

FINAL INVESTIGATION REPORT



SERIOUS INCIDENT OF RUNWAY EXCURSION BY
M/S GULF AIR FLIGHT GFA 784, A330, REG. NO. A9C-KD
AT BACHA KHAN INTERNATIONAL AIRPORT (BKIAP)
PESHAWAR ON 04-04-2017

FINAL REPORT

SERIOUS INCIDENT OF RUNWAY EXCURSION BY M/S GULF AIR FLIGHT GFA 784, A330, REG. NO. A9C-KD AT BACHA KHAN INTERNATIONAL AIRPORT (BKIAP) PESHAWAR ON 04-04-2017

Synopsis

The serious incident of runway excursion of Gulf Air Flight GFA 784 was reported on 4th April 2017 by Chief Operation Officer Bacha Khan International Airport (BKIAP) Peshawar (**Appendix 'A'**). Mandatory Occurrence Report (MOR) was also raised by the operator (Gulf Air) (**Appendix 'B'**). Memorandum was issued vide letter No. HQCAA/1901/329/SIB/303 dated 5th May, 2017 (**Appendix 'C'**). The incident was notified vide letter No. HQCAA/1901/392/SIB/341 dated 05th June, 2017 (**Appendix 'D'**) in accordance with ICAO Annex – 13.

1. FACTUAL INFORMATION

1.1 **History of Flight.** On 4th April, 2017, M/s Gulf Air Flight GFA 784, A330, Reg. No. A9C-KD was a scheduled passenger flight from Bahrain to Peshawar with 210 passengers and 11 crew members. Aircraft came in contact with Peshawar Tower 0054 UTC. Weather reported by local Met office was a thunderstorm with moderate rain. When the cockpit crew contacted ATC tower, the controller passed weather information along with surface condition as "runway surface wet with water patches". The cockpit crew opted to land through runway 35. After landing, during the landing roll, the pilot transmitted a "mayday" call when he realized that the deceleration was not sufficient. However, in the last quarter of landing roll, the aircraft slowed down at faster rate and came to stop in overrun after crossing end of runway by approximately 350 feet.

1.2 **Injuries to the person(s).** During the incident of the said flight, there was no injury reported to any person.

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor / None	Nil	Nil	Nil

1.3 **Damage to Aircraft.** As a result of the occurrence Cowling of No. 2 engine of the aircraft was damaged.

1.4 **Other Damage.** Nil.

1.5 **Flight Crew Information.**

Captain

• Age	54 years
• ATPL No.	BAH-P1175
• Medical Validity Date	30 th June, 2017
• Total Flying Experience	20687:36 hrs
• Total Hrs on Airbus A330	5536:28 hrs
• Total Hrs as Captain	15987:25 hrs

First Officer

- Age : 39 years
- ATPL No. : BAH-P1603
- Medical Validity Date : 13th June, 2017
- Total Flying Experience : 6191:56 hrs
- Total Hrs on Airbus A330 : 4759:45 hrs

1.6 Aircraft Information.

Aircraft Make & Model	Airbus A330-243
Registration Marking	A9C-KD
Manufacturer Serial No	287
Year of Manufacture	1999
C of A (S No. , expiry date)	No. 38 / 10 Expiry: 17 th December, 2017
Maint review prior to 04-04-2017 (date, hrs, cycles, expiry date)	CMR Date: 2 nd February, 2017, 71967:21 FH, 17128 FC, Expiry Date: 2 nd June, 2017
Daily inspection prior to 04-04-2017 occurrence (date, location)	03 rd April, 2017, BAH
Transit check prior to 04-04-2017 occurrence (date, location)	03 rd April, 2017, BAH
Total Aircraft Hours as on 04-04-2017 (prior to occurrence)	FH Prior Occurrence: 72687:31 FH FH On Occurrence: 72690:08 FH
Total aircraft cycles as on 04-04-2017 (prior to occurrence)	FC Prior Occurrence: 17288 FC FC On Occurrence: 17289 FC
Total Landings as on 04-04-2017 (prior to occurrence)	Landings Prior Occurrence: 17288 FC Landings On Occurrence: 17289 FC
Last Check-C (type, date, hrs, cycles, agency performed & location) prior to occurrence	C1 Check, 27 th June, 2016, 69245:28 FH, 16502 FC, JORAMCO, AMM
Last Check-A (type, date, hrs, cycles, agency performed & location) prior to Occurrence	A3 Check, 21 st February, 2017, 72213:15 FH, 17176 FC, GULF AIR BASE MAINTENANCE, BAH

1.6.1 Engines' Data

Engine	Serial No.	TSN	TSO	CSN
No. 1 Engine	41079	67095:45	3772:33	16189
No. 2 Engine	41094	66907:26	16346:28	16057

1.6.1.1 Thrust reverser of No. 2 engine was locked (de-activated on 31st March, 2017 as per MEL item 75-30-01A) on the request of Maintenance Control Center (MCC) as per Aircraft Maintenance Manual (AMM) 78-31-00-040-806-A (**Appendix 'E'**).

