

AIRCRAFT INCIDENT REPORT

				Reference:		CA18/3/2/0672	
Aircraft Registration	ZS-SFN	Date of Incident	07 Sept. 2008		Time of Incident	0453Z	
Type of Aircraft	Airbus A319-131 (Aeroplane)			Type of Operation		Scheduled Domestic Flight	
Pilot-in-command Licence Type		Airline Transport		Age	49	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours		15591.0		Hours on Type	1951
Last point of departure		Cape Town International Aerodrome (FACT), Western Cape					
Next point of intended landing		O.R. Tambo International Airport (FAJS), Gauteng					
Location of the incident site with reference to easily defined geographical points (GPS readings if possible)							
During cruise at 37000ft from FACT en-route to O.R. Tambo International Airport (FAJS).							
Meteorological Information	The weather was fine, en route; the wind 350°/17kt and visibility: CAVOK.						
Number of people on board	2+4+59	No. of people injured		0	No. of people killed	0	
Synopsis							
<p>On 06 September 2008, the aircraft was despatched as per Minimum Equipment List (MEL) from FAJS to FACT on a Scheduled Domestic Flight SA 377 with No 1 engine bleed system inoperative. According to the Minimum Equipment List (MEL 36-11-01 Category C), the requirements for the proposed flight were that the No.1 engine bleed system was to be selected "closed" and No 2 engine bleed system was to be selected "open" by means of the press button switches on the overhead panel. The Captain nevertheless decided to select both No 1 and No 2 engine bleed switches to the "open" position and in the event of an engine bleed system malfunctioning, he planned to isolate the faulty bleed system. An uneventful flight was undertaken to FACT.</p> <p>On 07 September 2008 at approximately 0352Z the following morning, the aircraft departed FACT on the return flight (SA378) to FAJS with the No 1 engine bleed system selected "open" and the No 2 engine bleed system selected "closed". During cruise at 37000ft AMSL (above mean sea level), at approximately 0452Z, the cockpit crew received an ECAM (Electronic Centralised Aircraft Monitoring System) warning of the failure of the No 1 engine bleed system. The crew then closed the No. 1 engine bleed with the applicable press button on the overhead panel. The cabin altitude started to increase dramatically and the cockpit crew advised FAJS ATC on VHF frequency 128.3 MHz of the pressurization problem and requested an emergency descent to a lower level. During the emergency descent to 11000 ft AMSL, the cabin altitude warning sounded at 33000ft and the cockpit crew activated the cabin oxygen masks. The APU (Auxiliary Power Unit) was started and pressurization re-established at 15000ft AMSL.</p> <p>The crew continued with the flight to FAJS and landed safely without any further event. The crew and passengers sustained no injuries during the event and no damage was caused to the aircraft.</p>							
Probable Cause							
Failure of the crew to carry out a proper pre-flight inspection leading to the number 1 engine bleed air system being left on and the number 2 engine bleed air system being secured; subsequently the failure of the pressurisation system.							
IARC Date		Release Date					

ABBREVIATIONS IN THE REPORT:

SAA	: South African Airways
AOC	: Air Operator Certificate
APU	: Auxiliary Power Unit
ATC	: Air Traffic Controller
ATNS	: Air Traffic Navigation Services
ATPL	: Airline Transport Pilot's Licence
CVR	: Cockpit Voice Recorder
DFDR	: Digital Flight Data Recorder
TL12	: Flight Crew & Technical Irregularity Report
TL/36	: Flight Defect and Maintenance Reports
GT/83	: Acceptable Deferred Flight Defect Record
ECAM	: Electronic Centralised Aircraft Monitoring
X-Bleed	: Cross Bleed
MEL	: Minimum Equipment List
Pb	: Push Button
SOP	: Standard Operating Procedures
FACT	: Cape Town International Airport
FAJS	: OR Tambo International Airport
ft	: Feet
kts	: Knots
METAR	: Meteorological Aeronautical Report
MHz	: Megahertz
TOD	: Top of Descent
PALT	: Pressure altitude
VHF	: Very High Frequency.

