focus

ON COMMERCIAL AVIATION SAFETY

SUMMER 2004

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UNITED KINGDOM FLIGHT SAFETY COMMITTEE

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Front Cover Picture: Boeing 757-200 in the Livery of Flyjet

FOCUS *is a quarterly subscription journal devoted to the promotion of best practises in aviation safety. It includes articles, either original or reprinted from other sources, related to safety issues throughout all areas of air transport operations. Besides providing information on safety related matters,* ***FOCUS*** *aims to promote debate and improve networking within the industry. It must be emphasised that* ***FOCUS*** *is not intended as a substitute for regulatory information or company publications and procedures.*

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A brief introduction to the Safety Assessment of Foreign Aircraft (SAFA) Programme

The European Civil Aviation Conference (ECAC) has recently developed an inspection programme known as the Safety Assessment of Foreign Aircraft (SAFA) that complements the ICAO safety oversight audits but concentrates on checking aircraft that stop at European airports.

An aircraft arriving in an ECAC member state from another country or another ECAC state may be subject to a ramp inspection. This inspection is concerned mainly with aircraft documents, the crew competencies and licensing, the apparent condition of the aircraft and the carriage of mandatory cabin equipment. These inspections are intended to identify non-compliance with the ICAO requirements as set out in the Chicago Convention Annex 1 – Personnel Licensing, Annex 6 - Operation of aircraft and Annex 8 - Airworthiness of aircraft.

The inspections are carried out to common procedures using a common reporting format. This is an important prerequisite to determine if action should be taken against a particular operator. This commonality is brought about by the training of the inspectors which minimises the potential for variation in the interpretations and implementation.

The findings are categorised as follows:

- Category 1 – Minor, the safe operation of the aircraft is not affected.
- Category 2 – The findings concern deficiencies that have a limited affect on the safe operation of the aircraft.
- Category 3 – Major findings that affect the safe operation of the aircraft.
- Follow-up action is defined on the basis of the infringed category. In the case of major findings the operator and the appropriate oversight authority are contacted about the corrective action to be taken. All the reports and their data are kept in the Joint Aviation Authority (JAA) database, which also holds additional information like the list of actions carried out following the inspection. The JAA is the regulatory body associated with ECAC.

There are currently more than 17,000 reports which can be accessed on-line by ECAC member states and ICAO headquarters. ECAC publishes an annual report describing the program and providing an overview of the inspections carried out and the trends indicated by the findings.

The oversight authorities of the ECAC member states choose which aircraft to inspect. Some authorities do random checks whilst others target specific airlines of aircraft that they suspect do not comply with the ICAO standards. The number of inspections may vary from one State to another and may range from a few to several hundred each year.

The aircraft checks may include the following:

- Pilot licences.
- Written procedures and manuals that should be carried on board the aircraft.
- Compliance with procedures by flight and cabin crew.
- Safety equipment carried in the cockpit and cabin.
- Cargo carried in the aircraft.
- The apparent condition of the aircraft.

A checklist of 54 items is used during the ramp check. If the turn-around time is insufficient to complete the entire checklist, then selected items are inspected. The SAFA policy is not to delay aircraft departure except for safety reasons.

On average one finding was made during each inspection. 46 % fell into Category 1, 40 % in Category 2 and 14% in Category 3.

An analysis of the reports indicated that a high number of member states experience difficulty in meeting their obligations and responsibilities under the Chicago Convention. These difficulties often manifest themselves in a lack of regulation, staff shortages, lack of meaningful experience and ineffective safety oversight. The results show a clear link between these difficulties and the accident record at regional level.

As a pilot of an aircraft flying for an operator that has routes into an ECAC State, you should expect to be audited from time to time. There is nothing you can do about it except cooperate fully with the inspector. The outcome of the audit will depend on the professionalism of yourself, your crew and your organisation and the overall attitude to flight safety. Hopefully you will not become one of the statistics, but if you do then perhaps you are not playing an active enough part on your company's safety programmes.

Chairman's Column

Maintaining an Open Reporting Culture

We, the industry, have always tried to engender a culture of free admission of mistakes and the courage to tell others so that everyone can learn. The UK Civil Aviation Authority are world leaders in this approach to Flight Safety, and has been the driving force to encourage industry to meet and discuss its own Flight Safety issues. This was the very foundation and principle of the UK Flight Safety Committee back in 1959.

The Mandatory Occurrence Reporting Scheme (MORs), although legislated in the UK Air Navigation Order, still relies on the integrity of the individual crewmember to submit reports - confidentially if appropriate. The statement by the Chairman of the CAA at the front of the MOR publication also includes the following:

"Where a reported occurrence indicated an unpremeditated or inadvertent lapse by an employee, the Authority would expect the employer to act responsibly and to share its view that free and full reporting is the primary aim, and that every effort should be made to avoid action that may inhibit reporting. The Authority will accordingly make it known to employers that, except to the extent that action is needed in order to ensure safety, and except in such flagrant circumstances as are described under the heading 'Prosecution' (dereliction of duty amounting to gross negligence), it expects them to *refrain from disciplinary or punitive action* which might inhibit their staff from duly reporting incidents of which they may have knowledge."

In most cases where Human Factors are a cause, the mere fact that the incident occurred is usually enough to prevent re-occurrence - any reflection on the aircrew's professionalism is usually enough embarrassment for them!

The last few years have also seen an increase in the CAAs interest in the management of safety within organisations. They, quite rightly, expect to see a written statement of the company system of safety management. A principle concept of this system is that the ideal safety culture is one that is supportive of the staff and systems of work, and, most importantly, recognises that errors will be made and that *apportionment of blame will not resolve the problems*.

Flight Data Monitoring (FDM) has also seen the need for a great deal of trust between the company and its employees with the establishment of sound protocols to ensure harmonious working relationships. All levels of staff in those companies using FDM have quickly recognised the benefits of the system both for improved safety and cutting costs.

The UKFSC, as we know and can justly boast, is unique. We have almost all the UK airlines (and other countries), a lot of providers and, most important, the Regulators (not just the UK) in the same room. We are able to share our thoughts and exchange critical safety information. We can do this by admission with no fear of recrimination from our contemporaries but rather the certain knowledge that we will get help and advice if it is available. This culture can only lead to better confidence in reporting and more scope to take appropriate action to stop other errors.

The recent decision by a European court to hand out long prison sentences as a result of an accident between two aircraft at an airport, has given the aviation industry cause for serious thought. It has probably led to, as another publication has already commented; "the message to other individuals is keep your head down". We must, of course, all take responsibility for our actions, but the level of blame is the tricky assessment. If we are, as an industry, to continue to build the levels of trust that we have so far, the way ahead needs to be clear. This is particularly the case if we are going to be more involved with the EU and thus EASA.

This case may have clouded the issue.

by Stuart McKie-Smith
flybe

UK FLIGHT SAFETY COMMITTEE OBJECTIVES

- To pursue the highest standards of aviation safety.
- To constitute a body of experienced aviation flight safety personnel available for consultation.
- To facilitate the free exchange of aviation safety data.
- To maintain an appropriate liaison with other bodies concerned with aviation safety.
- To provide assistance to operators establishing and maintaining a flight safety organisation.

Bird Strike DNA

by Carla Dove, Marcy Heacker and Lee Weigt
Division of Birds and Laboratories of Analytical Biology
Smithsonian Institution, Washington, DC

The Feather Identification Lab at the Smithsonian Institution has discovered DNA. Well...we're going to be using it in our BASH efforts anyway!

The Federal Aviation Administration (FAA) is joining the U.S. Air Force's feather identification program at the Smithsonian Institution to identify species of birds that collide with aircraft by developing a new DNA database.

Beginning in July 2003, the FAA is providing funding to the Feather Lab to build a database of DNA sequences of approximately 300 species of birds commonly involved in bird/aircraft collisions. Currently, only about 60 of the birds that are involved in bird strikes have been partially sequenced and are available on GenBank (a national data-base of DNA sequences) for comparison, and many of those do not contain the appropriate gene(s) or gene region(s) for bird strike analysis.