1.6.1.2 The aircraft engines were found adequately serviced with no other anomaly. However, as a result of the occurrence, Cowling of No. 2 engine sustained minor dent which was replaced with a new one and the aircraft was declared serviceable as per in-vogue procedures.

1.7 **Meteorological Information.** The detailed weather information before after and at the time of occurrence is mentioned below (METAR issued by Metrological Depratment, BKIAP Peshawar attached as **Appendix 'F'**) :-

Time in UTC	Wind	Visibility	Weather	Clouds	Temperature	QNH
0030	230/12 kts	4000 m	TSRA	Few 030 SCT 040 BKN 100	19/14	1010
0100	230/12 kts	4000 m	TSRA	Few 030 SCT 040 BKN 080	18/14	1011
0130	230/12 kts	4000 m	TSRA	Few 030 SCT 040 BKN 080	18/14	1011

1.7.1 The interpretation of METAR published at 0100 UTC, just before the event is explained below:-

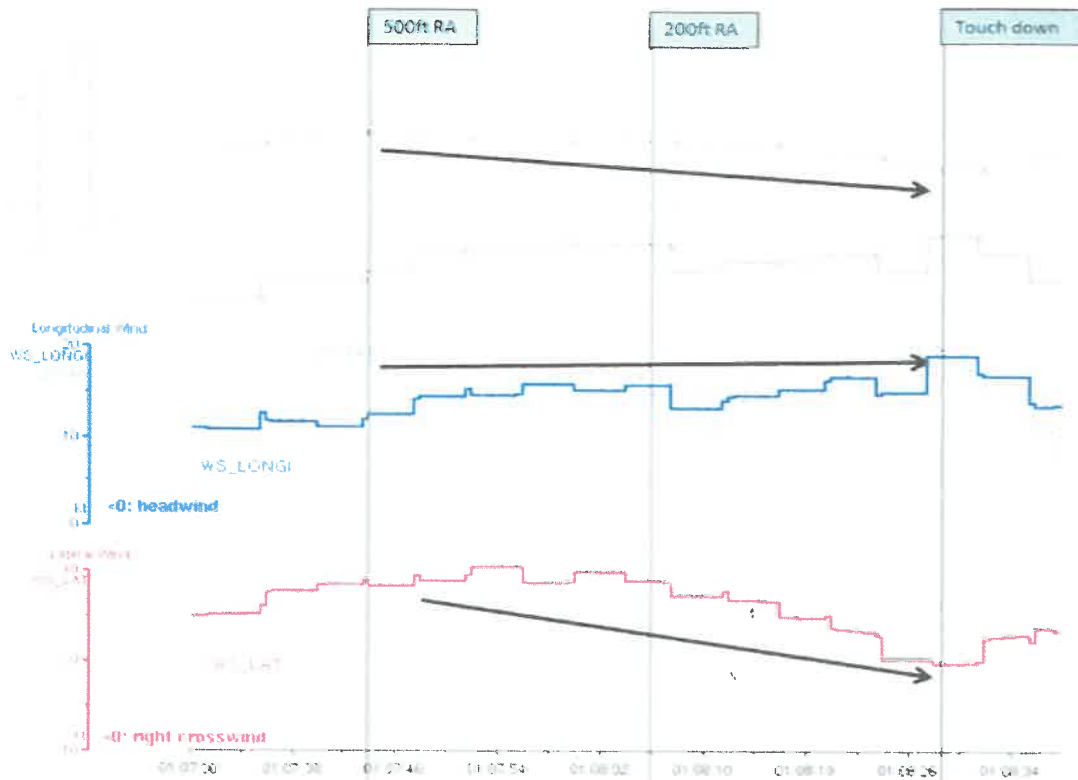
- Wind direction 230°, wind speed 12 kts.
- Visibility 4000 m.
- Thunderstorm with moderate rain.
- Few CB cloud layer (between 1/8 and 2/8 of the sky covered with clouds) with cloud base at 3000 ft.
- Scattered cloud layer (between 3/8 and 4/8 of its base at 4000 ft).
- Broken cloud layer (between 5/8 and 7/8 of the base at 8000 ft).
- Temperature is 18°C with a dewpoint at 14°C. QNH 1011 HPa.