AIRCRAFT INCIDENT REPORT

Name of Owner/Operator: South African Airways

Manufacturer : AIRBUS
Model : A319-131
Nationality : South African
Registration Marks : ZS-SFN
Place : En route FACT to FAJS
Date : 07 September 2008
Time : 0453Z

All time given in this report is Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

Disclaimer:

This report is produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On 06 September 2008, the aircraft was despatched as per Minimum Equipment List (MEL) from FAJS to FACT on a Scheduled Domestic Flight SA377 with the No 1 engine bleed air system inoperative. The requirements according to the Minimum Equipment List (M.E.L 36-11-01a Category C), was that the No 1 engine bleed system should be selected **closed** and No 2 engine bleed system to be selected **“open”** by means of press button switches on the overhead panel for the proposed flight. The Captain nevertheless decided to select both the No. 1 and the No. 2 engine bleed switches to the open position as the engine bleed was not manually locked out, and in the event of an engine bleed system malfunctioning, he planned to isolate the faulty bleed system. During the pre-flight inspection and cockpit check, the cockpit crew failed to notice that the ‘INOP’ placard was not stuck at No 1 engine bleed switch but at the No. 2 engine bleed switch. The aircraft nevertheless arrived at FACT after an uneventful flight.

1.1.2 On 07 September 2008 the following morning, another cockpit crew arrived at the aircraft and commenced with the pre-flight inspection for the return flight, (SA378) from FACT to FAJS. According to the crew, the Flight Defect and Maintenance Report (TL/36) including the Acceptable Deferred Flight Defect Record (GT/83) were only brought to the aircraft 10 minutes prior to departure. They read the TL36 and GT83, which indicated that the No.1 engine bleed was faulty and the aircraft deferred as per MEL but they did not configure the system as they thought that it was already set up as per the MEL on the previous flight from FAJS. The cockpit crew, nevertheless, failed to observe that the 'INOP' decal was stuck at the No 2 engine bleed system and not on the No. 1 engine bleed system.

1.1.3 The aircraft then departed at approximately 0352Z from FACT to FAJS with the No 2 engine bleed selected closed with an 'INOP' decal positioned at the switch, which was in fact the serviceable engine bleed system. The faulty engine bleed system switch (No.1) was selected open for the return flight. During cruise at 37000ft AMSL (above mean sea level), at approximately 0452Z, the cockpit crew received an ECAM (Electronic Centralised Aircraft Monitoring System) warning and failure of No 1 engine bleed air. The crew then closed the No. 1 engine bleed switch with the press button on the overhead panel. The cabin altitude started to rise dramatically and the cockpit crew advised FAJS ATC on the VHF frequency 128.3 MHz of the pressurization problem and requested an emergency descent to a lower level. During the emergency descent to 11000 ft AMSL, the cabin altitude warning sounded at 33000ft and the cockpit crew activated the cabin oxygen masks. During the descent, the APU (Auxiliary Power Unit) was started and pressurization re-established at 15000ft AMSL.

1.1.4 The crew continued to FAJS and landed safely without any further event. The crew and passengers sustained no injuries during the event and no damage was caused to the aircraft.

1.1.5 The incident occurred during daylight in fine weather conditions.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	4	59	-

1.3 Damage to Aircraft

1.3.1 The aircraft sustained no damage during the incident.

1.4 Other Damage

1.4.1 There was no other damage sustained.

1.5 Personnel Information

1.5.1 Pilot-in Command (Captain)

Nationality	South African	Gender	Male	Age	49			
Licence Number	Licence Type	Airline Transport Pilot					
Licence valid	Yes	Type Endorsed	Yes					
Ratings	Night, Instrument Rating; Instructor Rating Grade 2. Designated Examiner.							
Medical Expiry Date	18 January 2009							
Restrictions	Co-pilot restricted-Airbus A340-200/300/600							
Previous Accidents	None							

Flying Experience:

