

FINAL INVESTIGATION REPORT



**SERIOUS INCIDENT (TCAS – RA) BETWEEN AERO NOMAD
AIRLINE FLIGHT ANK4506, AIRBUS 320-233 AIRCRAFT, REG.
NO. EX-32009 (OPIS – UCFM) & BRITISH AIRWAYS FLIGHT
BAW2261, BOEING 777-236ER AIRCRAFT, REG. NO. GYMMD,
(EGLL – OPIS) ON 05-06-2022**

SCOPE

At Bureau of Aircraft Safety Investigation (BASI), Pakistan investigations are conducted in accordance with Annex-13 to the International Civil Aviation Organization (ICAO) Convention on International Civil Aviation and Civil Aviation Rules 1994 (CARs 94).

The sole objective of the investigation and the final report of an accident or serious incident under above stated regulations is the prevention of future accidents and incidents of similar nature. It is not the purpose of such an investigation to apportion blame or liability. Accordingly, it is inappropriate to use BASI Pakistan investigation reports to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

This report contains facts, which have been determined up to the time of publication. Such information is published to inform the aviation industry and the public about the general circumstances of civil aviation accidents and incidents.

Extracts may be published without specific permission provided that the source is duly acknowledged, and the material is reproduced accurately, and is not used in a derogatory manner or in a misleading context.

LIST OF FIGURES

Sr. No.	Title	Page No.
1.	ANK4506 Route	12
2.	BAW2261 Route	13
3.	TCAS (TA) alert	19
4.	TCAS TA & RA ranges	20
5.	Traffic Display	20
6.	HVR Encounters	21
7.	ANK came in contact with Islamabad ACC	24
8.	Traffic Information passed to BAW2261	25
9.	Traffic Information passed to ANK4506	25
10.	Activation of RA	27

LIST OF TABLES

Sr. No.	Title	Page No.
1.	Injures to persons on board – ANK4506	14
2.	Injures to persons on board – BAW2261	14
3.	Aircraft details – ANK4506	15
4.	Aircraft details – BAW2261	15
5.	Communication Frequencies for Islamabad ACC	16
6.	ATS Enroute Communication Frequencies for Islamabad ACC	17
7.	ATS Enroute Communication Frequencies for Islamabad ACC	18
8.	ROD / ROC	26

INTENTIONALLY LEFT BLANK

ABBREVIATIONS

AAIB	Aircraft Accident Investigation Board
AAIB	Air Accident Investigation Branch
ATC	Air Traffic Control
ATS	Air Traffic Services
BASI	Bureau of Aircraft Safety Investigation
BEA	Bureau of Enquiry and Analysis
BPS	Barometric Pressure Setting
CARs	Civil Aviation Rules
EASA	European Union Aviation Safety Agency
EGLL	Heathrow Airport
FL	Flight Level
ft	Feet
h	Hour(s)
hPa	Hectopascal
HVR	High Vertical Rate
ICAO	International Civil Aviation Organization
IOU	Incident Occurrence and Unserviceability Report
kt	Knots
MAC	Mid Air Collision
MET	Metrological
min	Minute(s)
NM	Nautical Miles
NTSB	National Transportation Safety Bureau
OCFM	Manas International Airport
OPIS	Islamabad International Airport
PCAA	Pakistan Civil Aviation Authority
ROC	Rate of Descend
ROD	Rate of Climb
SOP(s)	Standard Operating Procedures
STD	Standard
TCAS	Traffic Alert and Collision Avoidance System
UK	United Kingdom
USA	United States of America
UTC	Universal Time Coordinated

INTRODUCTION

This serious incident was reported to Bureau of Aircraft Safety Investigation (BASI), Pakistan previously known as Aircraft Accident Investigation Board (AAIB), Pakistan, by Pakistan Civil Aviation Authority (PCAA) vide Incident Occurrence and Unserviceability Report (IOU)¹. Ministry of Aviation, Government of Pakistan issued Memorandum² and Corrigendum³ issued by BASI, Pakistan to investigate the serious incident. This serious incident was notified⁴ to International Civil Aviation Authority (ICAO), Bureau of Inquiry and Analysis (BEA), France, National Transportation Safety Bureau (NTSB), United States of America (USA), Air Accident Investigation Branch (AAIB), United Kingdom (UK), Interstate Aviation Committee, acting on behalf of the Kyrgyz Republic, the State of Registry and the State of Operator in line with ICAO Annex-13. The investigation has been conducted by BASI, Pakistan. All corresponding timings are mentioned in Universal Coordinated Time (UTC).

¹ PCAA IOU Report dated 5th June, 2022

² Ministry of Aviation Memorandum No. HQCAA/1902/007/TCAS/Inv dated 27th September, 2022

³ BASI Pakistan Corrigendum

⁴ ICAO Initial Notification dated 13th June, 2022

SYNOPSIS

On 05th June, 2022, Aero Nomad flight ANK4506, Airbus 320 aircraft, Reg. No. EX32009 was a commercial passenger flight which took off from Islamabad International Airport (OPIS), Islamabad, Pakistan for Manas International Airport (UCFM), Bishkek, Kyrgyzstan on Air Traffic Services (ATS) route ISB-KALMI-J143-PS-P500. Meanwhile, British Airways flight BAW2261, Boeing 777 aircraft, Reg. No. GYMMD was operating from Heathrow Airport (EGLL), London, UK to OPIS, Islamabad, Pakistan on route P500-PS-J143-KALMI-ISB. Both were scheduled passenger flights.

When ANK4506 was 05 Nautical Miles (NM) North of position Peshawar (PS) VOR climbing out of FL318 for FL320, it encountered Traffic alert and Collision Avoidance System – Resolution Advisory (TCAS-RA) with reciprocal traffic BAW2261 which was descending from FL390 to FL330 passing FL332 at the time of incident. ANK4506 descended from FL318 to FL315 on TCAS-RA. BAW2261 did not report TCAS-RA however, it followed TCAS-RA command to level off at FL330⁵. Both aircraft had traffic information regarding each other.

