BUREAU OF AIRCRAFT SAFETY INVESTIGATION PAKISTAN

FINAL INVESTIGATION REPORT

SERIOUS INCIDENT

IN FLIGHT ENGINE NO 2 SHUT DOWN

Operator	Serene Air
Flight	SEP502,
Aircraft Type	Airbus 330-200
Registration	AP-BNE
Engine Type / S/N	GE CF6-80E1A4 / 0733
Date of Occurrence	05 April, 2021
Location	Karachi (OPKC)
Classification	Serious Incident – In Flight Shut Down
Report Status	Final Investigation Report
Report Reference	HQ BASIP/1000/434/Inv
Date of Report	03 August 2026
This report is issued pursuant to Pakistan Aircraft Safety Investigation (PASI) Act, 2023, Air Safety Rules 2025 and ICAO Annex 13.	

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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.

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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 05th April, 2021 – **Appendix 'A'**
[2] Notification to ICAO – **Appendix 'B'**

SYNOPSIS

On 05 April, 2021, Serene Air Flight SEP502, an Airbus A330-200 aircraft (registration AP-BNE), operating a scheduled international flight from Jinnah International Airport (JIAP), Karachi to Islamabad International Airport (IIAP), Islamabad experienced a MASTER CAUTION and subsequent ENG 2 FADEC FAULT at Flight Level (FL)370, resulting in Auto-Thrust Disconnection. The flight crew carried out the applicable procedures, shut down Engine No. 2 and returned the aircraft safely to JIAP, Karachi, where a single-engine landing was completed without incident.

The investigation determined that the Engine No. 2 Electronic Control Unit (ECU) had failed following exposure to excessive temperatures. Examination of the ECU confirmed an overtemperature condition and failure of both power supply modules.

Further investigation identified significant internal deterioration of the Engine No. 2 Thrust Reverser Pressurization Valve (TRPV), which allowed leakage of hot bleed air into the nacelle area. The investigation also found that, following Thrust Reverser deactivation under Master Minimum Equipment List (MMEL) provisions, the required pneumatic blanking cap had not been installed because it was not available and the hose end had been covered with polyethylene material instead.

The investigation concluded that hot bleed air leakage from the deteriorated TRPV, combined with the absence of the required pneumatic blanking cap, resulted in overheating of the ECU, leading to the ENG 2 FADEC FAULT and subsequent engine shutdown.

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ABBREVIATIONS

AOC	Air Operator Certificate
A/P	Auto Pilot
A/THR	Auto Thrust
ATPL	Air Traffic Pilot License
ATS	Air Traffic Services
BASIP	Bureau of Aircraft Safety Investigation Pakistan
CDU	Center Drive Unit
CPL	Commercial Pilot License
ICAO	International Civil Aviation Organization
ECAM	Electronic Centralized Aircraft Monitor
ECU	Electronic Control Unit
FCPCs	Flight Control Primary Computer
FDs	Flight Directors
FO	First Officer
FL	Flight Level
ft	Feet
IFR	Instrument Flight Rules
IIAP	Islamabad International Airport, Islamabad
ILS	Instrument Landing System
IOU	Incident Occurrence and Unserviceability Report
JIAP	Jinnah International Airport, Karachi
m	Minute
MCL	Maximum Climb
MLG	Main Landing Gear
MMEL	Master minimum Equipment List
NTSB	National Transportation Safety Board
OPIS	Islamabad International Airport, Islamabad

OPKC	Jinnah International Airport, Karachi
PAA	Pakistan Airports Authority
PASI	Pakistan Aircraft Safety Investigation
RFFS	Rescue and Fire Fighting Services
R/W	Runway
s	Second
TOGA	Take Off Go Around
TRPV	Thrust Reverser Pressurization Valve
UTC	Universal Coordinated Time
VFR	Visual Flight Rules

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SECTION 1 – FACTUAL INFORMATION

1.1. History of the Flight

1.1.1. On 05th April, 2021 Serene Air Airbus 330-200 aircraft bearing Registration No AP-BNE was scheduled for a routine flight SEP-502 from JIAP, Karachi to IIAP, Islamabad. Aircraft landed back at JIAP, Karachi due to In Flight Shut Down (Engine No.2).

1.1.2. **075123** – Aircraft commenced take-off from JIAP, Karachi Runway (R/W) 25L, enroute to IIAP Islamabad.