This five-year project represents an Interagency Agreement between FAA and USAF and aims to increase the accuracy and ability of the Feather Lab to identify those "hard-to-identify" bird remains included in paper towel swipes that do not contain downy (plumulaceous) barbs for microscopic examination. By joining forces, the USAF will allow the Feather Lab to conduct identifications on civil bird strikes, and the FAA will provide funding for the research and development of a DNA identification system that can be used by both agencies in cases that lack morphological evidence for museum comparisons. The DNA identification process should be fully functional in five years, but for the time being we are going to be busy developing protocols, extracting DNA from frozen tissues stored in the museum's collection, and sequencing bird "snarge" (a Feather Lab term for the goop that is wiped from the air-plane after a bird strike).

In 2002, nearly 2000 military bird strike cases were received for identification in the Feather Lab. This represents an increase from 1532 cases in 2001 and does not include the nearly 200 cases received annually from the FAA for civil bird strike identifications. The average number of bird strike cases identified per working day is approximately seven, but Spring and Fall migration are by far the busiest times of the year in the Feather Lab. The increased awareness of BASH programs and the ease of on-line reporting within the Air Force is no doubt responsible for the fact that a record 49% of the USAF bird strikes are now reported for positive identification.

Because the amount of time it takes to identify species of birds from fragmentary evidence can range from one hour to several days, we are in desperate need of some high-tech assistance. Additionally, Flight Safety personnel are becoming expert detectives when it comes to gathering bird strike evidence and are making it much more difficult to find feather barbs in the minute samples they scrape off the aircraft. These samples do, however, often contain bits and pieces of tissue or blood that may be useful in DNA testing. Fortunately, the Smithsonian has a cryogenically preserved tissue collection of birds from all over the world that will be used to establish the DNA database.

Old "Bird Dog," New Tricks

We all know that the first step in preventing a wildlife problem on an airfield is to identify the culprit, and the USAF BASH programs are now very aware of the importance of collecting even the tiniest samples for identification. Lee Weigt, manager of the Smithsonian's Laboratories of Analytical Biology (LAB) molecular program, will lead the DNA project, the major obstacles of which are over-coming the degraded state of the DNA in the samples being collected. The project will have a forensic approach and the database will initially focus on the mitochondria! DNA (mtDNA) most likely to be recovered from degraded samples ("snarge"). We will establish the database for large portions of three gene regions of the mtDNA and design primers and probes to detect these in poor-quality tissue and fluid samples. Rapid isolation of the samples in the field will be paramount, and we'll be testing several user-friendly field collection protocols from the beginning of the project to determine our highest probability of success. Identification via DNA sequencing is the "gold" standard, but we hope to develop cheaper and faster methods as a result of the database development.

"If It Ain't Broke..."

Just because we are going high-tech does not mean that we are going to abandon the "old way" of doing things! Even though the feather identification

process is complex, it's still the easiest, fastest and cheapest way to determine what kind of bird was ingested into your engine or smacked up against your aircraft.

Once we get bird strike remains, there are several steps we take to make a positive final identification. First, we look over the USAF SAS (Safety Automated System) report for information such as date of strike, location, damage and remarks that can really be helpful in narrowing down the avian culprit.

Many times, the remains we get are in pretty rough shape - there is nothing quite as smelly as bird remains that have gone through an aircraft engine and then been subjected to the confines of the postal service. In these cases, washing the feathers in hot, soapy water is necessary to help restore the natural color, shape and texture. Sounds simple...but it works!

The unique expertise of our Feather Lab is that we have many years of experience peering through a microscope trying to figure out what microscopic features of the plumulaceous (downy) region of the feather sets one species apart from another. Using the feather microstructure can be an important step in the ID process if the material does not contain any obvious whole feather characters for specimen comparisons. We prepare microslices from unknown feather samples and compare the microscopic structures to "known" reference slides of feathers made from museum specimens. While these microstructures alone cannot tell us the exact species, they can tell us what "group" of birds we are dealing with (i.e., duck, shorebird, passerine).

Once we have gone through these initial steps, we usually have an idea of what type of bird we are dealing with. It's at this point that we boldly go into the museum collection of over 620,000 bird specimens to search for a match to the unknown feather sample. Having access to such a large collection allows for specific, accurate comparisons. Whether we need a Wilson's Warbler from California in September, or a Pin-tailed Sandgrouse from Iran...chances are it's in the collection. We also feel that this direct comparison to "known" specimens increases the accuracy of the IDs by not relying on memory or experience alone. The final identification call is made after considering all of the information and clues gained from this process and the information provided by you on the AF SAS report.

When you consider the condition of much of the material we receive, in addition to the variation in bird plumages, identifying feathers from bird strikes can be a daunting task. Our goal of adding the new molecular identification techniques is to continue to build our traditional old morphological ID methods and (ultimately) make this task as efficient and accurate as possible.

2002 Feather Lab Statistics

In 2002, feather samples were received from 328 different USAF airfields and a total of 255 different species were identified from bases all over the world. Many new species were added to the list last year as a result of increased flying at overseas bases. This underscores the importance of having a large research collection that is worldwide in scope of these new identifications. The top reporting USAF bases for 2002 included: Little Rock (86 cases), McConnell (66), Altus (59), Columbus (57) and Travis (57). Considering that even the smallest bird can cause damage to an aircraft, it is important to keep track of all bird strikes.

Identifications based only on microscopic analysis reached the highest recorded

number in 2002 at 487 cases. The majority of these identifications were confirmed to ordinal level only (170 Passeriformes), but many were identified to at least the family level (i.e., swallow, thrush). The DNA technology that we are developing with the FAA will hopefully assist us in refining these types of identifications. The increase in microscopic identifications is attributed to the new technique of wiping the bird strike off the aircraft with a wet paper towel (see collecting methods at htt : / /afsafety.af.mil / AFSC / Bash / wild.html).

Reporting: Part Of The Greater Good Big Picture

Proper species identifications help provide base-line data needed to properly implement habitat management plans on airfields, warn aircrews of bird strike dangers and assist engineers in designing safer engines and windscreens. Some of the other important reasons for accurate species identifications and continued reporting include answering questions regarding strike hazards at individual airfields; the development and enhancement of the BAM (Bird Avoidance Model); permit hearings and construction of landfills; U.S. Fish and Wildlife Service concerns of species protection; and obtaining depredation permits. In order to keep "muscle" in the bird strike database and help prevent damaging strikes, we need

to work together to assure the continued accuracy and consistency of the bird strike data. You are the ultimate beneficiary, so please report all bird strikes via the USAF Safety Automated System (AF SAS) at http://SAS.kirtland.af.mil. We will be supplementing all collecting methods once we have determined our protocols for the DNA-based molecular testing.

This new system will greatly enhance our identification efforts, and it will help to make the skies safer for all of us.

Feather Lab FAQs

1. What kind of feather material do I collect?

   The more the better... if you have a whole bird, pluck feathers from the wing, tail breast and back. DO NOT CUT FEATHERS. We need the fluffy barbules located at the base for microscopic analysis. Other helpful parts include: feet, beaks and bones.

2. What if there is no whole feather material?

   We'll take what we can get. If all you see is a smudge of blood, tissue, or small feather bits ("snarge"), wet the area and wipe it with a paper towel. Send us the towel and all. This type of material will be the main focus of the molecular ID techniques.

3. Do you only identify birds?

   No, we have identified everything from frogs and turtles to bats. In fact, we have a bat identification expert in the division of mammals (Suzanne Peruach, USGS) who is working on microscopic identification of hair samples.

4. What is a passerine?

   A passerine is a shortened name for birds that are in the order Passeriformes. Species in this order are commonly known as perching birds or song birds and include warblers, sparrows, finches and crows. Because the microscopic structures of these birds can be similar to each other, we often stop at the "passerine" level on these identifications.