1.7.2 The Tower Controller passed weather information to Pilot of Aircraft at three occasions.

Time	Position of the Aircraft	R/T Phraseology Used	Tailwind component
0056:42	Approx 40 NM	Presently Rain in progress, water patches on runway, runway surface condition is wet, the wind right now light and variable	-
0105:15	On 7 Miles Final R/W 35	Wind is 180° 05 kts	5 kts
0105:56	On 5 Miles Final R/W 35	Wind is now 200° 06 kts	5 kts

1.7.3 Weather Experienced by the Pilot on Landing

1.7.3.1 According to cockpit crew heavy rain was encountered on finals and landing. The wind computed from FDR parameters was 16 kts tailwind. The graphical representation of the encountered wind is as follows:-



Recorded Wind during Final Approach

- 1.7.3.2 Between 500 ft till touchdown the average wind recorded by the DFDR was from 191° and 17 kts (tailwind component 16 kts and left crosswind component 06 kts). Below 200 ft, the crosswind component was decreasing to almost zero, however, the tailwind remained constant about 16 kts.
- 1.8 **Aids to Navigation.** The mishap aircraft was equipped with serviceable ADF, VOR / DME, ILS and GPS for the conduct of flight operations. All ground equipment related to ADF, VOR / DME and ILS was serviceable at the time of occurrence.
- 1.9 **Communications.** The mishap aircraft was equipped with serviceable UHF / VHF sets for radio contact with all concerned agencies during flight / on ground.
- 1.10 **Aerodrome Information.** The BKIAP, Peshawar detailed aerodrome data is appended below:-

OPPS 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
1	2	3	4	5	6
17	176°	2743 x 46	60/F/B/X/T With reduced TKOF load 218 Tons Bitumen	340021.62N	THR 357M / 1171FT
35	356°			0713048.76E 335853.16N 0713056.35E	THR 369M / 1211FT
Designations RWY NR	Slope of RWY/SWY	SWY dimension (M)	CWY dimension (M)	Strip dimension (M)	Obstacle Free Zone
7	8	9	10	11	12
17	0.5%	122	274	3107 X 92	-
35		122	274		

RESA: RWY 17/35 90X 92M

OPPS AD 2.13 DECLARED DISTANCES (M)

Designations RWY NR	TORA	ASDA	TODA	LDA	Remarks
1	2	3	4	5	6
17	2743	2865	3017	2743	-
35	2743	2865	3017	2743	-

OPPS AD 2.14 APPROACH AND RUNWAY LIGHTS

RWY Designator	APCH LGT type LEN INTST	THRLGT colourWB BAR	VASIS (MEH) PAPI	TDZMLG T LEN	RWY Centre line LGT Length, spacing, colour, INTST	RWY EDGE line LGT Length, spacing, colour, INTST	RWY End LGT spacing colourWB AR	SWYLG LEN (M) colour	Remarks
1	2	3	4	5	6	7	8	9	10
17	SALS	GREEN	PAPI / Left 3°	-	-	2743 M 60 M WHITE LIL	RED	-	Strobe lights
35	(CAT-1) HIL	GREEN	PAPI / Left 3°	-	-	2743 M 60 M WHITE LIL	RED	-	Strobe lights

OPPS 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
NDB	PS	308 KHZ	H24	3359.45N 07130.16 E	368 M	Coverage 150NM.
GP/ TDME 35	Dots/Dahes	334.1MHz CH20X	H24	335904N 0713052E		
LLZ 35	IKBK	108.3MHz	H24	340031N 0713048E		
DVOR/DME (2°E/1995)	PS	114.3 MHz CH90X	H24	335841.54N 0713100.91E		-
BS	Radio ofPakistan	540 KHZ 729 KHZ	HX	-		PBC Hours 0045- 0405 0500-1800

OPPS AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency	Hours of operation	Remarks
1	2	3	4	5
APP	Cherat APP	125.6 MHZ	H24	PAF. Primary frequency
TWR	PESHAWAR Tower	122.9 MHZ	AS AD 2.3	Primary frequency
		118.4 MHZ	AS AD 2.3	Standby Frequency
		121.8 MHZ	AS AD 2.3	
		121.5 MHZ	AS AD 2.3	
		243.0 MHZ	AS AD 2.3	
ATIS	ATIS	126.7 MHZ	AS AD 2.3	
GCA		118.3 MHZ	AS AD 2.3	
G/A/G		5601 KHZ	AS AD 2.3	
G/A/G		2923 KHZ	AS AD 2.3	