1.1.3. **080523** – During climb through FL282.2, MASTER CAUTION illuminated; Electronic Centralized Aircraft Monitor (ECAM) changed from CRUISE to ENG page. Autopilot (A/P), Flight Directors (FDs), and Auto Thrust (A/THR) remained engaged.

1.1.4. **081042** – Passing FL350.8, Starter Valve 2 FAULT message became invalid; N1 and N2 indications remained balanced between engines.

1.1.5. **082014** – Levelled off at FL370; both Thrust Levers at Maximum Climb (MCL); ENG 2 FADEC FAULT triggered, accompanied by MASTER CAUTION.

1.1.6. **082052** – A/THR system **recorded** as disconnected.

1.1.7. **082120** – ENG 1 thrust lever moved **to** Take-Off/Go-Around (TOGA) detent.

1.1.8. **082230** – ENG 1 thrust lever held at **TOGA** for approximately 10 seconds (s), then returned to MCL; A/THR remained armed but disengaged.

1.1.9. **082243** – ENG 2 master lever set to OFF; low-pressure fuel shut-off valve closed; both Captain and First Officer (F/O) **MASTER** CAUTION lights illuminated.

1.1.10. **082301** – Aircrew initiated turn-back to JIAP, Karachi; **destination** officially changed approximately 1 minute (m) 21 s later.

1.1.11. **082844** – Descending through **FL331**, A/THR re-engaged in MACH mode; transitioned to SPEED mode after 13 s.

1.1.12. **090910** – Aircraft landed on **R/W** 25L JIAP, Karachi without overweight landing.

1.2. Injuries to Persons

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

Injuries	Crew	Passengers	Total on Aircraft	Others
Fatal	Nil	Nil	Nil	Nil
Serious	Nil	Nil	Nil	Nil
Minor	Nil	Nil	Nil	Nil
None	11	239	250	Nil
Total	**11**	**239**	**250**	**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	**Last Simulator 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:

SEP502	
Operator	Serene Air
Aircraft Make & Model	Airbus 330-200
Registration Number	AP-BNE
Serial Number	0733
Year of manufacturing	2006
Date of Induction	03 September, 2020
Sector	Karachi (OPKC) – Islamabad (OPIS)
Maximum Take-off Weight	242,000 Kilogram (kg)
Maximum Landing Weight	182,000 kg
Maximum Fuel Capacity	139,090 liters
Flight Conditions	Normal

Table 4 Aircraft Details

Engine No 02	
Engine S No	811356
Manufacturer	GE Aviation (USA)
Engine Type	CF6-80E1A4/B
Date of Manufacturing / Installation	- / 31st March, 2006
TSN / CSN	66063 / 10226
Last BSI	05th February, 2021

Table 5 Engine No 2 Details

1.7. Meteorological Information

1.7.1. The meteorological observation for Jinnah International Airport (OPKC), Karachi, issued at 0900 reported surface wind from 240° at 15 knots, prevailing visibility of 5,000 meters, no significant clouds (NSC), air temperature of 33°C, dew point temperature of 21°C, and an altimeter setting (QNH) of 1008 hPa. The trend forecast indicated no significant change (NOSIG) in the meteorological conditions during the subsequent two hours.

Value	Description
OPKC	ICAO airport code for JIAP, Karachi Pakistan
050900Z	Date 05th, time 0900 UTC
24015KT	Wind from 240° at 15 kts
5000	Visibility 5000 m
NSC	No Significant Clouds
33/21	Temperature 33°C / Dew Point 21°C
Q1008	Altimeter pressure in 1008 hPa
NOSIG	No significant change expected in the next 2 hours

Table 6 METAR description OPKC

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. OPKC is located approximately 8 Nautical Miles (NM) east of the city center of Karachi at an elevation of 100 ft above mean sea level. The aerodrome is operated by the PAA and accommodates both Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) traffic. It is equipped with two parallel R/W, designated 07R/25L and 07L/25R, measuring 3,400 meters and 3,200 meters in length respectively, with asphalt / concrete surfaces. Air Traffic Services (ATS) are provided H24 from the Air Traffic Control Tower. The aerodrome is equipped with precision Approach aids, including Instrument Landing System (ILS) facilities for R/W 25L and 25R. 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. Flight Data recorders were provided for read out and all the cautions were confirmed.