5. Can I get West Nile Virus from collecting bird remains?

   So far, there have been no reported cases of cross-infection of this virus from dead birds to humans, but it is not beyond the realms of possibility. We urge you to use commonsense and minimize contact with bloody remains. If in doubt, wear latex gloves.

6. How do I package remains?

   Place remains in a clean zip-lock bag, sealed paper envelope or anything that will keep the sample contained. DO NOT USE TAPE or Post-It notes. The sticky material traps the downy feather barbs. PLEASE PUT AF SAS NUMBER ON THE SAMPLE.

7. Do you ever want whole birds?

   If you find an unusual or interesting bird in good condition on your airfield, please contact us... we may like to have it for our research collection. Recently, we received a Black Kite from Pakistan that had been prepared with a spread wing to facilitate feather identification. Remember to freeze the bird as soon as possible and note the date and location that it was found.

8. Where do I send the material?

   Due to delays following the anthrax scare of 2001, the Smithsonian has set up a Post Office Box address for items that should not be irradiated (such as feathers in plastic bags). We ask that you please send non-rush cases via regular post to:

Feather Lab
Smithsonian Institution
NHB E-610, MRC 116
PO Box 37012
Washington, DC 20013-7012

For overnight, express, or priority shipping please send to:
Dr. Carla Dove
Smithsonian Institution
NHB E-610, MRC 116
10th & Constitution Ave., NW Washington, DC 20560

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Groundcrew Fatigue Management

By Commander Ian Peck RN, SO1 Engineering Policy, DASC

It may come as a surprise to some of you, but those who fly our aircraft, control them from the tower or even drive our MT vehicles have their working hours regulated. The same cannot be said of those who maintain and support those aircraft on the ground. So while the pilot will have had sufficient beauty sleep as a prerequisite for safe aviation, the highly skilled technicians who have carefully prepared the systems in the aircraft in which he or she is about to take to the skies, may have worked well beyond the point where their human performance will be degraded and errors slip in unnoticed.

The effects of fatigue on human performance are increasingly well researched and documented. The linkage between high levels of fatigue and increased error-proneness may appear to be a statement of the blindingly obvious. Maintenance organisations may believe that local knowledge and management is suitable mitigation of the increased risk, yet there is sufficient evidence in the shape of Incident Reports and Human Factors Open Reports (HFORs) to suggest that groundcrew fatigue leading to maintenance errors is alive and well.

In a recent amendment to Joint Air Regulation (JAR) 145, which sets out the requirements for maintenance organisations within the civil aviation field, the Civil Aviation Authority (CAA) mandated not only that all maintainers should be given Human Factors training (to be refreshed bi-annually, in order to raise awareness of the effects of the limitations of human performance) but also to provide comprehensive guidelines on groundcrew working hours. The CAA stopped short of actually mandating working hour limitations, preferring to give operators the flexibility to accommodate their own working practices, but the effects of consistently long working hours should now be well recognised by workers and managers alike.

Within the Military Air Environment, the DASC is attempting to provide similar safeguards against the effects of error by fatigued groundcrew. In the military, even more so than the civil world, we demand almost infinite flexibility in the support of flying operations, which has engendered a long established 'can do' attitude, where risks associated with fatigue are put aside in the battle to see the job through to completion to get the aircraft airborne on time and in the right configuration. This attitude has succeeded often enough for this behaviour to become the norm and suggestions to the contrary are for 'wimps'.

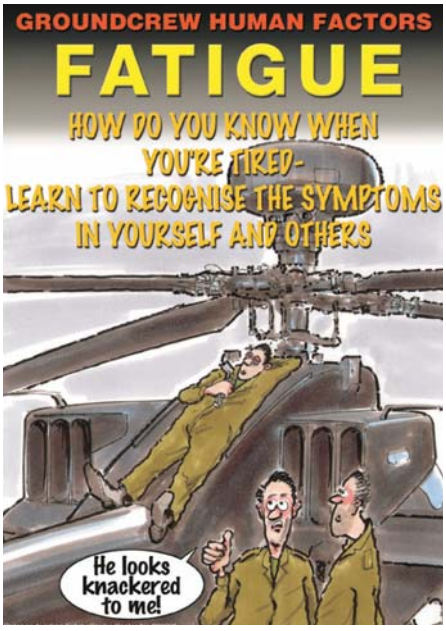
The fact that we have been lucky rather than clever is borne out by the numerous HFORs and servicing error reports where long duty times, performance of extraneous and/or secondary duties, the effects of long haul sorties on deployed maintenance parties, where the effects of time zone changes exacerbate the problem have all led to 'near misses'. Many of these could so easily have gone one step further along the chain and resulted in a serious accident resulting in possible deaths and injuries.

So what changes can the military make in the face of this long-established culture? To impose proscribed working hour limits would only serve to reduce flexibility, stifle initiative and encourage the submission of bids for significant manpower establishment increases which would be laughed out of every Headquarters building in the MoD; particularly in these times of scarce STP resources. What is recommended, therefore, is a flexible, risk- managed system with an hours-based backstop. It is recommended that the normal working day in peacetime for aircraft maintainers should be 8 hours hands-on. This would increase to 10 hours per day on exercise and be a maximum of 12 hours per day on operations.

It is recognised that even these generalised limits will not pertain in every case, nor are they designed to. Local management must be allowed to 'manage locally' which is why the effects of fatigue must be evident to the workforce, management and leadership.

It is envisaged that Command level policies should be produced to cater for environmental differences but that any system should be based on the management of the risk introduced by extended working hours. Risk Management is an activity, which most managers and leaders believe they exercise already in everyday life. Indeed this may be so, to some degree. Risk Management however, needs to be more than an 'intuitive' process and the discrete stages of the process should be considered every time extended periods of working are proposed, for whatever reason.

There are numerous models for Risk Management, most of which describe a similar process in different ways. A useful example is that used in the US Navy's aviation maintenance environment, which employs a '5 step, 4 principles' approach.



A Poster on Fatigue from the DASC series on Army Groundcrew Human Factors

Aircraft marshalling at night during Op TELIC

The 5 steps are:

- Identify the Hazards – fatigue caused by working extra hours or shifts.
- Assess the Hazards – how long will the extension be?
- Make Risk Decisions – is the completion of the task really worth the risk?
- Implement Controls – to mitigate the effects of fatigue.
- Supervise – good supervision is more important than ever under increased pressure.

The 4 principles are:

- Accept risk when benefits outweigh the cost.
- Accept no unnecessary risk.
- Anticipate and manage risk by planning.
- Make risk decisions at the right level.

So far, it seems very sensible. But evidence from reports from the field suggest that these steps and principles are not being followed. In many incidents, the occurrence has happened because of chasing an unfeasible timescale, which ultimately was self-imposed rather than operationally necessary. The 'big picture' view of priorities and timescales is invariably lost as huge efforts are made at the local level to meet a timescale imposed from above which may well be flexible, if the communication takes place between the levels to allow the flexibility to be exploited. Most HFORs and Incident Signals state that achievement of the task did not override the need to take the time to do it safely – useful to know beforehand!

The discipline of Risk Management by managers is a proactive activity which takes the responsibility for working the extra time from the person doing the job (self-pride encourages them to get the job done, and not let the boss down) into the leadership sphere where the risks associated with fatigue-inducing hours are managed properly.

While even generalised guidelines can be helpful in setting up a fatigue management system, they are based on an assumption that personnel turn up for work in a refreshed state. Professor Drew Dawson of the Centre has devised two 'rules of thumb' on this question for the Centre for Sleep Studies, University of South Australia. The first is the '5/12 start rule' which means that the person should have had at least 5 hours sleep in the past 24 hours or 12 hours sleep in the past 48 hours. This rule refers to actual sleep, not the time away from work. This provides an auditable, quantitative methodology for determining that staff are getting sufficient sleep. The complementary 'Finish Rule' states that the period from wake-up to the end of shift should not exceed the amount of sleep obtained in the 48 hours prior to commencing work. A simple, yet effective, management tool introduced by the Army for their drivers and which could adapt well to maintainers is a card on which the man or woman notes on a time grid the hours they have slept, worked, rested etc to give managers an easy guide to how much longer they can be usefully employed that day.