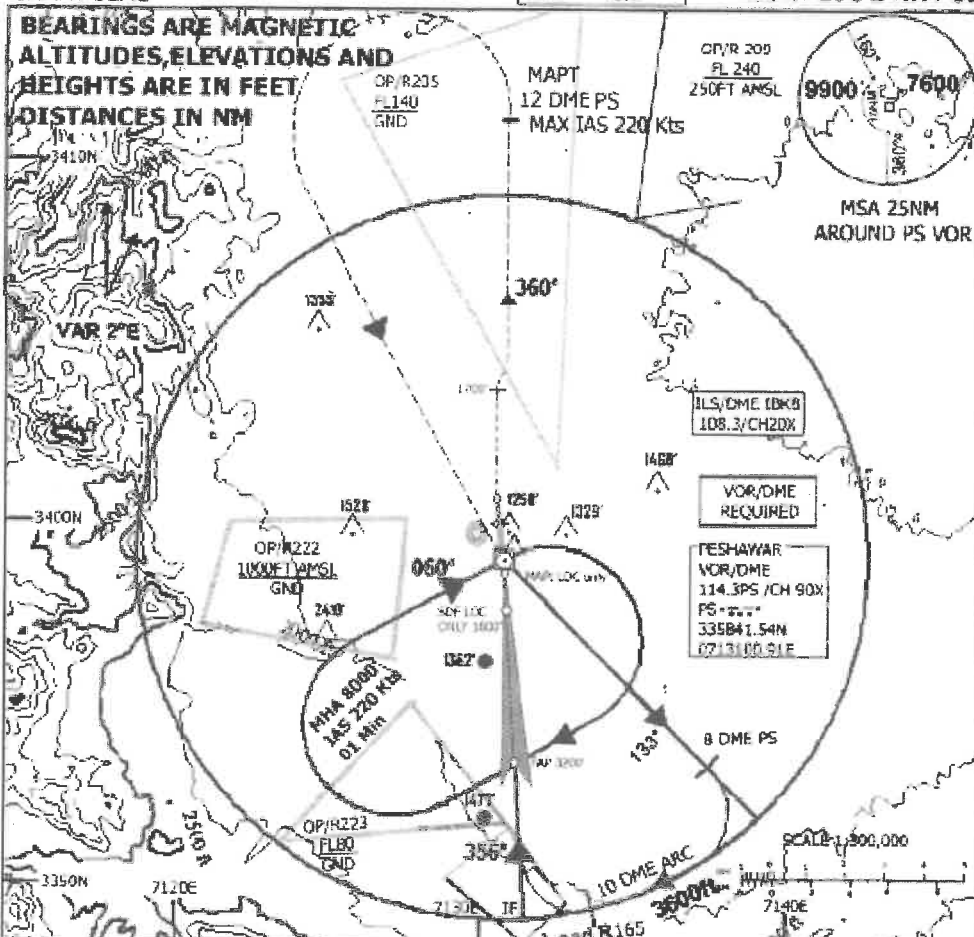
AIP
PAKISTAN

AD2. OPPS-31
31 DEC 15

INSTRUMENT AD ELEV 121'
APPROACH HEIGHTS RELATED TO
CHART-ICAO THRESHOLD ELEVATION 121'

TWR 122.5
118.4
CHEARAT 125.6
ATIS 126.7

PESHAWAR
Bacha Khan Int'l
ILS or LOC 2 RWY 35



2. ANALYSIS

2.1. Operational Analysis

- 2.1.1. The mishap flight was a scheduled passenger flight from Bahrain to Peshawar. The flight departed from Bahrain and it was to arrive at Peshawar at scheduled arrival time of 0100 UTC.
- 2.1.2. The Captain and First Officer both were qualified and medically fit to undertake the flight.
- 2.1.3. The Captain and First Officer had adequate rest before the flight in accordance with Flight Duty Time Limitation (FDTL).
- 2.1.4. Before departure, the weather at departure aerodrome, enroute and final destination forecast were within the limit for the safe conduct of the flight. However, the weather encountered at landing and related aspects are discussed in para 1.7 above and in ATS analysis.
- 2.1.5. The aircraft took off with only No. 1 engine reverser serviceable whereas Engine No. 2 reverser was inoperative but covered under Minimum Equipment List (MEL). The relevant OEM procedure is appended below:-

