. At 23:34:00, PIA 398 acknowledged and at 23:35:00 informed SIAP Tower about Going Around. SIAP Tower cleared them for initial climb to 3,000 ft.

1.1.5. At 23:36:00, PIA 398 expressed intentions to turn left. SIAP Tower cleared them to climb visually to 3,000 ft and asked if they had field in sight to which PIA 398 replied Negative and informed that they are climbing to 5,000 ft. SIAP Tower cleared them accordingly.

1.1.6. At 23:37:00, SIAP Tower asked for the intentions of PIA 398 to which PIA 398 replied that they would like to turn for another Approach and heading 350°. SIAP Tower cleared PIA 398 for circling Approach for Runway (R/W) 04 and, as convenient, to report established on Localizer (LOC). At 23:38:00, PIA 398 informed SIAP Tower that they are climbing to 7,000 ft.

1.1.7. At 23:39:00, SIAP Tower cautioned PIA 398 for International Border. PIA 398 acknowledged and requested climb to 10,000 ft and reported diverting to AIIAP, Lahore. While climbing through 8000 ft, the aircraft encountered a lightning strike.

1.1.8. At 23:40:00, SIAP Tower informed PIA 398 to contact Lahore Radar 127.5 MHz. PIA 398 informed SIAP Tower about diverting to AIIAP, Lahore in coordination with AIIAP, Lahore and climbing to FL200 at 23:41:00. SIAP Tower asked for the reasons of diversion to which PIA 398 replied, *"We are climbing to FL200 and will call you again"*.

1.1.9. At 23:42:00, during climb out, aircraft was in coordination with Lahore Radar. At this time, AIIAP, Lahore was also reporting partly cloudy conditions. During the approach to AIIAP, Lahore, Auto Pilot (AP) tripped with unsuccessful reset coupled with Auto Thrust (A/THR) failure. In addition, the Flight Directors (FDs) also became unserviceable. Upon encountering these failures, flight crew decided to discontinue the Approach at AIIAP, Lahore.

1.1.10. During the process, the airspeed also exceeded beyond the aircraft Landing Gear (L/G) retraction limits due to which the L/G could not be retracted.

Captain then called another A320 Captain who was travelling as a passenger on the same flight. The second Captain guided the flight crew regarding L/G retraction and system failure diagnosis. Aircraft then diverted and landed safely at JIAP, Karachi at 01:53:00.

1.2. Injuries to Persons

1.2.1 During this occurrence there were no injuries to crew and passengers.

1.3. Damage to Aircraft

1.3.1 Aircraft experienced Lightning Strike when climbing out through 8,000 ft after discontinuing Approach for R/W 04 at SIAP, Sialkot. Post flight inspection revealed damage to Fuselage and Probes of the aircraft.

1.3.2 The aircraft sustained extensive burn marks and pitting at different areas of the fuselage and wing on both sides. Additionally, static dischargers, VHF antenna, Standby pitot probe, fire seal, ice detection probe as well as flap and rudder tips were damaged.

1.4. Other Damages

1.4.1. No other damages were reported.

1.5. Personnel Information

Captain	
Date of Birth	26th August, 1971
Date of Joining PIA	03rd March, 1996
License type	Air Transport Pilot License (ATPL)
Last Medical Examination	17th October, 2017 (Class-I)
Flying Experience	F27 / Cessna / Tomahawk / B4 Airbus / B737 / A310 / B777 / ATR / A320
Type Rating	A320
Total in Command on A320	1,536 hrs
Grand Total	12,000 hrs
Last Simulator Training	Kuala Lumpur, Malaysia (24th October, 2017)

Table - 1 Captain's Brief Description

First Officer (FO)	
Date of Birth:	15th February, 1980
Date of Joining PIA:	02nd January, 2012
License type:	Commercial Pilot License (CPL)
Last Medical Examination:	28th February, 2017 (Class-I)
Flying Experience:	Cessna / ATR / A320
Type Rating:	A320
Total in Command on A320:	779 hrs
Grand Total:	Bangkok, Thailand (29th November, 2017)
Last Simulator Training:	15th February, 1980