Total Hours	15591.0
Total Past 90 Days	105.0
Total on Type Past 90 Days	105.0
Total on Type	1951.0

1.5.2 First Officer (Co-pilot)

Nationality	South African	Gender	Female	Age	27			
Licence Number	Licence Type	Airline Transport Pilot					
Licence valid	Yes	Type Endorsed	Yes					
Ratings	Instrument Rating							
Medical Expiry Date	19 June 2009							
Restrictions	Co-pilot-restricted-Airbus-A340-200/300/600-& Boeing B747-400 (Int.)							
Previous Accidents	None							

Flying Experience:

Total Hours	4150.6
Total Past 90 Days	174.1
Total on Type Past 90 Days	142.4
Total on Type	142.4

1.6 Aircraft Information

1.6.1 Airframe:

Type	AIRBUS A319-131	
Serial Number	2501	
Manufacturer	Airbus Industries	
Year of Manufacture	2005	
Total Airframe Hours (At time of Accident)	7809.14	
Last CKC 2 (Hours & Date)	7792.37	28 August 2008
Hours since Last CKC 2	16.77	
C of A (Issue Date)	29 June 2005	
C of A expiry date)	28 June 2009	
C of R (Issue Date) (Present owner)	09 June 2008	
Operating Categories	Standard	

1.6.2 Engines:

Engine No.1 (Left Hand)

Type	V2500A-5 (IAE)
Serial No.	PP11961
Hours since New	7809.14
Hours since Overhaul	TBO not yet reached

Engine No.2 (Right Hand)

Type	V2500A-5 (IAE)
Serial No.	PP11969
Hours since New	7809.14
Hours since Overhaul	TBO not yet reached

1.6.3 The aircraft was despatched as per Minimum Equipment List (MEL) with the No 1 engine bleed air system inoperative. The requirements according to the Minimum Equipment List (M.E.L 36-11-01a Category C) are as follows:

- 1) The associated ENG BLEED pb is selected off.
- 2) The aircraft does not operate in icing conditions.
- 3) The aircraft is limited to 37000ft.
- 4) The speed brakes are operative.
- 5) The X-Bleed selector switch is selected open.

1.7 Meteorological Information

1.7.1 The following weather information was obtained from the pilot's questionnaire:

Wind direction	350°	Wind speed	17 knots	Visibility	> 10km
Temperature	13 °C	Cloud cover	few 1000	Cloud base	Bkn 2600
Dew point	11°C				

1.8 Aids to Navigation

1.8.1 The Airbus A319-131 is equipped with the following aids to navigational equipment:

ADIRU: 3x Air Data/Inertial Reference Units
DME: Distance Measuring Equipment
ILS: Instrument Landing System
VOR, VHF: Omni range
PVI: PARA Visual Indicator
GPS: Global Positioning System
ADF: Automatic Direction Finder
RA: Radio Altimeter; Marker
GPWS: Ground Proximity Warning System
WXR: Weather Radar System
TCAS: Traffic Collision Avoidance System.

1.9 Communications

1.9.1 The cockpit crew communicated with FAJS ATC on the VHF frequency 128.3MHz and requested an emergency descent from 37000ft to 11000ft AMSL when they experienced an engine bleed air supply system problem, resulting in a dramatic rise in the cabin altitude pressure.

1.10 Aerodrome Information:

1.10.1 The incident did not occur at an aerodrome but during cruise, approximately 37 minutes prior to landing at FAJS on a flight from FACT to FAJS.