78-30-01	Thrust Reverser
Ident.: MI-78-30-00007682.0002001 / 22 MAR 10	
Applicable to: ALL	

78-30-01A

Repair interval	Nbr installed	Nbr required	Placard
C	2	0	Yes

(o) (m) One or both may be inoperative provided that:

- 1) The inoperative thrust reverser is deactivated and secured in the stowed position, and
- 2) The ENG 1(2) REV INHIBITED alert is displayed on the EWD after deactivation, and
- 3) Appropriate performance adjustments are applied

- 2.1.6. The flight remained uneventful since departure till arrival at BKIAP except final approach and landing.
- 2.1.7. The aircraft weight while at landing at BKIAP was within maximum permissible weight limitations given by Airbus (actual landing weight 175.2 tons and maximum permissible landing weight 180.0 tons).
- 2.1.8. Before landing, the latest weather information was obtained from ATC which indicated runway condition wet and tailwind 05 kts. The cockpit crew calculated required landing distance (RLD) keeping these parameters in consideration. The calculated landing distance (RLD) was 7807 ft which was within limits on OPSS runway of 9000 ft long.
- 2.1.9. When the aircraft was on final approach it encountered heavy rain so the decision was made by the cockpit crew to land through Autoland which is otherwise not permissible except for training purposes and good weather. This was a deviation from OEM recommended procedures which is appended below:-

AUTOLAND IN CAT I OR BETTER WEATHER CONDITIONS

The flight crew may wish to practice automatic landings in CAT I or better weather conditions for training purposes. This type of approach should be carried out only with the airline authorization. The flight crew should be aware that fluctuations of the LOC and/or GS might occur due to the fact that protection of ILS sensitive areas, which applies during LVP, will not necessarily be in force. It is essential, therefore, that the PF is prepared to take over manually at any time during a practice approach and rollout, should the performance of the AP become unsatisfactory.

- 2.1.10. The contribution of this procedural deviation (to land through Autoland in inclement weather) was however, not established as a cause during course of investigation.
- 2.1.11. The V_{ref} for the landing was 134 kts IAS. The aircraft touchdown at 1800 ft from the runway 35 threshold at 01:08:28 UTC. The touchdown was smooth at speed 131 kts IAS whereas the recorded ground speed was 154 kts due to 16 kts tailwind.
- 2.1.12. The strong tailwind information was not passed to the cockpit crew before landing instead 06 kts tailwind was communicated to the crew (max permissible 10 kts). According to FDR recorded parameters the strong tailwind was encountered during final approach and after touchdown.
- 2.1.13. Approximately five seconds after touchdown thrust reverser of No. 1 engine was deployed at the Idle detent. During this period, the deceleration rate increased to reach a constant level of 0.2g. 14 seconds after touchdown (the remaining runway length was 4200 ft), the crew started applying full braking inputs without significant deceleration rate change, which was a result of poor runway adherence causing the braking system to keep braking pressure just below the limit at which skidding would start. The ground speed at this time was 125 kts. Observing this situation the crew transmitted MAYDAY call considering that the aircraft might not stop within remaining length of the runway.
- 2.1.14. Twenty Eight seconds after touchdown and 7600 ft from the beginning runway 35 (runway remaining length 1400 ft) and at a ground speed of 84 kts, max reverser thrust on No. 1 engine was deployed while full pedal braking was already in use. In this situation where unexpected tailwind was encountered along with less than expected deceleration, the following FCOM procedure was to be applied. The procedure necessitated use of Max Reverse immediately.

Ident: PRO-NOP-SOP-19-B-10020773-000-001 (20 MAR 17)

AT TOUCHDOWN

Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.

ROLL OUT mode

ALL REVERSER LEVERS

CHECK ENGAGED/ANNOUNCE

REV MAX OR REV IDLE

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- An emergency
- The deceleration is not as expected
- A failure affects the landing performance
- A long flare or a long touchdown
- An unexpected tailwind.

- 2.1.15. This procedure was not applied at first indication of slow deceleration which increased landing roll. But when in the latter half of landing roll when Max Reverse was applied, maximum deceleration was achieved.