Table - 2 FO's Brief Description

1.6. Aircraft Information

Aircraft	
Aircraft Make & Model:	Airbus A320-214
Registration Marking:	AP-BLU
Year of Manufacture:	2006
Manufacturer Serial No.:	2719
Owner / Lessor:	Icelandic Aircraft Management (IAM) Aviation
Operator:	Pakistan International Airlines (PIA)
Date of Induction in PIA:	17th June, 2015 (Dry Lease)

Table - 3 Aircraft Details

1.7. Meteorological Information

1.7.1 At the time of incident, SIAP, Sialkot was reporting Thunderstorm Rain (TSRA) with few CB clouds. The weather at SIAP, Sialkot throughout the day had been overcast with rain changing to Thundershowers in the evening. In the morning, AIIAP, Lahore was reporting Thunderstorm rain which changed to partly cloudy weather during the afternoon for the rest of the day.

1.8. Aids to Navigation

1.8.1 Navigational aids for SIAP, Sialkot and navigational aids for AIIAP, Lahore are provided below. At the time of the incident no abnormality was reported for either SIAP, Sialkot or AIIAP, Lahore.

OPST AD 2.19 RADIO NAVIGATION AND LANDING AIDS

TYPE OF AID CAT of ILS (VAR VOR/ ILS)	ID	Frequency	Hours of operation	Site of transmitting antenna coordinates	Elevation of DME transmitting antenna	Remarks
1	2	3	4	5	6	7
ILS/LOC CAT I 04	ISL	109.3 MHz	H24	323305.51N 0742252.74E	-	-
VOR/DME	SLT	113.8 MHz	H24			

Table - 4 Radio Navigation and Landing Aids – Sialkot International Airport

OPLA AD 2.19 RADIO NAVIGATION AND LANDING AIDS

TYPE OF AID	ID	Frequency	Hours of operation	Site of transmitting antenna coordinates	Elevation of DME transmitting antenna	Remarks
1	2	3	4	5	6	7
ILS/LOC CAT I 36L	ILO	109.7 MHz	H24	313223.66N 0742410.53E	-	-
ILS/LOC CAT III 36R	ILA	109.9 MHz	H24	313224.49N 0742417.66E	-	Coverage 20NM
NDB	LA	268.0 kHz				

Table - 5 Radio Navigation and Landing Aids – Allama Iqbal International Airport

1.9. Communications

1.9.1 Communication frequencies for SIAP, Sialkot and for AIIAP, Lahore are provided below. At the time of the incident no abnormality was reported for either SIAP, Sialkot or AIIAP, Lahore.

Table - 6 ATS Communication Facilities – Sialkot International Airport

OPLA AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency	Hours of operation	Remarks
1	2	3	4	5
APP	Lahore APP	121.30 MHZ	H24	Primary
APP	Lahore APP	121.50 MHZ	H24	Emergency
APP	Lahore APP	125.30 MHZ	H24	Secondary
ATIS	ATIS	126.30 MHZ	H24	-
BS	Radio Pakistan	630.00 KHZ	HX	0130 --1900 HR
BS	Radio Pakistan	1090.00 KHZ	HX	Variable SKED
GCA	Lahore Ground	118.40 MHZ	H24	Primary
GCA	Lahore Ground	121.80 MHZ	H24	Secondary
TWR	Lahore Tower	118.10 MHZ	H24	Primary
TWR	Lahore Tower	118.875 MHZ	H24	Secondary

Table - 7 ATS Communication Facilities – Allama Iqbal International Airport

1.10. Aerodrome Information

1.10.1 Aerodrome Information of SIAP, Sialkot and AIIAP, Lahore are provided below. At the time of incident, no abnormality was reported for either SIAP, Sialkot or AIIAP, Lahore.

