BUREAU OF AIRCRAFT SAFETY INVESTIGATION PAKISTAN

FINAL INVESTIGATION REPORT

SERIOUS INCIDENT

SMOKE FROM LANDING GEAR

Operator	SAUDI AIRLINES
Flight	SVA792, Riyadh (RUH/OERK) to Peshawar (PEW/OPPS)
Aircraft Type	Airbus A330-343
Registration	HZ-AQ28
Engine Type / S/N	Rolls Royce / Trent 768-60/16
Date of Occurrence	11 July 2024
Location	Upon arrival, BKIAP Peshawar, Pakistan
Classification	Serious Incident – Smoke observed from Landing Gear
Report Status	Final Investigation Report
Report Reference	HQ BASIP/1000/457/Inv
Date of Report	11 July 2026
This report is issued pursuant to Pakistan Aircraft Safety Investigation (PASI) Act, 2023, Air Safety Rules 2025 and ICAO Annex 13.	

TABLE OF CONTENTS

SCOPE

At Bureau of Aircraft Safety Investigation Pakistan (BASIP), investigations are conducted in accordance with Pakistan Aircraft Safety Investigation (PASI) Act, 2023, Air Safety Rules 2025, and International Civil Aviation Organization (ICAO) Annex-13.

The sole objective of the investigation and its final report is to prevent future accidents, serious incidents, and incidents of similar nature, without apportioning 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 or administrative purposes.

This report contains facts which are based on information that 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 serious incidents.

Extracts may be published with specific permission from BASIP provided that the source is duly acknowledged, and the same material is reproduced accurately, and is not used in a derogatory manner or in a misleading context.

INTRODUCTION

This incident was reported to Bureau of Aircraft Safety Investigation Pakistan (BASIP) by Pakistan Airports Authority (PAA) vide Incident Occurrence and Unserviceability Report (IOU)[1]. This incident was notified[2] in accordance with International Civil Aviation Organization (ICAO) Annex-13. The investigation has been conducted by BASIP. All corresponding timings are mentioned in Universal Coordinated Time (UTC).

[1] PAA IOU Report dated 11th July, 2024 – **Appendix 'A'**
[2] Notification to ICAO – **Appendix 'B'**

SYNOPSIS

On 11 July 2024, Saudi Arabian Airlines Flight SVA792, an Airbus A330-343 aircraft (registration HZ-AQ28), operating a scheduled international flight from King Khalid International Airport, Riyadh (OERK), Saudi Arabia to Bacha Khan International Airport, Peshawar (OPPS), encountered an abnormal condition after landing.

While the aircraft was holding at Taxiway-J after landing, the Air Traffic Control (ATC) observed smoke emanating from the Left Main Landing Gear (MLG) area and promptly alerted the flight crew and dispatched the airport Fire and Rescue Services. No abnormal indications were initially reported in the cockpit. As the smoke increased, the flight crew shut down both engines as a precautionary measure.

Subsequently, the aircraft lost its braking, and moved at low speed, coming to rest on unpaved ground adjacent to the Taxiway. A precautionary evacuation was carried out using emergency slides. A total of 276 passengers and 21 crew members were onboard; all occupants were evacuated safely, with no fatalities reported. A limited number of passengers sustained minor injuries and were provided first aid at the airport medical facility.

The investigation determined that the occurrence was caused by the rupture of a brake hose on the Left-Hand Main Landing Gear (LH MLG), resulting in hydraulic fluid leakage. The observed smoke was consistent with hydraulic fluid coming into contact with hot brake components.

ABBREVIATIONS

ALT	Alternate
AMM	Aircraft Maintenance Manual
ATC	Air Traffic Controller
ATPL	Air Transport Pilot License
BASIP	Bureau of Aircraft Safety Investigation Pakistan
CPL	Commercial Pilot License
CT	Control Tower
CVR	Cockpit Voice Recorder
DFDR	Digital Flight Data Recorder
FO	First Officer
ft	Feet
h	Hours
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IOU	Incident And Occurrence Unserviceability Report
kgs	Kilogram
kts	knots
LH MLG	Left Hand Main Landing Gear
ltrs	Liter(s)
m	Minute (s)
MLG	Main Landing Gear
NM	Nautical Miles
NWS	Nose Wheel Steering
OERK	King Khalid International Airport, Riyadh, Saudi Arabia
OPPS	Bacha Khan International Airport, Peshawar, Pakistan
PAA	Pakistan Airport Authority
PAF	Pakistan Air Force

PASI	Pakistan Aircraft Safety Investigation
PBSV	Parking Brake Selector Valve
PCAA	Pakistan Civil Aviation Authority
PIC	Pilot in Command
psi	pounds per square inch
R/W	Runway
RFFS	Rescue and Fire Fighting Services
RH MLG	Right Hand Main Landing Gear
s	seconds
SCF-NP	System/Component Failure or Malfunction – Non-Powerplant
UHF	Ultra-High Frequency
UTC	Universal Coordinated Time
VFR	Visual Flight Rules
VHF	Very High Frequency

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Sr.	Description	Appendix
1.	PAA – IOU Report	**Appendix A**
2.	ICAO – Notification	**Appendix B**

SECTION 1 – FACTUAL INFORMATION

1.1. History of the Flight

1.1.1. On 11 July 2024, Saudi Arabian Airlines Flight SVA792, an Airbus A330-343 aircraft, registration HZ-AQ28, operated a scheduled flight from King Khalid International Airport, Riyadh, Saudi Arabia (OERK) to Bacha Khan International Airport, Peshawar, Pakistan (OPPS).

1.1.2. **052435.** The aircraft landed on **Runway (R/W) 35** and was subsequently cleared to taxi via **Taxiway-H** and hold short of R/W 35 at **Taxiway-J** due to successive arrivals of fighter aircraft on the same R/W.

1.1.3. **052747.** SVA792 reached holding point R/W 35 on Taxiway-J and the pilot applied parking brake. As per the data retrieved from the Digital Flight Data Recorder (DFDR), the ground speed reduced to 0 knots (kt), and the parking brake parameter was recorded as ON. At this time, the Alternate (ALT) brake pressure increased to approximately 2464 pounds per square inch (psi) and gradually rose to 2814 psi over the next 4 minutes (min) and 40 seconds (s).

