EVA AIR Flight BR 61 Loss of Both Bleed Air Systems During Cruise Resulting in Cabin De-Pressurization and Emergency Usage of Oxygen Masks by Flight Crew

Executive Summary

On Dec.29 2011, the scheduled passenger flight BR 61 of EVA Airways Corporation (EVA), an A330-200 aircraft registered B-16312, took off at 04:42 from the Bangkok International Airport of Tailand. Its destination was the Vienna International Airport of Austria.

At 13:33, the aircraft cruise altitude 40,000ft over the flight information region of Simferopol International Airport (SIP) in Ukraine. ECAM displayed the “AIR ENG 2 BLEED FAULT” message and the cabin pressure altitude started to rise. Flight crews made an emergency descent request to ATC and diverted to SIP. At 14:05, the aircraft landed safely with no passenger injury and no aircraft damage.

The Aviation Safety Council (ASC) contacted the Ukraine authority after received the notification report from Civil Aeronautics Administration (CAA) and EVA. Ukraine authority suggested that according to the Annex 13 to the Convention on International Civil Aviation and delegated ASC to investigate the occurrence. ASC accepted the delegation and launched the investigation. Several parties were invited for joint investigation, including: CAA, EVA, AIRBUS, BEA and Ukraine authority.

FINDINGS AS THE RESULT OF PROBABLE CAUSES

1.Condensation arose in the number 1 and number 2 engine air supply system bleed pressure transducers due to changes in the environmental temperature; when cruising the aircraft was located in a sub-zero temperature environment which caused the condensation within the bleed pressure transducers to freeze, the bleed pressure transducers of both sets of air supply systems being affected in succession by the condensation freezing, resulting in a false air supply pressure reading, resulting in the BMC mistakenly believing that the air supply pressure was too high resulting in it shutting the pressure regulation valve, which caused this incident.

FINDINGS RELATED TO RISKS

1.After the CAB PR EXCESS CABIN ALT warning occurred, the pilot acted according to procedure to make an emergency descent, however during that process they were requested to revert to level flight at flight level 280 at one point by the air traffic controller due to separation concerns; although the pilot continued to request permission to descend he remained unwilling to declare an emergency situation, with the result that he did not receive the best possible assistance from the air traffic controller and was not able to continue to descend within the shortest possible time to a safe altitude.

2. Based on the bleed pressure transducer flight test data provided by AIRBUS, when A330 aircraft with engine pods fitted with GE engines were compared to A330 aircraft with engine pods fitted with other types of engines, it was discovered that there was a higher risk of failure in the A330 aircraft with engine pods fitted

with GE engines.

OTHER FINDINGS

1. The maintenance records of this aircraft indicate that maintenance operations and enforcement of airworthiness satisfied the airworthiness requirements.

2. The licences and dispatches of the pilots of this flight satisfied civil aviation law; his rest regime had been normal for the 72 hours prior to the accident and there was no evidence to suggest that he had been affected physiologically, psychologically or been affected by drugs or alcohol.

3. The aircraft was cruising at an altitude within flight level 400 between 0731 and 1334 hours, the external temperature was between -52ºC and -72ºC, with an average of around -61ºC. During the last hour of flight in flight level 400 there had been no clouds along the course nor had there been any meteorological dangers.

4. EVA AIR could make better use of the after-sales follow-up technical information provided regularly by AIRBUS and of the recommendations of the relevant annual seminars, provided by AIRBUS for reference and as a source of experience to A330 aircraft users.

5. Regarding to the influence of dual bleed system fail in A330 type of aircraft, AIRBUS categorized as medium category in the contents of the Technical Follow-up, then changed to high category in the 9th edition of the Technical Follow-up after this

occurrence occurred.

6. Prior to this occurrence, the frequency of failure of both air supply systems of the A330 aircraft was less than 3.2x10-6, which satisfied the EASA CS25 requirements that the frequency of failure should be less than 10-5.

7. The CVR record was downloaded normally in good quality. It contained voice information for the accident flight of Dec 31, 2010 departing from Vienna to Taiwan. The CVR record did not include any voice record during the period of the accident.

