

Rt. Honorable Douglas Alexander
Secretary of State for Transport
Department for Transport
Great Minster House
76 Marsham Street
London
SW1P 4DR

Friday, 12 May 2006

Dear Mr Alexander,

Being entirely funded by the industry it regulates, there is a risk that some may accuse the CAA of being prejudiced by that connection and so to have misinformed, misled and failed to protect the health and welfare of passengers and crews, in connection with exposure to contaminated air on UK registered commercial aircraft

The extensive factual detail of this letter will clearly outline many occasions of inconsistencies, discrepancies, contradictions and show that in relation to contaminated air, the CAA has been negligent and failed to take steps to address the very serious health and flight safety issues exposure to contaminated air can create.

I hope that when you have digested the scale of this scandal you will agree that this whole matter should be the subject of a public inquiry which the CAA should be instructed to co-operate fully with.

AOPIS is a non profit group set up originally in Australia in 2001. AOPIS now has pilot and cabin crew members in 14 countries globally and over 1000 on our database with a large UK membership. Our members include those who have either suffered short or long term medical effects from exposure to contaminated air on commercial aircraft or crew who care about the issue. AOPIS is the leading non profit representative voice on the issue of contaminated air and was one of the main sponsors of the two day 'International Aero Conference' that took place in London In April 2005. The 'International Aero Conference' was called for by the then MP Paul Tyler now Lord Tyler and John Smith MP and organised in the UK by the British Airline Pilots Association (BALPA).

The effects of exposure to synthetic jet engine oils leaking into aircraft cabins were first reported and published 29 years ago by the head doctor at US Air National Guard. Even in 1977 they recognised it was not the rare event the CAA would today have us believe it is. The concerns over synthetic jet engine oil and hydraulic fluid inhalation within the aviation industry date back to the 1950's. In 1953 the Aerospace Medical Association expressed their concern about the toxicity risks of exposure to oil lubricants and hydraulic fluids in cabin air supplies.

So why has this problem gone on so long? Common sense dictates that exposure to contaminated air in an aircraft should be of concern to all crew, passengers, airlines, manufacturers and the regulator, however, the CAA does not give these matters the focus and attention they deserve.

Contaminated air events are real and not imagined (as some would have us believe). It has been acknowledged by many industry bodies that contaminated air events are primarily due to leaking synthetic jet engine oil. For example, Rolls Royce stated in 1990:

“The approach adopted some years ago by Rolls Royce was to recognize the fact that in the majority of instances where cabin air contamination was a problem, it was mostly associated with small leakages of synthetic lubricant from bearing seals etc”.

The CAA itself more recently, in its criticised 2004 Cabin Air Quality paper on contaminated air, stated:

“Evidence from these incidents indicated that contamination of the ventilation systems by engine oil fumes was the most likely cause...subsequent CAA investigations found no weight of evidence indicating that other causes were involved”.

“The conclusions from Phase 2 were that the ducts were contaminated with a carbonaceous material containing chemicals entirely consistent with the pyrolysis products of aircraft engine oil.”

“The CAA has reviewed the results of concurrent and similar research conducted by the aircraft and engine manufacturers. This, together with the CAA research indicates that fumes from engine oil leaking into the bleed air system and hence into the cabin air supply, is the most likely cause of the incidents”.

In 2002 a British Air Line Pilots Association (BALPA) survey was published in a leading journal of occupational health and safety. Having canvassed a particular group of pilots as to their experience of contaminated air events the published survey showed that less than 4% of contaminated air events experienced by pilots were actually recorded on the CAA Mandatory Occurrence Report (MOR) database.

Despite the published BALPA survey the CAA (through the Government) advised Lord Tyler, then sitting as an MP in the Commons, in February 2004 (153410) as well as the Countess of Mar in the Lords in October 2005 (HL1779):

“...the CAA is not aware of any under-reporting of oil fume exposures by air crew”.

The CAA has, therefore, despite being aware of the survey (see below) stood by the incredible position of refusing to recognize that it's figures are wrong and that they significantly understate the number of contaminated air events occurring. It would also seem that since publication of the survey the CAA hasn't taken any action to address the serious under reporting issue, not to mention the associated health and flight safety issues.

Some might say that this denial is purely to protect those that fund the CAA, the airlines. By having an inaccurate database the CAA can argue that events are very rare and therefore action is not required. If reporting was encouraged and the reports collated then the database would be accurate but this would result in action having to be taken, which would impact on the operating costs of the airlines.

On the 18th October 2004 the Government was asked in the Commons by Lord Tyler (191638) why there were differences between the number of contaminated air events recorded on the CAA MOR database and the number of reports held by BALPA and others regarding contaminated cabin air quality incidents in UK aircraft. The Government (on behalf of the CAA) explained why the BALPA database had far higher numbers than that of the CAA by stating:

“Much of the survey data related to low level events, often with inconclusive connections to contaminated air. Inclusion of the survey data in the Authority's database would not have advanced or improved the formal intervention action taken to mitigate the threat to safety posed by impairment of pilot performance through exposure to contaminated air.....”

This answer is extraordinary given that the CAA clearly had reviewed the BALPA database or the published survey and simply decided to pass off many events as 'low level events'. An interesting

conclusion given that aircraft do not have detection systems for contaminated air or any form of contaminated air measuring systems, so how did they know they were 'low level events'?

Additionally the CAA has attempted to get away with its failure to take responsibility for many of these contaminated air events by advising, through the Government, the Countess of Mar in the Lords in November 2005 (HL2311) that:

"The survey carried out by the British Airline Pilots Association included events that were not safety related".

Just to be clear, the CAA has stated that contaminated air events **'were not safety related'**.

Please let me highlight these two issues, under-reporting and classification, one by one.

The CAA records of contaminated air events from 2000 to 2005 show over 350 events took place whereas data from BALPA shows that during this period over 700 contaminated air events are recorded on their database. Therefore, from 2000 to 2005 only about 50% of the contaminated air events **actually reported** ended up on the CAA MOR database. When I say **actually reported** it is vital to remember that in fact under reporting is widespread in the industry with less than 4% of events actually reported in the first place. So even with 96% of events not reported the CAA the CAA MOR database still had over 350 events it could have used to properly research these issues.