1.1.4. **053458.** The aircraft's ALT brake pressures suddenly decreased to 1600 psi.

1.1.5. **053510.** The Military supervisor (Mil ATC) at the Aerodrome Control Tower observed faint smoke emanating from the left engine (Engine No. 1) and informed SVA792 accordingly. The flight crew responded that all aircraft parameters were normal and that no abnormal indications were observed in the cockpit.

1.1.6. Meanwhile Civil Air Traffic Controller (Civil ATC) at the Aerodrome control tower alerted the aerodrome fire station and the duty Airside Inspector. The flight crew requested clarification regarding the location and extent of the observed smoke. The Civil ATC advised that the smoke appeared to be originating from the left side of the aircraft, below the left engine (Engine no. 1).

1.1.7. **053553.** Civil ATC subsequently observed that the smoke was increasing in density and had turned darker (black) and relayed the same to the SVA792. The pilot requested Civil ATC to check from the airport vehicles the extent of the smoke being reported.

1.1.8. At that time, a formation of four fighter aircraft was on Approach to R/W 35. One aircraft was cleared to land, while the remaining three were instructed to discontinue the Approach.

1.1.9. 02 Aerodrome fire vehicles and a Follow-Me van was positioned on standby at Taxiway-C and were instructed to hold position until clearance was issued to enter the R/W, due to successive arrivals.

1.1.10. **053616.** Mil ATC informed SVA792 that he was observing fuel spillage / fuel fumes from the left engine (Engine no.1) of the aircraft.

1.1.11. **053638.** A Military Aircraft (M1) operating in the circuit, after observing the increasing smoke, advised SVA792 to request a parking bay immediately and shut down Engine no. 1. The flight crew misunderstood this transmission as originating from the fire services and requested a report regarding the left engine. Mil ATC responded that they were **"observing some leakage from your left engine, fuel fumes."**

1.1.12. **053748.** Upon receiving this information, the flight crew of SVA792 shut down Engine No. 1 and informed ATC accordingly. DFDR data indicates that the Engine No. 1 master lever was OFF. Subsequently, the Blue hydraulic system pressure decreased from approximately 2,950 psi to 0 psi within 1 min and 12 s.

1.1.13. **053815.** Following the landing of the Military Aircraft, one airside vehicle and two fire vehicles were cleared to cross the R/W. The pilot again inquired about the extent of damage. The Mil ATC informed that the smoke appeared to be increasing, and suggested switching off both engines.

1.1.14. **053906.** APU was started by the flight crew of SVA792.

1.1.15. **053915.** SVA792's Engine no. 2 Master Lever was set to OFF. The Yellow and Green hydraulic pressures decreased from 3,000 psi to 0 psi indicating both engines shut down.

1.1.16. **053932.** SVA792 again requested a report from the fire services regarding the extent of the situation. ATC responded that the aerodrome vehicles were observing the aircraft and would report shortly.

1.1.17. At the same time, M1 suggested SVA792 to **switch of your left engine, you keep your right engine running, once fire chief has told you the damage and you can move either to your parking bay or you can fully switch off at the present position**. The flight crew again misinterpreted this transmission as originating from the fire services and subsequently informed that both engines had been shut down and they were awaiting further information.

1.1.18. **053934.** The ALT brake pressure of the aircraft reached 0 psi.

1.1.19. **053938.** Inside the cockpit, a master caution indicating **BRAKES PARK LO PR** triggered for 7 sec, followed by the ALT brake pressure increasing to 800 psi. 39 sec later, the pressure reduced back to 0 psi and triggered the caution again.

1.1.20. **054025.** The ground speed of the aircraft started to increase (reaching 2 kts in 44 sec). At that time, both brake pedals were applied 3 times and the park brake was selected ON-OFF-ON by the pilot. The captain applied Nose Wheel Steering (NWS) 75˚ (degrees) towards the left and the rudder pedals up to 26˚ towards the left.

1.1.21. **054047.** ATC at the Control Tower observed the aircraft's movement toward the unpaved area beyond the Taxiway-J shoulder in the direction of the R/W. When advised to apply brakes, the pilot responded that braking action was being attempted.

1.1.22. Meanwhile the DFDR recorded that the aircraft's anti -skid, autobrake and NORM brake as faulty. Despite applying multiple brake pedal applications, the ground speed remained 1 kts.

1.1.23. **054109.** The blue hydraulic system pressure again increased to 832 psi. By this time the ground speed had reached 2 kts. The flight crew continued to steer the aircraft towards the left and applied full pedal brakes. Subsequently, the hydraulic pressure increased to 830 psi and the aircraft's ground speed reduced to zero.

1.1.24. **054111.** SVA792 again requested an update on the situation from the fire services. Civil ATC relayed information received from the duty Airside Inspector indicating that the situation was under control and that the fumes were apparently from the left MLG rather than the engine.

1.1.25. **054127.** The Mil ATC observed a renewed heavy emission of smoke from the left side of the aircraft and instructed SVA792 to disembark the passengers, stating that the left wing was on fire. The flight crew subsequently instructed personnel in the vicinity to move clear of the aircraft in preparation for passenger disembarkation.

1.1.26. **054134.** The aircraft's ground speed started to increase again, reaching 4 kts in 20 sec, despite the brake pedals and park brakes being fully applied by the pilot.

1.1.27. **054203.** SVA792 reported that the aircraft's brakes were no longer effective and cautioned that the aircraft was continuing to drift off from Taxiway-J onto the unpaved surface adjacent to the R/W. The aircraft came to a stop with its nose and Right-Hand Main Landing Gear (RH MLG) wheels on soft ground on the right-hand edge of Taxiway-J.

1.1.28. Once the aircraft came to a stop, an emergency evacuation was performed during which, passenger door 1R jammed and could not be opened.

