Contaminated cabins

Aerotoxic syndrome is prevalent in the airline industry, writes former pilot Dr Susan Michaelis.
Recognising the problem
There is increasing literature supporting that exposure to the bleed air contaminants are associated with a diverse range of short and long-term adverse effects. Neurological, neurobehavioural, respiratory, irritant effects among others have recently been reported in a World Health Organization journal paper identifying ‘Aerotoxic Syndrome’ as a new occupational disease. Additionally, many organisations recognise the flight safety implications related to contaminated air including ICAO, the International Federation of Airline Pilots (IFALPA), and the UK Air Accidents Investigation Branch (AAIB). The AAIB has twice recommended for EASA to mandate contaminated air detection systems in all aircraft, yet this has not been implemented. The AAIB also reported that bleed air contamination is not new, is wider than more generally recognized and has serious consequences with crew not realising that the oil fumes were slowly degrading their performance.

The aviation industry, along with governments, have continued to suggest there is no concern regarding the aircraft contaminated air issue. Studies surrounding leaking oils and contaminated bleed air commenced with US military studies in the early 1950s, which identified the oils became more toxic with increased temperatures. The number of studies, inquiries, standards, bills and reviews has greatly increased internationally in the last two decades. The manufacturers, airlines, regulators and governments continue to rely on a number of standardised statements including:

- Levels of contaminants identified are too low to cause harm and below occupational and other exposure limits.
- TCP isomer (T0CP) associated with neurotoxicity is not present or too low to cause OP induced delayed neuropathy (OPIDN).
- Aerotoxic Syndrome is not a medically recognised term.
- Effects are due to other factors, such as hyperventilation, psychosomatic, nocebo, coffee makers, aircraft motion.

Taking action
There are a range of on-going actions and studies investigating cabin air quality (CAQ). EASA and the European Commission are undertaking a major CAQ study, following on from two recent studies. The studies suggest all levels are below safe limits, that future studies should dismiss the aerotoxicity concerns, while recognizing there are key knowledge gaps related to OPs, mixtures, repeat exposures and safe levels. There is a Memorandum of Understanding (MOU) in the UK between the Civil Aviation Authority (CAA) and HSE, addressing the health and safety responsibilities. The CAA takes the lead responsibility, including exposure to hazardous substances in aircraft, however it has acknowledged it does not have hazardous substances under the CLP regulations; Bleed air systems in aircraft ensure low-level exposure will occur in normal flight to all occupants; and a new bill has been submitted to the US Congress to address air supply safety improvements. There have also been a several legal cases undertaken. While most have been settled, in 2010 the High Court of Australia, found that heated Mobi Jet Oil II harms the lungs.

Risk managers should independently assess the contaminated air environment, as distinct from merely accepting the industry and government suggestions that there is no hazard or risk. Risk assessments must recognise:

- Lubricants and hydraulic fluids contain hazardous substances under the CLP regulations;
- Bleed air systems in aircraft ensure low-level exposure will occur in normal flight to all occupants;
- The controls at present are inadequate. Bleed free systems for future aircraft, bleed air filtration and detection sensors should be implemented, along with the mandatory use of oxygen for pilots and flight should be discontinued whenever the air is suspected to be contaminated, with full reporting enforced and the use of PPE for all others.

Dr Susan Michaelis is a world expert in contaminated air supply: www.susanmichaelis.com. She will be speaking at the forthcoming air quality conference, taking place on 19-20 September in London. Book your place at www.aircraftcabinair.com.