Secondly, we need to look at what the CAA appear to be calling 'lesser events' and 'not safety related' events. This categorisation of events is believed by many to be an attempt by the CAA to dismiss such events as not of their concern. There are two points here. As will soon be seen, all contaminated air events according to the regulations are safety issues as they have the potential to impact on flight safety. Secondly, all exposures to contaminated air have a potential health impact on crew and passenger health. These events cannot be dismissed as the contaminants present, in what concentrations and exposure time is unknown as this have never been quantified.

The events that the CAA classify as 'low level' or 'not safety related' and then dismiss as not of their concern are events which crew describe as:

"oil smell, noxious fumes on take off climb, oxygen not used",
"co-pilot used oxygen due to suspected contaminated air",
"transient fumes in flight deck",
"flight crew effects reported with no apparent fumes"

Clearly all of these examples do not relate to full incapacitation, but they all relate to contaminated air with the last one possibly being related to carbon monoxide, which has no smell and is known to be a product of pyrolysed engine oil. Therefore they are all contaminated air issues and ought to be taken seriously to get a full picture of what is going on and not merely dismissed as 'non events' by the CAA. The CAA is negligent in claiming such events are 'low level' and not worthy of their attention.

Such action gave rise to an interesting statement made at the BALPA2005 Contaminated Air Protection conference by the Reverend John Woodley (former Australian Senator who chaired the year-long inquiry into cabin air quality on the BAe 146 aircraft in 1999/2000). He said:

'Some people in the industry and some of the regulators seem to think they are God and so can take risks with the lives of their employees and customers, but they are not God and this is not a joke. It is time they got serious, stopped mucking around and started to play the game seriously.'

Many claim that the CAA appears 'to be playing God' by determining their own rules rather than adhering to the regulations.

Of the airworthiness regulations for transport aircraft that govern an aircraft's fitness for flight, section 25 covers the aspect of air conditioning and air supply to the aircraft. European regulations come from the European Aviation Safety Agency (EASA) rules that are themselves derived from the US Federal Aviation Regulations or FARs. The main airworthiness ventilation regulation, whether FAR or EASA, is number 25.831 which states what is required for an aircraft to be airworthy with regard to the air supply system.

The regulation includes the very clear statements that:

“Each crew compartment must have enough fresh air.... to enable crewmembers to perform their duties without undue discomfort or fatigue” and,

“Crew and passenger compartment air must be free from harmful or hazardous concentrations of gases or vapours.”

However, the CAA sees fit to interpret its responsibilities in connection with regulation 25.831 and obviously believes it is exempt from enforcing or complying with regulation 25.831. The CAA advised the Countess of Mar, through the Government, in November 2005 (HL 1763) that its definition of when an aircraft was airworthy in relation to contaminated air was completely different to the legal definition above when the CAA stated that:

*“Air contamination would be considered to make an aircraft unairworthy **if** it is likely to incapacitate the aircraft's flight crew”.*

A similar view expressed by the CAA was recorded in the Report of the UK House of Lords Select Committee on Science and Technology - Air Travel and Health dated 22 November 2000 of:

“The airworthiness design requirements... are limited in their scope in addressing health effects, and are almost exclusively confined to assuring environmental conditions that would not incapacitate the persons on board due to short term health effects and preclude continued safe flight and landing”.

One can clearly see that the CAA misinformed the Lords in 2000 and are ignoring the regulations which clearly state that air contamination cannot occur to the extent that it causes “undue discomfort and fatigue” and that the air “must be free of harmful / hazardous concentrations of contaminants”.

This situation is unacceptable as we are talking about serious flight safety issues, short and long-term health effects for not only crews but passengers as well.

In January 2005 Lord Tyler asked the Government if crews had to be provided with enough fresh air to be able to undertake their duties free of discomfort & fatigue and whether the air had to be free of harmful and hazardous concentrations of gases and vapours. Lord Davies of Oldham responded on behalf of the DfT and therefore the CAA, with a very brief reply: YES.

Therefore the Government and therefore the CAA know this regulation must be met for an aircraft to be able to fly. However the DfT and consequently the CAA have advised the Lords on two occasions that it is only incapacitations that they are concerned with.

I would be grateful if you could assist us in understanding why the CAA appears to refuse to recognize the full extent of the hazards of contaminated air, how the CAA defines a contaminated air event and whether all contaminated air events are in your view the responsibility of the regulator, the CAA.

The CAA in the way of Mr Stephen James advised the public at the BRE sponsored air quality conference in 2003 held at the Royal Aeronautical Society that the CAA's primary safety focus was on incapacitations and partial incapacitations. These were stated to be cases where the crew were '*unable to perform duties*' or '*able to perform them with great difficulty*' respectively. Mr James went on to state that the CAA kept a safety focus on events of impairment or slight impairment. These were described as '*able to perform duties with some difficulty and/or minor mistakes made*' and '*able to perform duties with little difficulty but with reduced efficiency*' respectively. Mr James also and alarmingly to us went on to state that the following effects DID NOT fall into the CAA safety focus at all. These effects were listed as:

"feeling unwell with no impairment: (e.g. headaches, nausea) and irritation with no impairment:(e.g. eyes, nose & throat)".

How anyone can feel unwell or experience irritation such as headaches, nausea, eye irritation etc and not allow it to decrease their efficiency. This is simply absurd. This is even more unbelievable given the very specific demands made upon flight crew in the air who are required to respond to complex problem solving exercises especially in an emergency situation.

As a crew representative group AOPIS has looked at the legal definition of when an aircraft is deemed to be airworthy in relation to contaminated air, as have I understand BALPA and the T&G in the UK. The view expressed to us is that there has to be enough fresh air so that the crew can perform their duties without undue discomfort or fatigue and that the air has to be free of harmful or hazardous levels of gases or vapours. The number of events occurring due to contaminated air clearly shows that there is undue discomfort occurring and the air is contaminated. I will only refer to the UK events that have been reported, however we all know that our own very thorough Australian Inquiry chaired by Senator Woodley reviewed hundreds of such events and showed it was not rare, in fact on the BAe 146 it was seen as common and routine.