1.1.29. All person on board evacuated safely from 5 doors out of 6 via chutes.

1.2. Injuries to Persons

1.2.1. First aid treatment was given to 26 passengers who had minor skin abrasions / skin peeling and bruises due to disembarking from the chutes. However, no major injury was reported to any person on board the aircraft or on the ground. Details are as follows:

Injuries	Crew	Passengers	Total on Aircraft	Others
Fatal	Nil	Nil	Nil	Nil
Serious	Nil	Nil	Nil	Nil
Minor	Nil	26	26	Nil
None	21	250	271	Nil
Total	**21**	**276**	**297**	**Nil**

Table 1 Injuries Details

1.3. Damage to Aircraft

1.3.1. No structural damage to the aircraft was reported at the time of the occurrence.

1.4. Other Damage

1.4.1. No damage to third-party property or infrastructure was reported.

1.5. Personnel Information

Captain	
License type	Air Transport Pilot License (ATPL)
Medical date with status	12-May-2024
Type of the aircraft flown	A330
Total in Command (hrs)	1584
Total in Command on the Type (hrs)	1017
Grand Total (hrs)	9855
Last Simulator Training: a) Date b) Place of Training	 a) 30 June 2024 b) Prince Sultan Academy
Date of joining the organization	03 December 2009

Table 2 Captain's Brief Description

First Officer (FO)	
Type of License held & No.	Commercial Pilot License (CPL)
Medical Date with Status	07 July 2024
Total in Command (hrs)	-
Total in Command on the Type (hrs)	-
Grand Total (hrs)	4092.61
Last Simulator Training: a) **Date** b) **Place of Training**	**Last Simulator Training:** a) 28 June 2024 b) Prince sultan academy
Date of joining the organization	10 October 2017

Table 3 FO's Brief Description

1.6. Aircraft Information

1.6.1. Aircraft details are as follows:

SVA792	
Operator	Saudi Airline
Aircraft Make & Model	Airbus 330-343E
Registration Number	HZ-AQ28
Serial Number	1803
Year of manufacturing	18 September, 2017
Sector	Riyadh – Peshawar
Maximum Take-off Weight	199,000 Kilogram (kg) (438 719 lb)
Maximum Landing Weight	185,000 kg (407 855 lb)
Maximum Fuel Capacity	97530 liter (76561 kg) 25746 US gal (168788 lb)
Total Aircraft Hours	16588:03 FH
Cycles prior event flight	8018 FC
Certificate of Airworthiness	31 October 2027
Last Daily inspection prior event flight	WO. 93900061 C/W 09JUL24 JED
Last Weekly Check prior to event flight	04 July 24
Last Check A	10 June 24
Last Major Check	WO. 12352934 (C03-CHK) WO. 15450716 (6Y-CHK) C/W 08SEP23 MLA STN W/P: AQ28/H-23 6Y+C3 CHK / 135
Auxiliary Power Unit (APU)	PN 3800454-6 / SN P-1844
Flight Conditions	Normal

Table 4 Aircraft Details

Engine No 01	
Engine S No	42770
Manufacturer	Rolls Royce
Engine Type	TRENT 768-60/16
Date of Installation	18 December 2022
TSN / CSN	16136:02 / 8011
TSI / TSO	4314:14 / 4314:14
CSI / CSO	2011 / 2011
Engine Trend / Health	No trend
Last Borescope Inspections (BSI)	05 March 2024 at TSN/CSN: 14967:27/ 7499

Table 5 Engine No 1 Details

Engine No 02	
Engine S No	42846
Manufacturer	Rolls Royce
Engine Type	TRENT 768-60/16
Date of Installation	27 November 2023
TSN / CSN	13991:25 / 6916
TSI / TSO	2025:23 / 2025:23
CSI / CSO	917 / 917
Engine Trend / Health	No trend
Last BSI	14.Sep.2023 During Engine Shop Visit

Table 6 Engine No 2 Details

Landing Gears			
Position	**MLG L/H**	**MLG R/H**	**NLG**
Part No	10-210101-011	10-210201-011	NA20182-33
Sr. No.	MDLMDL1745	MDLMDL1745	MD17B48989
Installation date	18 Sept 2017	18 Sept 2017	18 Sept 2017
Next overhaul date	18 Sept 2027	18 Sept 2027	18 Sept 2027
1st LLP due at LSN	27'790 FC	27'790 FC	27'790 FC
LSN current	8'018 FC	8'018 FC	8'018 FC
Remaining LLP	19'772 FC	19'772 FC	19'772 FC

Table 7 Landing Gear details

1.7. Meteorological Information

1.7.1. OPPS 110500Z 31004KT 6000 SCT040 35/22 Q1001 NOSIG

1.7.2. On the day of occurrence at 0500 h, meteorological conditions were routinely observed and reported at BKIAP, Peshawar airport. The wind was observed from the North-West at 310° with a light speed of 4 kts. Horizontal visibility was reported till 6,000 meters (m). Scattered clouds were present at an altitude of 4,000 feet (ft) above ground level. The temperature at the time of event was 35°C with a dew point of 22°C, with 47% relative humidity. The atmospheric pressure was measured at 1,001 hPa. No significant weather changes were expected in the near term, as indicated by the "NOSIG" remark.

Value	Description
OPPS	ICAO airport code for Peshawar, Pakistan
110500Z	Date 11th, time 0500 UTC
31004KT	Wind from 310° at 04 kts
6000	Visibility 6000 m
SCT040	Scattered clouds at 4000 ft
FEW100	Few clouds at 10,000 ft
36/22	Temperature 35°C /Dew Point 22 °C
Q1001	Altimeter pressure in 1001 hPa
NOSIG	No significant change expected in the next 2 hours

Table 8 METAR description OPPS

1.8. Aids to Navigation

1.8.1. Not Applicable.

1.9. Communications

1.9.1. Communication between the flight crew and ATC was established and maintained throughout the occurrence.

1.10. Aerodrome Information

1.10.1. OPPS is located approximately 1 Nautical Miles (NM) west of Peshawar Cantt at an elevation of 1211 ft. The aerodrome is operated by the PAA (previously Pakistan Civil Aviation Authority (PCAA)) and accommodates both Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) traffic. It is equipped with a single R/W, designated 17/35, measuring 2743 m in length with a bitumen surface. Air traffic services are provided H24 from the Control Tower. The aerodrome is categorized as Rescue and Fire Fighting Services (RFFS) Category 9, with emergency response services available at the time of the occurrence.

1.11. Flight Recorders

1.11.1. The aircraft was equipped with a Cockpit Voice Recorder (CVR) and FDR in accordance with regulatory requirements.