1.11 Flight Recorders

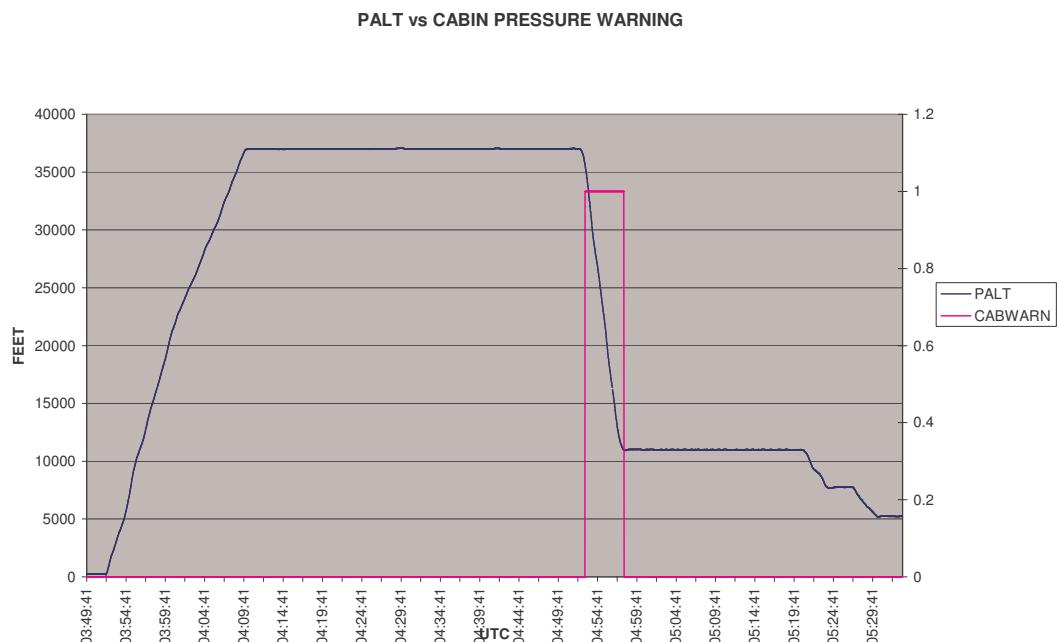
1.11.1 The aircraft was equipped with a Cockpit Voice Recorder (CVR) and a Digital Flight Data Recorder (DFDR) as required by CAR.

1.11.2 The CVR and DFDR were in good condition and not exposed to any impact forces. They were removed for downloading at the South African Airways Avionics Section

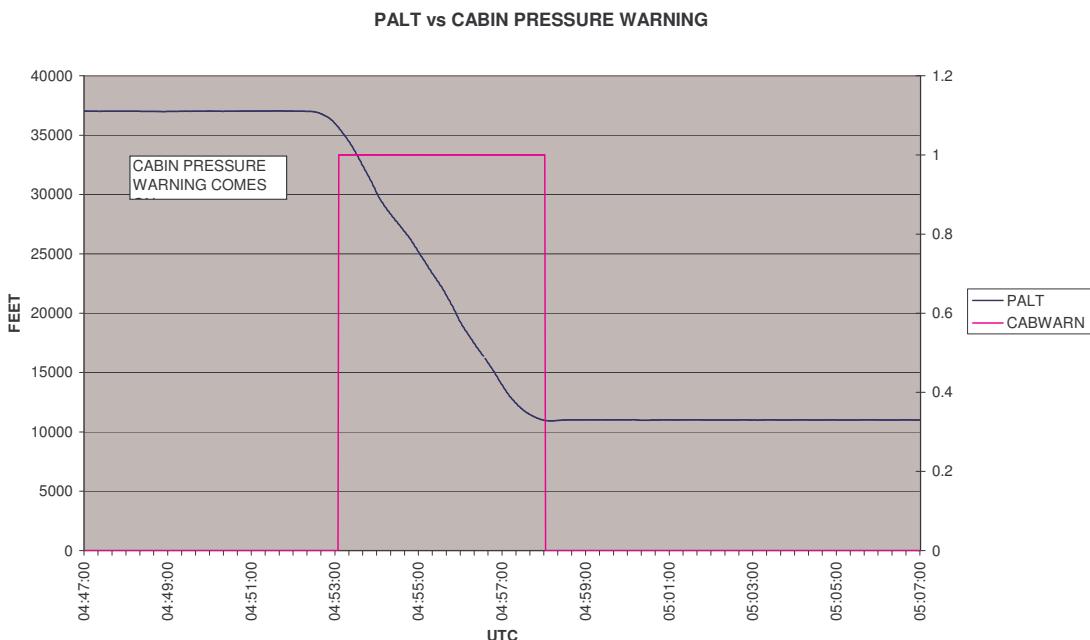
which was approved to carry out the CVR and DFDR downloading.

