FINAL INVESTIGATION REPORT

SERIOUS INCIDENT
TCAS-RA

SAUDIA AIRLINE FLIGHT SVA792 AIRBUS 330-343 AIRCRAFT REG. NO. HZ-AQ18 (OERK TO OPPS) AND MILITARY AIRCRAFT ON 05-03-2024

SCOPE

At Bureau of Aircraft Safety Investigation Pakistan (BASIP) investigations are conducted in accordance with Pakistan Aircraft Safety Investigation (PASI) Act, 2023 and International Civil Aviation Organization (ICAO) Annex-13.

The sole objective of the investigation and its final report as per above stated regulations is to prevent future accidents / serious incidents / incidents of similar nature without apportion blame or liability. Accordingly, it is inappropriate to use BASIP investigation reports to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for Judiciary and administrative purpose.

This report contains facts, which are based on information which came to the knowledge of BASIP during the investigation 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 serious incidents.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ABBREVIATIONS

AAIB	Aircraft Accident Investigation Board
ACAS	Airborne Collision Avoidance System
AHQ	Air Headquarters
AIB	Aviation Investigation Bureau
BASIP	Bureau of Aircraft Safety Investigation Pakistan
BEA	Bureau of Enquiry and Analysis
EAT	Expected Approach Time
FL	Flight Level
ft	Feet
h	Hour
hPa	Hectopascal
ICAO	International Civil Aviation Organization
IOU	Incident Occurrence and Unserviceability Report
KSA	Kingdom of Saudi Arabia
Kts	Knots
MA1	Military Aircraft 1
MA2	Military Aircraft 2
m	Meter(s)
MAC	Mid Air Collision
METAR	Meteorological Aerodrome Report
MWO	Meteorological Watch Office
NM	Nautical Mile
OERK	King Khalid International Airport, Riyadh
OPPS	Bacha Khan International Airport, Peshawar
PAA	Pakistan Airports Authority
PAF	Pakistan Air Force
PASI	Pakistan Air Safety Investigation
PCAA	Pakistan Civil Aviation Authority
PS	Peshawar
RA	Resolution Advisory
SVA	Saudia Airlines
TA	Traffic Advisory
TCAS	Traffic alert and Collision Avoidance System
UTC	Universal Time Coordinated

INTRODUCTION

This serious incident was reported to BASIP by then Pakistan Civil Aviation Authority (PCAA) vide Incident Occurrence and Unserviceability Report (IOU)[1]. This serious incident was notified[2] to International Civil Aviation Organization (ICAO), Aviation Investigation Bureau (AIB), Kingdom of Saudi Arabia (KSA) and Bureau of Enquiry and Analysis (BEA), France in line with Annex-13. The investigation has been conducted by BASIP. All corresponding timings are mentioned in Universal Time Coordinated (UTC).

[1] PCAA IOU Report dated 6 March, 2024
[2] ICAO Initial Notification dated 22 May, 2024

SYNOPSIS

On 05 March, 2024, Saudi Airline flight SVA792 Airbus A330-343 aircraft, Reg. No. HZ-AQ18, was a scheduled passenger flight operating from King Khalid International Airport (OERK) Riyadh, KSA to Bacha Khan International Airport (OPPS), Peshawar, Pakistan.

SVA792 was instructed by Air Traffic Control to hold overhead Peshawar (PS), until cleared for landing due to military flying. Meanwhile, due to emergency of a military aircraft, runway (RWY) was blocked and all military aircraft were advised to fly for endurance and hold overhead PS.

While holding overhead Peshawar the SVA792 reported “TA” followed by “RA” due to conflicting military traffic turning ahead of her with less than 1,000 feet (ft) separation. Later on, SVA792 again reported “TA” due military aircraft crossing its inbound course to PS at approximately 1,500 feet above, subsequently descending 500 ft below and 2 (nautical mile) NM ahead.

Being a joint user airfield, Peshawar has limited airspace, catering for both civil and military air traffic. This limitation combined with the blocked runway emergency leading to aircraft flying for endurance led to a serious incident of TCAS-RA; becoming a safety concern for both aircraft and passengers on board.

SECTION 1 - FACTUAL INFORMATION

1.1. History of the Flight

1.1.1. On 05 March, 2024, Saudi Airline flight SVA792, Airbus 330-343 aircraft, Reg. No. HZ-AQ18, operated from OERK, Riyadh, KSA to OPPS, Peshawar, Pakistan on Air Traffic Services (ATS) route PG – G325 – LAKRA – P500 – HANGU – OPPS as a scheduled passenger flight.