⁵ AAIB UK email dated 13th August, 2024

INTENTIONALLY LEFT BLANK

SECTION 1 - FACTUAL INFORMATION

1.1. History of the Flight

1.1.1. On 05th June, 2022, Aero Nomad flight ANK4506, Airbus 320 aircraft, Reg. No. EX32009 was a commercial passenger flight which took off from OPIS, Islamabad, Pakistan for UCFM, Bishkek, Kyrgyzstan on ATS route ISB-KALMI-J143-PS-P500.

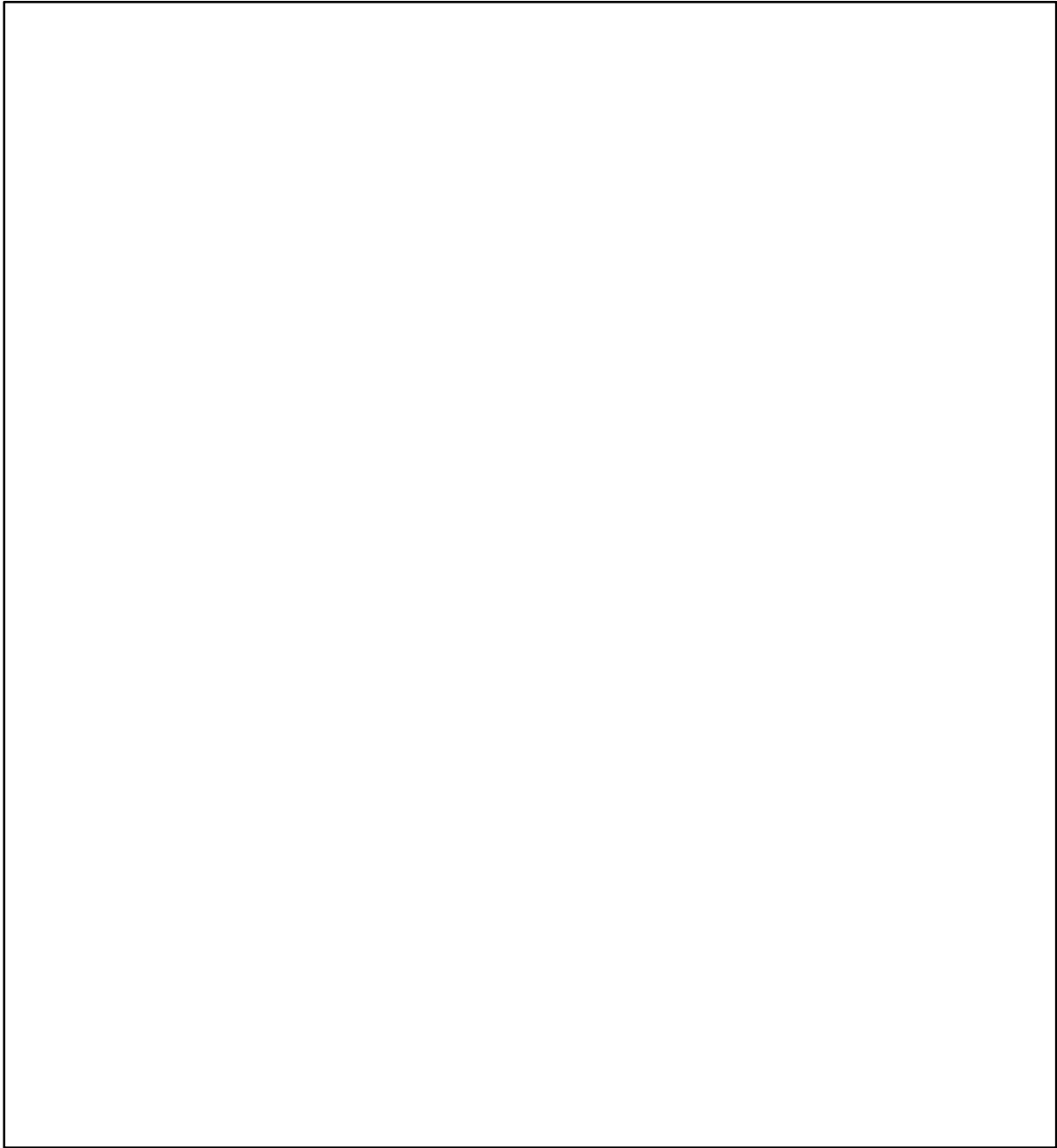


Figure 1 ANK4506 Route

1.1.2. British Airways flight BAW2261, Boeing 777 aircraft, Reg. No. GYMMD operating from EGLL, London, UK to OPIS, Islamabad Pakistan was on route P500-PS-J143-KALMI-ISB.

