Civil Aviation Safety Authority response to the Expert Panel on Aircraft Air Quality report: *Contamination of aircraft cabin air by bleed air – a review of the evidence.*

In 2002, in response to the recommendations from a Senate Inquiry, the Cabin Air Quality Reference Group was established by CASA. The group included representatives from the aviation industry, unions and government agencies. Given the increased public interest and emerging research since then, CASA decided to further examine the potential safety and health risks by establishing an Expert Panel on Aircraft Air Quality in 2007. The panel was given the following terms of reference:

1. Establish the current state of knowledge in relation to human safety and health risks from the quality of air onboard commercial aircraft;

2. Recommend whether the current research initiatives being undertaken internationally were sufficient, or whether additional research would be required in an Australian context and;

3. Recommend any further actions that should be taken in relation to human safety and health risks.

The panel's report, *Contamination of aircraft cabin air by bleed air – a review of the evidence (up to September 2009),* is a comprehensive review which consolidates the current state of research into what is a controversial area of increasing public concern. In parallel with this review, new research is appearing in the United States and Europe examining cabin air quality. The report was provided to CASA in January 2011.

The panel's inability to reach definitive conclusions highlights the fact that this is an area of research where reasonable people's views can differ. In the circumstances, it would not be prudent for CASA to make major policy and regulatory decisions on the basis of inconclusive evidence.

When considering the recommendations, CASA noted that many fall outside of the scope of CASA's functions under section 9 of the *Civil Aviation Act 1988*. In the event, CASA brought these recommendations to the attention of other agencies both in Australia and internationally. CASA forwarded the report and its recommendations to the Department of Infrastructure and Transport, the Australian Transport Safety Bureau, the Department of Health and Ageing, Safe Work Australia, the United States Federal Aviation Administration and the European Aviation Safety Agency. Input from agencies is generally supportive of CASA's proposed responses to the recommendations and has been incorporated into CASA's responses as appropriate. In particular, it is noted that the European Aviation Safety Agency (EASA) has concluded that: 'based on current available reports and evidence there is no safety case that would justify an immediate and general rulemaking action'. Beyond this, EASA found:

> a causal relationship between the reported health symptoms and oil/hydraulic fluid contamination has not been established. As there is no conclusive scientific evidence available, the Agency is not able to justify a rulemaking task to change the existing design or certification specifications.

The ATSB believes that: ‘current data standards are comprehensive enough to ensure useful datasets and agrees with CASA’s view that current incident reporting regimes are adequate’.

Therefore, following considered internal review of the report, CASA proposes the following responses to the Cabin Air Quality Reference Group for its consideration.

Recommendations 1, 2, 3, 4, 5, 6, 9, 24, 25, 29, 30 and 31
CASA believes that the current incident reporting regime is adequate for reporting fume events, and that the aviation industry is aware of its reporting responsibilities and the potential penalties for not reporting incidents. Civil Aviation Advisory Publication (CAAP) 51-1 (O) states that ‘(c) smoke, toxic or noxious fumes inside the aircraft is considered a major defect’.

CASA will write to the operators of aircraft fitted with bleed air systems reminding them of their reporting responsibilities in relation to fumes events. The ATSB also intends to undertake an educational campaign in 2012, in conjunction with the release of revised reporting regulations which, among other things, will remind air transport operators and pilots that all fumes are required to be reported to the ATSB.

Recommendation 7
CASA notes the recommendation, however flight crew incapacitation is listed as a serious incident in ICAO Annex 13 and contracting States are required to conduct an investigation into all serious incidents when the aircraft is above a mass of 2,250 kg.

Recommendations 8, 10, 11
CASA will work with the ATSB to analyse incident data for trends and common features in fumes events, through the Joint Aviation Safety Analysis Coordination Group (JASACG). The work of the JASACG will be ongoing and will examine data sets held by both agencies with a view to reporting publicly on any relevant findings.

Recommendations 12 and 17
CASA has brought the report to the ATSB’s attention. The ATSB has advised that it:

> does not have any evidence to suggest that there is any gross or systemic under-reporting of occurrences with respect to air transport operations, particularly with respect to mainline operators and larger regional airlines…Furthermore, a review of the nature of the fumes, smoke and fire events indicates that the vast majority are of a minor nature and does not support the proposition that reporting depends on perceived significance or on severe incapacitation.