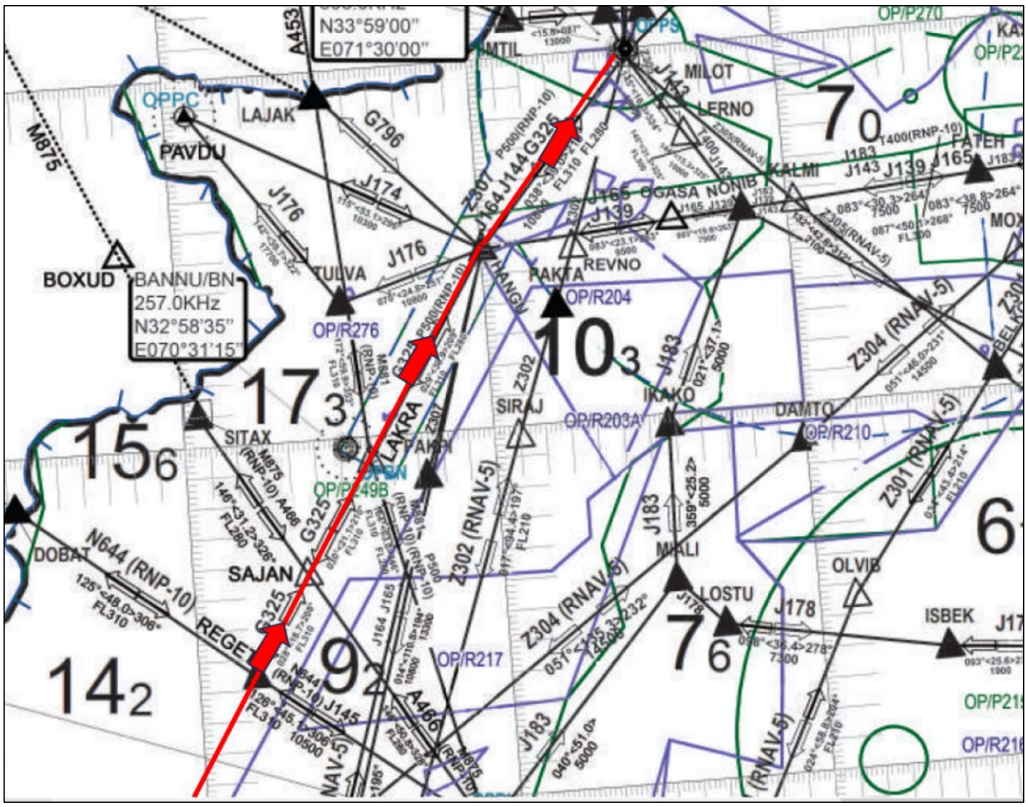

Figure 1 Route Map SVA792

1.1.2. Peshawar Airport (OPPS) is a joint-user airfield, where civil and military controllers operate concurrently from a shared Control Tower facility. The airport is served by a single runway (R/W), designated 17/35, accommodating both civil and military flight operations.

1.1.3. Civil Air Traffic Controllers are responsible for the provision of ATS to civil aircraft to / from Peshawar from Ground to FL140, which comes under the area of jurisdiction of Cherat Approach North / South.

1. Designation and Lateral Limits	Cherat North & South APP For details ENR2.1-3
2. Vertical Limits	14000 FT
3. Airspace classification	Class C
4. ATS Units call sign Language(s)	Peshawar Tower
5. Transition altitude	12000 FT MSL
6. Remarks	Nil

Figure 2 ATS Airspace (AIP AD 2 OPPS-1)

1.1.4. **035230.** SVA792 came in contact with Peshawar Tower at FL160, while proceeding to TOMON via HANGU 1 D Arrival as advised by previous controller (Cherat South Approach).

