Aircraft Contaminated Air Position Statement

January 2025

Background

Heated synthetic jet engine oils, hydraulic and de-icing fluids; that are known to contaminate ventilation air supplied to the cabin and flight deck. In all modern commercial jet aircraft with the notable exception of 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, in all conditions. As the oil contamination levels increase, a smell can often be noticed, often 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 more continued exposure due to abnormal conditions such engine seal wear, engine oil over fill or seal failure. In extreme levels of contamination, a visible smoke or mist may become apparent. 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 dating back as far the 1950s. Contaminated air may result in crew impairment or less frequently, in crew incapacitation and jeopardize flight safety. Both short and long term health effects have been reported as a consequence of these exposures.

Position

• GCAQE calls on aircraft manufacturers to incorporate bleed-free technology on 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.

• Its 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 contaminated air events occur.

• GCAQE is calling for better regulatory compliance and enforcement, in relation to bleed air contamination.

• GCAQE is calling on the aviation industry and Governments to acknowledge that the aircraft cabin and cockpit is a unique working environment. 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 also involve all expert stake holders to ensure the correct questions are asked.

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• Effective and comprehensive reporting of contaminated air events is essential.

• Proper education, effective on-going training and procedures for crew and maintenance personnel to mitigate and deal with contaminated air events should be introduced.

• The medical protocol published in 2023 as the '**Health consequences of exposure to aircraft contaminated air and fume events: a narrative review and medical protocol for the investigation of exposed aircrew and passenger'** should be used after reported or suspected contaminated air events. Additionally, we call for disease recognition to be implemented for these exposures.

• Newly developed, less hazardous synthetic turbine oils should be qualified as a priority by engine and APU manufacturers to reduce the hazard that is known to exist.

• New less hazardous hydraulic fluids should be developed as a matter of priority.