Would you agree that the CAA as the regulator is clearly ignoring the lesser cases of impairment by its own admissions and completely ignoring illness that it extraordinarily deems to cause 'nil impairment'.

Do you agree that all UK registered aircraft need to comply with the regulation 25.831 not just at the design stage but also in service? Richard Best, a former senior airworthiness officer for CASA who you may well know, advised the Australian Senate Inquiry into the BAe 146 air quality that if regulation 25.831 was not met he would not consider the aircraft to be airworthy. Mr Best in fact issued the first "Type Certificate" for the BAe 146-300 into Australia on behalf of CASA, so we can assume he is somewhat familiar with the ventilation regulation.

The CAA may choose to downplay what they see as acceptable "in flight effects" such as headaches and nausea and turn a blind eye. The CAA may say these effects cause nil impairment and therefore disregard them, but others don't appear to see it this way. Do you agree with the definition given by leading occupational doctors that in fact 'Discomfort' is an adverse effect.

In 2000, the former Chief Instructor of Aviation medicine for the Australian Air Force the RAAF advised that flying with a simple headache, fatigued or generally feeling unwell is unacceptable as these can be a distraction. He goes on to clearly state that attempting to deal with in-flight problems such as an aircraft emergency or deteriorating weather while experiencing such symptoms '*is likely to be a hindrance at the very least*', and may well make the symptoms worse. The Aerospace medical association in

1983 stated that the contaminants of oils and hydraulic fluids have acute effects which are of great concern due to the immediate threat to flight safety. The RAAF again in 2004 advised that the aircraft flight deck and cabin are unique workplaces and cannot be compared to other settings on the ground as aircrew are 'required to perform complex tasks requiring high level cognitive skills, which may be more sensitive to insult by hazardous contaminants in the smoke and fumes'.

British Aerospace supported these views in 2001 by stating in its industry Service Bulletin for the BAe 146 number 21-150 & 21-156 that:

"In the past, oil Leaks and cabin / flight deck odours and fumes may have come to be regarded as a nuisance rather than a potential flight safety issue".

BAe went on to say that the fumes must now be seen as a 'threat to flight safety' and no longer be dismissed as a mere nuisance. BAe also sent an All Operators Message to all UK airlines about the BAe 146 telling the airlines to make sure pilots were aware of the risks of contaminated air. Pilots from both the IPA and BALPA who are members of AOPIS who fly the BAe 146 have never seen the All Operator Message so many continue to take contaminated air events as an occupational hazard and part of the job. As the regulatory authority did the CAA not have the responsibility to ensure that UK AOC holders operating the BAe 146 complied with the BAe request to have this information circulated amongst its crews operating the BAe146. If the CAA was not responsible could you please clarify which government agency had this responsibility.

By ignoring and playing down the many events reported to the CAA, many claim that the CAA is simply dismissing and categorising the many events of contaminated air as merely a nuisance. We cannot accept the CAA continuing to ignore numerous contaminated air events by justifying these as not safety related. The lack of a comprehensive and appropriate reporting procedure detailing any or all adverse effects from contaminated air exposures is no excuse for a failure to regulate as I am sure you will agree. A duty of care must always be the primary function of any regulatory body as I am sure you would also agree.

Lets remind ourselves what has to be reported, what the CAA is required to know and then we will be in a position to confirm whether all contaminated air events ought to be advised to the CAA.

Up until **mid 2005** the UK Air Navigation Regulations (ANR) of 1993 as advised to the Countess of Mar in the Lords (HL1779) stated that mandatory reports sent to the CAA are required for incidents including:

"Impairment during a flight of the capacity of a member of the flight crew of an aircraft to undertake the functions to which his/ her licence relates".

This regulation also required incidents *"involving injury to a person"* to be reported as well as incidents considered to *"constitute an occurrence endangering, or which if not corrected would endanger, the safety of an aircraft, its occupants or any other person"*.

However, I note interestingly that the response given to Paul Tyler in the Commons in February 2004 (153410/ 153414) stated the above as well as advising that the CAA "Mandatory Occurrence Scheme gives detailed information and guidance that backs up the Air Navigation (General) Regulations 1993". Mr Tyler was advised that the MOR scheme requires pilots to report all cases of: *"smoke or noxious fumes in the aircraft that resulted in the use of emergency equipment or procedures"*. Additionally the MOR scheme requires pilots to report all cases of: *"incapacitation of any member of the flight deck operating crew, incapacitation*

of the cabin crew which renders them unable to perform essential emergency duties and significant injury to any person as a result of the aircraft which is not considered a reportable accident.”

In practice, pilots are reliant on information from their employers as to what they need to report. It is clear that the information our members is getting is some what lacking. It is clear to us that our members are not aware that the ANR requires **all** impairments to the flight crew to be reported as they are not required in practice to read these regulations. They were wrongly being informed that they only needed to report under the MOR scheme cases where oxygen was used or where full incapacitation occurred to the crew in relation to contaminated air events.

There is a confusion between the terms impairment and incapacitation. This results in the CAA only requiring crews (according to its MOR scheme) to report incapacitations (not impairments). This results, as can be seen when reviewing the data, many pilots do not see fumes without incapacitation as reportable incidents although they clearly are. The CAA has done nothing to correct this situation.

In **August 2005**, CAP 393, Air Navigation Order and the Regulations amendment 1/2005 came into effect. Article 142 deals with the mandatory reporting of occurrences. Part 142(3) states that:

“This article shall apply to occurrences which endanger or which, if not corrected, would endanger an aircraft, its occupants or any other person”.

Part 4 states that:

“a list of examples of these occurrences is set out in Annexes I and II (and their Appendices) of Directive 2003/42 of the European Parliament and of the Council of 13th June 2003 on occurrence reporting in civil aviation”.