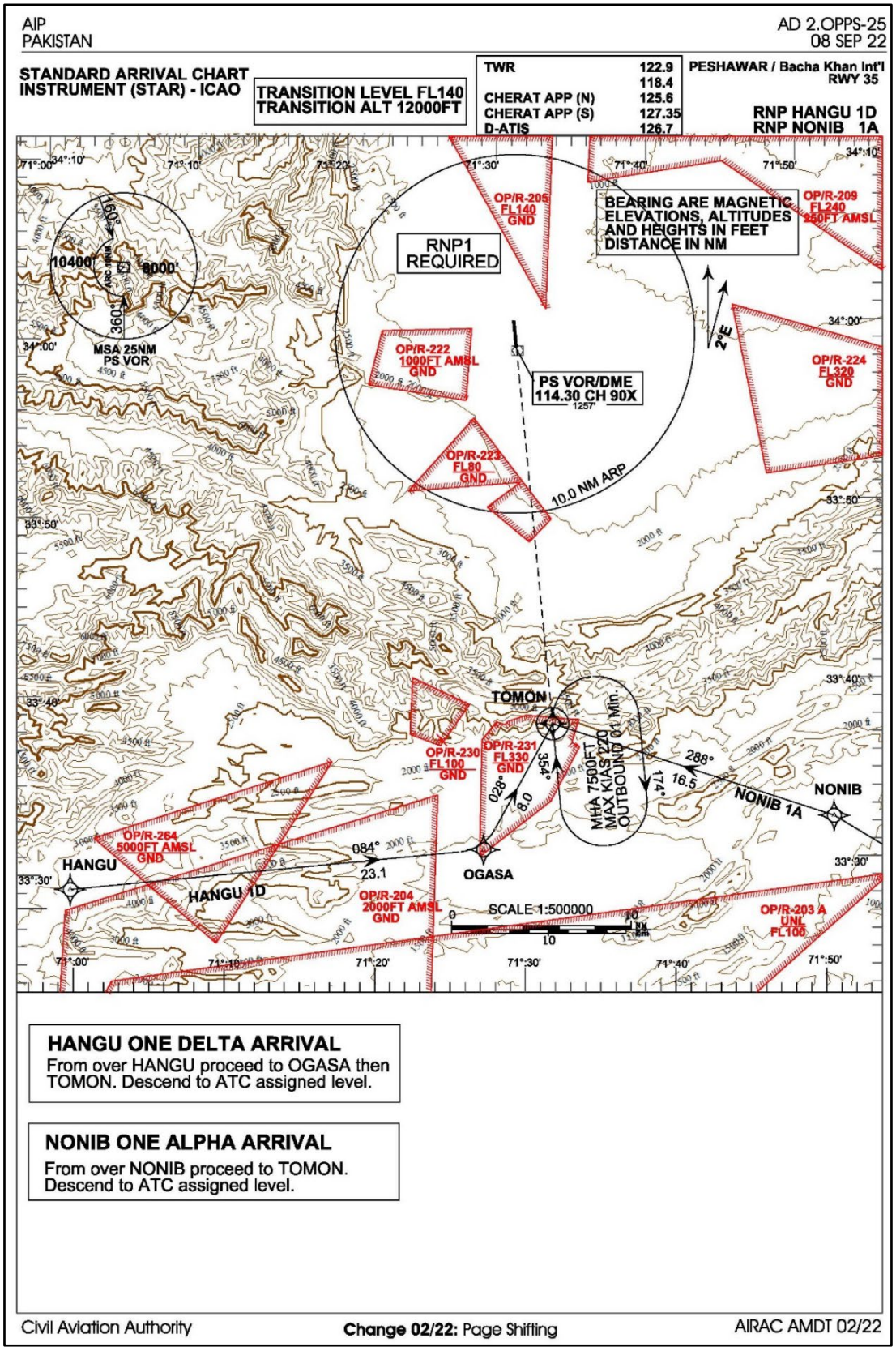

Figure 3 Approach Chart HANGU 1D Arrival

1.1.5. Civil Controller re-cleared the aircraft via HANGU 1 C Arrival for Instrument Landing System Zulu (ILS Z) Approach R/W 35 and instructed the pilot to report over-head PS VOR for holding due to ongoing military flying.

