



Aims and Objectives of the GCAQE 2019/2020

Background

The Global Cabin Air Quality Executive (GCAQE) is a global coalition of health and safety advocates committed to raising awareness and finding solutions to poor air quality in aircraft. Established in 2006, the GCAQE is the leading organization representing air crew (pilots, cabin crew and engineers) and passengers, that deals specifically with contaminated air issues and cabin air quality. We represent over 30 organizations, and over one hundred thousand workers around the world.

The primary aim of the GCAQE is to effect the changes in the aviation industry that are necessary to prevent exposure to 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.

GCAQE Objectives

Clean aircraft air supply

We recommend that aircraft manufacturers incorporate bleed-free technology on future aircraft types and that regulators (EASA, FAA, CASA, TC, etc.) require that all aircraft certificated to use 'bleed air', be equipped with an effective and suitably maintained air cleaning technology in the shortest time frame possible.

Air supply monitoring

We recognise the need to define appropriate chemical markers or particulates of air supply contamination, to implement continuous monitoring onboard, and to develop procedures for crew to respond to elevated levels at the earliest possible time. We wish to remind our industry colleagues that air accident investigation departments have been also calling for this for over a decade. The failure to install such technology contravenes the regulatory requirements.

Existing regulations/standards to be met

We call on regulators to ensure compliance with existing regulations, certification standards and compliance guidance material, including an air supply without harmful or hazardous concentrations of gases or vapors that can cause impairment or degraded crew performance, reporting of smoke/fume events, and proper maintenance follow-up. We also call on regulatory bodies with expertise in occupational health and safety to work with aviation regulators to ensure that crewmembers' health and safety is best protected.

Preventive measures to reduce the risk of air supply contamination

We call on aircraft and component manufacturers to develop design and operational features that are proven to reduce the frequency of oil and hydraulic fluid contaminating the air supply system (e.g., improved seal design, etc.) and for regulators to require airlines to implement them.

Education and training procedures

We call on manufacturers and airlines to acknowledge the potential for air supply contamination and to provide crewmembers with information on chemical contaminants to which crews may be exposed, symptoms, and standardised checklists, procedures suitable for fume events, and oxygen usage. We wish to remind our industry colleagues that ICAO introduced Fumes, Education and Training guidance material in 2015 and the FAA issued a Safety Alert for Operators (SAFO) in 2018 calling for enhanced procedures in this regard, yet no airline has to date adequately implemented these.

Maintenance

We call on the regulators to require manufacturers and airlines to improve their investigative procedures following report fumes events; and to provide access to relevant aircraft maintenance records to enable affected crewmembers and passengers to determine if the air supply was contaminated, and if so, with what.

Health impact of exposure to be properly assessed

We urge the industry to adapt a more precautionary approach to this problem as opposed to an entrenched position of denial by looking at all the currently available data.

If further research is undertaken to further clarify the toxicological mechanism, we recognize the need for truly independent and relevant inhalation toxicity research to be funded, and to be carried out by independent researchers, to properly investigate the health impact of inhalation exposure to pyrolysed engine oils with an emphasis on the chronic neurotoxic effects (e.g., difficulty concentrating, memory and communication problems, difficulty multitasking, etc.) reported by crews. The toxicity of oils should not be defined according to dermal and ingestion toxicity studies that assess peripheral neuropathy and paralysis when, by definition, aircraft occupants are exposed via inhalation and report chronic neurotoxic symptoms. We also call for an epidemiological survey of crewmembers to properly assess the health impact of exposure to contaminated cabin air.

Ready access to information on medical evaluation and treatment

We recognize the need for a comprehensive medical protocol to be readily available to passengers, crewmembers and their physicians, and for physicians to have access to any onboard air sampling data to assist in diagnosis and treatment.

Reporting

Under reporting of contaminated air events has been acknowledged globally for nearly 2 decades. We urge the industry to encourage the reporting of all contaminated air events. This will ensure all events are fully reported and help all stake holders better understand the frequency, nature and operational factors related to contaminated air events, and their effects on crew, passengers and maintenance practices.

In addition, we recognise that aviation maintenance workers are also impacted by these exposures, and that turbine engines maintained with the same oils have additional applications such as oil and gas production, marine, and military vehicles. The spirit of the aims and objectives described above apply equally in these other fields.