A recent Directive from the European Parliament and Council, Directive 2003/42/EC lists what incidents are considered reportable occurrences in civil aviation. By reviewing the 2003/42/EC Directive it clearly lists what incidents are considered reportable occurrences in civil aviation. These being:

- Fire, explosion, smoke or toxic or noxious fumes
- Incapacitation of any member of the flight crew
- Incapacitation of any member of the cabin crew which renders them unable to perform essential emergency duties’.
- Occurrences which have or could have led to significant injury to passengers or crew but which are not considered reportable as an accident
- An event leading to the declaration of an emergency
- Events requiring any use of emergency oxygen by any crew member
- The use of any emergency equipment or prescribed emergency procedures in order to deal with a situation
- Leakage of hydraulic fluids, fuel, oil or other fluids which resulted in a fire hazard or possible hazardous contamination of aircraft structure, systems or equipment, or risk to occupants
- Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect
- Any other event which could endanger the aircraft, or affect the safety of the occupants of the aircraft, or people or property in the vicinity of the aircraft or on the ground
- Repetitive instances of a specific type of occurrence which in isolation would not be considered reportable, but which due to the frequency with which they arise, form a potential hazard

"Fire, smoke or toxic or noxious fumes" are clearly listed as mandatory reportable incidents.

As stated in the Lords (HL 1940), the Directive was transposed in July 2005 into the UK Air Navigation Orders and as such *"incidents related to air quality are among the list of examples of reportable occurrences"*.

By reviewing our internal database and the BALPA contaminated air database, it is clear to us that this regulation is clearly not being adhered to. In summary, while the qualification that smoke or toxic or noxious fumes need to be reported if oxygen is used has been removed, the available reports show that still post August 2005 many events involving smoke or toxic or noxious fumes are still not being reported to the CAA as required. We believe that the CAA has failed to recognize that the reporting system is still not working properly and to take action to address this serious shortcoming.

Another area of concern is that until recently crews were virtually never using oxygen in contaminated air events as their checklists did not advise them to do so, nor did their airlines or the CAA. Indeed some checklists still may not advise pilots to use oxygen during contaminated air events where there is no smoke or fire. Therefore when noxious fumes occurred, pilots have rarely been using oxygen as shown via the available databases and reports and hence the pilots have not seen this as a reportable incident in part due to the fact that oxygen was not used. The data available also shows that generally only one pilot used oxygen rather than both as required and therefore the events generally have remained unreported. Would you agree that it is important and vital that all contaminated air events linked to contamination from engine oils, hydraulic fluids or de-icing fluids need to be reported ?

Whilst I accept in principal that in recent years the CAA decided to advise pilots to both use oxygen in all cases of suspected contaminated air but this was no more than a paper work exercise. For over 30 years most crews have seen fumes or contaminated air events as normal unless the cockpit was filling with visible smoke. To over turn what has become an industry normal situation to experience fumes without doing anything will require a serious educational process but this has not occurred. The CAA has done nothing to ensure an industry change in philosophy. Data from the union databases of incidents clearly shows this is not happening. In 2004 / 2005 out of the 300 or so events of contaminated air reported to unions oxygen was only used by pilots in less than 20% of the events. Of further concern is that by referring to the data, generally only one pilot elected to use oxygen, despite there being a requirement for both to use oxygen. Again the CAA has done nothing to correct this situation thus clearly placing crews and passengers at unnecessary additional risk.

Our research has looked at the CAA MOR data as well as incidents reported to unions. In connection with the CAA Mandatory Occurrence data base, we have been advised the CAA provides different data depending on who asks on what day. How can this be possible ?

In 2004 and 2005 the CAA MOR database shows just over 150 cases of smoke and or fumes most likely due to contaminated air, while the union databases list double the CAA MOR numbers. This gives a total of over 300 contaminated air events ACTUALLY REPORTED in 2004/5 of which only 50% were reported to the CAA. I stress "actually reported" as we must never forget that less than 4% of events are reported anyway. Not only did 2004/2005 list the largest number of contaminated air events to date but it was more than a 85% increase over the years 2002/2003 in which over 150 known events occurred of which the CAA only knew about 50%. In the years 1985 –2000 there were only 135 known events of contaminated air reported in 15 years, while this rose to over 300 in the years 2004/5. I must highlight that since the smoking ban on commercial aircraft the number of events has increased significantly, no doubt smoking masked a lot of contaminated air events prior to then. I am certain you will agree that the CAA MOR database needs to be robust and record all contaminated air events reported.

The CAA stated to the Countess of Mar in the Lords in October 2005 (HL 1779) that it was not aware of any under-reporting and that as:

“all UK aircrew take aviation safety very seriously, there is no reason to believe that they would deliberately under report occurrences involving impairment”.

This comment is clearly ludicrous.

One can clearly see this is happening and its time the CAA stopped disregarding many cases of contaminated air and dismissing them as ‘lesser events’.

To show the absolute confusion that is occurring within the CAA and the DfT I would like to highlight to you the wavering statements on the trend in events. In 2002 the CAA advised via their Flight Operations Communication to crews that contaminated air events were increasing. In October 2004 the CAA advised that fume events were now at a much lower rate and it advised Paul Tyler in the Commons (191638) that it agreed with the pilot union (BALPA) that there was a downward trend in fume events. The only problem was that the data presented by BALPA clearly showed an increasing trend in the number of fume events. In July 2005 the Aviation Health Working Group which we are told is responsible for passenger and crew health advised that *“fume events...are diminishing in number and seriousness”*. This most certainly is not what the complete databases of events are showing in fact it is the complete opposite. Then less than four months later the CAA did a complete back flip and advised the Countess of Mar in the Lords (HL 1637) that the number of events over recent years had increased, most likely due to better reporting.

It is clear the CAA have no idea what is going on and again are seriously misinforming the House of Lords and the public about these very serious health & flight safety issues.

I have stressed that the majority of contaminated air events never get reported at all for a variety of reasons. These are worth investigating as reasons given for this by pilots include problems such as:

- crews not understanding the risk of contaminated air;
- crews being advised that fumes and contaminated air are not reportable events;
- being advised clearly that fumes are not a safety or health issue;
- crews seeing them as they always have been seen, a nuisance and routine;
- crews fearful of reporting such a common problem and being branded a trouble maker;
- crews fearful to use oxygen, divert the aircraft and have to explain the hierarchy their actions;
- crews fearful to report when not all can smell the contaminated air etc.