Recommendation 13
CASA notes the recommendation and will continue to monitor the results of further research.

Recommendations 14, 15, 16, 18, 19
CASA has brought the report to the attention of the Department of Health and Ageing (DOHA) and to Safe Work Australia. CASA will provide technical advice to DOHA and Safe Work Australia should these agencies choose to conduct further studies.

Recommendation 20
Given the potential adverse safety implications of this recommendation, CASA does not support it. To turn the air conditioning packs off when the aircraft is on the ground would quickly result in rising temperatures in the cockpit and passenger cabin, as

these packs are the machines that provide cabin ventilation and cooling. In some cases the cabin would rapidly become most uncomfortable, and potentially distressing for both passengers and crew.

Recommendation 21
CASA does not support this recommendation. Changing emergency procedures for specific aircraft types to a standard response amongst all airline operators and throughout the general aviation community would be counter-productive to aviation safety given the range of aircraft type and configurations involved.

Recommendations 22, 23
CASA has brought the report to the attention of Safe Work Australia. CASA will provide technical advice to Safe Work Australia if requested.

Recommendation 26
CASA notes the recommendation, however the Federal Aviation Administration has advised it is not conducting a monitoring device trial.

Recommendations 27, 28
The 'health of passengers and crew' and 'the spread of communicable disease' are two separate issues. The spread of communicable disease is the responsibility of the Australian Quarantine Inspection Service. ICAO Resolution A35-12 is incorporated in ICAO Annex 9 and is the responsibility of the Department of Infrastructure and Transport (DoIT). CASA has drawn these recommendations to the attention of these agencies. In relation to Recommendation 28, CASA will assist in reviewing any research obtained by the ICAO Council on the consequences of air transport on the health of passengers and crew.

Recommendation 32
This recommendation would have significant implications for operators. Filters beyond those already in place would degrade the efficiency of the air conditioning system. Any device fitted would itself have a possibility of failure. This requirement would be unique to Australia, expensive and possibly difficult to implement in some aircraft types. CASA policy is to avoid, if at all possible, placing requirements on Australian operators which are not imposed on foreign operators. This recommendation is also a certification issue for other authorities as most aircraft operating in Australia are designed and manufactured overseas and as such are beyond CASA's remit. Advice from EASA indicates that they support CASA's view on this and that, based on their discussions with major filtering system manufacturers, there is no readily available technical solution that could remove 100% of the targeted chemical compounds. The FAA agrees with CASA on this recommendation also.

Recommendation 33
CASA has brought the report to the attention of Safe Work Australia.

Recommendation 34
As most aircraft operating in Australia that use bleed air systems are manufactured in Europe or the United States and not under CASA oversight, CASA has forwarded the report to the European Aviation Safety Agency and the US Federal Aviation Administration. See response to Recommendation 32 for EASA's response. This is applicable to new aircraft as well as those already certificated. The FAA has advised CASA that it does not agree with this recommendation.

Recommendation 35

CASA will review the American Society of Heating, Refrigerating and Air-Conditioning Engineers standard. The FAA has advised that it will make a decision with respect to the Standard once they have completed their cabin air quality research.

Recommendation 36

CASA does not support this recommendation as it (like other regulatory authorities such as the FAA) does not have the authority to require specific designs or products to be used.

Recommendation 37

The use of particular fuels, oils or lubricants in aircraft is mandated as part of the type certification process for the aircraft. Fuels, oils and lubricants must be produced to internationally recognised standards by the fuel and oil manufacturers. As such, this is a certification issue for the State of Design, which is generally in Europe or the United States for aircraft which use bleed air systems. CASA has forwarded this report to the United States Federal Aviation Administration and the European Aviation Safety Agency. EASA has indicated that: 'from existing studies it is not clear which chemical compound(s) in engine oil can be linked to the reported symptoms ie there is no demonstrated causal relationship between symptoms and chemical compound'. The FAA has advised that it does not possess the legal authority to take this action and that this authority rests with the US Environmental Protection Agency.