There is also, of course, a responsibility on the individual to ensure that they use their 'off watch' time to ensure that they do get sufficient sleep and do not partake in extraneous activities which will cause danger in their 'on watch' time. Apart from operations or exercises when 'off watch' activity can be regulated, the issue of how much influence an employer can have on a person's time away from work is very much a case for education and awareness to ensure that sufficient sleep is taken. An appreciation of the effects of fatigue can only be gained through a programme of awareness training at all levels of the workforce from maintainers in the hangar or line, movers, supervisors, through Squadron and Station hierarchies. Fatigue Management is one aspect of the Human Factors policy, which the DASC aims to introduce Defence- wide in the near future. Like the Civil Aviation world, the requirement to provide training in the limitations of human performance in the workplace will be mandated to be carried-out every 2 years to ensure that the message is refreshed.

Fatigue Management is a key aspect of aviation safety. Rather than a means of restricting activity, fatigue management should be a proactive way of achieving the task safely and delivering Operational Capability in a more robust manner.

A technician loads munitions for a sortie during Op TELIC

Reprinted with kind permission of Aviate Magazine.

Alcohol Limits and Flying

by Anthony Barrett-Jolley

A herd of buffalo can move only as fast as the slowest animal. When hunted by predators, it is the slowest and weak ones that are first caught and killed. But this is good for the herd as a whole because the speed and health of the group is improved by this culling of the weak. It is the same with the human brain: it can act only as fast as the slowest brain cells and excessive use of alcohol kills the weakest cells first. Therefore it follows that the more alcohol one consumes the quicker and more efficient the brain becomes. That is why one always feels smarter after a drink or two. Cheers!

Convinced?

Last year in Europe and the United States there were several occasions when pilots were alleged to have been "over the limit" when reporting for flying duties and you may have seen the photographs of the deeply ashamed pilots. It is a hot tabloid issue. Before we lock ourselves into the flight deck, there is a whole series of staff who would justifiably "blow the whistle" should any suspect that we had been drinking alcohol recently. Further, in these days of tight security checks, we are all under much closer direct scrutiny than in the past. Several countries have introduced random alcohol and drug tests for aircrew regardless of nationality or licence.
And take note of this:

In 1996 JAR-OPS set the following limits for flight crew:

1. 9 microgrammes of alcohol per 100ml of breath,
2. 20 milligrammes of alcohol per 100ml of blood,
3. 27 milligrammes of alcohol per 100ml of urine.

These numbers are just a quarter of the British drink-drive limits. The "Railways and Transport Safety Act 2003" has brought these rules into law in the United Kingdom and the Department for Transport has given the police power to conduct a preliminary test, using a "road side" type breathalyser, on reasonable suspicion that the individual concerned has conducted an aviation function at a time when his/her ability to do so has been impaired by alcohol or drugs. Again, if there was reasonable suspicion, following an accident, the police may decide to test anyone involved, flight crew or others. There is no provision for random testing in this act. Ideally, the

amount of alcohol in the blood should be zero but because all human beings can create small amounts of their own, the level was set at 20mg per 100ml to avoid marginal prosecutions. Without legal doubt, anyone who exceeds this level will have consumed alcohol in the recent past.

The same limits apply to pilots, other flight crew, cabin crew and Air Traffic Controllers.

There is a sting in the tail, too. It has been a long day, or night, and the cabin crew has prepared an after landing cocktail. We have all been there and done that. But we cannot do it anymore. The legislation specifically includes ancillary duties such as filing reports after flight. In effect, this means we must not have a drink until we are "off the premises".

And now for the first time licensed aircraft maintenance engineers are included in the legislation. These limits have been set at 80mg/100ml in blood. This higher limit, the same as the UK driving limit, acknowledges the fact that equally important as their role is, rapid reaction is unlikely to be necessary. (No humour intended.)

The procedure in the United Kingdom is that with "reasonable suspicion", a uniformed police constable can conduct an immediate breath test. If it indicates that an offence may have been committed, you may be arrested and taken to the police station where you will be asked to provide a further specimen, most probably of blood but it could be urine or a further breath test, for laboratory analysis. Obviously, without reasonable cause, you cannot decline these tests.

If this second test shows you to have been over the limit, you will be charged with an offence and be given a date to attend court.

Should the police have serious concerns that you are unsuited to your position of trust in the aviation world, your employer or professional body may be informed even before the results of the laboratory analysis are available. This applies to foreign workers and licence holders, too.

In the event that the Civil Aviation Authority considers that you may be alcohol or drug dependent and as such are a risk to flight safety, your licence may be suspended and you may be invited to take part in a treatment and rehabilitation schedule. If successful, the licence suspension would be lifted.

In the United States, the Department of Transport carries out 10,000 random alcohol and drug tests on pilots each year and some countries in Europe, e.g. The

Netherlands, have introduced similar legislation. Pilots' unions may object to this approach but it is such an emotive issue for the travelling public that our politicians may find that they have little choice but to follow suit.

And yet another warning: it has been known for some wiseacres to carry a sweet smelling mouthwash before reporting for duty after a tipple at lunchtime. If you think that could fool a breathalyser, think again! Colgate's Plax contains 5.7% alcohol, Johnson and Johnson's Reach 7% alcohol and Pfizer's Listerine a staggering 22% alcohol. The mouthwash manoeuvre will simply result in your arrest and a quick trip to the police station for further testing.

[NB The formulations of these products may not be universal; these are the numbers for one particular country.]

Let us look again at those boring facts: Regardless of the total amount consumed alcohol is removed from the body at a steady rate of about one unit, 15ml, per hour. Gender, age and body mass affect this rate considerably. A unit is half a pint, a small glass of wine or a miserly pub measure of spirits. (There are 27 or 28 shots, units, of Scotch in a publican's one litre bottle). It is highly likely that a snifter or two or three followed by only a short rest will cause the individual to be committing an offence, let alone more serious drinking.

However, we must not try to calculate our own safe limit. There are some self-assessment tables available on the Internet but individual metabolic rates vary so much that the only way to be certain we are alcohol free is to abstain completely from even moderate consumption for twelve hours or so before beginning any duties. And for heavier sessions? Be warned, there have been some UK prosecutions of car drivers who have been over the 80mg limit after a night in bed. From now on, an evening in the bar followed by an early morning departure is likely to be criminal. Six pints of premium beer consumed in the four hours before midnight will still be detectable at 11.00 the following morning.

Cold showers, black coffee and other quack remedies are just that; the only cure for intoxication is time.

This article is focused on alcohol but the legislation includes illicit drugs. Of course, properly prescribed drugs such as antibiotics or anti-depressants can also interfere with work performance; always check with the prescriber and bear in mind that certain combinations of alcohol and, say, anti-histamines, can have dangerous effects. Even over-the-counter medicines can have unwanted effects, e.g. "Sudafed", a treatment for the relief of nasal congestion, can cause side-effects including anxiety, tremors, rapid pulse and headache. The basic rule is to take no medicines unless you are certain that there can be no adverse effects on your work.

Since the beginning of 2003 criminal record checks are made for both first issue and renewal of airside security passes. It is unlikely that a national employer would wish to retain your services after an alcohol related offence but it goes further. To obtain an airside pass anywhere in the EU requires a criminal record check in your own country. It follows that if you cannot get a UK pass then you are unemployable in aviation throughout the EU.

In Britain, most people drink and most pilots drink more. Now, EU statistics show that collectively we are damaging our health. Apart from accidents, some violence and the car driving issues, chronic liver disease is increasing in England paralleling the increase in alcohol consumption.

Moderate social drinking is a perfectly acceptable and enjoyable pastime in Western culture but there is drinking and then there is problem drinking. Perhaps drinking alone is not a good idea. Try answering the following questions truthfully:

- Do you drink to calm your nerves or to forget worries?
- Do you feel guilty after drinking?
- Have you tried, but failed, to cut down?
- Have you lied to conceal your drinking?
- Have you hurt yourself, or someone else, as a result of drinking?
- Are you drinking more and more to achieve the same result?
- Do you get ratty when you cannot or have not had a drink?
- Have you medical, family or social difficulties because of drinking?