1.11.2. The DFDR data showed that during Approach and Landing, all hydraulic systems (Green, Blue, and Yellow) were operating at approximately 3000 psi. Braking parameters during landing and taxi were recorded in the DFDR.

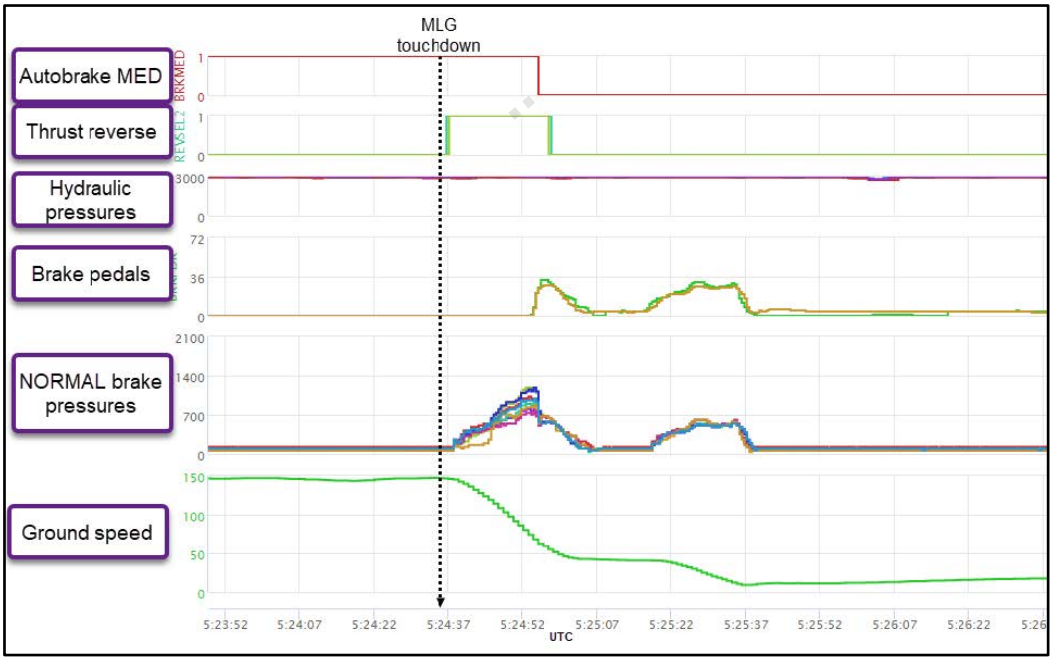

Figure 1 Plot of the Braking Parameters during the Landing Phase

1.11.3. After the aircraft vacated the R/W and the park brake was applied, alternate brake pressure was recorded to increase and stabilize. **Subsequently, a reduction in alternate brake pressure was recorded, followed by a progressive decrease in Blue hydraulic system pressure to zero.**

1.11.4. ECAM cautions recorded included “BRAKES PARK BRK LO PR” and low Blue hydraulic reservoir indications.

1.11.5. Intermittent increases in Blue hydraulic pressure were recorded following activation of the electric pump.

1.12. Wreckage and Impact Information

1.12.1. Nil.

1.13. Medical and Pathological Information

1.13.1. Medical samples for pathological investigations of the Flight Crew were not collected.

1.14. Fire

1.14.1. After receiving the emergency call from ATC RFF vehicles of PCAA proceeded via Taxiway-C. Due to succeeding landing aircraft, RFF vehicles were instructed to hold at Taxiway-C until cleared to cross the R/W.

1.14.2. Once cleared, the RFF vehicles proceeded to the incident site, established their positions in accordance with standard emergency response protocols, and immediately commenced firefighting operations.

1.14.3. Upon reaching the site, dense smoke was observed by the RFF emanating from the rear left side wheel assembly / undercarriage area of the aircraft. Hydraulic fluid was observed actively leaking and dripping on the wheel assembly.

1.14.4. Portable fire extinguishers of capacities 09 kg and 06 kg were used while the aircraft was in motion. After using DCP, cooling process of the undercarriage / wheel assembly was started by discharging water from Striker S-04-O, which discharged approximately 2,000 liters of water to cool the affected components.

1.14.5. Despite continued dripping of hydraulic fluid during the cooling phase, the area beneath the aircraft was secured, and fire risk was effectively mitigated by RFF personnel.

1.14.6. The PAF provided additional firefighting and rescue support, deploying three RFF tenders and a crew of 14 personnel. These units actively participated in the firefighting operation and utilized 50 kg of DCP during the suppression phase.

1.14.7. Following the successful evacuation and containment of the fire hazard, LFCT Barracuda L-16-B was released from the site and returned to the fire station. Striker S-04-O remained on standby with assigned personnel at the aircraft’s location. After

the aircraft was towed via Loop Taxiway-J and repositioned at Bay 03, Striker S-04-O was released and returned to station at approximately 1830 hrs.

1.15. Survival Aspects

1.15.1. Upon activation of the airport emergency response protocol, medical teams were immediately deployed alongside RFFS to the incident site. Cabin crew initiated emergency evacuation procedures by deploying five emergency escape slides. Following the successful evacuation of 276 passengers and 21 crew members via emergency slides, first aid and triage stations were promptly established in a designated safe zone within the airside area.

1.15.2. All occupants underwent initial medical assessment to screen for potential smoke inhalation, physical injuries, or signs of psychological distress. No serious injuries were reported. A limited number of passengers with minor abrasions received on-site medical attention. Ambulances remained on standby, though no individuals required hospital transfer.

1.15.3. All aircraft occupants were medically assessed and subsequently escorted to the terminal.

1.16. Tests and Research

1.16.1. Following the incident, The Parking Brake Selector Valve (PBSV), LH Alternate Brake Manifold, and Brake no. 1 Hydraulic Hose were removed and examined by the manufacturer.

1.16.2. The PBSV and LH alternate brake manifold were tested and no internal faults were identified.

1.16.3. Leak rate testing established a hydraulic fluid loss rate of approximately 8–10 ltrs per min.

1.16.4. Examination of the brake hose revealed fretting damage on the external nylon cover and stainless-steel braid.

1.16.5. A fatigue crack was identified; however, the initiation point and time of crack propagation could not be determined.

1.16.6. Photographic evidence showed the presence of tape applied to the hose prior to the occurrence. The tape was not part of the original hose configuration.