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. During the time of occurrence or post occurrence, no fire was reported.

1.15. Survival Aspects

1.15.1. Not applicable.

1.16. Tests and Research

1.16.1. Following the incident, the ECU and TRPV module was shipped to Original Equipment Manufacturer (OEM) for detailed teardown assessment.

1.17. Organizational and Management Information

1.17.1. Serene Air (Private) Limited is a privately owned commercial air transport operator based in Islamabad, Pakistan. The airline was established in 2016 and operates scheduled domestic and international passenger services under an Air Operator Certificate (AOC) issued by the Pakistan Civil Aviation Authority (PCAA), now the PAA and the PCAA under the applicable regulatory framework. At the time of the occurrence, the operator maintained its principal place of business in Islamabad and operated a fleet comprising Boeing 737 and Airbus A330 aircraft. The operator's organizational structure included accountable management, flight operations, continuing airworthiness management, maintenance control, ground operations, and safety management functions in accordance with the applicable national regulations and ICAO Standards and Recommended Practices (SARPs).

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 05th April, 2021 Serene Air Airbus 330-200 aircraft bearing Registration No AP-BNE was scheduled for a routine flight SEP-502 from JIAP, Karachi to IIAP, Islamabad. Aircraft landed back at JIAP, Karachi due to In Flight Shut Down (Engine No.2).

2.1.2. During the climb from Karachi to Islamabad, the aircraft experienced a MASTER CAUTION accompanied by an ECAM transition from the CRUISE to ENG page. Although engine parameters remained normal and balanced, a STARTER VALVE 2 FAULT message was recorded and subsequently became invalid. After levelling at FL370, an ENG 2 FADEC FAULT occurred, resulting in the disconnection of the auto-thrust system. Following the fault, Engine No. 2 was shut down and the flight was turned back to JIAP, Karachi. During the descent, the auto-thrust system re-engaged and operated normally. The aircraft subsequently landed at JIAP, Karachi, without an overweight landing.

2.2. Flight Operations

2.2.1. Following the occurrence of Engine No. 2 caution messages during the climb, the flight crew monitored engine indications and maintained the climb profile as engine parameters remained within normal limits. Upon the subsequent ENG 2 FADEC FAULT at FL370 and the associated auto-thrust disconnection, as per PFR, “ENG2 FADEC FAULT” triggered at 08:20 UTC. Then engine #2 experienced a thrust decrease, which led to a yawing moment towards the right. This thrust asymmetry was compensated by left rudder deflection. ENG 1 thrust lever held at **TOGA** for approximately 10 seconds (s), then returned to MCL; A/THR remained armed but disengaged. In case of non-standard disconnection, a message A/THR OFF is logged into the PFR. As this PFR message is not present, crew has performed an A/THR standard disconnection with the instinctive pushbutton on the thrust levers. The crew carried out the relevant procedures, including shutdown of Engine No. 2. The flight was then discontinued and a return to JIAP, Karachi was initiated. During the descent, Auto-Thrust functionality was restored and remained available for the remainder of the flight. The aircraft completed a single-engine approach and landed at JIAP, Karachi without exceeding the maximum landing weight limitations.

2.3. Aircraft

2.3.1. The **Airbus A330-200 is powered by** CF6-80E1A4 high bypass ratio, dual rotor, axial flow turbofan power plant. Reverse thrust for braking the aircraft after landing is supplied by an integrated system which acts on the fan discharge airflow. The thrust reverser system is operated by pneumatic motors powered by compressor discharge bleed air. The thrust reverser system is pneumatically operated. The air pressure supply to the thrust reverser system is controlled by the Electronic Control Unit (ECU) through the Thrust Reverser Pressure Valve (TRPV). When the Reverse Thrust is selected, a signal is sent to

the Flight Control Primary Computers (FCPCs) to release the disk brakes, and to the ECU to pressurize the system by opening the TRPV.

2.3.2. Each Thrust Reverser cowl assembly is operated by a single Center Drive Unit (CDU) powered by compressor discharge bleed air. The CDU drives ball screw actuators through flexible shafts and gearboxes to translate and rotate thrust reverser components to the desired position. Appropriate interlocks, transducers and position microswitches are incorporated in the system.