OPST AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	True bearing	Dimensions of RWY (M)	Strength (PCN) and surface of RWY and SWY	THR coordinates	THR elevation and highest elevation of TDZ of precision APP RWY	Slope of RWY/SWY
1	2	3	4	5	6	7
04	43.16°	3600 x 45	64/F/B/X/T For surface (See remarks)	323126.04N 0742102.61E	THR 239.00 M / 784.12 FT TDZ 239.06 M(784.32 FT)	0.017% up
22	223.16°	3600 x 45	64/F/B/X/T For surface (See remarks)	323251.28N 0742236.98E	THR 239.46 M / 785.63 FT	Nil

SWY dimension (M)	CWY dimension (M)	Strip dimension (M)	RESA dimension (M)	Arresting system	Obstacle Free Zone	Remarks
8	9	10	11	12	13	14
300	1000	4320 x 150	100 x 120	-		-
300	1000	4320 x 150	100 x 120	-		Bitumen concrete 125mm. cement treated base 200mm, sub-base course 400mm & engineered fill.

Table - 8 Runway Physical Characteristics – Sialkot International Airport

OPST AD 2.13 DECLARED DISTANCES (M)

Designations RWY NR	TORA	ASDA	TODA	LDA	Remarks
1	2	3	4	5	6
04	3600	3900	4600	3600	-
22	3600	3900	4600	3600	-

Table - 9 Declared Distances – Sialkot International Airport

OPLA AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	True bearing	Dimensions of RWY (M)	Strength (PCN) and surface of RWY and SWY	THR coordinates	THR elevation and highest elevation of TDZ of precision APP RWY	Slope of RWY/SWY
1	2	3	4	5	6	7
18L	180.00°	3360 x 46	85/R/B/X/U Concrete	313211.94N 0742417.44E	THR 216.90 M / 711.61 FT	0.050%
36R	360.00°	3360 x 46	85/R/B/X/U Concrete	313023.30N 0742415.49E	THR 215.10 M / 705.71 FT	0.050%
18R	180.00°	2743 x 46	69/F/C/Y/T	313202.10N 0742410.19E	THR 216.50 M / 710.30 FT	0.050%
36L	360.00°	2743 x 46	69/F/C/Y/T	313033.10N 0742408.60E	THR 214.80 M / 704.72 FT	0.050%

SWY dimension (M)	CWY dimension (M)	Strip dimension (M)	RESA dimension (M)	Arresting system	Obstacle Free Zone	Remarks
8	9	10	11	12	13	14
122	305	3724 x 300	-	-	Available	-
122	305	3724 x 300		-	Available	-
244	244	3381 x 300	-		Available	-
274	274	3381 x 300	92 x 90	-	Available	-

Table - 10 Runway Physical Characteristics – Allama Iqbal International Airport

OPLA AD 2.13 DECLARED DISTANCES (M)

Designations RWY NR	TORA	ASDA	TODA	LDA	Remarks
1	2	3			

Table - 11 Declared Distances – Allama Iqbal International Airport

1.11. Flight Recorders

1.11.1 Not Applicable.

1.12. Wreckage and Impact Information

1.12.1 Not Applicable.

1.13. Medical and Pathological Information

1.13.1 Not Applicable.

1.14. Fire

1.14.1 Not Applicable.

1.15. Survival Aspects

1.15.1 Not Applicable.

1.16. Test and Research

1.16.1 Not Applicable.

1.17. Organizational and Management Information

1.17.1 Not Applicable.

1.18. Additional Information

1.18.1 Not Applicable.

1.19. Useful or Effective Investigation Techniques

1.19.1 Not Applicable.

SECTION 2 – ANALYSIS

2.1. General

2.1.1. PIA 398 was a scheduled passenger flight of A320-214 aircraft from JIAP, Karachi to SIAP, Sialkot. The aircraft departed from JIAP, Karachi as per plan. Weather at SIAP, Sialkot was reported to be TSRA with Few CB Clouds. The flight remained uneventful till final Approach at SIAP, Sialkot.

2.1.2. There was no abnormality reported in the aircraft. Captain of the aircraft was sufficiently experienced; however, for the First Officer, it was his 3rd flight on the A320.