If the answer to any of these questions is yes, it is reasonable to conclude that you are at least partly dependent on alcohol

and you really must take care. A serious attack of self-discipline is required. Why not seek help from your family, your GP, your AME or your union? In the morning it may be easier to leave the bottle on the supermarket shelf than to leave it in the cupboard at home in the evening. You cannot drink it if is not there.

And the shape of things to come? There is a huge amount of research directed towards identifying problem drinkers in all walks of life. Some new tests for the breakdown products of alcohol are being developed that will make it much more difficult to conceal a drinking problem or a recent heavy session. For example, ethyl glucuronide lasts for up to five days in urine and another substance, phosphatidyl ethanol, is present in the blood for about three weeks after a moderate drinker stops. Further breakdown products appear in the blood some twelve hours after drinking and they are stored in the hair. Researchers have been able to distinguish between heavy and light drinkers by looking at hair samples.

We in aviation have become proficient at allocating priorities and perhaps that is the greatest skill that an aviator needs professionally: for pilots, wings level and climbing and the rest follows, for everyone else, a clear focus on the task in hand. Now, should we apply these same skills to our social lives?

What are our priorities? Who has control? What three things does drink especially provoke?

Marry, sir, nose-painting, sleep, and urine. Lechery, sir, it provokes and unprovokes: it provokes the desire but it takes away the performance.

Book Review

Risk Management and Error Reduction in Aviation Maintenance

by Manoj S. Patankar and James C. Taylor

ISBN 0-7546-1941-9

This book, aimed at both aviation maintenance students as well as practitioners, is another commendable contribution to the wealth of material now available which discuss the area of Risk Management and Error Reduction in Aviation Maintenance.

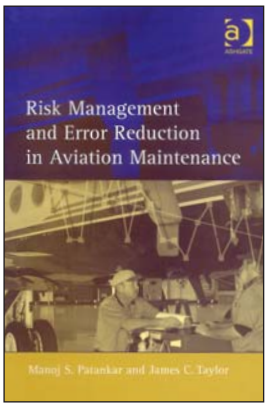
The book opens by setting the scene with an overview of industry safety statistics and a number of supporting case studies. The authors then discuss the differences between national, professional and organisational cultures and how the interaction of these cultures can be an impediment to the establishment of a safety culture.

One of the key themes that is well developed within the book, is the area of Maintenance Resource Management (MRM). The intention of Maintenance Resource Management programmes to provide skills for aircraft maintenance staff to manage errors that are within their control is expanded into the type of MRM programmes that have been tried. A number of related case studies are provided to illustrate the points made. The book explores the impact of MRM on the aircraft maintenance professional and his/her interpretation of acceptable risk. Professionalism issues and the value sets within the maintenance community are discussed at length and their impact upon the safety culture of the organisation. There is a small chapter on the return of the investment required to service MRM programmes, which is an absolutely fundamental aspect needed to persuade the financial controllers within organisations of the benefits to be gained by these programmes.

To conclude the book, the authors have included summaries of the better known safety programmes and sources of safety data. In support of this there is also an excellent list of references.

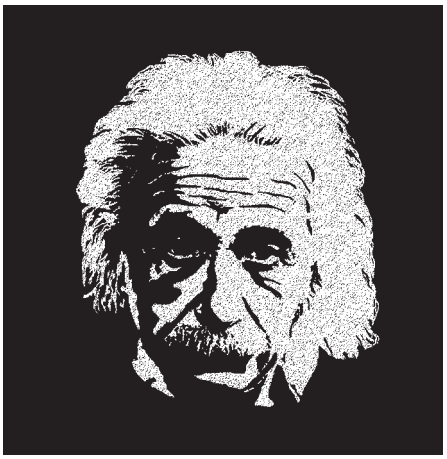
Although the book claims to be aimed at aviation maintenance students and practitioners, the bias is towards students being structured as it is with learning objectives at the beginning of each chapter and review questions at the end. However, it does succeed in being an excellent text for an academic programme of study that explores why Aircraft Maintenance personnel behave the way that they do and a valuable reference for Error Reduction Practitioners in the workplace.

Reviewed by:
Steve McNair MIQA Quality Manager
Flybe Aviation Services



Flying Safety & Einstein's Paradox

by J.S.T. Ragman



One hundred years of flight safety briefings, yet the accidents continue. One hundred years of regulations, standard operating procedures, notes, cautions and warnings, which, while no doubt saving countless lives, cannot save all lives. One hundred years of "lessons learned", each new lesson illuminating a previously unexposed gap in the flight safety net.

As each new "lesson learned" has illuminated yet another gap in the flight safety net, the fragile and porous nature of that flight safety net has become readily and obviously apparent: There will always be the unforeseen element, the unknowable factor, which, under the correct alignment of circumstances, will reach out to tap the aviator upon his/her shoulder.

Enter Einstein: "As the circle of light increases, so too, does the circumference of darkness." With each successive flight safety accident, with each successive "lesson learned", with each successive illumination of a gap in the flight safety net, our "circle of light" increases – and that is a good thing: We learn something, we identify yet another unforeseen element, we know more. Yet, as the "circle of light" increases, so too, does the circumference of darkness: We are reminded, yet again, that there is much we do not know. And that too is a good thing, for it is that which we do not know, that which resides beyond the circle of light, which can – and as evidenced by each successive accident, does – reach out to tap us upon the shoulder.

The "circle of light, circumference of darkness" model takes on ever-greater weight when one considers that so many accidents happen despite aircrews doing absolutely everything right; drawing upon

every previous "lessons learned", touching all the bases, crossing all the T's, dotting all the I's. Put another way, the accidents continue despite flawless operation with the "circles of light" of aircrew knowledge.

The model takes on yet another order of magnitude when one considers that so many accidents happen despite the stellar qualifications (check airmen, flight examiners, instructors), experience (thousands of hours of flight time, hundreds of hours of combat time, scores of carrier landings), and reputation ("he/she was the best") of the accident aircrews: they had "mastered the circle of light", they knew it all, forward and backwards, inside and out. Yet, it is frequently that which resides beyond the "circle of light," that which resides within the "circumference of darkness" which prevails over aircrew mastery of the circle of light.

On a recent cross-country, an aircrew held a long-running discussion on the question of "What constitutes an exceptional aircrew member?" Perhaps Einstein would suggest that in addition to our quest as aircrew members to "master the circle of light" (know our job, practice good crew resource management, manage error), we might do well to recognise and appreciate the magnitude and significance of the "circumference of darkness", for it is within this ever-widening realm that the unforeseen resides, and it is from within this realm that many of our fellow aviators, past, present and future, encounter the unexpected.

"Man's flight through life is sustained by the power of his knowledge." The "circumference of darkness" is out there. Paradoxically, with each new "lesson learned", with each new increase in the "circle of light", the "circumference of darkness" likewise increases. Know it. Never forget it. Einstein was a smart guy.

"J.S.T. Ragman" is the pen name of a C-130 pilot and unit commander in the Air Force Reserve. He is also a Boeing 777 pilot for a major airline.

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Missile Strike

The crew of a DHL A300 heard a loud noise and the aircraft began to shake as it was hit by a hand-held missile.

The pilots were able to guide the aircraft to a safe landing using only engine power settings. The aircraft lost all three hydraulic systems and all flight controls.

It has been said that the incredible feat of airmanship is explained partly by a safety seminar the captain attended in Brussels earlier in the year. In a stroke of luck, one of the speakers was retired captain Al Haynes. In 1989, Haynes commanded a UA DC10 in which all the hydraulics had been lost due to a catastrophic engine failure. Using engine thrust alone, the United crew was able to crash land the crippled aircraft at the Sioux City airfield and the majority of the passengers survived.