2.3.3. Initial Ground Checks on Aircraft: -

2.3.3.1. After landing maintenance crew found ECU environment heated up. Troubleshooting was performed as per TSM 73-21-71-810-802. Internal failure of Eng # 02 ECU FADEC test was not accessible as ECU was not responding, resetting the system was also not helpful. Eng # 02 ECU was removed as unserviceable i.a.w AMM 73-21-34-000-801 and another ECU was installed from Engine # 01, for fault confirmation purpose i.a.w AMM 73-21-34-400-801. During operation test on ground with engine non-motoring, msg J3/J4/TR press switch (E2-4112KS) found. After swapping TRPV from Eng # 01, T/R system test were carried out i.a.w AMM 78-31-00-710-802, J3/J4 T/R pressure switch fault disappeared and new fault Eng # 02 Rev Unlock appeared.

2.3.3.2. In the previous flight there was pilot reported defect of Thrust Reverser Unlock. The Thrust Reverser was deactivated as per AMM and put on MMEL by the maintenance crew. The MMEL maintenance procedure requests to install a dust cap on the flexible hose between the thrust reverser pressurization valve and the center drive unit, but, after the event flight, this cap was found missing. Which was further confirmed to be not installed and instead the hose end was wrapped with polythene using a tie wrap.

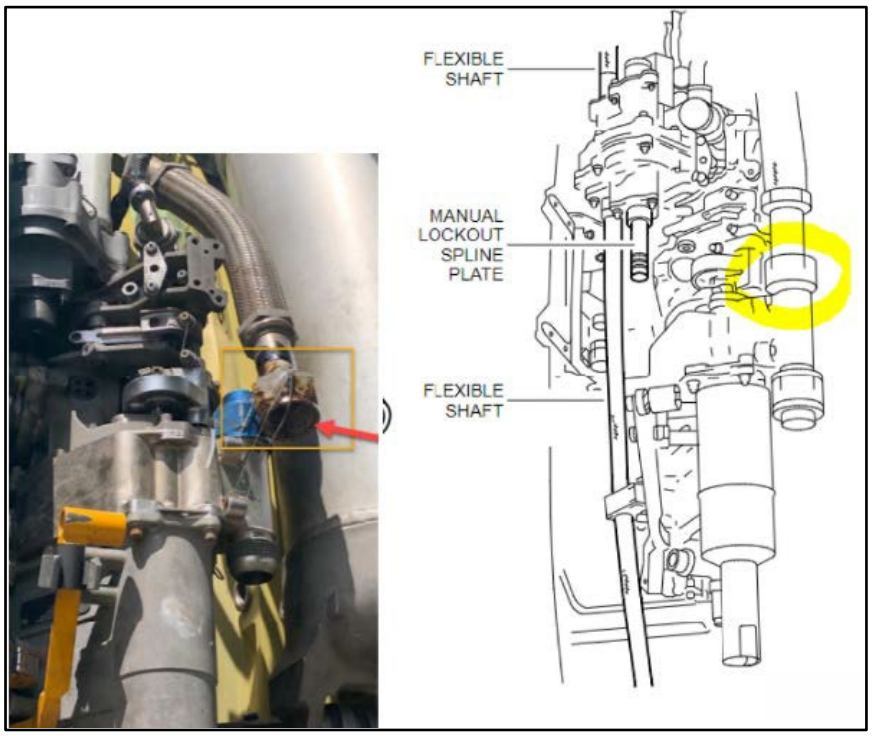
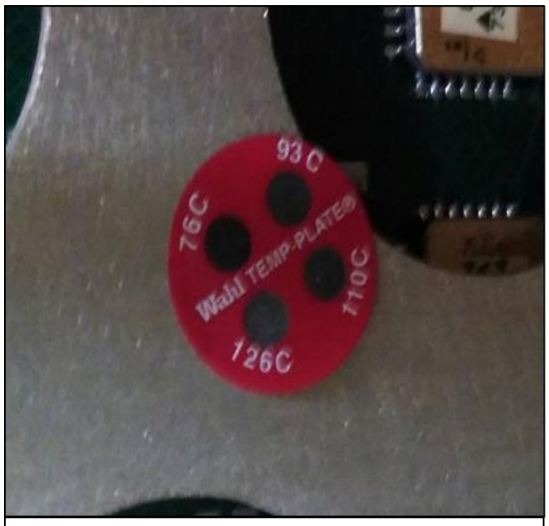