- 2.1.16. As far as landing on a wet runway with one thrust reverser inoperative is concerned, the aircraft is authorized to land as per Airbus recommended procedure mentioned below:-

78-30-01A		Thrust Reverser
Ident : MO-78-30-00008023 0004001 / 03 MAY 17 Applicable to: ALL		
FLIGHT PREPARATION/LIMITATIONS		
Performance Adjustments		
One Thrust Reverser Inoperative	Runway State	Performance Adjustments
	Takeoff Dry, or Landing Dry, or Landing Wet	No performance adjustments are necessary (Basic performance data is computed without thrust reversers)
Both Thrust Reversers Inoperative	Runway State	Performance Adjustments
	Takeoff Wet, or Takeoff Contaminated, or Landing Contaminated	Use performance data computed either with: - One Thrust Reverser inoperative, or - All Thrust Reversers inoperative

- 2.1.17. The deceleration substantially increased 41 seconds after touchdown, about 65 ft from the end of the runway, most likely as a consequence of a better adherence with the runway and the aircraft stopped approximately 350 ft after crossing end of the runway, in overrun.
- 2.1.18. Airbus performed computation indicating that if max reverser on No.1 engine was used immediately after touchdown, the aircraft would have stopped within remaining length of the runway.

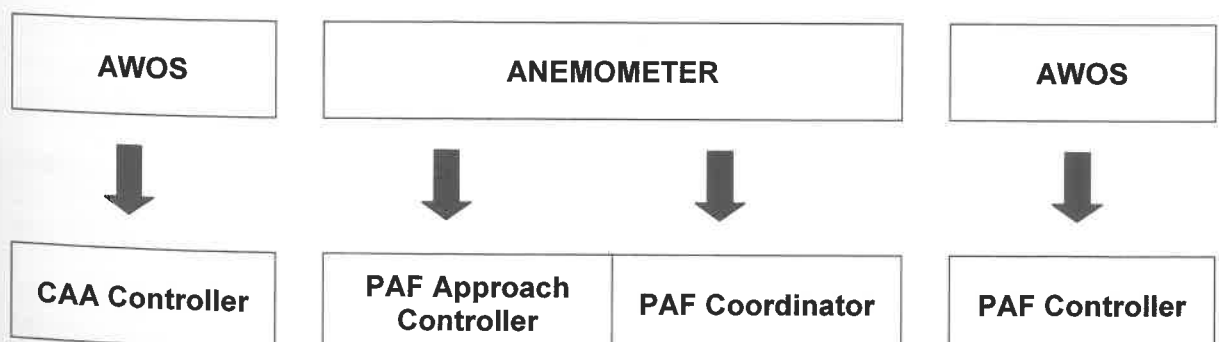
2.2 ATS Analysis

- 2.2.1 At 0054 UTC Flight GFA 784 came in contact with Peshawar Tower. Aerodrome Controller cleared the aircraft for ILS Z approach for runway 35 and gave descend to 8000 ft and passed on QNH 1012 HPa. As the Controller observed some lightning towards the outbound leg of Z approach, he requested Pilot observation about the weather and offered him runway 17. The pilot informed that weather was not severe and opted to land through runway 35.
- 2.2.2 The information passed to the pilot was surface condition **wet** along with **water patches**, whereas as per ICAO Annex – 14, the reporting of water on runway surface is according to following guidelines and terminologies:-

Note: Whenever water is present on a runway, a description of the runway surface conditions should be made available using the following terms:-

Terminology	Description
DAMP	The surface shows a change of colour due to moisture.
WET	The surface is soaked but there is no standing water.
STANDING WATER	For aircraft performance purposes, runway where more than 25% of runway surface area (whether in isolated areas or not) within the required length and width being used is covered by water more than 3 mm deep.