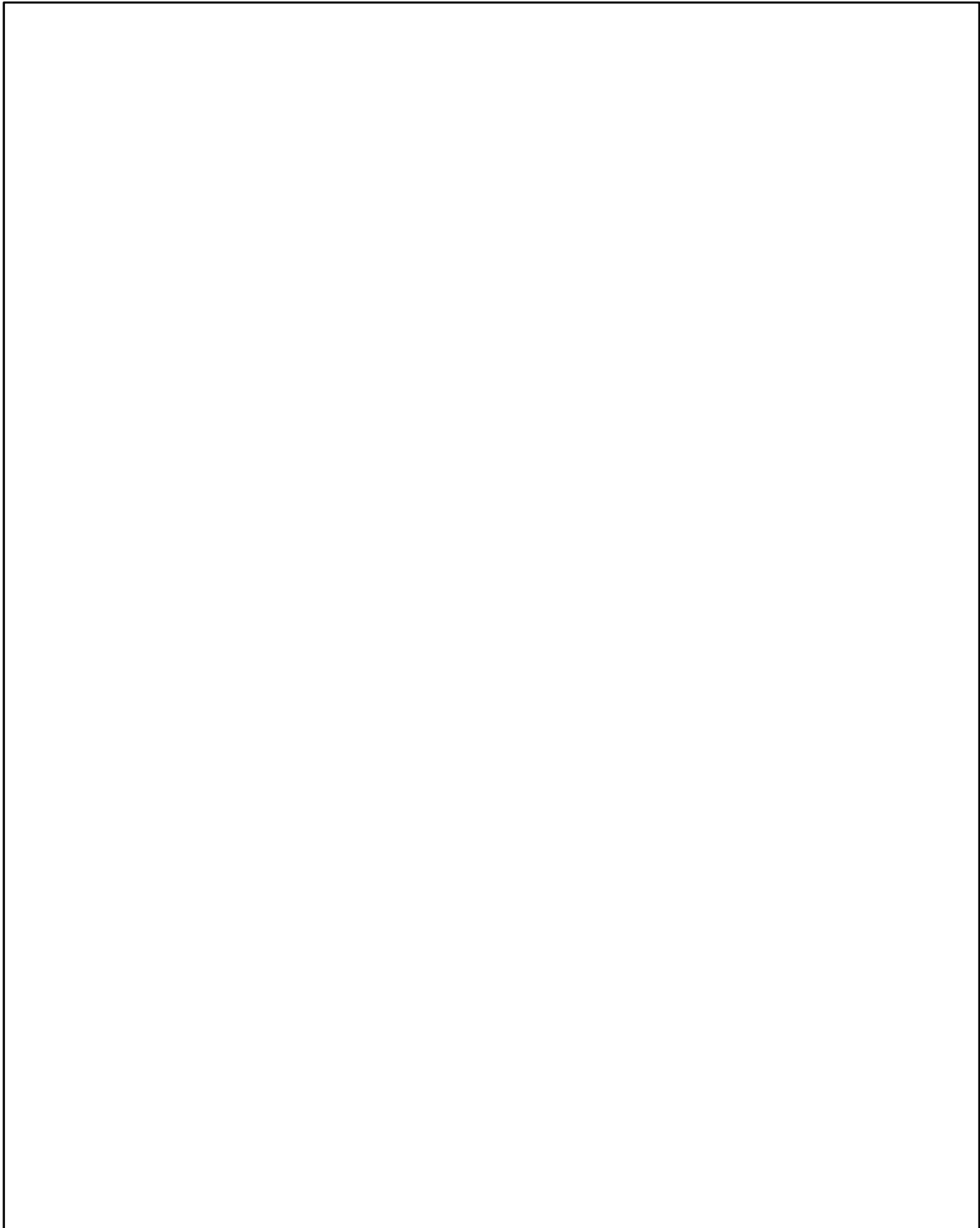


Figure 2 BAW2261 Route

1.1.3. When ANK4506 was 05 NM North of position PS VOR climbing out of FL318 for FL320 with Rate of Climb (ROC) 1,100 ft/min, it encountered TCAS–RA with reciprocal traffic BAW2261 which was descending from FL390 to FL330 passing FL332 with Rate of Descent (ROD) 1,600 ft/min at the time of incident.

1.1.4. ANK4506 descended from FL318 to FL315 on TCAS-RA. BAW2261 did not report TCAS-RA however, it followed TCAS-RA command to level off at FL330.

1.1.5. At the time of occurrence, 1,400 ft vertical separation and 05 NM horizontal separation existed between the two aircraft. Standard separation was not infringed.

1.1.6. Both aircraft continued to their destination without any further incident.

1.2. Injuries to Person(s)

1.2.1. No injury was reported to any person on board the aircraft.

ANK4506				
Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	07	51	58	-
TOTAL	07	51	58	-

Table 1 Injures to persons on board – ANK4506

BAW2261				
Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	10	148	158	-
TOTAL	10	148	158	-

Table 2 Injures to persons on board – BAW2261

1.3. Damage to Aircraft

1.3.1. There was no damage reported to any of the aircraft.

1.4. Other Damage

1.4.1. Not Applicable.

1.5. Personnel Information

1.5.1. Not Applicable.

1.6. Aircraft Information

ANK4506	
Aircraft Make & Model	Airbus 320-233
Registration Marking	EX32009
Manufacturer Serial No.	0916
Year of Manufacturer	1998
Operator	Aero Nomad Airlines
Sector	Islamabad to Bishkek
Engine Type	IAE V2527-A5

Table 3 Aircraft details – ANK4506

BAW2261	
Aircraft Make & Model	Boeing 777-236ER
Registration Marking	GYMMD
Manufacturer Serial No.	30305
Year of Manufacturer	2000
Operator	British Airways
Sector	London to Islamabad
Engine Type	Rolls Royce Trent 895

Table 4 Aircraft details – BAW2261

1.7. Meteorological Information

1.7.1. No significant weather was reported by Pakistan Meteorological Department⁶, METAR for the time 1700 is as follows: -

1.7.2. 1700Z 31003KT 6000 NSC 32/08 Q1001 NOSIG RH22%.

Time	1700 UTC
Wind Direction	310 degrees
Speed	03 Knots
Visibility	6,000 meters
Clouds	No Significant Cloud
Temperature	32°
Dewpoint	08°
Pressure	Q1001
Weather	No Significant Weather
Humidity	RH22%

⁶ Pakistan Meteorological Department Weather Report dated 20th December, 2023

1.8. Aids to Navigation

1.8.1. According to the European Aviation Safety Agency (EASA) SIB No. 2016-05R2⁷ of 22nd April, 2016, a design error of the SSR Mode S transponder installed on the **Airbus 320-233 Reg. No. EX32009 aircraft (performing the ANK4506 flight), transmits the QNH pressure setting instead of transmitting the actually set QNE pressure to the ATC controller's radar receiving unit**⁸.

1.9. Communications

1.9.1. Communication frequencies for Lahore Flight Information Region (FIR) are provided below. At the time of incident, no abnormality was reported.