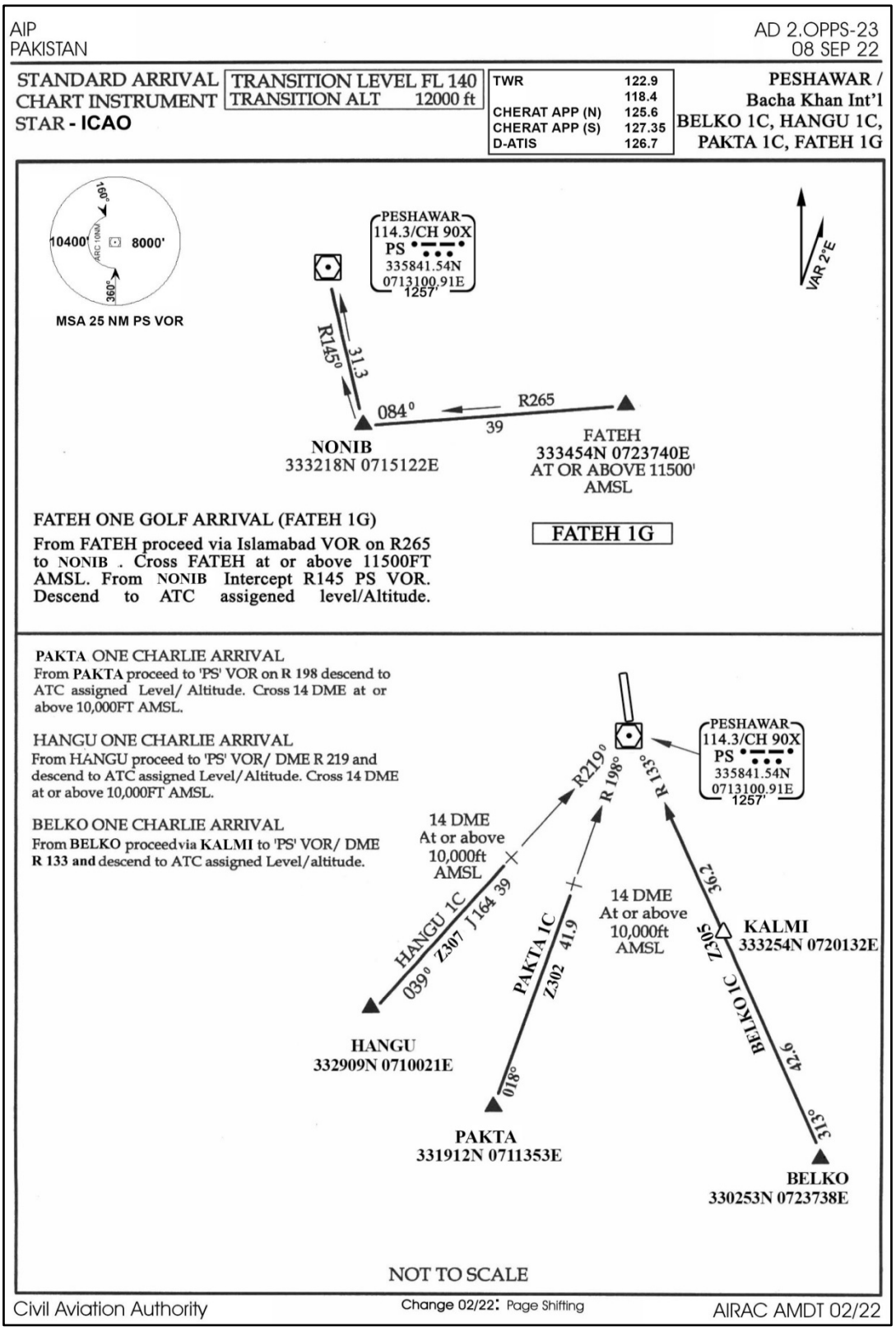

Figure 4 Approach Chart HANGU 1C Arrival

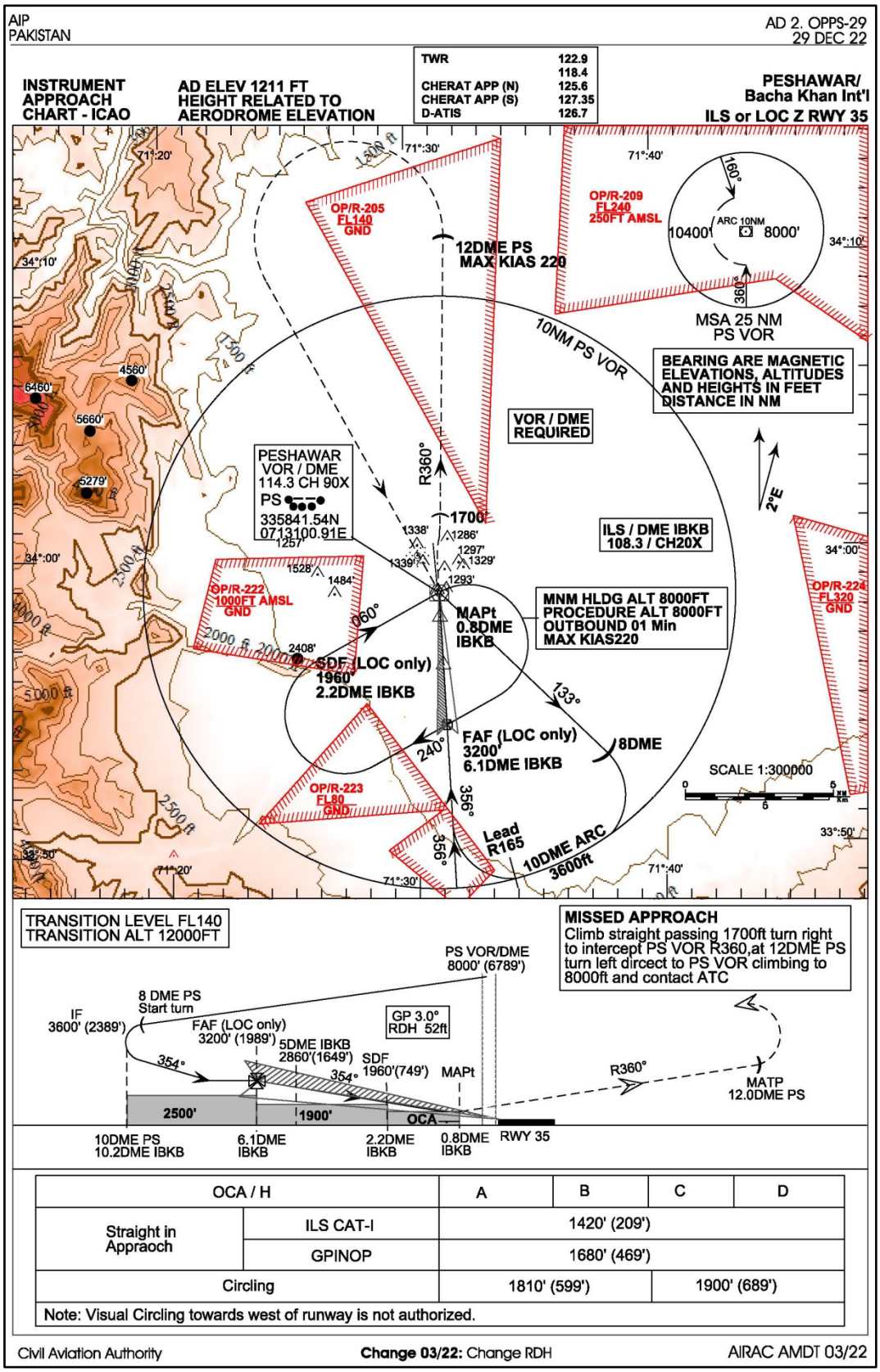

Figure 5 ILS Z Approach R/W 35

1.1.6. **035700**. The Civil Controller issued traffic information to SVA792 regarding military aircraft operating at FL140 and below, overhead PS.

1.1.7. **035732.** SVA792 was issued Expected Approach Time (EAT) i.e. 0430 by Civil Controller, for ILS Z Approach RWY 35.

1.1.8. **035900.** SVA792 reported 10 NM short of PS on radial 219 and was instructed to join standard holding pattern overhead PS (Peshawar VOR), maintaining FL160.

1.1.9. **035950.** SVA792 was instructed to descend and maintain FL140.

1.1.10. **041344.** SVA792 was informed about the emergency landing of military aircraft at PS and was advised to standby for revised EAT. (At that time due to a military aircraft emergency, the RWY 35 at PS was blocked and all military aircraft were advised to fly for endurance and hold overhead PS VOR)

1.1.11. Meanwhile, a Military aircraft (MA1) recovering from a routine training mission was cleared to FL160 and directed to hold over OPPS VOR by the Military Controller.

1.1.12. While holding overhead PS VOR, MA1, which was flying with minimum power for endurance (i.e. operating at minimum power for extended holding), inadvertently lost altitude and descended to FL147, triggering a TA, followed by an RA for SVA792.

1.1.13. **042300.** SVA792 reported Traffic Advisory (TA) followed by Resolution Advisory (RA) and initiated an RA descent from FL140 to 13,500 ft, due to the Military Traffic (MA1) turning ahead of it with less than 1,000 ft vertical separation.

1.1.14. Civil Controller passed the Traffic information to SVA792 about military flying operating at FL160 and 12,000 ft, along with the revised EAT 0450.