- 2.2.3 The standard R/T phrasology should be either runway surface condition WET or STANDING WATER as required landing distance to be calculated by the pilot before landing depends on reported amount of water on the runway surface. Keeping in view the deceleration recorded in the FDR parameters, it appears that runway surface had STANDING WATER or SLIPPERY WHEN WET which reduced surface friction causing braking action to be poor. If reported surface condition was correct then the landing distance calculation may have required diversion to alternate aerodrome. (The RLD in CONF FULL with 16 kts tailwind / standing water was 10989 ft and BKIAP runway length is 9000 ft).
- 2.2.4 Besides non standard runway condition, reported wind to the pilot by Aerodrome controller was 06 kts tailwind component consistent with METAR at the time of occurrence (Max permissible for landing was 10 kts tailwind). The actual wind encountered by the aircraft at and during landing was 16 kts tailwind. This was primarily due to observing instantaneous wind speed on the Automated Weather Observation System (AWOS) installed in ATC Tower. The AWOS had different settings which should have been correct to obtain accurate readings. It was established that PCAA Aerodrome Controller on duty was not trained to use AWOS, also he was not authorized to use AWOS. Since the installation of AWOS in ATC Towers by Pakistan Air Force the PCAA controllers were using it at their own.
- 2.2.5 There are three different methods of observing the wind through equipment installed at BKIAP, which are discussed below:-
- 2.2.5.1 **Wind Socks.** One wind sock standard international pattern is installed close to touch down points of runway 17 and 35. It is difficult to see the wind sock with naked eye while sitting in the ATC tower for which binoculars have been provided which can be used whenever required. Watching windsock through binoculars gives a clear view of windsock to assess the prevailing wind direction and speed at touchdown point of either of the runway ends.
- 2.2.5.2 **Anemometer.** It is installed in the ATC Tower with its sensors are located on the roof of the tower. The wind speed and wind direction dials are installed at the middle of front console. The wind speed dial has its first mark at 10 kts with subsequent graduations of 01 kt. It is difficult to accurately estimate wind below 10 kts while looking at wind speed dial. Since this anemometer is installed in ATC Tower which is far from touchdown points of runway, it may not give actual wind blowing at touchdown points.
- 2.2.5.3 **Automatic Weather Observation System (AWOS).** It is an electronic system installed by Pakistan Air Force (PAF). It gives different weather parameters, including wind, in digital form on 02 screens installed at both extremes (01 each) of front console. Its sensors are located at both ends of the runway and provide weather parameters like wind, temperature, visibility etc. in the proximity of touchdown points. As AWOS has multiple user settings which must be in desired scale / parameters, hence, it requires proper under supervision training to enable a controller view correct readings.
- 2.2.6 At ATC Tower BKIAP Peshawar, anemometer / AWOS displays in front of ATC controllers are as depicted below:-



- 2.2.7 The positioning of CAA controller in Bacha Khan Tower is on the extreme left corner of the front console. From this position, while sitting, the anemometer dials are not visible to ATC controllers at both ends. Additionally, no formal training has been imparted to PCAA controller to use AWOS which may lead to incorrect display due to undesirable incorrect settings (as in the case under discussion).
- 2.2.8 Less reported tailwind lead to incorrect decision by the cockpit crew to land through runway 35.
- 2.2.9 Actual tailwind beyond the permissible limits of landing lead to landing at higher ground speeds thereby increasing landing roll.

3. FINDINGS

3.1 Operational Findings

- 3.1.1. The mishap flight was a scheduled passenger flight from Bahrain to Peshawar. The flight departed from Bahrain and it was to arrive at Peshawar at scheduled arrival time of 0100 UTC.
- 3.1.2. The Captain and First Officer both were qualified and medically fit to undertake the flight.
- 3.1.3. The Captain and First Officer had adequate rest before the flight in accordance with Flight Duty Time Limitation (FDTL).
- 3.1.4. Before departure, the weather at departure aerodrome, enroute and final destination forecast were within the limit for the safe conduct of the flight.
- 3.1.5. The aircraft took off with only No. 1 engine reverser serviceable whereas Engine No. 2 reverser was inoperative but covered under Minimum Equipment List (MEL).
- 3.1.6. The flight remained uneventful since departure till arrival at BKIAP except landing.
- 3.1.7. The aircraft weight while at landing at BKIAP was within maximum permissible weight limitations given by Airbus (actual landing weight 175.2 tons and maximum permissible landing weight 180.0 tons).
- 3.1.8. Before landing, the latest weather information was obtained from ATC which indicated runway condition WET and tailwind 06 kts. The cockpit crew calculated required landing distance (RLD) keeping these parameters in consideration. The calculated RLD landing distance was 7807 ft which was within limits on OPPS runway of 9000 ft long.
- 3.1.9. The landing on WET runway with one thrust reverser inoperative was permitted by the Airbus recommended procedures ref. FCOM PRO-NOR-SOP Descent Preparation.
- 3.1.10. The aircraft was Autoland against Airbus recommended procedure. The contribution of this procedural deviation (to land through Autoland in inclement weather) was, however, not established as a cause during course of investigation.
- 3.1.11. The V_{ref} for the landing was 134 kts IAS. The aircraft touchdown at 1800 ft from the runway 35 threshold at 0108:28 UTC. The touchdown was smooth at speed 131 kts IAS whereas the recorded ground speed was 154 kts due to 16 kts tailwind.
- 3.1.12. The strong tailwind information was not passed to the cockpit crew before landing instead 06 kts tailwind was communicated to the crew (max permissible 10 kts). The strong tailwind was only encountered after touchdown, according to FDR recorded parameters.

