OPEN LETTER

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Dear Doctor Dowdall,

Responsibility for safeguarding the health of persons on board aircraft

Thank you for your email of 12 May.

You will be aware, especially from my letter to Dr Thiebald(IATA) which was copied to yourself, of my concerns concerning contamination of the breathing air supply. Additionally, that I corresponded with Dr Ruge back in 2005 saying:

"Quite apart from hazards to adults there is clearly the risk posed to the foetus....and infants."

I have been left in no doubt by the Department for Transport (DfT) that you, personally, are the ultimate UK authority for issuing authoritative guidance on medical and health matters airside. Hence you, uniquely, have a knowledge of all reports made as a result of actual contamination of the breathing air supply. Furthermore, the pertinent regulations such as MS17 and C3 together with relevant scientific papers including those by Latendresse and Chapin.

Given the foregoing I must admit to being surprised that your informed opinion remains akin to that expressed back in 2007:

HOUSE OF LORDS Science and Technology Committee
Air Travel and Health: an Update 12 December 2007
Dr Nigel Dowdall of British Airways who told us that *"I have no evidence to suggest that there is a serious medical problem here" (Q 73).*

As to the DfT sponsored investigations you will be aware of the House of Lords Science and Technology Committee comment in 2008:

"we are pleased that the Government is committed to filling the knowledge gap in this area and to ensuring that the AHWG-sponsored research to identify the substances produced during a fume event is completed urgently."

The Cranfield Report was published on 10 May 2011 and the IOM Report on 7 June 2012. It is understood that both were then referred by the DfT direct to the Committee on Toxicity(COT) for audit/comment.

Turning now to passengers. In respect of your comment that:

"I would expect that any passenger who felt unwell following an incident would also seek medical attention."

If the crew have been taken to a medical facility why are the passengers not informed so they, and their clinicians, can make an informed decision/assessment of their health?

I remain mindful that in the British Medical Association booklet:

The impact of flying on passenger health - A guide for healthcare professionals 2006

which you co-authored, it states at Appendix IV:

"The regulations lay down specific requirements in some areas, such as minimum cabin air pressure, maximum levels of carbon monoxide, carbon dioxide and ozone, and minimum ventilation flow rates. There is also a general requirement that the crew and passenger compartment air must be free from harmful or hazardous concentrations of gases or vapours (JAR 25.831)."

and yet there is no monitoring or control of CO2, CO and Ozone, to say nothing of 'harmful or hazardous concentrations of gases or vapours'. CO detectors are mandated in Holiday Hire Caravans but even these basic detectors are missing from multi-million pound aircraft

Additionally, the IOM Report (4.3.2.2 reproduced below) found that in terrestial forms of public transport "zinc dialkyl dithiophosphate additives generally being used in place of organophosphates"

so if the driver of a bus, the driver of a London Tube train, the driver of a Manchester tram, or the driver, guard and buffet staff on a train, were taken to hospital suffering the effects of noxious fumes they would not have been exposed to organophosphates. I am sure such a rare occurrence would also result in the passengers being made fully aware of the situation and able to make an informed decision about any resultant health impact.

Sadly, it has become painfully obvious that the answer to my question:

How exactly does the CAA ensure the health and safety of passengers is safeguarded.?

is that the CAA does not ensure the health and safety of the travelling public.

In 2009 I wrote to Geoff Hoon expressing my belief that:

"It is becoming increasingly obvious that we are dealing here with a fundamental design flaw. With the introduction of high by-pass engines it was decided that the previously used separate ram air provision of cabin air could be changed to tapping such air from the engine compressor system via medium and high stage bleeds, thereby achieving savings in both cost and weight. The air still being delivered to the air-conditioning system unfiltered and only controlled for temperature and pressure."

Given the evidence to date I see no reason to alter that belief and the last word goes to Dr Richard P Feynman:

"For a successful technology, reality must take precedence over public relations, for Nature cannot be fooled."

Kind Regards

Ian Panton

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http://www.iom-world.org/pubs/IOM_TM1106.pdf

4.3.2.2 Non-aviation Transport Controls

Potential non-aviation transport controls with operational similarity to commercial aircraft were identified during the initial desk-based phase of the study. This group included bus and rail operating companies, who use vehicles with distinct passenger and crew areas, thus potentially providing a close comparison with aircraft flight decks and passenger cabins

In practice, however, there were significant difficulties in recruiting directly-comparable
participants from train and bus companies, as none of the companies with whom successful contact was made used fluids or oils containing organophosphates.

The search was therefore widened to include other organisations using heavy-duty engines, for example the fire and ambulance services and ferry companies using marine oils. However; those organisations which did respond used fluids of similar composition to train and bus operators, with zinc dialkyl dithiophosphate additives generally being used in place of organophosphates.

The oil manufacturers confirmed that this alternative composition was commonplace for general automotive oils. In the absence of available transport-related controls, it was therefore decided to concentrate the sampling programme on an extended range of aircraft types as noted above.

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Dear Professor Cranmer,

Having read the Commentary by de Ree et al (doi 10.1016/j.neuro.2014.08.011) on aircraft cabin air quality, the risk assessment in my opinion has multiple errors and does little to address current concerns. I am a medically qualified toxico-pathologist with experience in regulatory risk assessment.

The first problem is that only the ortho- isomer of tricresylphosphate (TOCP) is addressed. However anti-wear additives in jet engine lubrication oil form a complex racemic mixture which is further complicated by pyrolosis products when in use. For example the di- and mono-orthocresyl phosphates are present at much higher concentrations [1,2] and are more neurotoxic [3,4]. Then there are the para- and meta- isomers, and a number of other problematic chemicals in addition. The commercial formulation of TCP, DURAD 125 and the para isomers recently are reported as inhibiting enzymes, including those linked to cognition. [5]

The second problem is that the toxicological endpoint, OPIDN, requires a high level of exposure. In regulatory toxicology it is normal to adopt the most sensitive toxicological endpoint for setting standards. Low dose functional neuro-behavioural deficits (rather critical when flying an aeroplane) are much more relevant than exposures leading to gross pathology. A recent paper [6] has demonstrated *in vitro* that the dose of TOCP required to induce neurophysiological compromise is 900 times lower than that which will cause cell death.

The third problem is that the authors adopt an industrial standard based on a NOAEL and then apply it to an aeroplane cabin setting where the general public, which includes many vulnerable sub-groups, e.g at the extrema of life, that will be exposed. It is more usual to adopt regulatory limits for the general public that are lower and based on NOELs.

The authors question the existence of aerotoxic syndrome by stating that the presenting symptomatology is too varied to constitute a syndrome. TOCP is known to cause a demyelinating neuropathy [7]. It is well recognised that multiple sclerosis (MS), which is a demyelinating disease, can mimic almost any neurological condition when presenting clinically. This is why MS is often regarded as a diagnosis of exclusion. Therefore I would expect aerotoxic syndrome *a priori* to have a highly variable presenting symptomatology. It is certainly not a reason to try to dismiss it. That said, there is a consistency across the plethora of symptoms of aircrew complaining of aerotoxic syndrome.

We should learn from the current debate about pollinating insects and neonictinoid pesticides. It wasn't their acute toxicity that was the main problem but very low dose exposure leading to subtle neuro-behavioural abnormalities that impaired bee's ability to navigate. The airline industry needs to address this matter urgently and with relevant risk assessment methods. In my opinion the Commentary by de Ree et al is misleading .

Yours sincerely

References

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