OPIS AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency	Hours of operation	Remarks
1	2	3	4	5
Aerodrome Control Service	Islamabad Ground	124.350 MHZ	H24	Fire
Aerodrome Control Service	Islamabad Departure	118.550 MHZ	H24	Clearance Delivery
Aerodrome Control Service	GMC (N)	125.150 MHZ	H24	Secondary
Emergency Service	Islamabad	121.500 MHZ	H24	Function Emergency
Approach Control Service	Islamabad APP	124.650 MHZ	H24	Secondary
Military Frequency	Islamabad APP	241.200 MHZ	HX	Secondary
Aerodrome Control Service	GMC (N)	123.050 MHZ	H24	Primary
Aerodrome Control Service	Islamabad Tower	122.150 MHZ	H24	Primary
Approach Control Service	Islamabad APP	121.650 MHZ	H24	Primary
Aerodrome Control Service	Islamabad Ground	122.950 MHZ	H24	Secondary
Aerodrome Control Service	Islamabad Departure	119.650 MHZ	H24	Departure Frequency
Aerodrome Control Service	Islamabad Tower	123.225 MHZ	H24	Secondary
Military Frequency	Islamabad APP	240.500 MHZ	HX	Primary
Aerodrome Control Service	Islamabad Ground	121.850 MHZ	H24	Vehicle / Follow-Me
Aerodrome Control Service	Islamabad Ground	130.600 MHZ	H24	Primary
D-ATIS	D-ATIS	126.200 MHZ	H24	Weather Broadcast Service

Table 5 Communication Frequencies for Islamabad ACC

⁷ EASA Safety Information Bulletin Airworthiness SIB No. 2016-05R2 issued on 22nd April, 2016

⁸ IAC Comments on the Draft Final Report para 3

ENR 3.3 RNAV ROUTES

Route designator RNAV Type Name of significant points COORD	Magnetic Track Distances (NM)	Upper limits Lower Limits. Airspace classification	Lateral limits NM	Direction of cruising levels		RMK Controlling unit FREQ
				Odd	Even	
1	2	3	4	5		6
P500 (RNP-10)						
▲ D.I. KHAN VOR (DI) 315446N 0705308E	<u>346°</u> 164° 63.0NM	<u>UNL</u> FL280 Class A	20	↑	↓	Lahore ACC West Primary FREQ. 124.1 MHZ. Secondary 118.950 MHz
▲ LAKRA 325606N 0703547E	<u>029°</u> 209° 38.9NM	<u>UNL</u> FL280 Class A	20	↓	↑	Islamabad ACC Primary FREQ. 120.75 MHZ. Secondary 125.75 MHz
▲ HANGU 332909N 0710021E	<u>038°</u> 219° 39 NM	<u>UNL</u> FL280 Class A	20	↓	↑	
▲ PESHAWAR DVOR/DME (PS) 335842N 0713101E	<u>005°</u> 184° 115.3NM	<u>UNL</u> FL280 Class A	20	↓	↑	
▲ ATROL 355310N 0714800E	<u>327°</u> 147° 21.6NM	<u>UNL</u> FL280 Class A	20	↑	↓	In avoiding frequent level changes within short distance b/n ATROL to MOMTO aircraft to maintain ATC assigned Level
Route designator RNAV Type Name of significant points COORD	Magnetic Track Distances (NM)	Upper limits Lower Limits. Airspace classification	Lateral limits NM	Direction of cruising levels		RMK Controlling unit FREQ
1	2	3	4	5		6
▲ GERRY 361159N 0713458E	<u>005°</u> 185° 16.2NM	<u>UNL</u> FL280 Class A	20	↓	↑	To establish Contact 15 Minutes prior to entering Lahore FIR For continuation, see AIP Afghanistan.
▲ MOTMO 362759N 0713758E						

Table 6 ATS Enroute Communication Frequencies for Islamabad ACC

ENR 3.1 ATS ROUTES

Route designator Name of significant points COORD	Magnetic Track Distances (NM)	Upper limits Lower Limits. Airspace classification	Lateral limits NM	Direction of cruising levels		RMK Controlling unit FREQ
				Odd	Even	
1	2	3	4	5		6
J143						
▲ PESHAWAR DVOR/DME (PS) 335842N 0713101E	<u>145°</u> 324° 16.0NM	<u>UNL</u> 10000 FT Class A at or above FL 155 Class C below FL 155	20	↓	↑	Islamabad ACC Primary 120.75 MHz Secondary 125.75 MHz Cherat North APP FREQ 125.6 MHz. Below FL280
△ LERNO (APCH- OPPS) 334513N 0714126E	<u>144°</u> 325° 15.3NM	<u>UNL</u> 10000 FT Class A at or above FL 155 Class C below FL 155	20	↓	↑	
Route designator Name of significant points	Magnetic Track	Upper limits Lower Limits	Lateral limits	Direction of cruising levels		RMK Controlling unit

Table 7 ATS Enroute Communication Frequencies for Islamabad ACC

1.10. Aerodrome Information

1.10.1. Not Applicable.

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. **TCAS Working Principle** – TCAS stands for Traffic alert and Collision Avoidance System, and its purpose is to minimize the risk of mid-air collisions between aircraft. Working independently from Air Traffic Control, TCAS uses nearby aircraft's transponder signals to alert pilots to the danger of mid-air collisions. It does so by constructing a three-dimensional map of airspace through which the aircraft is travelling. In detecting the other aircraft's transponder signals, it can foresee the potential collisions based on speeds and altitude of planes passing through the airspace in question. If TCAS detects a potential collision, it will automatically notify each of the affected aircraft. In this instance, it will automatically initiate a mutual avoidance manoeuvre. This involves the system informing the crews of the aircraft in question both audibly and visibly to either climb or descend in a manner that ensures that, when their paths cross, they do not meet.