Figure 1 Missing cap location on the flexible hose

2.3.4. Electronic Control Unit

2.3.4.1. The ECU was sent for tear down investigation where after initial inspection with minor observation of external body the component was subjected to testing. Initially NVM (Non-volatile memory / fault data) retrieval was not possible and unit did not communicate with data loader. Troubleshooting revealed defective PSM (Power Supply Module) on Channel A and Channel B. After replacement of both PSM, NVM retrieval and decode was performed. NVM Data showed several faults on both channels including “ECU OVER TEMPERATURE”. The reported ENG 2 FADEC Overheat ECAM Master Caution was confirmed by NVM analysis.

2.3.4.2. Both temperature recorder inside the ECU showed all fields dark, which means internal temperature was over 126°C. The ECU contains two temperature recorders on the plate between Channel-A and Channel-B Circuit Card Assemblies (CCAs). Each temperature recorder is divided into four sections, and each section has a different temperature threshold (76 °C, 93 °C, 110°C, and 126 °C). As each temperature threshold is reached, the temperature recorder section associated with that temperature threshold darkens. We found both temperature recorders dark on all four segments, which indicates that the internal ECU temperature was above 126 °C.



Circuit Card Assembly – Channel A

Circuit Card Assembly – Channel B

Figure 2 Circuit Card Assembly

2.3.4.3. The loss of both PSM is most likely caused by overheat of the ECU. The final temperature was above 126°C, which is outside the specified operating temperature range for electronic parts used in the ECU. As there are no indications that this extreme heat has been generated inside the ECU, therefore, there can only be an external cause for the over heat of the ECU.

2.3.5. Thrust Reverser Pressurization Valve: -

2.3.5.1. Maintenance personnel observed that the valve appeared capable of allowing bleed air flow despite the absence of a thrust reverser deployment command. Following replacement of the valve, previously recorded thrust reverser pressure switch faults

disappeared. Subsequently, the removed valve was examined by Honeywell under National Transportation Safety Board (NTSB) oversight.

2.3.5.2. The examination revealed significant internal deterioration including; Severe galling of the flow housing and inlet assemblies, galling of multiple poppet assemblies, Grooving of stem poppets, Wear of sealing elements, Leakage of both regulator assemblies. These findings indicate degradation of internal valve sealing surfaces and pressure control components.