1.11.3 The Cockpit Voice Recorder (CVR), Honeywell, Part Number 9806022001; serial number 04580 was downloaded at the SAA Avionics Section.

1.11.4 The Digital Flight Data Recorder (DFDR) was downloaded at SAA Avionics Section with the applicable Graphs and Data as shown below:



1.11.4.1 The Pressure Altitude (PALT) indicated on the blue line shows the aircraft during takeoff at 03:52Z and how it climbed to 37000ft above mean sea level (AMSL). During cruise at this altitude, the crew made an emergency descent at approximately 0451Z to 11000ft AMSL.



11.4.2 The red line on the PALT versus CABWARN graph shows that the cabin altitude

warning came on at 33000ft AMSL at 0453Z until 0458Z during descent from 37000ft to 11000ft AMSL.

1.12 Wreckage and Impact Information

1.12.1 The aircraft departed FACT at 0352Z en route to FAJS and climbed to FL370 (37000ft AMSL). The aircraft engine bleed system malfunctioned with the cabin pressure rising dramatically. The cockpit crew then carried out an emergency descent from 37000ft to 11000ft AMSL at 0451Z. At 15000 ft AMSL, the APU was started and the cabin pressurization restored. The aircraft continued to FAJS and landed on Runway 03L without any further event.

1.13 Medical and Pathological Information

1.13.1 All occupants on board survived with no injuries.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

2. The incident was considered survivable, as there was no damage to the cockpit and cabin area and all passengers and crew were properly restrained by their respective safety harnesses.

1.16 Tests and Research.

1.16.1 During the investigation, it was noted that according to the 'Flight Defect and Maintenance Records' (TL/36), the aircraft was dispatched on 6 September 2008 from FAJS to FACT, in accordance with the prescriptions of the Minimum Equipment List (MEL) 36-11-01a Category 'C' procedures. This was due to the No. 1 engine bleed system fault that developed on the flight from Victoria Falls, Zimbabwe to FAJS.



PHOTO 1: VIEW OF OVERHEAD PANEL IN COCKPIT WITH DECAL STUCK AT ENG 2 BLEED

1.16.2 During an interview with the SAAT technician who had performed some work on the aircraft when the aircraft arrived at FAJS, he stated that he had placed (stuck) the 'INOP' decal at the No.1 engine bleed (ENG BLEED) press button (pb) switch and selected the X-BLEED to the open position as per MEL procedures. His supervisor stated that he was busy in the cockpit at the time and did not check whether the 'INOP' decal was placed at the No. 1 engine bleed press button switch or not.

1.16.3 It became obvious during the investigation when the aircraft arrived back at FAJS after the flight from FACT, that the 'INOP' decal was placed at the No 2 engine bleed (ENG BLEED) pb switch and not placed at the No 1 engine bleed pb switch.



PHOTO 2: VIEW OF FULL OVERHEAD AIR CONDITIONING PANEL IN COCKPIT

1.17 Organisational and Management Information

1.17.1 Aircraft Maintenance Organisation:

According to available records, the (AMO 1) Aircraft Maintenance Organisation that certified the last Maintenance Check CKC 2 on the aircraft prior to the incident was in possession of a valid AMO Approval Certificate.

1.17.2 South African Airways was the holder of an International and a Domestic Air Service Licence issued by the Air Services Council in terms of the International Air Services Act, 1993, (Act No. 60 of 1993) and Air Services Licensing Act, 1990, (Act No. 115 of 1990). The operator had a valid AOC 3342 issued on 20 March 2008, valid until 30 March 2009, issued in terms of Part 121 of the Civil Aviation Regulations of 1997 as amended.