1.1.15. Once clear of the conflicting traffic, SVA792 climbed back to FL140. The flight crew subsequently reported that, during the turn, the conflicting military traffic was observed to be on a head-on trajectory, descending through their level.

1.1.16. **042943.** Civil Controller informed SVA792 regarding military aircraft descending from FL160 to 10,000 ft, 15 NM North of OPPS, which was acknowledged by SVA792.

1.1.17. **043800.** SVA792 was issued revised EAT 0500.

1.1.18. **045500.** SVA792 reported receiving a second Traffic Advisory (TA) due to an aircraft crossing its inbound course to PS at approximately 1,500 feet above. The crew subsequently reported that the traffic descended below their altitude by 500 feet, passing approximately 2 NM ahead. Upon inquiry, the Military Controller informed that the traffic was another military aircraft (MA2), which was descending from FL160 for landing due to low fuel status.

1.1.19. **050100.** SVA792 was given revised EAT 0510.

1.1.20. **050500.** SVA792 was re-cleared to descend in a standard pattern on QNH followed by ILS Z Approach for RWY 35.

1.1.21. SVA792 landed safely at time 052000.

1.2. Injuries to Person(s)

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

1.3. Damage to Aircraft

1.3.1. No damage was reported due to this incident 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

SVA792	
Aircraft Make & Model	Airbus 330-343
Registration Marking	HZ-AQ18
Manufacturer Serial No.	1743
Operator	Saudi Airline
Sector	OERK – OPPS

Table 1 SVA792 Aircraft details

1.7. Meteorological Information

1.7.1. No significant weather was reported by Meteorological Watch Office (MWO) at the time of the incident.

METAR
OPPS 050400Z 05004KT 7000 14/00 QNH1021 NOSIG=

Table 2 METAR details for OPPS

METAR DESCRIPTION	
OPPS	**(Station ID)** Peshawar
050400Z	**(Date and Time)** Day 05, Time 04:00 UTC
05004KT	**Wind Direction & Speed-** Wind Direction: 050°, Speed: 04 knots (kts)
7000	**Visibility-** 7,000 meters (m).
14/00	**Temperature:** 14°C, **Dewpoint:** 0°C
QNH1021	**Altimeter setting -** Air pressure QNH 1021 Hectopascal (hPa)
NOSIG	**No significant change** is expected within the next 2 hours (h)

Table 3 METAR description

1.8. **Aids to Navigation**

1.8.1. Navigational Aids for OPPS, Peshawar are provided below: -

Type of AID CAT of ILS (VAR/VAR/ILS)	ID	Frequency	Hours of Operations	Site of transmitting antenas coordinates	Elevation of DME transmitting antena	Remarks
1	2	3	4	5	6	7
ILS/LOC CAT 35	IBKB	108.300 MHz	H24	340030.83N 0713047.90E	364.6 M	Nill
DVOR/DME 2° E/2020	PS	114.300 MHz CH90X	H24	335841.54N 0713100.91E	383.17 M	Nill
NDB	PS	308.000 kHz	H24	335957.00N 0713010.00E	Nill	Coverage 150 NM PAF Controlled
GP/TDME 35	IBKB	334.100 MHz CH20X	H24	335904.62N 0713052.18E	376.9 M	GP 3° RHD/TCH 52 FT

Designations RWY NR	APCH LGT Type LEN INTST	THT LGT colour WBAR	VASIS (MEHT PAPI)	TDZM LGT LEN	RWY Centre Line LGT Length, Spacing, colour, INTST	RWY Edge Line LGT Length, Spacing, colour, INTST	RWY End LGT colour WBAR	SWY LGT LEN (M) colour	Remarks
1	2	3	4	5	6	7	8	9	10
17	Nil	GREEN	PAPI LEFT/3°	N/A	N/A	2743M 60 M WHITE LIH	RED	N/A	Strobe Lights
35	CATI PALS 824 M LIH	GREEN	PAPI LEFT/3°	N/A	N/A	2743M 60 M WHITE LIH	RED	N/A	Strobe Lights

Figure 6 Navigational Aids for OPPS

1.9. **Communications**

1.9.1. Communications facilities for OPPS, Peshawar are provided below: -

Service Designation	Call Sign	Frequency	Hours of Operation	Remarks
1	2	3	4	5
APP	Cherat APP	121.200 MHZ	H24	Cherat Aproach Frequency
APP	Cherat APP	125.600 MHZ	H24	PAF Primary Frequency
APP	Cherat North	121.200 MHZ	H24	Secondary Frequency
APP	Cherat North	125.600 MHZ	H24	Primary Frequency
APP	Cherat South	126.250 MHZ	H24	Secondary Frequency
APP	Cherat South	127.350 MHZ	H24	Primary Frequency
ATIS	D-ATIS	126.700 MHZ	H24	For broadcasting of terminal information
G/A/G	Radio	2923.000 KHZ	H24	HF Secondary Frequency
G/A/G	Radio	5601.000 KHZ	H24	HF Primary Frequency
Tower	Peshawar Tower	121.500 MHZ	H24	VHF Emergency Frequency
Tower	Peshawar Tower	121.800 MHZ	H24	Ground Frequency
Tower	Peshawar Tower	122.900 MHZ	H24	Primary Frequency
Tower	Peshawar Tower	243.000 MHZ	H24	UHF Emergency Frequency
Tower	Peshawar TWR	118.400 MHZ	H24	Stand by Frequency
Apron	Peshawar TWR	118.300 MHZ	H24	Stand by Frequency

