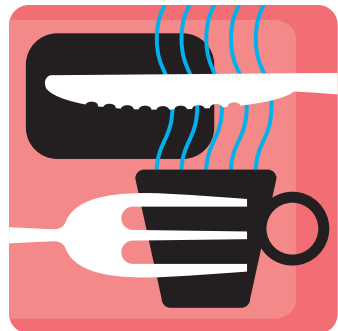




# The Aircraft Environment



The Chairman's column referred to the environmental task group set up earlier this year to study the long-term effects of the cabin environment on pilots, who spend their working lives in the "office in the sky".

Freelance aviation journalist  
**Julian Moxon reports.**

Have you, the pilot, ever thought that there is something about the flight deck environment in which you work that may be affecting your long-term health? If so, have you discussed it with anyone – or have you simply brushed your thoughts under the carpet in the hope that the feeling will just "go away?"

Whether it is in-flight fatigue, headaches, indigestion or a range of other symptoms, it is all too easy to blame the feeling on something that you might have done in the hours before take-off. After all – you spend many, many hours on the flight deck environment without any signs of ill-health. Why should that have changed all of a sudden?

While it is true that every day thousands of passengers and flight crew arrive safely at their destinations with no apparent ill-effects, there is growing evidence of a number of potential health-threatening factors which it is thought may have short, medium and long-term effects on the health of pilots. They arise from a number of widely differing factors, such as, cabin air contamination from leaking engine oils, poor seating and the effects of high-frequency flying, as is now the norm for low-cost carriers, or daily food intake.

It is to find out whether there are, in fact, serious health issues, and what they are, that BALPA has set up the Aircraft Environment Task Group (AETG). Its aim is to investigate a range of issues including air quality, noise, cosmic radiation, cockpit design (particularly seating) and food and general nutrition.

The difficulty, according to BALPA Chairman Captain Mervyn Granshaw, is that pilots appear reluctant to report on many, and in deed any, ill effects that may be as a result of spending long hours on the flight deck. This makes it virtually impossible to know if there is, indeed a problem at all. One of AETG's main aims is to encourage pilots to report all effects,

even the smallest incident, so that useful databases can be built up to help an understanding of the issues.

"Ground-based workers are protected by a huge amount of health and safety legislation", he says; "yet in the UK there is virtually none concerning the flight deck environment, which is where pilots spend almost their entire working lives." The future EU Physical Agents Directives will include the flight deck environment. However, the introduction of such legislation can only be on the basis of facts. "So BALPA is asking pilots to take this seriously and to report any health-related symptoms during or after a flight," says Task Group member Captain Richard Ward.

One small victory has already been won – but only after a clandestine operation in which a carbon monoxide (CO) monitor was hidden aboard an aircraft, proving that there was, indeed, a possibility of CO contamination.

"BAe and others have in the past taken readings, but they never found anything," says AETG Chairman Captain Tristan Loraine. "So we were able to provide evidence in association with the American Flight Attendants Association that there were significant amounts, and won agreement for CO detectors to be fitted." He admits, however, that fitment will not be mandatory. "It will be up to the airlines."

AETG will continue to work on two main fronts: to take input from pilots, and to pursue the research necessary to find out if there are health risks associated with spending long periods on the flight deck. The issue has become all the more important as new, ultra-long range, aircraft enter the global fleet. The A340-500 recently introduced into service by Singapore Airlines can spend 18 hours in the air on its non-stop flights. Many are becoming aware of the fatigue issues but what does that mean for pilots physiologically?

## THE AIRCRAFT ENVIRONMENT

BALPA CAMPAIGNING FOR HEALTH & SAFETY

The AETG's objectives are fourfold:

- ✈ to educate and raise awareness amongst flight crew and BALPA representatives of the need to report incidents, and what to do when incidents happen;
- ✈ to work with other organisations, build alliances and win support for its approach;
- ✈ to secure independent epidemiological and medical research into the issue of contaminated air and engine oils;
- ✈ to influence regulators, designers and manufacturers to re-think their approach long-term and have filters fitted short-term.

BALPA is asking pilots to take this seriously and to report any health-related symptoms during or after a flight



## Organophosphates Under the spotlight

According to Task group member Captain Richard Ward, "organophosphates resulting from leaking engine oil could be a prime candidate for possible illness experienced on the flight deck after prolonged repeated low dose exposure, although he adds, "other compounds may also be to blame."

BALPA, along with other pilots unions, is pushing for more research into the adverse effects of organophosphates. Loraine says that although the medical condition known as organophosphate-induced delayed neurotoxicity (OPIDN) may not be triggered, chronic neurotoxicity from repeated low-level exposure is a real concern. The organophosphate TCP is included in oil as a key anti-wear additive and, as such, cannot simply be removed. Loraine points to two possible solutions: modifying the engine bleed air system with catalytic converters, now under development by some companies, and moving towards bleed-free

engines, such as those which will power the new Boeing 7E7. This will take years, however. In the short term, the "win-win" solution is filters, he says.