The reasons for under-reporting have been well recognized in a growing number of published papers and can no longer be ignored like the CAA is doing. Additionally I am not convinced that events such as the following should be termed as ‘diminishing in seriousness’:

- “All 3 pilots smelt and tasted oil with APU air on”;
- “Captain, First officer unwell and making small errors, slow to put gear down”;
- “Air contamination in flight deck & cabin, first officer & cabin crew were light headed, dizzy & nauseous with some passengers effected by fumes”;
- “Oxygen given to one cabin crew member with another in distress, diversion to Stansted”;
- “First officer recovered enough to carry out duties on descent, crew hospitalised as a precaution, hydraulic system faults found”;

- “Flight crew incapacitation due to possible air quality problem, First Officer felt faint, breathless with shaking hands, oxygen was administered”;
- “Captain had a headache with flu like symptoms and was in a state of euphoria although successfully landed the aircraft while operating as single crew, incident not entered in aircraft technical log”;

There are hundreds of such events ranging from the lesser but still very important contaminated air events through to the ones listed above.

There are two other very important points that we must briefly look at. Firstly you must realize that crews have never been educated to report all health effects in the aircraft technical log or in the associated reporting forms. Crews are being told continually that the fumes have no health impact and that any symptoms are not related to the aircraft air, despite copious quantities of other data indicating the opposite, but crews rarely get to see any of the later. In lay terms the crews just do not understand that they need to report the health effects. If the reports include limited health data it will only cover the symptoms at the time and rarely cover effects experienced by cabin crew at all and virtually never those experienced by the passengers. Why? Because the passengers are never told there was a contaminated air event so how would they know to report adverse effects. The symptoms experienced once passengers leave the aircraft are almost never collated.

The CAA use this inaccurate data to portray an all is well mentality. The CAA advised the House of Lords Inquiry in 2000 that contaminated air events were very rare at once every 22,000 flights and for this reason the CAA have previously stated that spending money on research would be wasteful.

The Australian and Canadian Transport Safety Bureaus, RAAF, Aerospace Medical Association and many more credible bodies all recognize that fumes are seen as routine or a non event and that there is a problem of under-reporting. Therefore what many other credible bodies know combined with the differing figures of contaminated air events, show that the CAA is wrong and allowing under-reporting to carry on.

The 2001 BALPA survey I referred to earlier showed that 106 mostly Boeing 757 pilots reported in excess of 1600 contaminated air events of which only 3.66% made it to the CAA. Therefore in 2004 with just 72 or so reports being advised to the CAA, this could equate at a 3.66% reporting factor to 1750 events of contaminated air which would equate to 197,000 people potentially being exposed to contaminated air. The sad fact here is that this could be 197,000 passengers being exposed to an air supply containing neurotoxins and the airlines never told them. How many of these exposed passengers were pregnant or young children ?

By looking again at the union databases and the CAA number of contaminated air events there were in 2004 & 2005, 68 cases of pilot impairment. In fact there were 35 cases of at least 1 pilot impairment & 33 cases of both pilots being impaired on the same flight. This equates to some degree of 1 pilot or 2 pilot impairment in over 20% of all known contaminated air events in 2004/2005. The number of contaminated air events showing some form of crew impairment including cabin crew was over 100 in 2004 / 2005. Again this equates to some form of crew impairment in over 35% of known events. We must remember that these are only the reports that we know about. We have already learnt that most reports simply never take place, many never make it past the airline and cabin crew effects which the CAA admits are not their responsibility are generally not recorded on the pilot initiated report forms.

We learnt in the Lords recently (HL3078) the CAA had no record of a Boeing 757 incident on G-BIKI in November 1998. We know the Captain of that aircraft did file a Mandatory Occurrence Report entitled ”TOXIC FUMES IN THE FLIGHTDECK” and requested it to be sent to the CAA, however

it never made it past the airline. This particular captain was subsequently retired due to ill health by his airline, yet the CAA never even knew about it. I understand that the CAA is now aware of this event and the report has been forwarded by the airline with the CAA saying little more than that it will enter the event on its database. One would have thought this would again ring alarm bells as proof the system is not working, but sadly no and the lessons are not learnt nor it appears is the CAA willing to recognize its errors and investigate how wide scale these problems are. To do so would be bad for the airlines that fund the CAA but the travelling public and working crews deserve better than this.

Examples of the types of reports involving impairments that clearly should be taken into account range from metallic taste in the mouth, headaches, dizziness, eye nose & throat irritation, nausea, inability to concentrate, spots before eyes, flu like symptoms, breathlessness, spaced out, shaking, euphoria and complete incapacitation.

Just two such examples include:

- “Smokey air in cockpit during last 3 sectors, slight headaches for both pilots, numerous previous occurrences, concerns about air quality, aircraft released for service as no fault found.”
- “Fumes on start up. Before take off first officer felt strange and vague but recovered for take off. Both pilots were nauseous in the cruise yet no fumes smelt, oxygen not used. First officer had experienced another event 2 days earlier felt very fatigued, dizzy, nauseous, vague with a loss of balance. Airline medical centre nurse advised they had received a lot of calls on contaminated air of which a lot was somosomatic and would not let the pilot speak to a doctor.”

To go a step further we need to look at the misinformation provided to the Countess of Mar in the Lords in November 2005. While the CAAs own records showed in 2004/2005, 154 cases of smoke and or fumes or contaminated air, they advised the Lords that there were in fact only 71 cases. Lets not forget the known number of events reported to pilot unions was over 300 during this period. The union databases record over 35 cases of pilot impairment and over 30 cases of both pilot impairment, while the CAA advised the Lords that there had been only 1 case of 1 or 2 pilot impairment in 2004/2005. Even the CAAs own records showed 42 cases of 1 or 2 pilot impairment in 2004 & 2005.