2.2. Approach at SIAP, Sialkot

2.2.1. Once approaching SIAP, Sialkot, the aircraft was cleared for ILS Approach for R/W 04 at 23:27:00 and instructed to report once established on localizer as seen in figure below: -

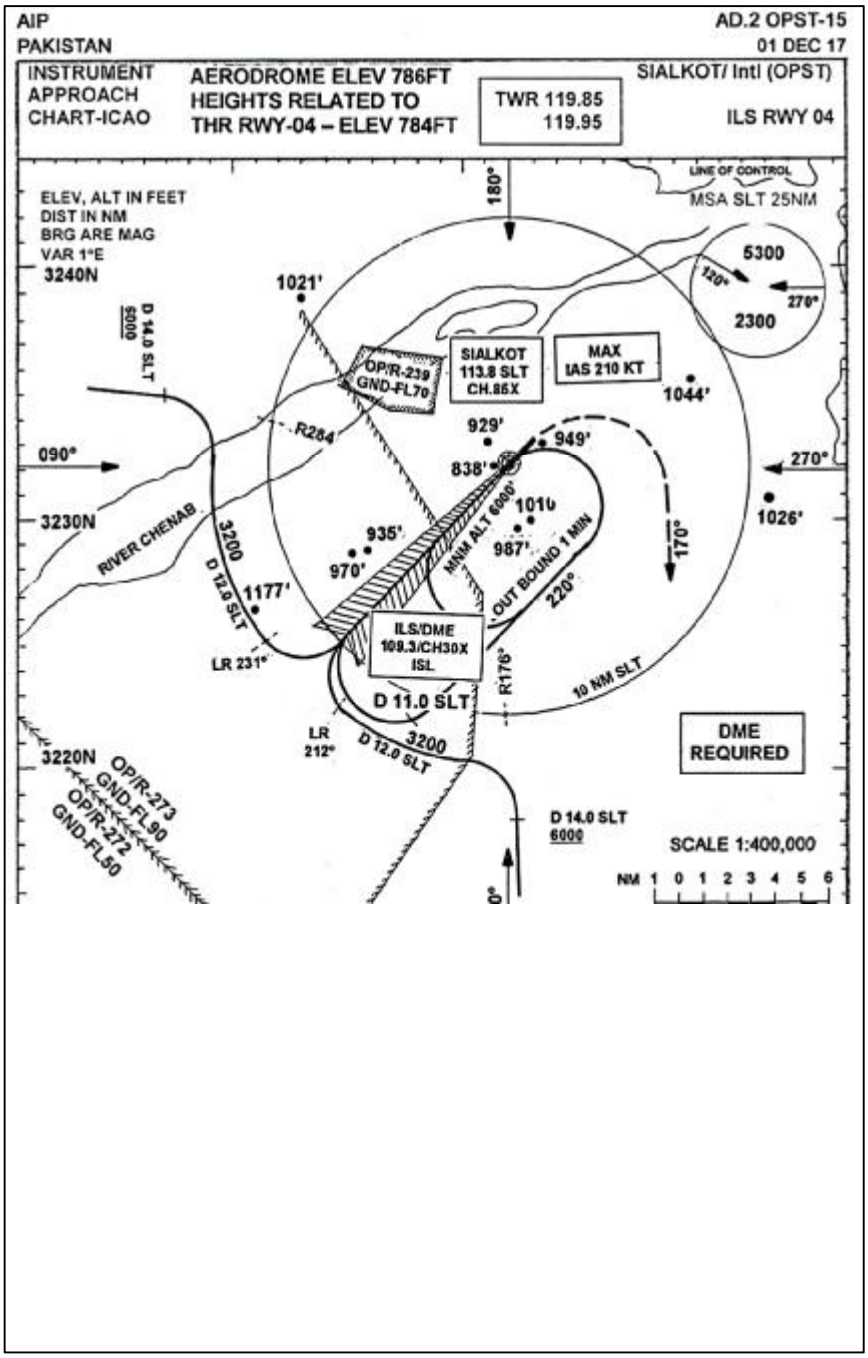

Figure 1 ILS Approach for R/W 04 SIAP, Sialkot

2.2.2. During the Approach, the aircraft weather radar became unserviceable but was recovered once it was recycled. At 23:34:00 aircraft reported Going Around due to weather and expressed intentions for another attempt. The aircraft was cleared for circling Approach and cleared for climb to 3,000 ft. Aircraft subsequently requested clearance for 5,000 ft which was approved by SIAP Tower.