1.17.3 The failure of the No. 1 engine bleed air system was identified before the aircraft was despatched as per MEL 36-11-01a CAT C. According to the MEL Minimum Equipment List:

- 6) The associated ENG BLEED pb is selected off.
- 7) The aircraft does not operate in icing conditions.
- 8) The aircraft is limited to 37000ft.
- 9) The speed brakes are operative.
- 10) The X-Bleed selector switch is selected open.

1.18 Additional Information

1.18.1 HUMAN FACTORS THEORY (Extracted from “Models of threats, error and CRM in flight operations” by the University of Texas Team Research Project.)

Crew Resource Management (CRM) can broadly be defined as the utilization of all available human, informational, and equipment resources toward the effective performance of a safe and efficient flight. CRM is an active process by crew members to identify significant threats to an operation, communicate them to the PIC, and to develop, communicate, and carry out a plan to avoid or mitigate each threat. CRM reflects the application of human factors knowledge to the special case of crews and their interaction.

1.18.1.1 THE MODEL OF THREAT AND ERROR MANAGEMENT

Data is most valuable when it fits within a theoretical or conceptual framework. The research group has developed a general model of threat and error in aviation. The model indicates that risk comes from both expected and unexpected threats. Expected

threats include such factors as terrain, predicted weather, and airport conditions while those unexpected include ATC commands, system malfunctions, and operational pressures. Risk can also be increased by errors made outside the cockpit, for example, by ATC, maintenance, and dispatch. External threats are countered by the defences provided by CRM behaviors. When successful, these lead to a safe flight.

The response by the crew to recognized external threat or error might be an error, leading to a cycle of error detection and response. In addition, crews themselves may err in the absence of any external precipitating factor. Again CRM behaviors stand as the last line of defence. If the defences are successful, error is managed and there is recovery to a safe flight. If the defences are breached, they may result in additional error or an accident or incident.

1.18.1.2 THE MODEL OF FLIGHTCREW ERROR MANAGEMENT

Errors made within the cockpit have received the most attention from safety investigations and have been implicated in around two-thirds of air crashes (Helmreich and Foushee, 1993). Our analyses of error 2, Early Investigations tended to focus on the crew as the sole causal factor. We realize today that almost all accidents are External Threats; Expected Events/Risks; Unexpected Events /Risks; External Error. Internal Threats; Flight crew Error; CRM Behaviours; Threat Recognition and Error Avoidance Behaviours; Error Detection and Management Behaviours; Outcomes. A Safe Flight Recovery to a Safe Flight; Additional Error; Incident/Accident have led us to reclassify and redefine error in the aviation context. Operationally, flight crew error is defined as crew action or inaction that leads to deviation from crew or organisational intentions or expectations. Our definition classifies five types of error:

- 1) Intentional noncompliance errors are conscious violations of SOPs or regulations.
Examples include omitting required briefings or checklists;
- 2) Procedural errors include slips, lapses, or mistakes in the execution of regulations or procedure. The intention is correct but the execution flawed;
- 3) Communication errors occur when information is incorrectly transmitted or interpreted within the cockpit crew or between the cockpit crew and others.
- 4) Proficiency errors indicate a lack of knowledge or stick and rudder skill; and

5) Operational decision errors are discretionary decisions not covered by regulation and procedure that unnecessarily increase risk. Examples include extreme maneuvers on approach, choosing to fly into adverse weather, or over-reliance on automation.

Crew response to error and error outcomes: Three responses to crew error are identified:

- 1) **Trap** – the error is detected and managed before it becomes consequential;
- 2) **Exacerbate** – the error is detected but the crew's action or inaction leads to a negative outcome;
- 3) **Fail to respond** – the crew fails to react to the error either because it is undetected or ignored.