The DHL crew headed back to Baghdad International Airport after it was hit at 8,000ft. When the missile exploded, the crew first thought an engine had suffered an uncontained failure, but all readings were normal. The hydraulic pressures started dropping and a radio call from the ground told them the wing was trailing smoke. The captain could see the wing was on fire. The crew had problems controlling the aircraft and at times did not think they would make it. The captain recalled the Haynes presentation and started using engine thrust for control, and was surprised to find it worked rather well. The aircraft circled twice while the crew manually lowered the undercarriage. They then lined up for a 20-mile straight-in approach at around 225kts. On landing, the aircraft ran off the left side of the runway and went through barbed wire fences before coming to rest near the Fire Station.

In the past 25 years there have been 35 shoulder-fired missile attacks on civil aircraft, 24 resulting in crashes.

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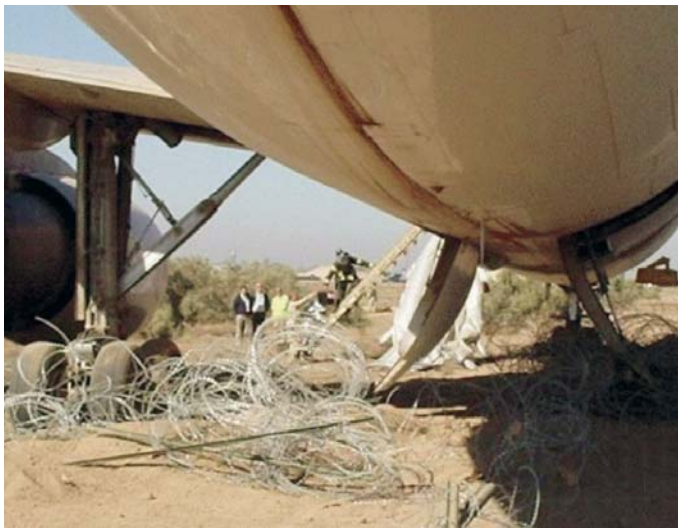

The Modern Pilot

Help needed - Dr Simon Bennett asks for pilots' help in his research

Commercial aviation is a dynamic and innovative industry. The rate at which the industry is changing can leave one breathless. Since 9/11, for example, there have been some 40 new entrants in the low-cost sector. Commercial aviation's dynamism creates wealth and opportunity. Commercial aviation drives innovation, facilitates business and provides (affordable) opportunities for leisure and cultural exchange. It also generates challenges for employees, managements and regulators — like the need to maintain an up-to-date picture of what is happening at the 'sharp end'. Failure to understand the 'lived experience' of the modern pilot may have serious consequences for the economic and safety performance of the industry.

Flight crew constitute the heart of commercial aviation. Their dedication makes commercial aviation what it is — the largest, most dynamic and impactful enterprise the world has ever seen. If the industry is to continue to prosper and grow it must understand its most vital asset — the pilot. This is the purpose of my research. I have secured a contract with the technical publisher Ashgate (UK) to write an account of the modern pilot. The book will give pilots a voice ... and a large audience. It will describe pilots' ambitions and concerns. It will give pilots the opportunity to reflect upon the industry, its prospects and their role within it. It will examine lifestyles, family and other support structures. It will look at commuting and lodging. It will discuss rostering and other pressures. It will review patterns of education and employment. It will, in short, draw a sociological picture of the industry's key asset — the pilot. This kind of comprehensive sociological review has not been attempted before. The industry has told me it is long-overdue.

The required information is gathered via a questionnaire. The questionnaire has 50 short questions. Some require 'yes/no' answers. Others give respondents the opportunity to express opinions and develop ideas. The survey is anonymous. Pilots cannot be identified from the questionnaire. Airlines will not be named. This is generic research intended to benefit the industry as a whole. Information supplied in this way will be used only for the purpose of writing the book. The book will be written in an open and accessible style. It will be reasonably priced. The objective is to reach and influence as wide an audience as possible, from educators/trainers to employers to national and international regulators. Understanding pilots as social beings with family and financial commitments, hopes, concerns, insights and ideas will (in theory, at least) provide for the more sensitive management of the industry's key resource. By developing a textured understanding of pilots it will provide an opportunity to improve management-worker relations. All those involved in the industry, from flight crew to operations staff to passengers will benefit.

If you are, or have been a Captain or First Officer (for any type of airline, from flag carrier to LCC, in any country) and would like to help you can obtain a questionnaire by e-mailing me at sab22@le.ac.uk. A questionnaire will be e-mailed to you by return (as a simple Word document). To preserve respondents' anonymity completed questionnaires should be posted back to me at The University of Leicester, 154 Upper New Walk, Leicester, England, LE1 7QA. The book will be published by Ashgate in 2005.

Topical Legal Issues

This edition's legal column covers a range of developments. First however, an item which comes too late to cover properly this time. In our first article for FOCUS, in the Winter 2002 edition, I wrote, in the context of civil litigation arising from an English air accident:

"in the future, in a political environment in which a desire to punish the "guilty" becomes increasingly prevalent, different considerations may come into play".

Is the recent news that four Italian officials – the ATCO on duty, the airport manager and two members of the Italian ATC Agency ENAV – were jailed for up to eight years on manslaughter charges arising from the Linate runway collision disaster in October 2001 an indication that the environment is indeed changing? While it is not the first occasion on which operating crew have been prosecuted it does seem to be unusual for management officials to be targeted in this way. Although we are not in a position to comment on the specific rights and wrongs of this particular accident the potential implications may be of wider importance and there seems to be widespread concern in the industry. In the last edition of FOCUS Doug Church of IFATCA wrote a powerful denunciation of the use of criminal prosecutions as a means of improving the safety culture within the industry. The news is too recent for us to comment any further at this stage but we propose to do so in the next issue.

Montreal Convention 1999 in force in Europe in June

There has been a certain amount of press fuss about the UK ratifying the Montreal Convention 1999. Much was made in the Government's press release about securing "a better deal for air passengers" with effect from late June 2004 when MC99 comes into force for the remaining EU Member States[1] . Given that liability issues arise from time to time at UKFSC meetings, the readership may be interested in two aspects. First, does this make a difference to air carriers in terms of liability to passengers, and second, does it matter to the flight safety community? The answer to both is, probably, no, at least for EU carriers, but the reasons are a little complex, and interrelated.

Historically an airline would almost always be liable to its passengers or their dependents, but theoretically could limit its liability – to fairly low levels – except in the most serious cases of default. The reality for many years has been that most accidents resulted in passenger settlements in excess of those limits, for a variety of factors. One would be the recognition of the risk that a Court might conclude an airline had been seriously at fault. Moreover EU law has stopped EU airlines from relying on limits of liability under SDR100,000 for nearly 6 years. In the future if an accident occurs where the carriage is subject to MC99 the airline may be able to avoid liability above that level if it can show that it was not in any way negligent or that some other party was solely at fault. However if an aircraft operator fails to act in accordance with the standards to be expected of the reasonable and prudent operator and that failure causes or contributes in any way to an accident, the carrier will be liable for full compensatory damages.

This is much the same as the test that has been applied to EU carriers since October 1998 so the difference in relation to passenger traffic is not great. For cargo, the ability of cargo interests to recover in full is reduced as limits upon the airline's liability, based upon the weight of the cargo, are unbreakable even in cases of intent or recklessness.

However, even though the trend is towards unlimited liability to passengers, this is not an issue with which the flight safety community should be unduly concerned. Firstly any legal liabilities are (almost invariably[2]) fully insured on the basis that full compensatory damages are payable anyway, and not on the assumption that liability may be limited by Convention or contract to US$20,000 or even SDR100,000 per passenger. Moreover most airlines and their flight

safety professionals are working to achieve standards which, day-to-day, exceed not merely a legal compliance level but are aimed at achieving best practice. Sadly, from time to time, a combination of circumstances may result in an accident in which an individual, or a group of individuals, may perform below the standard which would reasonably be expected. Nevertheless, a general change in the grounds for unlimited liability is not a basis for changing the standards to which we aspire. The bar is already high: it does not need to be pushed higher on account of this factor.