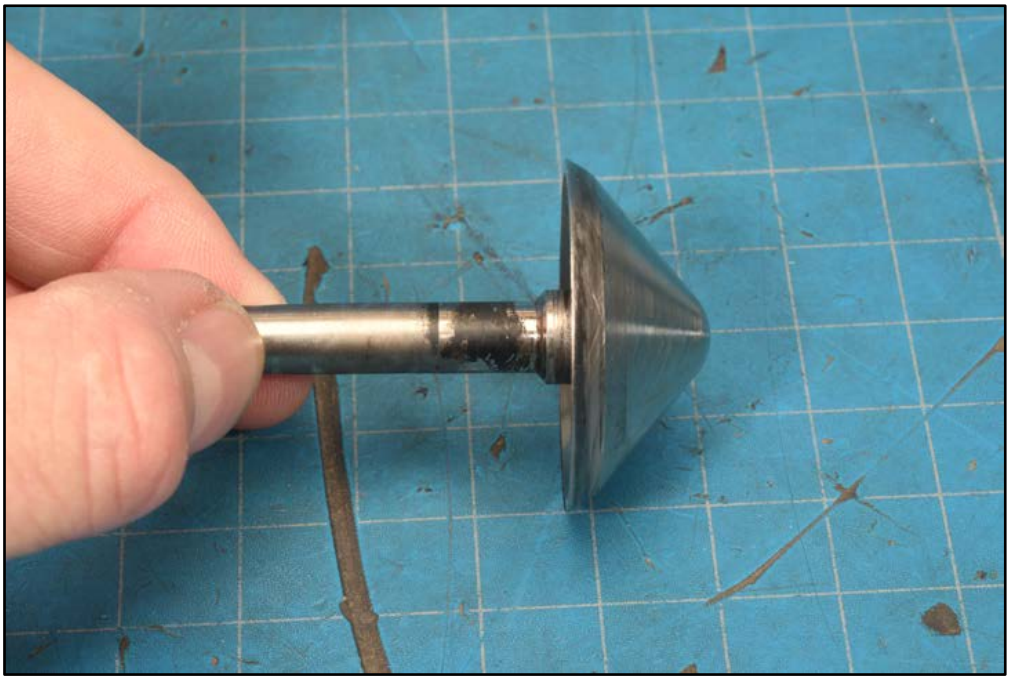


Figure 3 Internal Deterioration

2.3.5.3. Although testing of the isolated solenoid valve assembly showed acceptable functional performance, the overall valve examination identified multiple mechanical defects capable of affecting the valve's ability to prevent unintended bleed air leakage. This resulted in continuous leakage of hot bleed air downstream of the valve subsequently increasing the temperature of the area and effecting the ECU.

Figure 4 Solenoid Valve Assembly

2.4. Human Factors

2.4.1. The crew's recognition of abnormal engine indications, adherence to checklists, decision-making, communication with ATC, and execution of the diversion were appropriate and consistent with operator SOPs.

2.4.2. At the time of the occurrence, Engine No. 2 thrust reverser had been deactivated under MMEL provisions. The approved maintenance procedure required installation of a blanking cap on the flexible pneumatic hose between the thrust reverser pressurization valve and the centre drive unit. **Post-occurrence examination revealed that this cap had not been installed, as was not available, instead the hose end was covered with a polyethene with the use of tie wrap**. The polyethene is not designed to with stand the continuous hot bleed air and created an open pneumatic discharge path within the fan cowl area. Consequently, if pressure were present downstream of the thrust reverser pressurization valve, hot bleed air could be released directly into the nacelle compartment.

SECTION 3 – CONCLUSIONS

3.1. Findings

3.1.1. The Airbus A330-200, powered by CF6-80E1A4/B engines, was operating a scheduled flight from Karachi to Islamabad when a MASTER CAUTION and STARTER VALVE 2 FAULT message were recorded during the climb. Engine parameters remained normal and the fault subsequently became invalid.

3.1.2. After levelling at FL370, an ENG 2 FADEC FAULT occurred, resulting in auto-thrust disconnection.

3.1.3. The flight crew carried out the applicable ECAM and abnormal procedures, shut down Engine No. 2, discontinued the flight and returned to Karachi.

3.1.4. During the descent, auto-thrust functionality was restored and remained available for the remainder of the flight.

3.1.5. The aircraft completed a safe single-engine approach and landing at Karachi without exceeding the maximum certified landing weight.

3.1.6. The flight crew's actions, including recognition of the malfunction, checklist execution, decision-making, communication with ATC and diversion management, were consistent with company SOPs.

3.1.7. Initial maintenance troubleshooting identified that the Engine No. 2 ECU was unresponsive and ECU FADEC testing could not be accessed.

3.1.8. Subsequent ground testing isolated faults associated with the Engine No. 2 thrust reverser system, and replacement of the TRPV eliminated the previously recorded thrust reverser pressure switch fault.

3.1.9. A pilot-reported thrust reverser unlock defect had been recorded on the previous flight and the Engine No. 2 thrust reverser had been deactivated under MMEL provisions.

3.1.10. The applicable MMEL maintenance procedure required installation of a blanking cap on the flexible pneumatic hose between the TRPV and the CDU; however, the required cap was not installed and was later confirmed that the hose end was covered with polyethylene secured by a tie wrap instead.

3.1.11. Teardown examination of the Engine No. 2 ECU identified failed power supply modules on both channels and NVM data recorded multiple faults, including ECU OVER TEMPERATURE.

3.1.12. Both ECU temperature recorders indicated exposure to temperatures exceeding 126°C, which is above the specified operating temperature range of the ECU electronic components.

3.1.13. Investigation determined that the ECU overheating originated from an external heat source and resulted in failure of both ECU power supply modules.

3.1.14. Examination of the Engine No. 2 TRPV identified severe internal deterioration, including galling, grooving, seal wear and regulator leakage, which compromised the valve's ability to prevent bleed air leakage.

3.1.15. The deteriorated TRPV was capable of allowing continuous leakage of hot bleed air downstream of the valve in the absence of a thrust reverser deployment command.