The CAA have stated that they do not believe that pilots would deliberately under-report contaminated air events causing impairment, it appears that the CAA has done exactly this. This appears to be deliberate misinformation. Here we have union records stating that there were over 65 cases of impairment in 2004 & 2005 and the CAA said there was just **one** such case in this period. No wonder the CAA advised the Countess of Mar in the Lords (HL 1637) that:

“the number of events where impairment has been reported has remained low”.

This was total misinformation and cannot be allowed to continue.

To try to understand this deliberate misinformation campaign by the CAA we perhaps only have to look to the CAA’s definitions of airworthiness related to contaminated air and their definitions of crew effects which I have previously advised you about.

The CAA stated their primary safety focus is on partial and full incapacitation with a further reduced focus on impairment but nil focus on what it terms in a novel medical way as feeling unwell with no impairment. Therefore it appears that by reviewing the records there was only 1 case of full incapacitation in 2004 and perhaps this is what they were referring to. However, the CAA provided the answers to the Countess of Mar in HL 1637 on 1st November 2005 that there was just 1 case of ‘pilot

impairment' in 2004 and none in 2005. The CAA clearly deliberately based their figures on their interpretation of what they see as their primary safety focus, incapacitations. This was no error. This was in fact what the CAA have stated all along is what they consider important and what is considered as making an aircraft airworthy or not in relation to the air supply system. The CAA deliberately downplayed the number of crew impairments in two ways. Firstly, the CAA referred to impairments, but actually listed incapacitations only, ignoring the many cases of pilot impairment and completely ignoring cabin crew and passenger impairments. Secondly as stated in the article in the Observer on the 26th of February, 2006, the CAA accepted that the *'level of pilot impairment is higher than previously admitted'*. Given that the CAA acknowledged there was only 1 case of pilot impairment in 2004 / 2005 and the complete records available show at least 68 cases, this is hardly an error but an attempt to mislead the Lords, the Government and the public. I would question if the CAA would care to review its figures and advise the actual number of pilot impairments in 2004 and 2005. It would be interesting to see if the CAA will change their view on lesser impairments and so called non safety related events and include these in the figures to get a real picture combined with the known under-reporting problem. All these events are the CAAs concern and it is time we take action to ensure that the CAA and the Department of Transport start to wake up to their responsibilities.

Just in case you were not concerned I will now briefly draw your attention to just a few other issues of concern that become evident when reviewing these databases. Once again these issues are clearly the responsibility of the CAA, but we feel the CAA have done nothing to address these obvious failings in the system. I will only highlight a few of the actual comments to show the system needs an urgent overhaul:

- “Strong fumes with pilot effects, but not considered reportable under the MOR scheme, no technical log entry made therefore no engineering investigation”;
- “Mayday declared on descent into Paris as thick blue smoke filled the cabin, Capt could barely detect smell or smoke & decided oxygen not required for crew or pax. Oil leak from air conditioning pack attributed to oil seal failure and smokey oven in galley. CAA closure comment: “The hazard is acceptable provided the frequency of occurrence remains low”;
- “Oily smells in flight deck are an ongoing problem on this fleet. Crew did not use oxygen as advised by airline as this meant declaring emergency and felt best not to do unless really violent effects from the smoke and "used to bad smells on the aircraft". Captain left with sticky throat & bad stomach which was considered regular on the Boeing 757. Captain advised smelt contaminated air perhaps 100 times on that aircraft & part of the reason for leaving the fleet”;
- “Engineers had signed off report of fumes on previous sector with “please report further, no fault found”. Further strong fumes same day gave Captain immediate intense headache with crew hospitalised.”

Another issue of concern is the use of oxygen which we touched on briefly earlier. As we can see from the examples above taken from the various records of fume events, crews are reluctant to use oxygen. In fact the data collected shows over 650 contaminated air events since 2000, oxygen was only used in less than 20% of these. The actual records show that on the few occasions when oxygen is used, it is often only used briefly by 1 pilot.

The CAA has advised pilots to use oxygen but has failed to enforce this and failed to educate pilots about this. Our members advise us that their employers are not making them aware of this requirement despite the Government advising Lord Tyler in the Commons in December 2004 that and I quote:

“...pilots are required to use oxygen as a precautionary measure in all cases of suspected cockpit air abnormalities irrespective of the severity of the event”.

When the issue of contaminated air comes up the main industry responses we all too often hear from the Government, the CAA and airlines is that the doses of Organophosphates and other contaminants are too low to cause health effects.

The Countess of Mar was advised in the Lords in October 2005 (HL1641) that:

“air quality monitoring exercises have confirmed the acceptability of cabin air supplied”.

This was supported by CAA statements from the 2004 CAA Air Quality paper advising:

“no single component or set of components can be identified which at conceivable concentrations would definitely cause the symptoms reported in cabin air quality incidents”.

However the truth of the matter came out in a further response to the Countess of Mar in the Lords (HL2312) only two months later when it was acknowledged that not only is there no requirement for air quality monitoring exercises to be carried out on aircraft during contaminated air events, but that there was in fact and I quote the Government:

“...no record of any such measurements in the public domain”.

What the Government is acknowledging is in fact no one has published any data of what chemicals are present during a contaminated air event, in what concentrations and for how long. Yet we are told its safe. I am sure you will agree Sir Roy that to be told it is safe is pure misinformation.

The Government response was supported only months before by way of an AHWG statement stating that:

“air sampling has never been done during a fume event”.

Additionally the main CAA 2004 research which basically attempted to tell us the air was safe and there were no long term health effects made an important point of contradiction. Firstly it never measured the contaminants during an exposure event and therefore noted *“No quantitative information on the concentrations in inspired air necessary to cause irritancy was available”.*

The airlines and manufacturers often advise us that they have tested the air and all levels found were:

“well below toxicological levels for humans”.

We learnt by way of the speech given by the Countess of Mar in late 2005 that the studies undertaken for the CAA by the DSTL were based on DERA reviews of the oils which the Government advised in the Lords (HL1764) remain the property of BAe Systems and we were advised:

“the report is subject to legal privilege and therefore exempt from disclosure”.

The CAA was quite happy to advise based on this report that all was satisfactory but they never even saw the full report, as BAe only allowed the CAA limited access as acknowledged to the Countess of Mar in the Lords.