Figure 3 TCAS (TA) alert

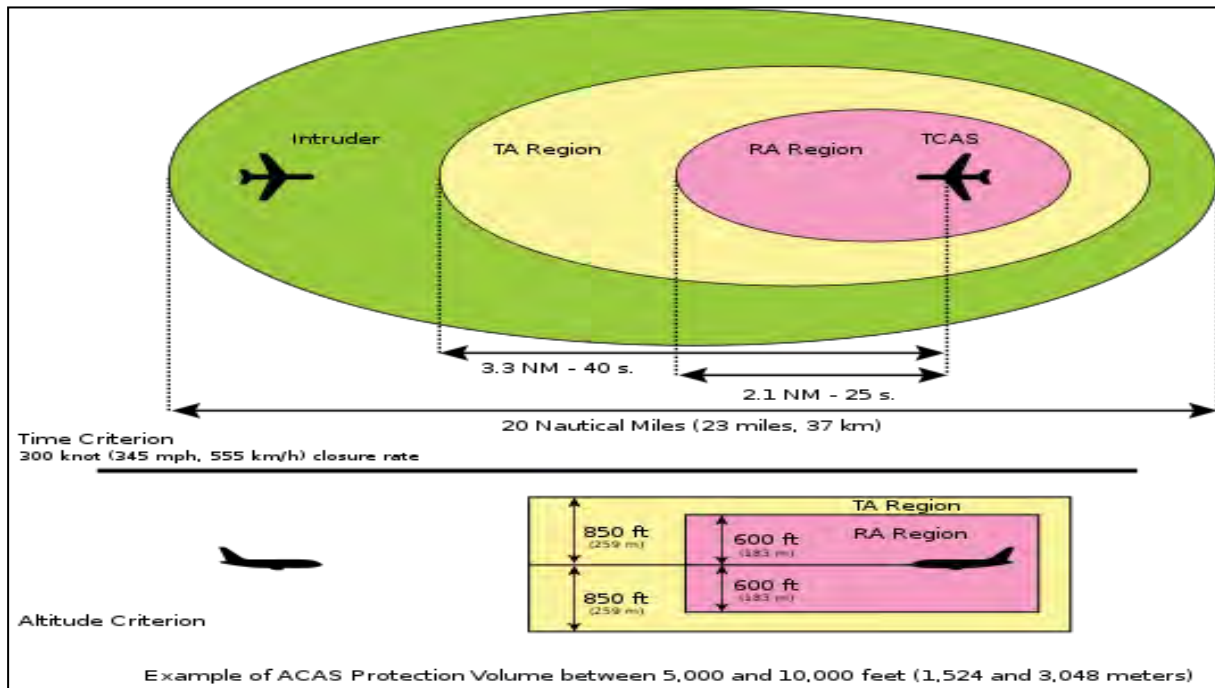


Figure 4 TCAS TA & RA ranges

1.18.2. **Traffic Display Symbology** – On the TCAS traffic display both colour and shape are used to assist the pilot in interpreting the displayed information.

1.18.2.1. Own-aircraft is depicted as a white or yellow aircraft-like symbol. Targets are displayed by different symbols, according to their threat status

1.18.2.2. Hollow white diamond – for other traffic. (No threat).

1.18.2.3. Solid white diamond – for proximate traffic.

1.18.2.4. Solid yellow or amber circle – for intruders (i.e. aircraft which trigger a TA).

1.18.2.5. Solid red square – for threats (i.e. aircraft which trigger an RA).



Figure 5 Traffic Display

1.18.3. ICAO Doc 8168 Vol-III High Vertical Rate (HVR) Encounters

1.18.3.1. ICAO Doc 8168 Vol-III, states that Pilots should use appropriate procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/s (or 1,500 ft / min) throughout the last 300 m (or 1,000 ft) of climb or descent to the assigned altitude or flight level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level, unless otherwise instructed by ATC. Some aircraft have auto-flight systems with the capability to detect the presence of such aircraft and adjust their vertical rate accordingly. These procedures are intended to avoid unnecessary ACAS II resolution advisories in aircraft at or approaching adjacent altitudes or flight levels. For commercial operations, these procedures should be specified by the operator.