Definition and classification of errors and crew responses to them are based on the observable process without consideration of the *outcome*. There are three possible outcomes:

- 1) **Inconsequential** – the error has no effect on the safe completion of the flight, or was made irrelevant by successful cockpit crew error management. This is the modal outcome, a fact that is illustrative of the robust nature of the aviation system;
- 2) **Undesired aircraft state** – the error results in the aircraft being unnecessarily placed in a condition that increases risk. This includes incorrect vertical or lateral navigation, unstable approaches, low fuel state, and hard or otherwise improper landings. A landing on the wrong runway, at the wrong airport, or in the wrong country would be classified as an undesired aircraft state;
- 3) **Additional error** – the response to error can result in an additional error that again initiates the cycle of response.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

3. ANALYSIS

2.1 The aircraft departed from FAJS to FACT on a Scheduled Domestic Flight (SA377) with the No 1 engine bleed system malfunctioning, but in accordance with the Minimum Equipment List (MEL) procedures. According to the M.E.L. the defective engine bleed press button switch (No.1) must be selected closed and an INOP placard placed at the applicable press button switch. The Captain elected to operate the aircraft with both engine bleeds switches selected to the open position on the overhead panel. He nevertheless did not observe whether the 'INOP' placard was placed on the defective

engine bleed switch during the cockpit crew pre-flight inspection. The aircraft arrived at FACT after an uneventful flight.

- 2.2 The following morning, another cockpit crew arrived at the aircraft and commenced with the pre-flight inspection for the return flight, (SA378) from FACT to FAJS. According to the cockpit crew, the maintenance engineer brought the TL/36 to the aircraft only 10 minutes before departure time; which indicated that the No.1 engine bleed was faulty and the aircraft despatched as per MEL. However, they did not configure the system as they thought that the system was already set up as per MEL on the previous flight. The cockpit crew did not notice that the 'INOP' placard was positioned at the No. 2 engine bleed system that was functioning normally instead of at the No. 1 engine bleed system that was defective at the time. This indicates that the cockpit crew failed to read the MEL instructions and TL/36 properly.
- 2.3 The aircraft then departed FACT to FAJS with the No 2 engine bleed selected closed with an 'INOP' decal positioned at the switch which was in fact the serviceable engine bleed system. The faulty engine bleed system (No.1) was selected 'ON' for the return flight. During cruise at 37000ft AMSL the cockpit crew received an ECAM (Electronic Centralised Aircraft Monitoring System) warning and experienced failure of the No 1 engine bleed system. The crew closed the No. 1 engine bleed switch with the press button. With both engine bleeds selected closed, the cabin altitude started to rise dramatically and the cockpit crew had to perform an abnormal emergency decent to a lower level. During the descent to 11000 ft AMSL, the cabin altitude warning sounded at 33000ft AMSL and the cockpit crew activated the cabin oxygen masks. The APU was started and pressurization re-established at 15000ft AMSL.

2.4 HUMAN FACTORS, THREAT RECOGNITION - ERROR MANAGEMENT

2.4.1 Equipment Failure. Recognised: Yes. Managed: Incorrectly.

The failure of the No. 1 engine bleed air system was identified before the aircraft was despatched as per MEL 36-11-01a CAT C. According to the MEL Minimum Equipment List:

- 11)The associated ENG BLEED pb is selected off.
- 12)The aircraft does not operate in icing conditions.
- 13)The aircraft is limited to 37000ft.
- 14)The speed brakes are operative.
- 15)The X-Bleed selector switch is selected open.

2.4.2 The SAA Maintenance technician at FAJS stated that he had placed the INOP decal at the No. 1 engine bleed and had opened the X-BLEED selector switch. On the return

flight from FACT to FAJS, the INOP placard was found placed (stuck) on the No. 2 engine bleed that was the serviceable bleed at the time. The maintenance supervisor stated that he did not check whether the decal was placed at the defective bleed system on the overhead panel.