Other studies also state all levels are below Government set levels. The major UK study undertaken by BRE on behalf of the Aviation Health Working Group (AWHG) advised that:

“In all instances, the measured values were similar to other cabin air quality studies and the air pollutant concentrations were below health guideline levels”.

However what they also stated was that the intention of the study was to monitor air quality during scheduled flights and compare these results with current health standards. They clearly stated the intention was not *“to monitor the air quality during any ‘unusual circumstances’”.*

The fact that monitoring has never been done during contaminated air events is not a secret. Here we have the lead UK Government research group acknowledging this and the Government advising in the Lords that to their knowledge it had never been done. The well respected US National Research Council air quality report of 2002 acknowledged the same.

So BRE who receive significant income from Boeing and Airbus and other industry parties state that the amounts of chemicals found are below exposure standards. But how can they say that? They have never measured the air during a contaminated air event and even if the studies had been done which they haven't, these referenced exposure standards do not apply as we have seen before. Many senior personnel within the aviation industry recognize that exposure standards should not apply in flight and are not adequately protective. These include, Honeywell, the manufacturer of the BAe 146 engine, Exxon Mobil, a major synthetic jet engine oil manufacturer, the Australian Air Force the RAAF, UK senior aviation medical experts and global academic experts. Therefore for BRE to state chemicals are below exposure standards is simply misleading the public.

BRE and many in the airline industry may wish to incorrectly refer to exposure standards for individual compounds but thankfully even the Government knows there are no exposure standards for the mixture of chemicals crews and passengers are exposed to. When the Countess of Mar asked in the Lords (HL1761) what standards apply to the mixture of chemicals, the response provided was that there were no standards. The response went on to state that the European airworthiness regulations require that the air provided to the crew and passenger cabin must be free from harmful or hazardous concentrations of gases or vapours. Why is this requirement not being enforced by the CAA?

When the Countess of Mar asked the Government (HL 1641) why contaminated air detection systems were not fitted to all UK commercial aircraft, Lord Davies of Oldham advised the Countess of Mar there was no requirement to fit monitoring equipment as the ventilation systems are designed to supply air of a suitable standard. I am sure they are, but the number of events occurring on certain aircraft fleets, particularly the BAe 146, the Boeing 757, the Airbus A320 and Embraer 145 would indicate this is not happening. It is clearly ludicrous to talk about what the system is designed to provide when we are highlighting the occasions when it is contaminated. The Government response went on to not only say the air was satisfactory perhaps 25 years ago when the aircraft were first certified, scheduled maintenance ensures these standards are maintained and corrective actions fix any problems. The documentation we have seen and heard from our members clearly shows these maintenance actions are not catching & eradicating the problems as they are ongoing on a regular basis. Again I advise that 2005 showed the highest number of events on record in the UK, we know this will only be a tiny fraction of the true number of events as this is a design issue of aircraft air supply systems and engine seal designs. After all the history dates back almost 30 years with large numbers of manufacturer supplied Service Bulletins highlighting the problems of leaking oil into the air supply way back in the mid 1980s.

It was clearly correct for BA Connect, a BAe 146 operator to advise the Observer on the 26th of February 2006 that this was a seal design issue. However to suggest that new seals would fix the

problem at the next 'maintenance overhaul', was misleading as the Service Bulletin history for the BAe 146 shows that there are a wide range of problems allowing oil to leak into the air supply, rather than just one seal. After all it was British Aerospace who advised the Australian Senate inquiry that:

"the modifications will not solve the problem completely".

They had previously stated several telling comments that our members should not be forced to accept as satisfactory. Firstly BAe advised in 2000 that:

"Improvements in seal design continue to increase efficiency, and when available, modifications are provided for the engines and APU".

They also advised Senator Woodley's Inquiry that:

"they had developed a "package of optional modifications" in 1992 that are designed to prevent oil leakage into the air conditioning system. These are being embodied in aircraft all over the world with excellent results".

Amazingly they also advised the Inquiry that their modifications made available in the mid 1990s on an optional basis had:

"reduced the frequency of oil leaks to an industry standard level".

As contaminated air is an airworthiness and an acknowledged health and safety risk, the aircraft and engine modifications should not be made available by the manufacturers as an option or recommendation only. They must be made mandatory by the aviation regulators to ensure the regulations are met and safe flight takes place.

It would appear that while many modifications have been made optional, many airlines have been less than willing to adopt such practices.

These specialised synthetic jet engine oils contain neurotoxins, sensitisers and a mix of contaminants. We know the exposures are taking place as not only has the CAA admitted this, but Professor Chris Van Netten at the University of British Columbia found the organophosphate TCP on the walls of UK BAe 146, in B757 aircraft HEPA filters and on a BAe 146 pilots trousers.

Lets be clear about this the 2000 Lords Select Committee on Science and Technology recommended the following take place and I quote:

"We recommend airlines to carry out simple and inexpensive cabin atmosphere sampling programmes from time to time, and to make provision for spot sample collection in the case of unusual circumstances".

We now know the sampling that has been carried out was never done nor never intended to be done during contaminated air events. The airline industry monitored the air in acknowledged routine flights never even intending to capture the contaminants we are referring to, yet has the audacity to tell us all levels are below levels of concern.

The final area I wish to raise with you is the matter of crew and passenger health.

The aviation industry have always denied there are health effects that could occur from exposure to jet engine oil and hydraulic contaminants, despite as the Countess of Mar highlighted in December 2005 the wealth of information even from the manufacturers of the oils clearly suggesting otherwise.

There were two exceptions to this. Ansett Australia accepted as we know that the short term symptoms associated with contaminated air events reported by crews on the BAe 146 and other aircraft types were substantiated. Additionally the CAA in their 2004 air quality report accepted the oils could produce symptoms of irritancy but denied the symptoms reported by crews were connected to the fumes.

The AWHG went as far as stating that:

“Over the last few years the UK Government and the CAA initiated and sponsored research into cabin air quality. The results of the various research projects did not suggest that there is a health risk for passengers, including infants, or crew”.

This is particularly amazing given that the actual wording in the CAA research small print said:

“Although some references are made concerning long-term health effects, the scope of this research did not include an attempt to determine the extent of any such risk.”