European Union enlargement

Perhaps a factor likely to be of greater relevance to the flight safety community is the addition of ten new Member States[3] to the European Union. Many of these are former Eastern bloc states whose economies and air transport industries may be at a different stage in their development from those of existing EU countries. These states' accession to the EU opens up opportunities within the air transport industry. For instance EU carriers have full traffic rights within the territory of the EU – so a French carrier, for example, would no longer have to apply for designation under a bilateral air services agreement to operate services between Paris and Warsaw. Conversely, a Hungarian carrier is now entitled to operate services between London and Rome, if it so wished (and could get the slots – but that is another story!). Conceivably there will therefore be more services in what used to be Eastern European airspace. If the result is more carriers operating in an unfamiliar environment, perhaps coming up against different local procedures, a different set of language issues and so on, the transitional phase may entail certain operational safety implications.

On the other hand, the accession states will now be subject to European regulation in many other respects, not least that their airworthiness regulation procedures (and in due course airports, flight operations and so on) must comply with the rules now being promulgated by EASA. Since some of these states are the first members of the former Soviet bloc to join the EU this may be an interesting cultural process for both them and the EU itself.

FAA Foreign Repair Station security audit

Many readers will be well aware that the FAA is insisting on a security audit of all (650-odd) overseas repair stations licensed to conduct maintenance on US-registered aircraft. This is a reaction to the concern that international terrorism may try to infiltrate the aviation system via overseas agencies, but it is causing great concern to repair stations in Europe. The threat is that if the US audit reaches the conclusion that security standards are not what is being achieved in the US, the FAA will pull a repair station's licence, with the economic consequences that flow.

The timetable is as follows: the Transportation Security Administration[4] will issue final regulations by 8 August 2004. These will cover both foreign and domestic repair stations. Within 18 months thereafter, all foreign repair stations[5] must undergo a security audit. Any security deficiencies thus identified – in the determination of the Under Secretary for Border and Transportation Security – must be rectified within 90 days – at the repair station's cost. If it is not, or if the audit is not carried out within the 18 month period, the FAA must withdraw the repair station's licence. Furthermore, any determination of an immediate security risk – e.g. during the audit itself – may result in immediate revocation of the licence.

The legislation raises a number of complex issues. Of course the aim of the Chicago Convention system is that there should be commonality of standards applicable to airworthiness and maintenance of aircraft. However this has not resulted in universal recognition of licences, approvals and so on to the extent that one licence enables an individual or organisation to work on aircraft of every contracting state.

Moreover the system makes it clear that continued airworthiness is the responsibility of the state of registration and so it is within the responsibility of the United States to ensure that businesses licensed to conduct maintenance upon US-registered aircraft meet the standards which they themselves set.

Such conduct does, however, call into question compliance with the spirit, at least, of Article 37 of the Chicago Convention, under which contracting states commit to "collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures and organisation in relation to aircraft, …". It is of course well known – and a bone of contention for the European industry - that since September 2001 the United States government has lent enormous financial support to its own industry in meeting the cost of additional security measures as well as the economic cost of the business downturn. European governments have not done so to the same extent, largely because of European law against state aid. There is also a degree of concern that the effect of this process will be further to restrict the ability of non-US repair stations to qualify, or maintain their qualification, to conduct maintenance on US-registered aircraft.

It is of interest that the Aeronautical Repair Station Association, a US-based trade association representing both domestic and overseas repair stations, has already submitted a forceful brief challenging not only the method of the proposed procedure – for instance how far would a public process of discussion of current security systems and their weaknesses actually prove to be a road map to a would-be terrorist – but also questioning whether there is a real risk. ARSA notes that the Federal Government has yet to identify any specific risks; however the organisations most closely connected to the finished product (i.e. a complete aircraft) are already subject to extensive security measures by virtue of operating from an airport. The threat must reduce considerably as one moves into the spectrum of small off-airport repair stations whose functions may well be limited, for example, to component overhauls which are subject to further testing before reinstallation.

The European industry is trying, through ASD's Repair Station and Maintenance Security Working Sub-group, to co-ordinate its response to the US measures. The European perspective will doubtless add different issues such as compliance with European law on employment screening, where US attitudes may differ: witness the current difficulties over supply of passenger data by European airlines to the US Government.

And finally: the demon drink

At a recent meeting it was noted that, the Railways and Transport Security Act 2003 now prescribes blood alcohol limits for aircrew and ATCOs. What we would add is that it extends to LAMEs; the previous legislation in the Air Navigation Order did not cover the ground-based functions but simply prohibited "drunkenness" in an aircraft or being under the influence in a way that impaired a crew member's ability to act. The existing legislation remains in place so the prohibition upon a passenger being drunk in an aircraft remains in place.

In conclusion we should record our pleasure that the Committee felt fit to ask us to act as co-opted legal advisers and would like to thank the Committee for that support. We hope that as a department we will be able to assist the Committee and its members for a considerable time and justify the confidence placed in us.

Simon Phippard
Barlow Lyde & Gilbert

[1] Greece and Portugal have already ratified, despite EU efforts to ensure all Member States ratified simultaneously.
[2] A European regulation is likely to be finalised shortly specifying precisely what levels of passenger, cargo and third party (including surface damage) liability insurance cover has to be carried by all aircraft operators using European airspace. Terrorism risks will have to be covered.
[3] Estonia, Lithuania, Latvia, Poland, Hungary, the Czech Republic, Slovenia, Slovakia, Cyprus and Malta
[4] Now part of the Department of Homeland Security rather than the Department for Transportation.
[5] The papers we have seen do not specify whether domestic repair stations are automatically going to be subject to a similar audit process: the TSA must produce a "plan" to strengthen oversight of domestic repair stations.

The Global Eagle Expedition

by Captain Andy Mortimore

Expedition Global Eagle is the name of the attempt to be the first to fly an autogyro around the world. I recently attended UKFSC FSO Course at the time of the expedition's departure on 26th April and, having explained my own limited participation in the project, was asked to write an article.

The head of this intrepid venture is WO2 Barry Jones, a 37 year old British Army Lynx pilot. Barry has been flying with the Army Air Corps since 1994, serving in the UK, Canada, and the Balkans. I had flown with Barry on several occasions and, after leaving the Army, have kept in touch, visiting Barry several times. On one of these visits he showed me a video of an Autogyro flying an amazing display sequence. At the end of the tape he asked "Do you reckon I could fly one of those around the world?"

The idea for the world trip came to Barry on his first ever flight in an Autogyro at Carlisle. Barry had seen these remarkable machines flying around Carlisle whilst carrying out training flights in the area. After qualifying on the type, Barry started to put together the plan for what would eventually become Global Eagle. Such a large undertaking requires an equally large amount of planning and administrative work to get it going. As well as putting his ideas forward and getting them accepted and approved by the higher echelons of the Army, Barry started putting together a team to work on the project, sourcing an aircraft and began looking for something to bring the project to the attention of the media and the general public. He established a small backup team of fellow Army Air Corps pilots, ground crew and technicians from the Royal Electrical and Mechanical Engineers. For most of the actual world trip though, Barry will be very much on his own.

Eagle 1, a Magni VPM16 was purchased from South Africa and imported to the UK. Once in the teams Hangar at Dishforth in North Yorkshire, team engineer Andy Wilson stripped the machine into its component parts and began refining and rebuilding it to his exacting requirements. It was also given an amazing paint job which caught the eye of everyone who saw it. Two of the most important features of the rebuilt craft were its long range fuel tank, which would be required for the record attempt, and the crashworthy front seat which came from the world of rallying. This would later prove a lifesaver. The team also built a website to publicise the trip as they set about looking for a major sponsor – something that would prove to be very difficult. Barry also gave a series of presentations to school children all over the country, explaining the planned trip and the finer workings of an Autogyro, in a way that was understood by the children. The reason for the school trips and educational theme came about because of Barry's own learning difficulties; being dyslexic Barry has had to overcome a multitude of problems, which he has done. In doing so he wanted to share his experiences with the children and show them that Dyslexia is not a disability but actually a gift. During this time he had also gained the support of General Sir Mike Walker, Chief of the Defence Staff, who became Patron of the project.