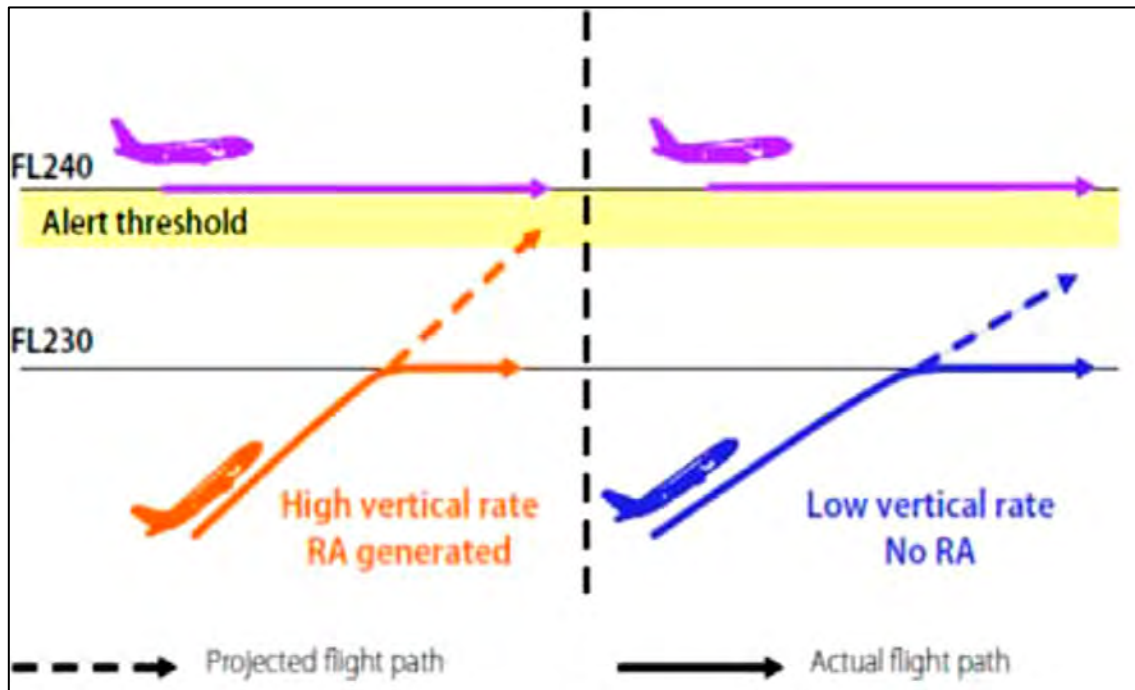


Figure 6 HVR Encounters

1.19. Useful or Effective Investigation Techniques

1.19.1. Standard investigation procedures and techniques were used during the course of investigation.

INTENTIONALLY LEFT BLANK

SECTION 2 – ANALYSIS

2.1. General

2.1.1. On 05th June, 2022, Aero Nomad flight ANK4506, Airbus 320 aircraft, Reg. No. EX32009 was a commercial passenger flight which took off from OPIS, Islamabad, Pakistan for UCFM, Bishkek, Kyrgyzstan on ATS route ISB-KALMI-J143-PS-P500.

2.1.2. British Airways flight BAW2261, Boeing 777 aircraft, Reg. No. GYMMD was operating from EGLL, London, UK to OPIS, Islamabad, Pakistan on route P500-PS-J143-KALMI-ISB.

2.1.3. At time 16:54 h, BAW2261 reported top of descent at 16:59 UTC to Islamabad ACC.

2.1.4. At 16:57 h, ANK4506 came in contact with Islamabad ACC and was instructed to continue climb to FL320.

2.1.5. At the same time, BAW2261 was given descent to FL330.

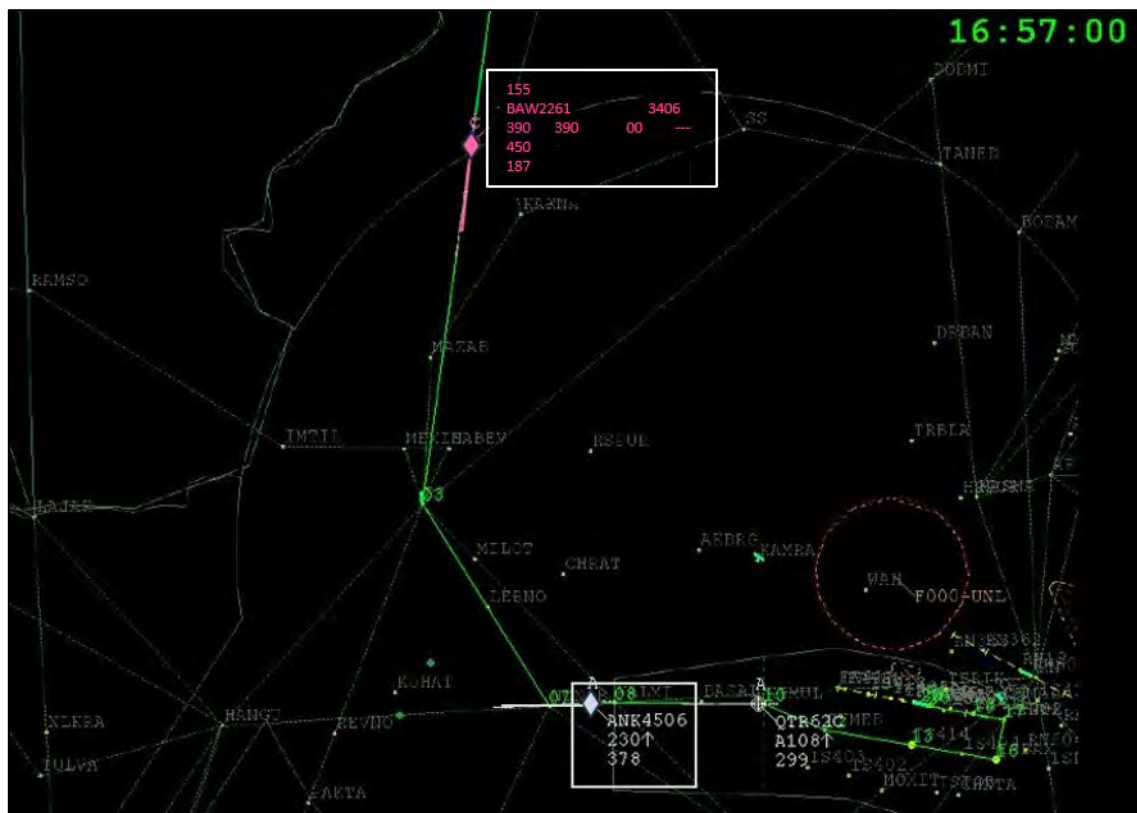


Figure 7 ANK came in contact with Islamabad ACC

2.1.6. At time 16:59 h, Islamabad ACC passed information of reciprocal traffic (ANK4506) to BAW2261.



Figure 8 Traffic Information passed to BAW2261

2.1.7. At time 17:00 h, Islamabad ACC passed traffic information of BAW2261 to ANK4506 upon which ANK4506 reported that they have traffic in sight.