- 2.4.3 The pilot-in-command who was scheduled on the flight from FAJS to FACT elected to open both engine bleed switches during the flight and if a fault had occurred, he would have isolated the defective bleed. This was not in accordance with the MEL procedures. The cockpit crew on this flight also did not notice that the INOP decal was placed at the No 2 bleed and not at the No.1 bleed that was defective at the time. The flight from FAJS to FACT was, however, uneventful.
- 2.4.4 On 07 September 2008, the following morning, another cockpit crew was scheduled on the return flight from FACT to FAJS. The crew stated that they read the TL36 and GT83 indicating that the No.1 engine was faulty and that the aircraft was deferred in accordance with the MEL, but did not configure the bleed system as they thought that the system was already set up according to the MEL requirements. The cockpit crew, however, also did not notice that the INOP decal was incorrectly placed at the serviceable engine bleed switch.

3. CONCLUSION

3.1 Findings

- 3.1.1 The aircraft was dispatched on 6 September 2008 from FAJS to FACT, according to the Minimum Equipment List (MEL) 36-11-01a Category 'C' procedures due to the No. 1 engine bleed system fault that developed on the flight from Victoria Falls, Zimbabwe to FAJS.
- 3.1.2 According to the SAA technician that was scheduled to work on the aircraft, he stuck the 'INOP' decal at the No.1 engine bleed (ENG BLEED) press button switch and selected the CROSS-BLEED to the open position as per MEL procedures. The supervisor concluded that they did not check whether the 'INOP' decal was placed at the No 1 engine bleed switch.
- 3.1.3 The Captain who was scheduled on the flight from FAJS to FACT, decided to operate the aircraft with both engine bleeds switches selected open with the press button on the overhead panel. This was not in accordance with the MEL procedures. He did not observe whether the 'INOP' placard was placed on the No 1 engine bleed on the overhead panel. The aircraft arrived at FACT after an uneventful flight.
- 3.1.4 On 07 September 2008 the following day, the aircraft departed FACT to FAJS on the return flight. According to the cockpit crew the TL/36 was brought to the aircraft 10 minutes prior to departure, which indicated that the No. 1 engine bleed was faulty and that the aircraft was despatched according to the MEL procedures. However, the cockpit crew did not check that the bleed system was configured correctly according to the MEL dispatch conditions.
- 3.1.5 The aircraft departed FACT on the return flight to FAJS. Approximately 1 hour after the aircraft had departed from FACT, the cockpit crew received a cabin altitude warning at 37000ft AMSL. As they selected the No 1 engine bleed system to the closed position, the cabin altitude started to increase dramatically. The oxygen masks were deployed

and an emergency descent was performed to 11000ft AMSL. During the descent, the APU was started and the cabin altitude restored at 15000ft AMSL.

- 3.1.6 It became obvious during the investigation when the aircraft arrived back at FAJS after the flight from FACT, that the 'INOP' decal was placed at the No 2 engine bleed (ENG BLEED) pb switch and not placed at the No 1 engine bleed pb switch when the aircraft was dispatched as per MEL.
- 3.1.7 The cockpit crew members on board the aircraft were appropriately licensed and type-rated on the aircraft type.
- 3.1.8 The weather was not considered to have been a contributory factor in this incident.
- 3.1.9 According to available records, the aircraft was equipped and maintained in accordance with existing regulations and approved procedures.

3.2 Probable Cause/s

- 3.2.1 Failure of the crew to carry out a proper pre-flight inspection, leading to the number 1 engine bleed air system being left on and the number 2 engine bleed air system being secured, subsequently the failure of the pressurisation system.

4. SAFETY RECOMMENDATIONS

- 4.1 It is recommended that South African Airways Flight Operations and Technical issue a briefing notice regarding the importance of strictly adhering to requirements stipulated in the MEL, where failure to do so could adversely affect the safe operation of a flight. It is also recommended that the briefing should include the importance of reading the TL/36 / GT/83 and cross-checking whether the aircraft configuration agrees with the MEL dispatch conditions.
- 4.2 Although it is not always practical that the TL 36 remains in the cockpit at all times as suggested by SAA Flight Operations, it is suggested that the TL 36/GT83 be available to the cockpit crew when they start with their pre-flight inspections approximately one hour before departure time.

5. APPENDICES

- 1. None.

-END-

Report reviewed and amended by the Advisory Safety Panel
5 May 2009