Most aircraft, such as the Boeing 747 and 767 and the Airbus A340, have virtually no reported flight deck contamination problems. Others, however, and most notably the BAe 146, are well known for the occasional leakage of contaminated air into the bleed air system. Capt. Loraine says the fumes are regarded by pilots as a nuisance rather than a serious threat to flight safety. But crews must beware of being "blasé" about the potential for long-term health issues and should report every incident to their airline or to the CAA. "It is quite possible that initially a pilot might not be aware of any ill-effects, but could suffer later from a sore throat, headache or other symptom that he or she might not associate with contaminated air," he says.

### Case History



AETG member Capt. Julian Soddy has personal experience of the possible adverse health effects of organophosphates, which led ultimately to the loss of his medical certificate

and the end of his commercial flying career.

As a BAe146 pilot over a six-year period, he says he had always considered the fumes produced by the auxiliary power unit at start-up as "noxious." "We considered it normal to run the air conditioning packs to burn off the oil leakage, but over a long period I began to suffer severe flu-like symptoms about 10 minutes after we got airborne."

Captain Soddy, an ex-RAF pilot with 40 years experience and, in his own words, "very fit," then noticed he was suffering from severe short-term memory loss. "I'd lose track of sentences halfway through. People were also saying that I had become irritable, which normally I am not." A visit to his doctor revealed that the symptoms were like those experienced by people exposed to sheep-dip chemicals - which contain organophosphates. Tests revealed that, indeed, organophosphates might have been to blame. "In any case, the CAA had to cancel my medical, and that was that."

Capt. Soddy says that while the BAe146 is clearly one of the main culprits, other aircraft such as the Boeing 757 also produce significant amounts of pollutant. He believes another factor, which as a military pilot wearing an oxygen mask never occurred, is the time spent taxiing around airports, often behind other aircraft producing exhaust fumes containing oil products.

The aircraft manufacturers are "aware of the problem," says Capt. Soddy and are working on filters and other solutions. The newest aircraft have improved air conditioning systems and often have air cycle machinery with oil-free, air lubricated bearings.

The Chairman of BALPA's Flight Safety group and a member of the AETG, Captain Martin Alder, says, "little attention has been given to the short, medium and long-term health issues concerned with being a pilot. Health and safety legislation doesn't apply as comprehensively as it does on the ground." He points to the example of hygiene: "aviation did not have to comply with food standards like restaurants do, and yet there are potential safety issues over cleanliness and hygiene. Things should have improved since UK hygiene regulation became effective on board aircraft in August 2003".

Alder believes pilots "have a right" to the same levels of legally based protection afforded to ground-based workers. "We appreciate that we work in an unusual environment and that there might be a need to adjust the usual parameters". The only way forward, he believes, is for there to be a single international body coordinating all health-related issues. "It doesn't make sense to have a raft of different ones as we have now."

The "most obvious" port of call for such a body in the UK is the CAA, and eventually the European Aviation Safety Agency (EASA). The CAA is already sponsoring the London School of Hygiene and Tropical

Medicine for an epidemiological study to investigate the question of serious health problems in the pilot and ATCO population. The results are due to be published next year.

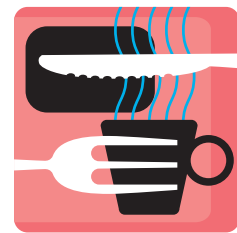
Alder wants a reporting system for every potential health-related incident that occurs onboard an aircraft. "At present there's no experience base or centralised data base for such events. If there is a cabin air contamination event, we only have the instantaneous solution, which is to deploy oxygen masks. That doesn't address the possibility of chronic low-level exposure over a long period." A single coordinating body would be able to draw together the threads, identify the issues and find ways of resolving them, he adds.

Another potential health issue identified by Alder results from the arrival of the low-cost airlines, with their "very intensive" short-range, high-frequency operations. "Pilots are under stress for quite long periods of the day throughout the year. They have virtually no time in which to recuperate between flights. We have to look at whether that is sustainable."

Pilots are essentially "trapped" on board their aircraft, he adds. "They don't have the time to step out for a coffee or a freshly made sandwich." This means pilots often take food on

board they purchased - or made - early in the day or even the night before and keep it in the warm cockpit environment until they have time to eat. "That may not be until much later in the day. Is that a good idea?" Alder adds that the energy content of the food provided under these circumstances might be insufficient. "We've identified that the total daily calorific value provided to pilots flying for one particular low-cost operation can be equivalent to that of a six or seven year old."

The establishment of the AETG is aimed at providing pilots with an additional resource which supplements specific, specialized BALPA groups to look at the health issues connected with the "office in the sky". BALPA General Secretary, Jim McAuslan, stresses that the campaign will be run on "strictly professional" grounds. "We're not in the business of scare-mongering, but there are issues here we must take on board," he says. "BALPA will be launching a series of initiatives over the coming months starting with a new section of our website and a motion to the September meeting of the TUC. We hope members will take an active interest and let the AETG have their views; you can e mail them at [aetg@balpa.org](mailto:aetg@balpa.org)."



For further information on BALPA's Aircraft Environment work log on to the BALPA website [www.balpa.org](http://www.balpa.org)



Pilots have a right to the same levels of legally based protection afforded to ground-based workers