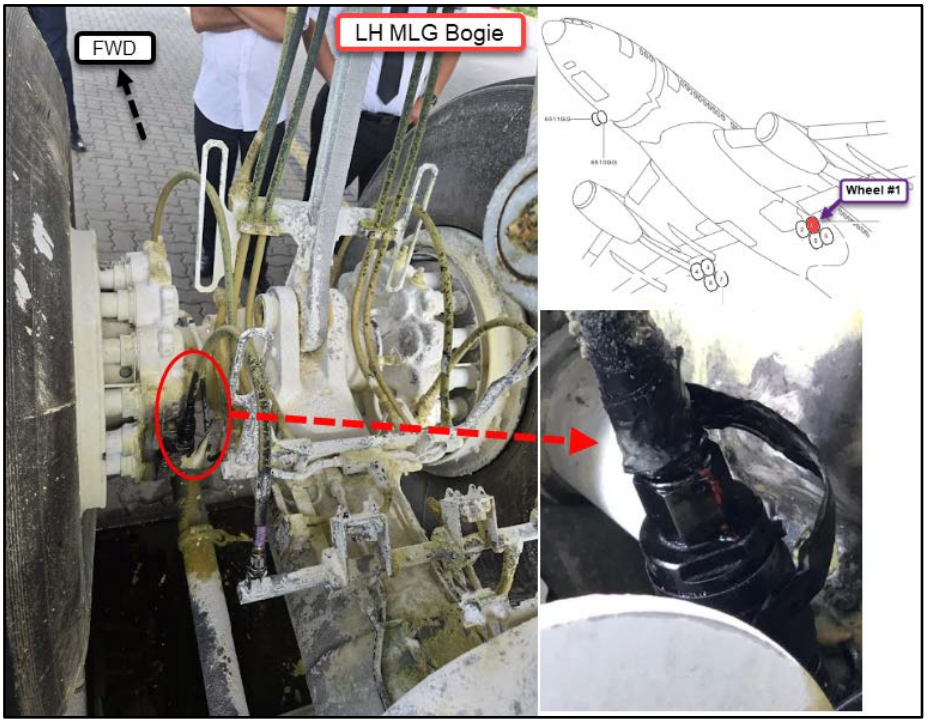

Figure 2 Tape on the Brake Hose

1.16.7. Inspection of the aircraft confirmed that the Blue hydraulic system reservoir was empty.

1.16.8. A hydraulic leak was identified at the flexible hose connected to Brake #1 at the MLG.

1.16.9. Hydraulic fluid residue was observed near the brake assembly.

1.17. Organizational and Management Information

1.17.1. Bacha Khan International Airport, Peshawar (OPPS), operates as a joint-use aerodrome where both civil and military flight operations are conducted on a single R/W, designated 17/35. Air Traffic Management is provided from a shared Control Tower, staffed by both civil air traffic controllers of the PAA and Military Controllers. Communication for civil traffic is conducted on Very High Frequency (VHF) frequencies under the control of civil ATC, whereas military operations are managed on Ultra High Frequency (UHF) frequencies under the control of Military Controllers. During military flying, the senior most military controller acts as the supervisor for the overall flying operations.

1.18. Additional Information

1.18.1. Not Applicable.

1.19. Use of Effective Investigation Techniques

1.19.1. Standard investigation procedures and techniques were used.

SECTION 2 – ANALYSIS

2.1. General

2.1.1. On 11 July 2024, Saudi Arabian Airlines Flight SVA792, an Airbus A330-343 (HZ-AQ28), experienced smoke from the left Main Landing Gear after landing at OPPS. The event subsequently led to a loss of braking capability while holding. Thereafter, emergency evacuation of the passengers and crew on board was carried out. This analysis examines operational, technical, and procedural aspects of the occurrence in accordance with ICAO Annex 13 and Doc 9756.

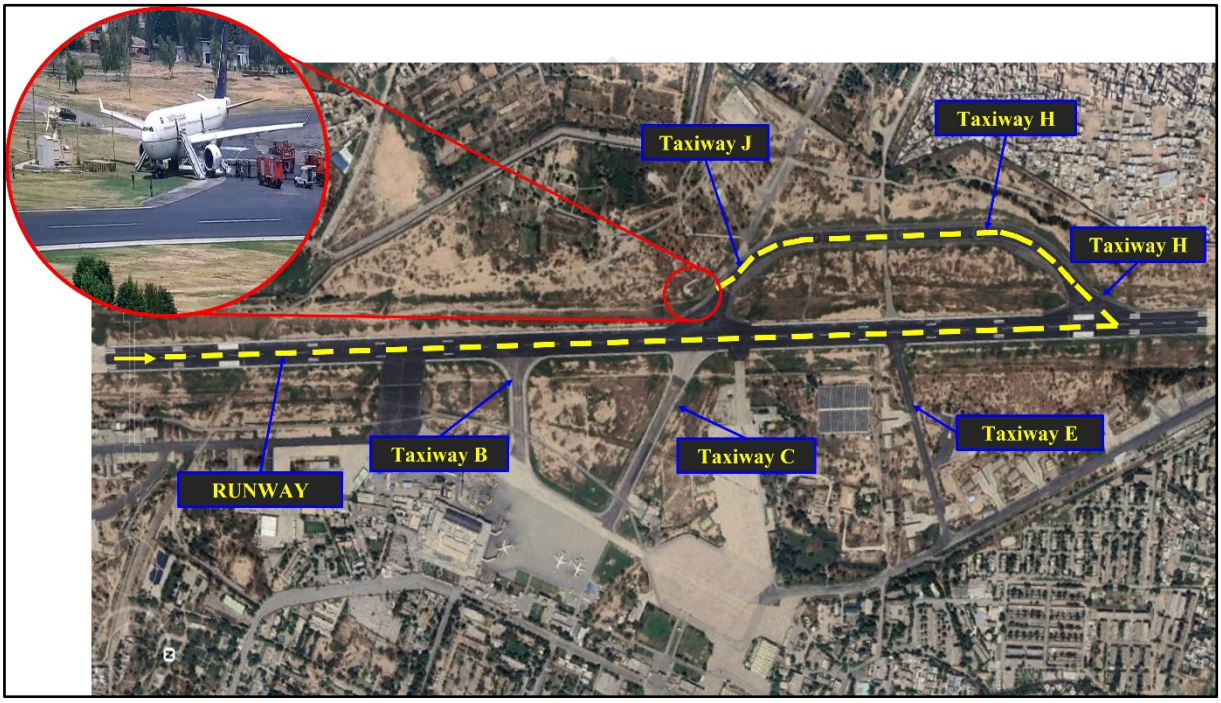

Figure 3 SVA792 Landing and Taxi Roll Trajectory

2.2. Flight Operations

2.2.1. Landing and Initial Taxi Phase

2.2.1.1. SVA792 landed at OPPS uneventfully, with the AUTOBRAKE MED mode selected. During the landing roll no abnormal indications, warnings, or system alerts were generated in the cockpit, and no anomalies were reported by the flight crew.