8. EVA AIR acted by terminating the operation of the cockpit voice recorder, without referred proper documents to determine the correct circuit breaker and cause the CVR improper deactivation; without following the correct procedure erroneously filling out the flight and maintenance log and dispatched the aircraft.

9. EVA AIR did not indicate to the AOG team for this aircraft that they should take a replacement flight recorder with them to Simferopol Airport, the AOG team was left before received the ASC request to replace the flight recorder, deciding to deal with the situation by deactivated the CVR, which increased the difficulty faced by the AOG team for this aircraft in dealing with the situation, this in turn increased the risk of the audio record of the event contained in the CVR being overwritten.

10. After the captain decided to divert and land, the cabin attendants started to make an announcement of the abnormalities of cabin altitude and diverting to Ukraine, the aircraft was experiencing.

SAFETY RECOMMENDATIONS

TO EVA AIRWAYS

1.Require their pilots to always announce an emergency to air traffic control where an emergency descent is required due to loss of control over cabin pressure, in order to ensure that they may be provided with the best possible assistance.

2.Instruct their pilots using “examples of failure of both air supply systems in twin engine aircraft” in order to improve their awareness of and ability to respond to such emergency situations. 3.Carry out one-off checking of the bleed pressure transducers of all aircraft of this type in addition to formulating maintenance procedures and methods of coping with failures of both air supply systems, in order to avoid further “failure of both air supply systems”.

4.Establish a procedure for suspension of use of the cockpit recorder, to act as a reference for maintenance technicians when necessary.

5.Introduce appropriate measures or training to ensure that maintenance technicians no longer use the minimum equipment handbook as grounds when signing an aircraft flight and maintenance log after a cockpit recorder has been switched off.

6.Instigate a full review and make improvements to policy, operational procedures, training and internal control mechanisms relating to preservation of flight recorder evidence as applies to aviation safety incidents, in order to avoid further recurrences of

the flight recorder data being overwritten, the situation being dealt with preferably by a method involving exchange of the flight recorder.於

7.If such abnormal circumstances arise, the cabin crew should quickly explain the nature of the abnormality using the most effective means, in order to ensure that passengers receive the best possible level of service.

To Civil Aeronautics Administration , CAA

1.Supervise EVA AIR in insisting that their pilots should always announce an emergency to air traffic control when control is lost over cabin pressure and it is necessary to make an emergency descent, thus ensuring that they receive the best possible assistance.

2.Supervise EVA AIR in carrying out one-off checking of the bleed pressure transducers of all aircraft of this type in addition to formulating maintenance procedures and methods of coping with failures of both air supply systems, in order to avoid further situations where “failure of both air supply systems” occurs.

3.Supervise EVA AIR in establishing procedures for turning off the cockpit voice recorder, to which maintenance technicians can refer when necessary.

4.Supervise EVA AIR in the introduction of appropriate measures or training to ensure that maintenance technicians no longer use the minimum equipment handbook as grounds when signing an aircraft flight and maintenance log after a cockpit recorder has been switched off.

5. Supervise EVA AIR in their implementation of a full review and introduction of improvements to policy, operational procedures, training and internal control mechanisms relating to preservation of flight recorder evidence as applies to aviation safety incidents, in order to avoid further recurrences of the flight recorder data being overwritten, the situation being dealt with preferably by a method involving exchange of the flight recorder.

6. Strengthen dissemination of knowledge of the regulations covered by both the Aircraft Flight Operations Administrative Procedures, section 111 and the Minimum Equipment Handbook relating to AIRBUS A330 aircraft flight recorders, in order to avoid further occurrences of such incidents.

To AIRBUS

1. The cause of this incident was the bleed pressure transducer part number ZRA380-00, manufactured by Auxitrol and fitted in GE engine pods of the aircraft concerned; AIRBUS should conduct an urgent review of the cause of this incident and provide updated after-sales follow-up technical information to operators of this type of aircraft for reference purposes during maintenance procedures.