3.1.16. The absence of the MMEL-required blanking cap created an open pneumatic discharge path, allowing leaked hot bleed air to be released directly into the nacelle area adjacent to the ECU.

3.1.17. The combination of hot bleed air leakage through the TRPV and the absence of the required blanking cap resulted in overheating of the Engine No. 2 ECU.

3.1.18. The ECU overheating led to ECU power supply module failures and the subsequent ENG 2 FADEC FAULT encountered during cruise flight.

3.2. Cause / Contributory Factors

3.2.1. Cause

3.2.1.1. The occurrence was caused by overheating of the Engine No. 2 Electronic Control Unit (ECU), which resulted in failure of both ECU Power Supply Modules and the subsequent ENG 2 FADEC FAULT during cruise flight.

3.2.2. Contributory Factors

3.2.2.1. The ECU overheating was caused by continuous leakage of hot bleed air through a deteriorated Engine No. 2 Thrust Reverser Pressurization Valve (TRPV), which exhibited significant internal wear and leakage of its pressure control components.

3.2.3. Latent Contributory Factors

3.2.3.1. Maintenance personnel did not fully accomplish the approved MMEL deactivation procedure for the Engine No. 2 thrust reverser, as the required pneumatic blanking cap was not installed and was replaced with a non-approved polyethylene covering. This maintenance non-compliance removed a designed barrier against hot bleed air discharge and remained undetected prior to the occurrence flight.

3.2.3.2. The failure to correct the incomplete accomplishment of the MMEL thrust reverser deactivation procedure indicates a breakdown in maintenance procedural compliance and verification processes, allowing a latent unsafe condition to remain on the aircraft prior to the occurrence flight.

Note: Aviation Occurrence Category (ADREP Taxonomy)

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

In Flight Shut Down (IFSD)

- *Failure or malfunction of an aircraft system or component other than the powerplant*
- *Includes IFSD for all causes: for example, flameout, internal failure, flight crew initiated shutdown, foreign object ingestion, and icing.*

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. Use of standard blanking	
Addressed To	**Aircraft Operator (Serene Air)**
Recommendation	The operator should review and strengthen controls governing MMEL maintenance actions to ensure that all required parts, blanking devices, caps and associated materials specified in approved maintenance procedures are available and installed prior to aircraft release to service.
Safety Rationale	The investigation determined that the MMEL-required blanking cap for the thrust reverser pneumatic hose was not available.

4.1.1.2. Use of non-standard blanking	
Addressed To	**Aircraft Operator (Serene Air)**
Recommendation	Where standard components are unavailable, maintenance personnel should be provided with clear instructions to prevent the use of unapproved alternatives. If required to use an alternative (non-approved) part, a risk assessment is to be carried out by the operator and approval / guidelines from OEM is to be obtained.
Safety Rationale	The investigation determined that a non-standard blanking technique, using polythene instead of standard blanking cap, resulted in the loss of the intended pneumatic isolation barrier

4.1.1.3. Maintenance verification by Operator	
Addressed To	**Aircraft Operator (Serene Air)**
Recommendation	The operator should enhance supervisory inspection and certification processes for MMEL deactivations involving pneumatic, bleed air and thrust reverser systems by incorporating an independent verification of critical isolation actions prior to release to service.
Safety Rationale	The absence of the required blanking cap remained unverified between shift change over and there was no cross check available in the system to address the issue before the release of aircraft.

4.1.1.4. Issuance of Safety Instructions by Regulator	
Addressed To	**Regulator (PCAA)**
Recommendation	In order to curb such occurrences, Regulator must carry out trend analysis of use of non-standard items by the operators and initiate necessary safety instructions to the operators.
Safety Rationale	A non-standard blanking technique used was left un checked and resulted in the serious incident.

4.2. Summary of Safety Recommendations

Para.	Subject	Addressed To	Status
4.1.1.1	Use of standard blanking	Aircraft Operator (Serene Air)	OPEN
4.1.1.2	Use of non-standard blanking	Aircraft Operator (Serene Air)	OPEN
4.1.1.3	Maintenance verification	Aircraft Operator (Serene Air)	OPEN
4.1.1.4	Issuance of Safety Instructions	Regulator (PCAA)	OPEN

END OF REPORT

Bureau of Aircraft Safety Investigation Pakistan (BASIP)
Report Reference: HQ BASIP/1000/434/Inv
03 August 2026