



**Aircraft Contaminated Air
Position Statement
November 2019**

Background

Heated synthetic jet engine oils, as well as hydraulic and de-icing fluids, are known to contaminate ventilation air supplied to the cabin and flight deck in most jet aircraft in operation today. In all modern commercial jet aircraft, with the notable exception being the Boeing 787, the cabin air supply is taken unfiltered directly from compressors in the engine or the Auxiliary Power Unit (APU) using a process known as 'bleed air'.

Current jet engine oil systems, by design, will enable oil to contaminate the 'bleed air' at low levels and in all conditions. As the oil contamination levels increase, an odour can often be noticed, generally described as a dirty sock, acrid, chemical or oily smell. This is often referred to as a 'fume event'.

'Fume events' can range from transitory exposure as part of normal operations, to the less frequent more noticeable exposure from abnormal conditions such as engine seal wear, engine oil over-fill, or seal failure. In extreme cases, a visible smoke or mist may become apparent in the cabin or cockpit.

Contaminated air exposures are acknowledged to occur by regulatory authorities, aircraft manufacturers, safety agencies, scientists, airlines, occupational doctors, oil manufacturers, and crew unions. Some reports date back as far as the 1950s. Contaminated air may result in crew impairment or, less frequently, in crew incapacitation and can jeopardize flight safety. Both short- and long-term health effects have been reported consequent to these exposures.

Position

- GCAQE recognises that there is adequate evidence available to identifying the effects related to contaminated bleed air exposure events for the aviation industry to take risk-mitigating actions. Further research will simply make the estimates of effects more precise. Arguments for delayed action pending further research serve only one interest; namely that of the industry. Action needs to be taken now. We call on the aviation industry to stop either denying or downplaying the extent of the problem and to cease further studies that either ask the wrong questions or ask the same questions that have already been asked, thus serving only to delay the already justified risk-mitigating actions.
- GCAQE calls on aircraft manufacturers to incorporate bleed-free designs in all future aircraft types. We call on regulators to require that all aircraft using 'bleed air' be equipped with an

effective and suitably maintained air cleaning technology system. This should be enhanced with contaminated air detection systems and introduced in the shortest time frame possible.

- It is more probable than not that exposure to contaminated air in aircraft can result in adverse health effects in those exposed, as first reported in the 1950s.
- Flight safety is being degraded through crew impairment and incapacitation when fume events occur.
- GCAQE calls for better regulatory compliance and enforcement in relation to the contamination of 'bleed air'.
- GCAQE calls on the aviation industry and governments to acknowledge that the aircraft cabin and cockpit are unique working environments. The use of ground-based exposure standards is inapplicable to the exposures known to occur in an aircraft.
- Future research studies should take into account chronic low-level and acute exposures, so as to accurately replicate the aircraft environment.
- The scope of future research studies should include all expert stakeholders to ensure that the correct questions are asked.
- Effective and comprehensive reporting of each and every contaminated air event is essential.
- Proper education along with effective on-going training and procedures for crew and maintenance personnel to mitigate and deal with contaminated air events should be introduced.
- A universal medical guidance protocol should be developed, tested, revised and implemented for use after reported or suspected contaminated air events. Additionally, we call for the recognition of diseases associated with fume events to be implemented. Such protocols should be evaluated by independent experts from time to time in light of accumulating data.