Lets not forget that the web of deceit that we have partially covered before but I feel is important to remind you of briefly. The House of Lords Inquiry of 2000 advised the absence of confirmed cases of TOCP poisoning from cabin air led them to believe there was not a significant risk to crew or passenger health. When reviewing the evidence this was based upon the fact that Dr. Virginia Murray of the UK Medical toxicology Unit had reviewed the records held at the London National Poisons Information centre looking for cases of TOCP poisoning from aircraft crew or passengers. She clearly advised there were no such cases & she doubted that such records were actually being kept. This was a gross misuse of the information and the Inquiry failed to take account of the evidence that crews were becoming unwell from breathing the mixture of contaminants in the oils as acknowledged in many other forums such as the Australian Senate Inquiry and a great volume of data to show this was happening. We are very concerned that the Under Secretary of the Department of Transport as recently as February 2006 has continued to maintain this mindset by advising us that as there were no cases of TOCP poisoning, there are no health risks to crew or passengers.

TOCP which the CAA and others like to refer to is the least toxic of ortho isomers present in the least amount. The CAA conveniently forget to remind us that in fact MOCP and DOCP the other two ortho isomers of the organophosphate TCP are present in the oil in far higher concentrations and are 10 and 5 times more toxic. This means that by only referring to TOCP the CAA and others underestimate the toxicity by a factor of at least 30000.

Lets not forget that the Government based its findings that there were no health effects (based on the doses of contaminants that it failed to measure) refer to only one selected neurotoxic effect that we have addressed before, OPIDN. As stated previously the Government have failed to look at chronic neurotoxicity, OPICN and additionally incorrectly stated that the meta and para isomers of TCP produce no neurotoxicity. This fact has now being challenged in the scientific circles. In summary, the CAA research is failing to look at what the crews are experiencing, chronic neurotoxic effects as distinct from the more traditionally well known OPIDN as acknowledged to Lord Tyler in 2004 in the Commons. Not only that but the CAA acknowledged to Lord Tyler that they had never collated crew data on acute effects after an exposure.

The CAA 2004 research states that:

“There is no common pattern of symptoms which can readily be identified as being characteristic of “cabin air quality incidents and the symptoms are not in themselves characteristic and, therefore, suggestive of any specific form of chemical toxicity”.

This is misinformation at its best as all the worlds leading experts looking at this issue are clearly advising that there is most certainly a specific pattern of symptoms associated with contaminated air events. This is known as Aerotoxic Syndrome.

However when the Department of Transport and the AHWG was presented with this information what did they say? None other than that the information was inconclusive, they were unaware if there really was a problem and that there was no new evidence on the presence or effect of low levels of Organophosphates in aircraft cabins. This too was gross misuse of the information presented at the London BALPA 2005 contaminated air conference, as much new evidence was presented, showing what had been know for many years, that crews were becoming ill both short & long-term from the aircraft environment and possibly passengers as well, there was a very distinct pattern and also that Organophosphates had indeed been found in the aircraft.

While the Department of Transport continues to advise us there are no health effects from exposure to leaking synthetic jet oils apart from minor irritants and that the air supplied is of an acceptable standard, the CAA aviation medical department knows otherwise. In February 2004 the CAA advised Lord Tyler in the House of Commons that it was not aware of any long-term health effects in flight crew that could be traced back to the cabin air. However as stated previously 4 years earlier it had suspended a UK BAe 146 pilots medical certificate based upon the conclusions made by the pilots doctor stating that his illness may be related to exposure to chemicals on board the BAe 146. He was not the only pilot to have his medical taken away by the CAA aviation medical department connected to cabin air contamination as another UK pilot in 2001 was refused his medical and subsequently retired ill health with CAA being advised the pilot had been exposed to fumes in the aircraft. I am led to believe the CAA has since reviewed numerous other pilots medical ability to fly following exposure to contaminated air. A number of these pilots are no longer well enough to fly or work. The CAA aviation medical department to my knowledge has done nothing about this problem despite clearly being aware of the problem as they have removed numerous pilot medicals directly connected to contaminated air, others possibly connected and reviewed a growing list of pilots who have expressed concern about such exposures. It is no longer acceptable for the CAA to misinform the House as it did in 2004 nor is it acceptable to ignore this problem any longer.

After the Countess of Mar speech in December 2005 Lord Davies of Oldham responded by saying that the Government did take air contamination seriously and had established a dedicated Aviation health unit. He reiterated the House of Lords 2000 review stating that under normal operating conditions all was satisfactory. That may well be the case, but this issue is clearly not about normal aircraft conditions. It is as we all know about the air contamination incidents which the data that the CAA refuses to recognize shows is not rare and is very serious indeed. The CAA and Department of Transport have not done enough and this is no longer acceptable.

As I mentioned at the start of this letter, this whole matter should be the subject of a public inquiry which the CAA should be instructed to co-operate fully with.

I look forward to hearing your views on all the matters and points we have raised.

Yours sincerely,

Ms Joanna McDonald

www.aopis.org

CC

Mrs Gwyneth Dunwoody MP,
Chair of the Transport Select Committee on Environment, Transport and Regional Affairs

Mr Julian Brazier MP,
Shadow Transport Minister (Aviation)

Mr Tom Brake MP,
Liberal Democrat Shadow Transport Minister

Mr Ingo Marowsky,
Head of Aviation, International Transport Workers' Federation

Captain Tristan Loraine,
Chairman CAQTG, BALPA

Mr Brendan Gold
T&G National Secretary, Transport & General Workers Union

Captain Phillip Pettit
Director, Independent Pilot Association

Lawrie Cox
Senior Industrial Manager, Australian Federation of Air Pilots

Mr G. Maclean
Government & Regulatory Affairs, Flight Attendant Association of Australia

Lord Tyler

Reverend J. Woodley

Countess of Mar

Lord Davies of Oldham
Deputy Chief Whip, House of Lords

Mr Tony Bourne
Chief Executive, British Medical Association

Geoffrey Podger
Chief Executive Officer, Health and Safety Executive