Figure 7 Communication Facilities for OPPS

1.10. Aerodrome Information

1.10.1. At the time of incident, no abnormality was reported. Aerodrome data of OPPS, Peshawar is provided below: -

Designations RWY NR	True bearing	Dimensions of RWY (M)	Strength (PCR) 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
17	175.91°	2743 x 46	455/F/B/X/U Bitumen	340021.62N 0713048.76E	THR 357.00 M / 1171.26 FT	0.500%
35	355.91°	2743 x 46	455/F/B/X/U Bitumen	335853.16N 0713056.35E	THR 369.00 M / 1210.63 FT	0.500%

SWY dimension (M)	CWY dimension (M)	Strip dimension (M)	RESA dimension (M)	Arresting system	Obstacle Free Free zone	Remarks
8	9	10	11	12	13	14
60	Nil	2983 x 70	90 x 92	Nil	Nil	No Arresting system is available at this location for civil aircraft; However, being a joint user airfield, Arresting barriers are installed by PAF for fighter aircrafts only.
60	Nil	2983 x 70	90 x 92	Nil	Nil	No Arresting system is available at this location for civil aircraft; However, being a joint user airfield, Arresting barriers are installed by PAF for fighter aircrafts only.

Table 4 Aerodrome data of OPPS

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. Bacha Khan International Airport (BKIAP), Peshawar, functions as a joint-user aerodrome with both civil and military operations conducted from a single runway, designated 17/35. Air traffic management at the aerodrome is carried out from the Control Tower, which is jointly staffed by civil air traffic controllers of the Pakistan Civil Aviation Authority (PCAA) and military controllers. In accordance with the Aeronautical Information Publication (AIP) Pakistan, BKIAP falls under the jurisdiction of Cherat Approach (North and South) for the provision of approach control services.

1.17.2. The aerodrome's airspace is considered operationally complex due to the simultaneous operation of civil and military traffic on separate frequencies, requiring continuous coordination between the two controlling agencies. Furthermore, the single-runway configuration imposes inherent limitations on traffic handling capacity and flexibility, particularly during peak periods or concurrent operations.

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.

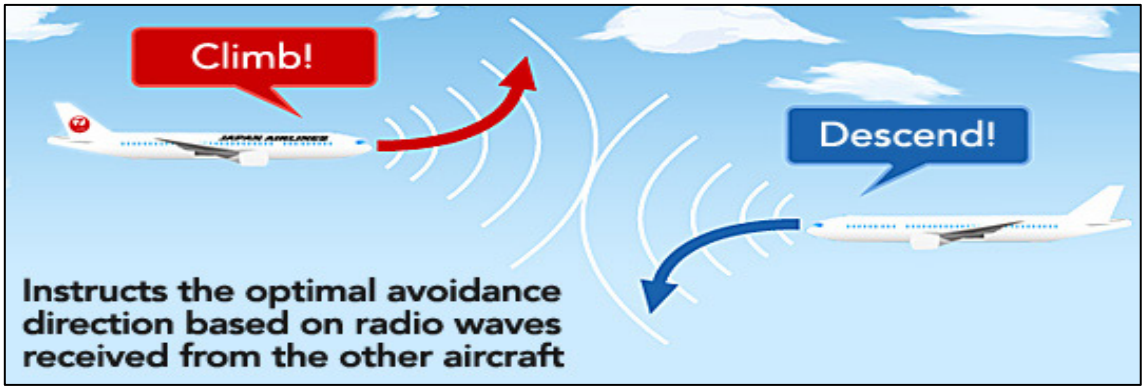

Figure 8 TCAS (TA) alert

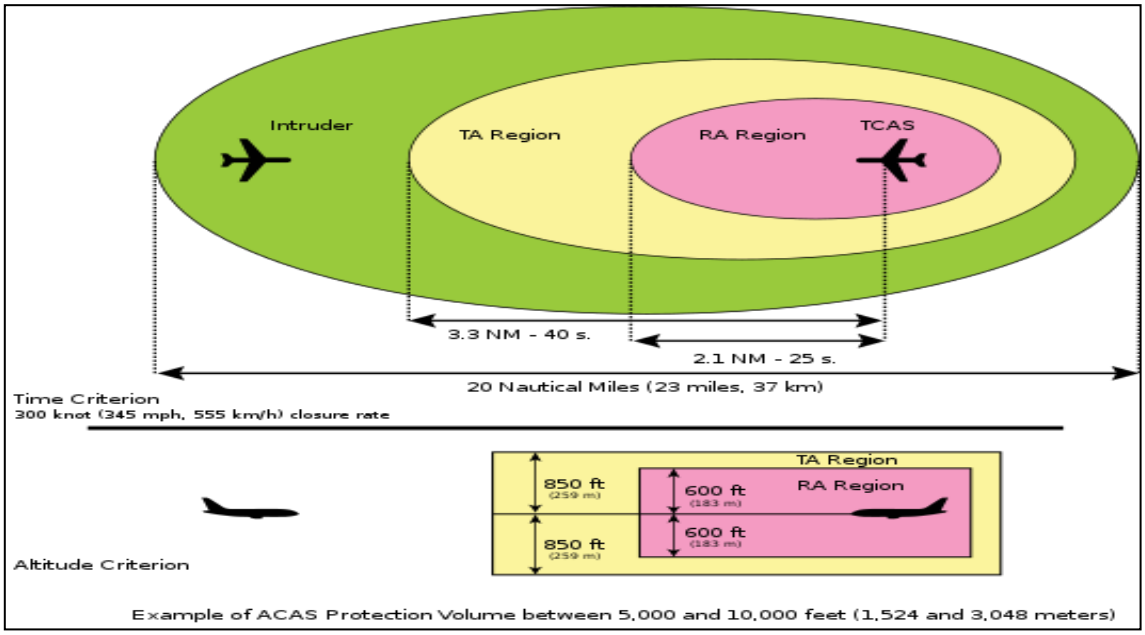

Figure 9 TCAS TA & RA ranges

1.18.2. **Airborne Collision Avoidance System (ACAS)**

1.18.2.1. The objective of ACAS is to provide advice to pilots for the purpose of avoiding potential collisions. This is achieved through Resolution Advisories (RAs), which recommend actions (including manoeuvres), and through Traffic Advisories (TAs), which are intended to prompt visual acquisition and to act as a precursor to RAs.