2.3. Diversion to AIIAP, Lahore

2.3.1. During climb out the aircraft requested climb to 10,000 ft and reported diverting to AIIAP, Lahore. Once climbing through 8,000 ft, the aircraft was struck by lightning, though the weather radar had not depicted any thunderstorm conditions around the aircraft. During the approach to AIIAP, Lahore, Auto Pilot (AP) tripped with unsuccessful reset coupled with A/THR failure. In addition, the FDs also became unserviceable. Upon encountering these failures, the flight crew decided to discontinue the Approach to AIIAP, Lahore and divert to JIAP, Karachi. The flight crew was unable to diagnose the reason for multiple system failures. Moreover, the airspeed was also exceeded beyond the aircraft L/G retraction limits due to which the L/G could not be retracted. Captain of the aircraft then called another A320 Captain who happened to be travelling as a passenger on the same flight. The second Captain then guided the flight crew regarding L/G retraction and system failure diagnosis. While this indicates good usage of available CRM, it also highlights the lack of situational awareness and inadequate emergency handling by the flight crew piloting the aircraft.

2.4. Diversion to JIAP, Karachi

2.4.1. Due to multiple system failures related to Auto Pilot, Auto Thrust and FDs, the flight crew decided to divert and land back at JIAP, Karachi. The aircraft landed safely at JIAP, Karachi at 01:53:00.

2.5. Organizational Factor & Training

2.5.1. The manner of abnormal situation handling by the flight crew points to lack of professional knowledge as well as situational awareness when faced with an atypical situation. The inability to identify the cause of multiple system failures as well as exceedances of L/G retraction speed indicates a lack of situational training and non-preparedness to deal with emergency situations which may occur at critical stages of flight, which is primarily to be ensured by the organization.

2.6. Initial Analysis & Recommendations

2.6.1. AAIB Pakistan upon initial analysis advised PIA for following training of Captain, FO involved in occurrence: -

2.6.1.1. One day ground schooling at operator level for refreshing the knowledge about pre-flight procedures and flight planning. Pertinent PCAA regulatory procedures and relevant operator’s SOPs to be included in the ground schooling.

2.6.1.2. The Captain and FO (as a pair) to undergo 1-2 simulator training sessions for practicing duties as Pilot flying (PF) / Pilot Monitoring (PM) as per A320 FCTM and other procedures in vogue while simulating non-normal situations.

2.6.1.3. Both Captain and FO to undergo CRM refresher training.

2.6.1.4. At the end of the training, Captain and FO (as a pair) to fly one CAA Flight Inspector monitored route check for evaluation of CRM and recommendation for fitness to resume routine flight operations.

2.6.2. PIA has imparted the aforementioned training to the Flight Crew and has also conducted the CAA Flight Inspector monitored route check.

SECTION 3 – CONCLUSIONS

3.1. Findings

3.1.1. PIA 398 was a scheduled passenger flight of A320-214 aircraft from JIAP, Karachi to SIAP, Sialkot.

3.1.2. The weather at Sialkot was reported as TSRA with Few CB Clouds.

3.1.3. There was no defect reported in the aircraft prior to the flight.

3.1.4. The Captain of the aircraft had sufficient experience on type whereas for the First Offc

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SECTION 4 – SAFETY RECOMMENDATIONS

4.1 **PIA**

4.1.1 One day ground schooling at operator level for refreshing the knowledge about pre-flight procedures and flight planning. Pertinent PCAA regulatory procedures and relevant operator's SOPs to be included in the ground schooling.

4.1.2 The Captain and FO (as a pair) to undergo 1-2 simulator training sessions for practicing duties as Pilot Flying (PF) / Pilot Monitoring (PM) as per A320 FCTM and other procedures in vogue while simulating non-normal situations.

4.1.3 Both Captain and FO to undergo CRM refresher training.

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