2.2.1.2. After vacating the R/W, the aircraft taxied normally via Taxiway-H to Taxiway-J holding point. The aircraft remained stationary for approximately 8 min without any reported cockpit warnings or alerts.

2.2.1.3. Meanwhile, ATC observed smoke emanating from the Left Main Landing Gear (LH MLG) area but the flight crew was unaware of any abnormal external condition.

2.2.2. System Design and Procedural Considerations

2.2.2.1. Although the ECAM procedure for park brake low pressure exists, **there is currently no procedure which covers the scenario of this event,** where the BRAKES PARK BRK LO PR caution triggered after both engines were shutdown.

2.2.2.2. The absence of a clearly applicable procedure for such a particular scenario likely reduced the crew's ability to anticipate aircraft movement under the prevailing conditions. Despite this, the crew's actions remained focused on passenger safety once the loss of braking and external smoke condition became apparent.

2.2.3. Emergency Response and Evacuation

2.2.3.1. Following confirmation of smoke, the airport fire services responded promptly and controlled the smoke originating from the LH MLG area. Given the uncertainty regarding the progression of the event and the aircraft's braking capability, the decision was made to evacuate the aircraft using emergency slides.

2.2.3.2. Emergency evacuation was completed successfully using the available exits.

2.3. Aircraft

2.3.1. Hydraulic System Failure

2.3.1.1. Post-event inspections revealed that brake hose No. 1 installed on the LH MLG had ruptured. The smoke observed by ATC was generated by hydraulic fluid leaking from this hose and coming into contact with the hot brake components.

2.3.1.2. The rupture of the brake hose resulted in a continuous leakage of hydraulic fluid from the Blue hydraulic system. Due to the sustained nature of the leak, the system reservoir progressively depleted, leading to a reduction in available hydraulic pressure. As the pressure decreased, the effectiveness of the braking system degraded, ultimately resulting in the loss of braking capability and unintended forward movement of the aircraft.

Figure 4 Post Event ECAM Hydraulic SD page

2.3.1.3. The recorded leak rate of approximately 8–10 liters per minute was below the activation threshold of the hydraulic system safety valve. **Consequently, the system did not isolate the leak, allowing continuous fluid loss and eventual depletion of the Blue hydraulic reservoir**.

2.3.2. Brake System Degradation

2.3.2.1. The progressive depletion of the Blue hydraulic system reduced the available braking pressure to a level insufficient to maintain the aircraft in a stationary position at the holding point.

2.3.2.2. Intermittent increases in Blue hydraulic pressure, as recorded in the DFDR, indicate that the electric pump provided temporary pressurisation. However, the ongoing hydraulic fluid loss prevented sustained braking effectiveness.

2.3.2.3. The aircraft's low-speed forward movement and subsequent stoppage are consistent with intermittent restoration of hydraulic pressure, resulting in only partial and temporary braking capability.

2.3.3. Hydraulic System Configuration and Impact of Engine Shutdown

2.3.3.1. Under normal operating conditions, the A330's braking and steering systems are supported by multiple hydraulic systems, namely the Green, Blue, and Yellow hydraulic systems. The Blue Hydraulic system powers the alternate braking and park brake while the Green Hydraulic system powers the normal braking. The steering is normally powered by the Green Hydraulic system and can use the Yellow system if the backup steering option is embodied.

2.3.3.2. Following the shutdown of Engine No. 1, the Blue hydraulic system pressure decreased due to the ongoing fluid leak. Subsequently, the shutdown of Engine No. 2 resulted in the loss of the Green and Yellow hydraulic systems, which are engine-driven.

2.3.3.3. As a result, the aircraft's hydraulic redundancy was significantly reduced, leaving only the alternate and park brake available and dependent on the compromised Blue hydraulic system.

2.3.4. Brake hose condition and Maintenance indicators

2.3.4.1. Examination of the brake hose revealed signs of fretting on the outer blue nylon layer and the metallic braiding. The metallic strands showed evidence of fatigue crack growth from pitting corrosion on the outer surface, with final fracture occurring by ductile overload.

2.3.4.2. A 1.1 mm longitudinal split was identified in the PTFE inner hose, located near the point where the stainless-steel braiding had fractured

2.3.4.3. **The presence of tape on the brake hose prior to the occurrence is consistent with the possibility that the affected area had been previously identified or subjected to temporary rectification**. This suggests that the damage to the hose was

not entirely sudden but had developed over a period of time. Permissible damage and defects on hydraulic hoses are specified in AMM 20-23-11-200-802-A-permitted damage and effects on hydraulic hoses.

2.3.4.4. The observed fretting and fatigue characteristics are consistent with a progressive deterioration mechanism of the component. In the absence of evidence of permanent rectification or component replacement prior to the occurrence, it cannot be determined whether the underlying condition had been fully addressed during maintenance or inspection activities.

2.3.5. Cabin Door Functionality and System Performance

2.3.5.1. During the emergency evacuation, passenger door 1R could not be opened due to reported jamming. While this did not contribute to the occurrence, it reduced the number of available exits and had an impact on evacuation efficiency. *(**Action Taken By OEM:** The jamming of doors 1R and 1L on A330/340 aircraft is addressed by the release of Airbus inspection Service Bulletins (SB) to repetitively inspect the doors and its rigging via Airbus SB No. A330-52-3150, mandated by EASA AD 2025-0053. The SB was first released in June 2024 and has to be accomplished within 24 months after aircraft Entry into Service (EIS) or before June 2026, whichever occurs later.)*

2.4. Human Factors

2.4.1. ATC and Aerodrome Emergency Response

2.4.1.1. The Aerodrome Control Tower (ATC) identified the presence of smoke emanating from the left side of the aircraft and promptly informed the flight crew.