1.18.2.2. ACAS equipment in the aircraft interrogates Mode 'A' / 'C' and Mode 'S' transponders on aircraft in its vicinity and listens for their replies. By processing these replies, ACAS determines which aircraft represent potential collision threats and provides appropriate display indications (or advisories) to the flight crew to avoid collisions.

1.18.2.3. **Traffic Advisories (TAs) –** TAs alert the flight crew to potential RAs and may indicate the range, range rate, altitude, altitude rate and bearing of the intruding aircraft relative to own aircraft. TAs without altitude information may also be provided on Mode 'C' or Mode 'S' equipped aircraft that have temporarily lost their automatic altitude-reporting capability. The information conveyed in TAs is intended to assist the flight crew in sighting nearby traffic.

1.18.2.4. **Resolution Advisories (RAs) –** If the threat detection logic in the ACAS computer determines that an encounter with a nearby aircraft could soon lead to a near-collision or collision, the computer threat resolution logic determines an appropriate vertical manoeuvre that will ensure the safe vertical separation of the two aircraft. The selected manoeuvres ensure adequate vertical separation within constraints imposed by the climb rate capability and proximity to the ground of the two aircraft.

1.18.2.5. The RAs provided to pilot can be divided into two categories: corrective advisories, which instruct pilot to deviate from the current flight path ("CLIMB" when

aircraft is in level flight); and preventive advisories, which advise the pilot to maintain or avoid certain vertical speeds ("DON'T CLIMB" when aircraft is in level flight).

1.18.2.6. **Warning Times –** In any potential collision, ACAS generates an RA nominally 15 to 35 seconds (s) before the Closest Point of Approach (CPA) of the aircraft. The ACAS equipment may generate a TA up to 20 s in advance of an RA. Warning times depend on Sensitivity Levels (SLs) of RAs.

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

Figure 10 Traffic Display

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

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

1.18.3.3. Solid white diamond – for proximate traffic.

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

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

1.19. Useful or Effective Investigation Techniques

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

SECTION 2 – ANALYSIS

2.1. General

2.1.1 On 05 March, 2024, Saudi Airline flight SVA792, A330-343 aircraft, from Riyadh to Peshawar reported 'TA' followed by 'RA' at time 042300 while holding overhead PS VOR and descended 500 ft below its assigned level (FL140) due to traffic turning ahead of her with less than 1,000 ft separation. Later at time 044400, SVA792 again reported 'TA' due to traffic descending in front of her at a distance of 2 miles. Both the occurrences involved military aircraft flying for endurance and holding overhead PS VOR as PS runway was blocked due military aircraft switched off after emergency landing on RWY 35.

2.2. Flight Operations

2.2.1 **Weather:** No significant weather was reported at OPPS as well as surrounding areas at the time of the incident.

2.3. Air Traffic Control

2.3.1 **Non-availability of Approach control Unit at Peshawar –** Station Air Traffic Instruction BKIAP Manual reveals that only Aerodrome Control Service shall be provided by rated aerodrome controller in the vicinity and on the manoeuvring movement area of the Aerodrome at BKIAP, Peshawar, from Ground to FL140. Contrary to this, the RT Transcripts reveal that SVA792 came in contact with PS tower well beyond the controller's area of responsibility (between HANGU and OGASA), at FL160 and was provided Approach Control Service in addition to the Aerodrome Control Service by the Aerodrome Controller.

2.3.2 During the course of investigation, it was revealed that the case pertaining to the establishment of a **dedicated** Control Zone around PS is under consideration, to provide Approach Control services to the civil traffic departing from and arriving at PS. A proposal in this regard has been submitted by Pakistan Airports Authority (PAA); awaiting response from Air Headquarters (AHQ).

2.3.3 **Un-authorized provision of Approach Control Services at Peshawar –** The practice of provision of Approach Control Service by an Aerodrome controller without proper authorization is against the rules and regulations, as mentioned in Air Traffic Controllers Training & Procedures Manual (MNL-002-OPAT-4.0) Para 7.4.7.

2.3.4 **Un-defined Civil Traffic handover procedures –** The traffic handover procedures with respect to civil aircraft are not defined between PS Aerodrome (Civil Controllers) and Cherat Approach, as there is no formal letter of agreement between the two units.

2.3.5 **Single holding point –** Military and Civil operations were overlapping in the same airspace without proper coordination as both the aircraft were holding over a single holding point. Since the operational requirements of military aircraft and civil

aircraft differ, especially in case of an emergency, therefore different holding points should be assigned to these aircraft, respectively.

2.3.6 **Runway Blocked –** BKIAP runway was blocked due to military aircraft emergency landing, which made all other military aircraft operating nearby to recover and fly for endurance. SVA792 was informed about the emergency situation and change in EAT.