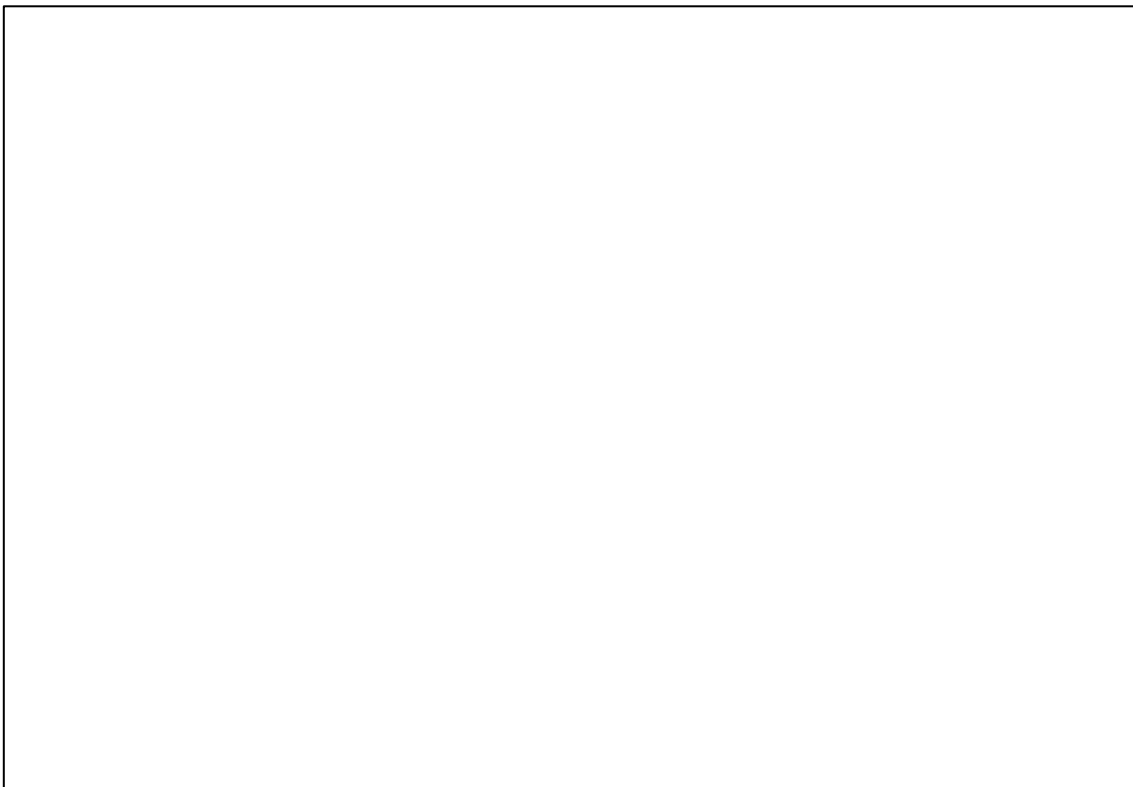


Figure 9 Traffic Information passed to ANK4506

2.1.8. At time 17:02 h, BAW2261 also acknowledged the traffic on TCAS.

2.1.9. When ANK4506 was 05 NM North of position PS VOR climbing out of FL318 for FL320 with ROC 1,100 ft/min, it encountered TCAS-RA with reciprocal traffic BAW2261 which was descending from FL390 to FL330 passing FL332 with ROD 1,600 ft/min at the time of incident.

2.1.10. ANK4506 descended from FL318 to FL315 on TCAS-RA. Meanwhile, BAW2261 did not report TCAS-RA however, it followed TCAS-RA command to level off at FL330⁹.

2.1.11. BAW2261 was maintaining high ROD Approx 2,200 ft / min just before RA which was contrary to ICAO Doc 8168 Vol-III¹⁰, which states: -

“3.3 HIGH VERTICAL RATE (HVR) ENCOUNTERS

Pilots should use appropriate procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/s (or 1,500 ft / min) throughout the last 300 m (or 1,000 ft) of climb or descent to the assigned altitude or flight level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level, unless otherwise instructed by ATC. Some aircraft have auto-flight systems with the capability to detect the presence of such aircraft and adjust their vertical rate accordingly. These procedures are intended to avoid unnecessary ACAS II resolution advisories in aircraft at or approaching adjacent altitudes or flight levels. For commercial operations, these procedures should be specified by the operator”.

2.1.12. It was observed on Radar Display that the ROD of BAW2261 was fluctuating before the RA.

2.1.13. The RODs of BAW2261 and ROCs of ANK4501 as observed on Radar Display are as follows: -

Time	BAW2261	ANK4501
	ROD	ROC
17:01:51	2,600 ft/min	1,400 ft/min
17:01:59	2,800 ft/min	1,400 ft/min
17:02:21	1,600 ft/min	1,100 ft/min