- 3.1.13. Approximately five seconds after touchdown thrust reverser of No. 1 engine was used at the Idle detent. Approximately five seconds after touchdown thrust reverser of No. 1 engine was deployed at the Idle detent. The aircraft decelerated at a much slower rate which resulted in application of full pedal brakes by the cockpit crew. By this time (14 seconds after touchdown) the remaining runway length was 4200 ft. The deceleration increased but sufficient length of the runway was already lost during this process. The ground speed at this time was 125 kts. Observing this situation the crew transmitted MAYDAY call considering that the aircraft might not stop within remaining length of the runway.
- 3.1.14. Twenty Eight seconds after touchdown and 7600 ft from the beginning runway 35 (runway remaining length 1400 ft) and at a ground speed of 84 kts max reverser thrust on No. 1 engine was deployed while full pedal braking was already in use. In this situation where unexpected tailwind was encountered along with less than expected deceleration, the FCOM procedure to use of Max Reverse was to be applied immediately after realizing the slow deceleration. The relevant procedure was not applied at first indication of less than expected deceleration which increased landing roll.
- 3.1.15. The deceleration increased substantially shortly before the end of the runway, most likely as a result of local better adherence to the runway. Approximately 350 ft after crossing end of the runway, in overrun.
- 3.1.16. If max reverser on No. 1 engine was used immediately after touchdown the aircraft would have stopped within remaining length of the runway as other landing parameters.

3.2 **ATS Findings**

- 3.2.1 At 0054 UTC Flight GFA 784 came in contact with Peshawar Tower. Aerodrome Controller cleared the aircraft for ILS Z approach for runway 35 and gave descend to 8000 ft.
- 3.2.2 Keeping in view the prevailing weather the pilot was given runway 17 but he opted to land through runway 35 considering that weather was ok.
- 3.2.3 The information passed to the pilot was surface condition **wet** along with **water patches**. Whereas as per ICAO, the standard R/T phrasology was either runway surface condition WET or STANDING WATER. Keeping in view the deceleration recorded in the FDR parameters, it appears that runway surface had STANDING WATER which reduced surface friction causing braking action to be poor. If reported surface condition was correct then the landing distance calculation may have required diversion to alternate aerodrome. (The RLD in CONF FULL with 16 kts tailwind / standing water was 10989 ft and BKAP runway length is 9000 ft).
- 3.2.4 Besides non standard runway condition, reported wind to the pilot by Aerodrome controller was 06 kts tailwind consistent with METAR at the time of the occurrence (Max permissible for landing was 10 kts tailwind). The actual wind encountered by the aircraft at and during landing was 16 kts tailwind. This was primarily due to observing instantaneous wind speed on the Automated Weather Observation System (AWOS) installed in ATC Tower. The AWOS had different settings which should have been correct to obtain accurate readings. It was established that PCAA Aerodrome Controller on duty was not trained to use AWOS, also he was not authorized to use AWOS. Since the installation of AWOS in ATC Towers by Pakistan Air Force the PCAA controllers were using it at their own. The incorrect reporting of the wind by ATC contributed significantly in following ways:-
- 3.2.5 Less reported tailwind lead to incorrect decision by the cockpit crew to land through runway 35.

3.2.6 Actual tailwind beyond the permissible limits of landing lead to landing at higher ground speeds thereby increasing landing roll.

3.3 Cause of Occurrence

3.3.1 Non adherence of OEM recommended landing procedure (non application of Max Reverser) by the cockpit crew in case of slow deceleration after landing.

3.3.2 Use of incorrect R/T phraseology by the Aerodrome Controller to report runway surface condition after rain.

3.3.3 Inaccurate wind reporting by the Aerodrome Controller by using an equipment for which he was neither trained nor authorized.

4. SAFETY RECOMMENDATIONS

4.1. All Airbus aircrews should be briefed to adhere to OEM recommended procedure when encountered by slow deceleration after landing.

4.2. PCAA (Directorate of Operations) is to review the process of determining / reporting the runway surface conditions in case of rain as per international standards. Also relevant procedures should also be revised / prepared & ensure use of standard R / T phraseology by all ATC units in Pakistan.

4.3. PCAA (Directorate of Operations) is to ensure proper training / authorization of ATC controllers using AWOS.



(NAEEM ASHRAF MIRZA)

Group Captain
Sr. Additional Director
Ops Investigation SIB

Dated: 22nd February, 2018



(MIAN TAHIR AFTAB)

Wing Commander
Additional Director
Tech Investigation SIB

Dated: 23 February, 2018



(MUHAMMAD MUNIR BUTT)

Air Commodore
President SIB
Investigation Incharge

Dated: 26 February, 2018