

Summary of Aerotoxic Safety Risks

Christine Standing MA - 14 June 2011

The key to aviation safety systems lies in the identification of risks prior to a point whereby pilots are left as the endpoint in the safety chain. Standard safety principles dictate that pilots should never have to struggle with issues inflight where those issues had been identified prior to taking an aircraft off the ground. However, there is indeed an identified problem. It concerns the interface between heated jet-engine oils and air that is ducted off the engine into the cabin. This is done without filtering the fumes. These contain the residue of tricresyl phosphate and other organophosphates that are related to nerve toxins - those that are used in chemical warfare. The safety risks are twofold - that of **acute pilot incapacitation**, with its commensurate risk to the total aircraft; and the **long-term health effects** to crew and passengers alike.

In 1955, there had been a heated debate about the potential faults that were being introduced into this **air conditioning technology**.¹ Detractors argued over the safety of the oils *per se*. A recent doctoral thesis has raised the standard of argument now, noting that they failed to take into account that, "The cabin environment pressurised to approximately 8000 feet is ... a hypoxic environment to which the same exposure standards cannot be applied as on the ground."² Concurrently, new technology is being developed to detect oils in cabin air.³

The wider industry has dealt with the ongoing safety deficit by the use of denial. Now, the problem has resurfaced and it is the independent medical fraternity who are discovering its extent. Pilots, flight attendants and passengers are experiencing neurotoxic symptoms. The clue to discovering the reason for this lies in the fact that pilots are becoming incapacitated *in-flight*; some experience moments of black-out others are paralyzed; others have transitory neurological symptoms and find it difficult to land their aircraft safely. Responsible, fit and healthy young pilots have to be stretchered off aircraft and hospitalised. Others find that their illness progresses incrementally with each successive flight. Many have life-long illnesses as a result of this policy. In 1999, this condition was termed ***Aerotoxic Syndrome***.⁴

The British Government has funded The Cranfield Report that concurs with their pre-existing views. This same administrative mechanism was criticised roundly by Justice Mahon when 'the hallowed halls of Westminster' issued equally erroneous and dangerous statements following the ***Mt. Erebus disaster***⁵ in 1979. Here a systemic problem which was part of airline management, was conveniently termed 'pilot error'. The ensuing report was merely a thinly disguised cover up. When Governments have input into the aviation safety system for **political reasons**⁶ and without a view to safety, potential errors stay in situ and the risks to crew and passengers continue. We must not forget that passengers are not told of the risks to their health. Pregnant women, nursing mothers and their infants, and those with toddlers ought to be told when their health is at such devastating risk. We owe such honesty to these, to the elderly and the infirm, as well as the employees on board aircraft. The political protection of the tobacco industry was deemed unacceptable when people had to inhale others' smoke and developed cancer; how much is this the case?

Currently there are legal actions, some successful and some pending, regarding harm done to persons through the illegal release of toxic gases into the confined space of aircraft cabins. The German Government has instigated **investigations**⁷ into an Air Berlin flight that showed signs of oil leakage around 8-9 April this year. The choices for the traveling public are now becoming obvious - choose the airlines where the governments of the country take Aerotoxic Syndrome seriously.

The UK Health and Safety Executive no longer provides the information link: *Medical aspects of work-related exposures to organophosphates (Guidance Note MS17)* They refer enquiries to **aerotoxic.org**

NOTE: The author acknowledges Michaelis, S. (2010) *Health and Flight Implications From Exposure to Contaminated Air in Aircraft*. Doctoral Thesis. University of New South Wales. If anyone objects to the facts as stated in this summary, 'Aerotoxic Safety Risks', please acquaint yourself with that study prior to raising objections. Any inadvertent mistakes are my own. References and information can be viewed on Hyperlinks on **Aerotoxic.org**

1 Add detail here re debate.

2 **Michaelis, S. (2010:130)** Health and Flight Implications From Exposure to Contaminated Air in Aircraft. Doctoral Thesis. University of New South Wales

³ **Schmidt, Mario (2011)** *A new method for the detection of lubricating oils in the bleed air*. Presentation at GCAQE. London. Mario Schmidt, Product Manager, AIRSENSE Analytics GmbH www.airsense.com schmidt@airsense.com

4 **Balouet, JC ; Hoffman, H; and Winder. C. (1999)** *Aerotoxic Syndrome in air crew as a result of exposure to airborne contaminants in aircraft*. ASTM (American Society of Testing and Materials):

See also **Michaelis, S. (2007:460)**: Aviation Contaminated Air Reference Manual.

5 In 1979, an Air New Zealand flight crashed on Mt Erebus killing all on board. Debate raged over who was at fault for the accident. The chief inspector of air accidents attributed the disaster to pilot error. Justice Peter Mahon's Royal Commission of Inquiry disagreed, placing the blame on Air New Zealand and its systems. <http://www.nzhistory.net.nz/culture/erebus-disaster>
In a later video, 'Impact Erebus', Justice Mahon was asked whether "One of the confusing things about the error in this case was that, involved in it was the Government, one of its Departments, a major state enterprise run by Government appointees, all of them with something to say, did this make it more complex for you?" Justice Mahon replied: "That type of situation always make an enquiry complex where some disaster or scandal involving some Government agency and the procedure adopted by some Governments, the United Kingdom in particular, is to set up such an enquiry, then wait to see what the findings are. If the findings are in favour of the government it warmly supports the report, if on the other hand the findings implicate some government agency then the tendency is for the government of the day to reject the report and they will say that it is wrong. This does not happen in Australia of course, but in England and New Zealand, such an approach is in accordance with the hallowed traditions of the Westminster style of government."

An excellent account of the details of this case is to be found in: Vette, Gordon (1983 reprint 1990) *Impact Erebus*. Aviation Consultants Ltd. Auckland, New Zealand

6 **Standing, C. (2005)** *The Aviation Safety System: Political, Organisational, and Personal*. Hansard. <http://www.publications.parliament.uk/pa/cm200506/cmselect/cmtran/809/809we40.htm>

7 Air Berlin is facing multiple investigations into problems with one of its Airbus A330-200s, which resulted in the German airline conducting a passenger flight with an engine showing clear signs of oil leakage. The aircraft, registration D-ALPD, suffered multiple oil contamination events around 8-9 April. On the third of these, flight AB7152, between Munich and Bangkok, the crew noticed a strong smell of oil shortly after take-off.

For the pictures and full story please visit:

<http://www.flightglobal.com/articles/2011/04/28/356037/pictures-air-berlin-faces-investigation-over-engine-oil-leak.html>