2.4.1.2. ATC initiated the aerodrome emergency response urgently, by alerting the RFFS and positioned the emergency vehicles in proximity to the occurrence site.

2.4.2 Flight Crew Response

2.4.2.1 The flight crew responded to the reported situation based on the information available to them at the time, which included indications of smoke and possible leakage from the left side of the aircraft.

2.4.2.2 The shutdown of Engine No. 1, followed by Engine No. 2, was consistent with a precautionary response to a perceived abnormal or potentially hazardous condition.

2.4.2.3 Following the degradation of the braking system, the crew applied brake pedals and utilized available systems, including the electric pump, in an attempt to maintain control of the aircraft. These actions were consistent with expected procedural responses to reduced braking effectiveness.

2.4.3 Communication and Information Limitations

2.4.3.1 During the occurrence, communication to the flight crew was not limited to Civil ATC, as transmissions were also made by a military aircraft (M1) operating in the vicinity and Mil ATC Supervisor. The flight crew misinterpreted these transmissions as originating from aerodrome emergency services, indicating that the source of information was not clearly distinguishable under the prevailing conditions. The additional communication routed directly by the Mil ATC and the military aircraft holding overhead M1, instead of Civil ATC contributed to uncertainty regarding the nature and severity of the condition, directly influencing subsequent flight crew decision making.

2.4.3.2 Information provided to the flight crew included visual observations of smoke and possible leakage; however, the exact source and nature of the abnormal condition remained unconfirmed during the initial phase. Similarly, despite repeated requests from the flight crew for updates from the Fire Chief, ATC appeared to rely primarily on visual observations from the tower and reports received from the Airside Inspector.

2.4.4 Decision-Making and Outcome

2.4.4.1 The flight crew's decisions were made under uncertainty, with limited confirmation of the source and severity of the observed smoke, and reliance on partially verified external reports suggesting a potential fire condition.

2.4.4.2 The shutdown of both engines, as a precautionary response, resulted in the loss of engine-driven hydraulic systems, reducing braking and steering capability.

2.4.4.3 Similarly, the decision to initiate emergency evacuation was based on perceived risk and uncertainty regarding the progression of the condition.

2.4.5 Aircraft Maintenance Personnel

2.4.5.1 The examination of the hose was unable to determine when crack initiation started however, the presence of the tape indicates that the damage must be present to the hose prior to the flight and must have been noted by the maintenance personnel in order to have been covered by tape.

2.4.5.2 Maintenance personnel should be reminded of the damage limitations to hydraulic hoses and to replace them if those limitations are exceeded.

2.5. Aerodrome Operations and System Factors

2.5.1. Aerodrome Operational Environment

2.5.1.1. The occurrence took place at a joint user aerodrome where both civil and military flight operations were conducted on a shared R/W.

2.5.1.2. The aerodrome emergency response was conducted within an operational environment involving concurrent aircraft movements, requiring coordination between air traffic management and emergency services.

2.5.2. Command and Control Considerations

2.5.2.1. During the occurrence, the military ATC supervisor present in the control tower provided instructions to the flight crew to disembark the passengers.

2.5.2.2. In civil aviation operations, ATC provides information and advisory support to flight crews during abnormal and emergency situations; however, operational control of the aircraft remains with the pilot-in-command (PIC), and instructions related to aircraft handling or evacuation are not issued by ATC.

2.5.2.3. Such instructions are not characteristic of standard civil aviation communication practices, where operational control of the aircraft remains with the PIC.

SECTION 3 – CONCLUSIONS

3.1. Findings

3.1.1. The aircraft landed and taxied without any reported cockpit warnings or abnormal indications during the landing and initial taxi phase.

3.1.2. The aircraft remained stationary at the holding point for approximately **8 min prior** to the development of the abnormal condition.

3.1.3. During post-event examination, Brake hose No. 1 installed on the LH MLG was found ruptured.

3.1.4. The rupture of the brake hose resulted in continuous leakage of hydraulic fluid from the Blue hydraulic system.

3.1.5. The hydraulic leak led to progressive depletion of the Blue hydraulic system reservoir and reduction of hydraulic pressure.

3.1.6. The recorded hydraulic fluid leak rate was approximately 8–10 liters per minute, which remained below the activation threshold of the hydraulic system safety valve.

3.1.7. Due to the leak rate being below the safety valve threshold, the system did not isolate the leak, allowing continued fluid loss.

3.1.8. The flight crew's situational awareness was based primarily on external reports, as no direct cockpit indication of the source or severity of the condition was available.

3.1.9. The flight crew actions, including activation of the Blue electric pump and brake applications, were consistent with available procedures.

3.1.10. Following shutdown of both engines, the Green and Yellow hydraulic systems became unavailable, significantly reducing hydraulic redundancy and contributing to loss of braking and steering capability.

3.1.11. The reduction in hydraulic pressure resulted in ineffective braking, steering, and control inputs.

3.1.12. The flight crew misinterpreted transmissions from the M1 as originating from aerodrome emergency services.

3.1.13. During the occurrence, M1 kept on advising the aircraft on VHF frequency to park and shut the engines, whereas the Military Controller provided instructions to the flight crew regarding passenger disembarkation.

3.1.14. Following degradation of braking performance, the aircraft experienced unintended forward movement at low ground speeds.

3.1.15. The aircraft came to a stop with its nose and right-hand main landing gear partially on unpaved ground adjacent to Taxiway-J.

3.1.16. The decision to initiate emergency evacuation was made in response to perceived risk to passengers and crew.

3.1.17. Passenger door 1R could not be opened during evacuation due to reported jamming, reducing the number of available exits.

3.1.18. Emergency evacuation of passengers and crew was conducted using available exits, with no serious injuries reported.