Table 8 ROD / ROC

⁹ AAIB UK email dated 13th August, 2024

¹⁰ ICAO Doc 8168, Vol-III, Section 4, Chapter 3 para 3.3

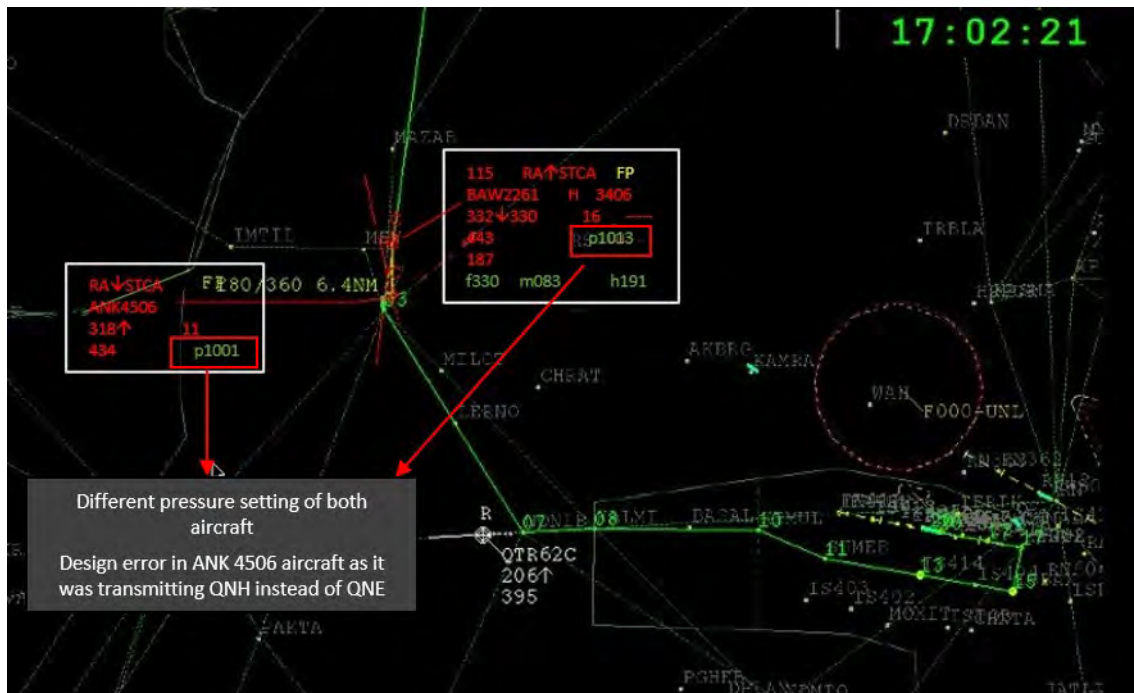


Figure 10 Activation of RA

2.1.14. At the time of incident, 1,400 ft vertical separation and 05 NM horizontal separation existed between the two aircraft. Standard separation was not infringed.

2.1.15. Both aircraft continued to their destination without any further incident.

2.1.16. In this incident it was observed on the ATC controllers display that BAW2261 was maintaining standard QNE 1013.2 hPa while ANK4501 was observed maintaining QNH 1001 hPa instead of standard QNE 1013.2 hPa.

2.1.17. Both aircraft were maintaining different pressure settings as per ATC Surveillance Radar Display which was not verified by Islamabad ACC.

2.1.18. After detailed technical evaluation¹¹ of IIAP Islamabad Radar and ATM system regarding anomaly in display of Mode-S pressure setting, it was concluded that no anomaly existed in the display pressure setting values as it was also verified from other aircraft operating in the area of responsibility of Islamabad ACC by the ATC Controller. The report further stated that the data displayed on ATC Controller's display is found to be same as transponder reported data.

2.1.19. The issue of the discrepancy of the QNH setting to the correct QNE setting as per the data received by radar was highlighted to Interstate Aviation Committee in light of the European Union Aviation Safety Agency (EASA) Safety Information Bulletin¹² Airworthiness SIB No. 2016-05R2 issued on 22nd April, 2016 [Mode S Enhanced Surveillance – Incorrect Downlinked Barometric Pressure Setting (BPS)]. It was established that due to a design error, the previous value of BPS selected before application of the STD continues to be downlinked to the ground via the SSR Mode S transponder¹³.

¹¹ PCAA Technical Evaluation Report of Islamabad Radar and ATM System Regarding Anomaly in Display of Mode-S Pressure Setting dated 13th October, 2022

¹² EASA Safety Information Bulletin Airworthiness SIB No. 2016-05R2 issued on 22nd April, 2016

¹³ IAC Comments on Draft Final Report para 8

2.1.20. In response Interstate Aviation Committee concurred with the observation and informed BASI Pakistan regarding inclusion of correct altimeter setting procedure in the Standard Operating Procedures (SOPs) of the Operator.

SECTION 3 – FINDINGS

3.1. Findings

- 3.1.1. On 5th June, 2022, Aero Nomad flight ANK4506, A320 aircraft, and British Airways flight BAW2261, B777 aircraft, were both scheduled passenger flights.
- 3.1.2. ANK4506 departed from OPIS, Islamabad, Pakistan, bound for UCFM, Bishkek, Kyrgyzstan, following the ATS route ISB-KALMI-J143-PS-P500.
- 3.1.3. BAW2261 was enroute from EGLL, London, UK, to OPIS, Islamabad, Pakistan, following the route P500-PS-J143-KALMI-ISB.
- 3.1.4. When 05 NM North of PS VOR, ANK4506, climbing from FL318 to FL320 with a ROC of 1,100 ft/min, encountered a TCAS-RA with BAW2261, which was descending from FL390 to FL330, passing FL332 with a ROD of 1,600 ft/min.
- 3.1.5. ANK4506 descended from FL318 to FL315 in response to the TCAS-RA, while BAW2261 did not report TCAS-RA however, it followed TCAS-RA command to level off at FL330¹⁴.
- 3.1.6. At the time of the occurrence, there was 1,400 ft vertical separation and 05 NM horizontal separation between the two aircraft.
- 3.1.7. ANK4506 and BAW2261 continued to their destinations without further incident and followed their designated routes as per their flight plans.
- 3.1.8. There were no reported injuries or damage to either aircraft.
- 3.1.9. The Pakistan Meteorological Department did not report any significant weather conditions at the time of the incident.
- 3.1.10. ICAO Doc 8168 specifies vertical rate minimums to ensure safety, which were not strictly adhered to in this incident.
- 3.1.11. BAW2261 high ROD before the TCAS-RA and fluctuating RODs observed on radar display indicate deviation from ICAO guidelines.
- 3.1.12. Both aircraft maintained different pressure settings, which were noted on the ATC surveillance radar display; however technical evaluations found no anomalies in the ATC surveillance system.
- 3.1.13. The issue of the discrepancy of correct QNH setting in aircraft altimeter was highlighted to Interstate Aviation Committee in light of the EASA Safety Information Bulletin Airworthiness SIB No. 2016-05R2 issued on 22nd April, 2016 which was agreed by Interstate Aviation Committee and included in the Operator's SOPs.

3.2. Cause / Contributory Factors

3.2.1. Cause

- 3.2.1.1. Activation of TCAS – RA (**MAC – Mid Air Collision**) due high Rate of Descend by BAW2261.

¹⁴ AAIB UK email dated 13 August, 2024

3.2.2. Contributory Factors

3.2.2.1. Incorrectly transmitted previously set QNH pressure by the ANK4506 transponder which was not monitored by ATC Controllers as well as flight crew.

Note: *Aviation Occurrence Category (ADREP Taxonomy)*

“Mid-Air Collision (MAC): *Separation-related occurrences caused by either air traffic control or cockpit crew*

INTENTIONALLY LEFT BLANK

SECTION 4 – SAFETY RECOMMENDATIONS