2.3.7 **1st Occurrence (TCAS-RA) –** SVA792 reported TCAS-RA at time 042300, and descended from FL140 to 13,500 ft due to the conflicting military aircraft (MA1) which was flying with minimum power for endurance. It was further revealed that MA1 lost altitude and descended from FL160 to FL147, reducing the vertical separation with the civil traffic to less than 1,000 ft. At that moment, traffic reported by Military Controller were military aircraft at FL160 and 12,000 ft overhead PS/VOR, which was then passed to SVA792. This indicates lack of timely coordination / information by Military Controller.

2.3.8 **2nd Occurrence (TA) –** At 045500, SVA792 reported a second Traffic Advisory (TA), stating that an aircraft had crossed its inbound course to PS at 1,500 feet above, followed by crossing her altitude and descending below by 500 feet, at a distance of approximately 2 NM ahead. Upon inquiry, the Military Controller confirmed that the traffic was another military jet (MA2), which had descended from FL160 for landing due to a low fuel state.

Although SVA792 had earlier been provided with traffic information regarding military aircraft descending from FL160 to 10,000 feet, approximately 15 NM north of PS airfield, the close proximity of the military aircraft triggered the TA.

2.3.9 **Revision in Expected Approach time –** Civil Aerodrome Controllers at PS are provided with tentative EAT by Military controllers, based on the prevailing traffic situation. R/T transcripts reveal frequent revisions to the EAT for the aircraft, attributed to the ongoing emergency situation. These changes reflect the dynamic and complex nature of simultaneous military and civil operations. Considering the unusual delays and air traffic management constraints, already promulgated via NOTAM, such variations in EAT are to be expected under these operational circumstances.

2.4. Communications

2.4.1 BKIAP is a joint user aerodrome, handling both Civil and military traffic, controlled using very high frequency (VHF) and Ultra high Frequency (UHF), respectively. This arrangement necessitates the requirement of continuous and close coordination between the two units; ensuring the required separation between the traffic operating to / from PS airport and military traffic operating at Peshawar.

SECTION 3 – FINDINGS

3.1. Findings

3.1.1 SVA792 was initially instructed to hold over OPPS VOR at FL160 due to ongoing military flying.

3.1.2 Military and civil operations were overlapped in the same airspace without proper coordination.

3.1.3 Late traffic information was passed by Civil Controller to SVA792 regarding military flying at FL140 and below over Peshawar.

3.1.4 SVA792 received an EAT of 0430 by Civil Controller, for ILS Z Approach RWY 35 and was cleared to descend FL140.

3.1.5 SVA792 was later informed about an emergency landing of a military aircraft that blocked the main RWY, causing a potential operational bottleneck.

3.1.6 While in the hold, SVA792 reported a TCAS-RA alert and initiated an RA descent to 13,500 ft due to conflicting military traffic, with less than 1,000 ft vertical separation.

3.1.7 Due to the RWY blockage at PS, all military aircraft were instructed to hold over OPPS VOR for endurance. MA1, which was flying with minimum power, unintentionally lost altitude and descended from FL160 to FL147, triggering a TA and subsequently RA for SVA792.

3.1.8 Information about the blocked RWY was relayed late to SVA792 by the Civil Controller, with multiple EAT revisions (0450, 0500 and 0510). These frequent changes caused operational uncertainty for air crew of SVA792.

3.1.9 SVA792 reported a second TA, indicating conflicting traffic crossing her inbound course to PS at 1500 ft above and later descending below, with less than 500 ft vertical separation, 2 NM ahead. Upon query, the Military Controller confirmed another military aircraft (MA2) was descending from FL160 for landing due low fuel. This indicated a lack of timely coordination / information from the Military Controller.

3.2. Cause / Contributory Factors

3.2.1. Cause

3.2.1.1. Activation of TCAS-RA **(Mid-Air Collision alert)** occurred due to inadvertent altitude loss by a military aircraft holding overhead PS VOR while flying for endurance at minimum power.

3.2.2. Contributory Factors

3.2.2.1. Runway blockage due to emergency landing by military aircraft.

3.2.2.2. Single holding point for both Military and Civil aircraft over PS VOR.

3.2.2.3. Delay in relying information to Civil Controller by Military Controller.

3.2.2.4. Lack of situational awareness of Civil Controller.

3.2.2.5. Undefined traffic handover procedures between PS Tower and Cherat Approach.

3.2.2.6. Non-Availability of Approach control unit at BKIAP.

Note: *Aviation Occurrence Category (ADREP Taxonomy)*
*"**Mid-Air Collision (MAC):** Separation-related occurrences caused by either air traffic control or cockpit crew*

SECTION 4 – SAFETY RECOMMENDATIONS

4.1. Safety Recommendations

4.1.1. PAA

4.1.1.1. Review the airspace structure around Peshawar aerodrome and define its lateral limits by establishing a **dedicated** Control Zone, handling civil air traffic to and from PS.

4.1.2. AHQ

4.1.2.1. Regular training sessions on operations of TCAS-RA may be conducted.

4.1.3. PAA & AHQ

4.1.3.1. PAA / AHQ should **sign letter of agreement**, re-defining the coordination and traffic changeover procedures between PS Tower and Cherat Approach.

4.1.3.2. PAA / AHQ should define **geographically de-conflicting holding areas** for civil and military air traffic, to avoid unusual level infringement.

4.1.3.3. Establish **mutual familiarization training** for Military and Civil Air Traffic Controllers, to be undertaken before deployment at joint-user airfields, to enhance coordination and safety in shared airspace.