3.1.19. Examination of the brake hose revealed fretting damage, pitting corrosion, and fatigue crack growth. *(**Action taken by Manufacturer:** To ensure regular inspections of the brake hoses, the AMM task 32-42-00-200-801-A - Inspection of the MLG Brake with the Wheel Removed has been updated to request a brake hose inspection whenever the brakes are inspected with the MLG wheel removed. This task is performed every ~300 FCs and will better capture hose wear before a leak).*

3.1.20. Photographic evidence confirmed the presence of tape applied to the brake hose prior to the occurrence, which was not part of the original configuration.

3.1.21. The observed condition of the hose was consistent with progressive deterioration over time.

3.1.22. The PBSV and LH Alternate Brake Manifold were tested and no faults were identified.

3.1.23. Smoke observed was consistent with hydraulic fluid contacting hot brake components.

3.1.24. Existing procedures did not provide specific guidance for managing hydraulic leak-induced loss of braking during post-landing ground operations

3.2. Cause / Contributory Factors

3.2.1. Cause

3.2.1.1. The occurrence was caused by the rupture of Brake Hose No. 1 on the LH MLG, which led to hydraulic fluid leakage, with resulting smoke generated by fluid contact with hot brake components.

3.2.2. Contributory Factors

3.2.2.1. The hydraulic leak rate remained below the activation threshold of the system safety valves, preventing automatic isolation of the leak.

3.2.2.2. Pre-existing mechanical degradation of the hydraulic hose, including fretting and fatigue damage.

3.2.2.3. Lack of specific flight crew procedures addressing post-landing hydraulic leak scenarios involving loss of braking capability.

3.2.2.4. Evidence of prior temporary intervention (tape applied to the hose), indicating that the affected area had been subject to earlier attention, during aircraft maintenance.

Note: *Aviation Occurrence Category (ADREP Taxonomy)*

SCF-NP (System/Component Failure or Malfunction – Non-Powerplant)

The occurrence was initiated by the failure of a hydraulic brake hose, which is a non-powerplant system component.
(ATA 29 – Hydraulic System / ATA 32 – Landing Gear Braking).

SECTION 4 – SAFETY RECOMMENDATIONS

4.1. Safety Recommendations

4.1.1. The following safety recommendations are issued in accordance with ICAO Annex 13 requirements. They are addressed to the responsible parties and are aimed at preventing recurrence of similar occurrences.

4.1.1.1. Inspection procedures for hydraulic brake hoses	
Addressed To	**Aircraft Operator (Saudi Arabian Airlines)**
Recommendation	Replacement of the effected hoses once fretting and early-stage fatigue damage is observed during inspections and modify the criteria if required for hoses inspection.
Safety Rationale	The fretting was detected before the occurrence flight however it was not replaced.
Any Action Taken by OEM	To ensure regular inspections of the brake hoses, the Aircraft Maintenance Manual (AMM) task 32-42-00-200-801-A - Inspection of the MLG Brake with the Wheel Removed has been updated in April 2026 by OEM to request a brake hose inspection whenever the brakes are inspected with the MLG wheel removed. This task is performed every ~300FCs and will better capture hose wear before a leak. A copy of the updated AMM task is attached.

4.1.1.2. Maintenance actions are formally recorded and followed in accordance with approved maintenance procedures	
Addressed To	**Aircraft Operator (Saudi Arabian Airlines)**
Recommendation	Ensure that any temporary maintenance actions (e.g., protective coverings or tape) are formally recorded, tracked, and followed by permanent rectification in accordance with approved maintenance procedures.
Safety Rationale	Application of tape on the hose did not protect it from further damage therefore, the maintenance actions taken was not effective.

4.1.1.3. Evaluate the adequacy of existing procedures.	
Addressed To	**Aircraft Manufacturer (Airbus)**
Recommendation	Evaluate the adequacy of existing procedures for managing hydraulic leak scenarios during ground operations, and consider providing additional guidance where necessary.
Safety Rationale	There is currently no procedure which assists the pilot when the BRAKES PARK BRK LO PR caution is triggered after both engines are shutdown.
Safety Actions Taken by OEM	To assist flight crews when the BRAKES PARK BRK LO PR caution is triggered, Airbus has launched a modification to the ECAM PARK BRAKE LO PRES ECAM procedure to additionally advise the crews to switch on the electric pump on the GREEN hydraulic system and use pedal braking. This modification will be incorporated in the next Flight Warning System software update which is expected to be launched in Q1 2028.

4.1.1.4. Reinforce standard communication protocols during abnormal situations	
Addressed To	**Aerodrome Operator / ATC Authority (PAA & PAF)**
Recommendation	Reinforce standard communication protocols during abnormal / emergency situations to ensure that only designated ATC personnel provide advice to flight crews, minimizing the risk of misinterpretation
Safety Rationale	Transmissions made on the ATC frequency by other aircraft were misinterpreted by the pilot affecting decision made during emergency.

4.1.1.5. Use of Advisory Phraseology during emergency situations	
Addressed To	**Aerodrome Operator / ATC Authority (PAA & PAF)**
Recommendation	Ensure that ATC personnel use advisory phraseology during emergency situations limiting the use of directive instructions in accordance with **ICAO Doc 9432 (Manual of Radiotelephony)** and **ICAO Doc 4444 (Procedures for Air Navigation Services — Air Traffic Management, or PANS-ATM)**.
Safety Rationale	The use of directive instructions by ATCs or other agencies during emergencies have comprised PIC situational awareness based on external factors as it created ambiguity in PIC decision making.

4.2. Summary of Safety Recommendations

Para.	Subject	Addressed To	Status
4.1.1.1	Inspection procedures for hydraulic brake hoses	Aircraft Operator (Saudi Arabian Airlines)	**OPEN**
4.1.1.2	Maintenance actions are formally recorded and followed in accordance with approved maintenance procedures	Aircraft Operator (Saudi Arabian Airlines)	**OPEN**
4.1.1.3	Evaluate the adequacy of existing procedures	Aircraft Manufacturer (Airbus)	**OPEN** (Till launch of updated software)
4.1.1.4	Reinforce standard communication protocols during abnormal situations	Aerodrome Operator / ATC Authority (PAA & PAF)	**OPEN**
4.1.1.5	Use of Advisory Phraseology during emergency situations	Aerodrome Operator / ATC Authority (PAA & PAF)	**OPEN**

END OF REPORT

Bureau of Aircraft Safety Investigation Pakistan (BASIP)
Report Reference: HQ BASIP/1000/457/Inv
11 July 2026