The World Range Record

For most people, the autogyro is associated with "Little Nellie" from the Bond movie "You Only Live Twice". The pilot of "Little Nellie" was Wing Commander (Retd) Ken Wallis, the intrepid Gyro pioneer. He had set the record for the longest distance flown in a single leg by an Autogyro in 1975, from

Lydd in Kent to Wick in Scotland. Barry contacted Ken to discuss the idea of setting a new record and the plan began to take shape. Barry planned to fly from Wick to Culdrose in Cornwall. A distance of 584 miles, this would break the previous record by some 40 miles. As the chosen date approached, long range Met forecasts indicated that a change of plan would be necessary. On the 24th of February, 2003, Barry set off from Culdrose and set course for Wick. The journey lasted for 7 and a half hours. Barry landed at Wick and was met by the media and a handful of airport staff. A new world record had been set. The team recovered to Dishforth and continued planning for a June departure on the world trip. Events at home and abroad, however, were about to conspire against them.

The record was ratified by the FAI a few months later but by this time things were not going the team's way. The Gulf War was in full swing, the SARS epidemic meant a lot of closed borders and the weather windows for the trip were fast approaching. In April, continuing with his schools visits, Barry flew the Eagle to Pirbright camp in Surrey to give a presentation on the project so far to a group of Army recruits.

On completion of the presentation Barry and team member Jim Donald, took off from the camps parade square. By his own admission, Barry mishandled the aircraft, it lost height, collided with a building and crashed to the ground hitting a small tree and a sign post in the process. Due to the decision to fit the crashworthy seat, Barry escaped with a couple of broken ribs and some bruising. Jim also suffered bruising to his legs. Those who saw the accident wondered how they had got out alive. The aircraft was a write off and it looked like the project was over. With only 3 months until the planned departure date the team were now without an aircraft and the pilot was in no condition to fly.

Unknown to Barry, the original manufacturers of the aircraft, Magni, had been watching the project from their base in Northern Italy. They now made contact with the team and agreed to sponsor the project with a new aircraft, the M16-2000. An engineering firm who make bespoke trailers got in touch and sponsored them a custom built trailer. The deal for the aircraft was finally signed in a ceremony at the Waddington Airshow in June, Barry's intended starting point for the world trip. The project was back but, with the weather windows now closed, the team would have to wait until early 2004 before they could launch again. The time until then would be spent getting the new aircraft through its section T, CAA inspection. This would be required as it was the first of a new type in the country. The Setting of the new range record had the desired effect. The project was now attracting sponsorship, albeit in a small way, from many companies. A major financial sponsor though, was still missing. The team attended heli-tech at Duxford in September and this raised more interest in both the project and the new aircraft. The team also continued with the schools visits and had completed over 200 by the time the world trip started.

Despite much hard work, it became obvious in February 2004 that the new aircraft would not get its section T certification in time for the world trip if a spring departure was to go ahead. Faced with a possible delay or cancellation of the project, the team sourced another VPM16 machine and prepared it for an April departure.

The trip will take approximately 4 months to complete. No leg of this epic journey is near as long as the range record already set. The plan is to fly 4-5 hours a

day, cruising at around 80 miles an hour and follow the route established by pilot Brian Milton when he became the first to make the journey in a Microlight in 1999. The diplomatic clearances required for such a journey are being done by the Army's flight planning department at Netheravon on Salisbury Plain. Contact between them and Barry will be maintained by a mixture of land, mobile and satellite phone. As the trip will take in some of the world's more remote and hostile areas Barry's personal equipment has been carefully chosen and, in some cases, specially modified to cope with the expected harsh conditions. For colder climes, a heated suit, powered by the aircraft's electrical supply will be worn. At 80 MPH, the wind chill factor will be severe at times. Head protection is in the form of a protective helmet with both clear and tinted visors. For large water crossings, Barry will be wearing an immersion suit and life jacket. 2 GPS navigation systems and a transponder have also been fitted. For safety, the aircraft is equipped with an ELT, Barry has a PLB in his life jacket and sponsors Brietling have supplied one of their Emergency Beacon watches. A GPS tracking system has also been installed which, as well as the obvious safety advantages, also permits the flight to be followed by anyone logging on to the team's website. The tracking system uses OrbComm instead of a GPRS system due to the fact that GPRS does not yet have full world coverage. At present, the tracking system updates every 30 minutes whilst Barry is in flight. Plans are being put in place to try to reduce this time interval but by the very nature of the system it may not always be possible.

Charities

Part of the project not mentioned so far is its charitable side. Barry is raising money, whilst on the trip, for 3 charities - The Dyslexia Institute, The National Society for the Prevention of Cruelty to Children and the British Red Cross Sept 11 appeal. Barry and two of his sons are Dyslexic and he is using the project as a means of not only highlighting the condition but also proving to others who are dyslexic that it doesn't have to be something that holds them back in life.

The Departure

The departure date of April 21st had to be changed when, with one day to go, a problem with the fuel supply became apparent. The problem was traced to a sticky one way valve and Monday 26th was now the start date. Barry departed Middle Wallop in the full glare of the UK media, accompanied by the Blue Eagles display team and an Apache Attack Helicopter.

The first leg, to Manston in Kent was uneventful but, on the second leg, to Ostend, the aircraft's radio failed which led to Andy Wilson making a hurried cross channel dash to fix it.

Aircraft repaired, Barry continued his journey. At the time of writing, Barry is in Athens and all being well will arrive in Cyprus on Thursday 13th May.
Anyone interested in following the project, wanting details of the equipment carried, or even providing assistance or sponsorship, can do so by visiting the team's website. www.globaleagle.co.uk

UK FLIGHT SAFETY COMMITTEE

Annual Seminar 2004

BREAKING THE BARRIERS IN COMMUNICATION

Enhancing Aviation Safety Through Better Communication

20th/21st September 2004

The Radisson Edwardian Hotel Heathrow

SEMINAR OBJECTIVE

Compartmentalised management structures can be counter-productive from a safety perspective. This Seminar will raise awareness and enable discussion about breaking down these barriers and offer some constructive suggestions.

PROGRAMME

20th September 2004

2000hrs Seminar Dinner
Jim Ratcliffe, Willis - After Dinner Speaker

21st September 2004

0800 - 0900	Registration
Session Chairman - Ian Crowe - Willis	
0900 - 0915	Welcoming Introduction **Stuart McKie-Smith** **(Chairman - UKFSC)**
0920 - 0955	Breaking the Barriers within the Military **Arthur Gibson - Defence Helicopter Flying School**
1000 - 1035	The Legal Ramifications of Poor Communication **Charles Haddon-Cave**
1035 - 1055	*Refreshment Break*
1055 - 1115	Keynote Speech **Rod Eddington - British Airways**
1120 - 1155	Understanding how Communications Succeeds or Fails **James Reason**
1155 - 1230	Questions
1230 - 1340	*Lunch*
1340 - 1415	One Voice in European ATM **Kathy Nuttall - GATCO**
1420 - 1455	Engineering Management and Communication **Stewart John - Director of TAECO**
1455 - 1510	*Comfort Break*
1510 - 1545	Transport Accident Investigation - Working together across the Modes **David King - AAIB**
1550 - 1625	Lessons Learned in the Rail Industry **Aidan Nelson - Rail Safety & Standards Board**
1625 - 1655	Questions
1655 - 1700	Closing Speech **Chairman UKFSC**

Seminar Information

- **Hotel Accommodation**
  Hotel Accommodation is not included in the Seminar Registration Fee. A rate of £147 (including breakfast & VAT) has been negotiated with the Radisson Edwardian Hotel (valid only until 23rd August). If you require accommodation please contact the hotel directly on Tel: +44 (0) 20 8759 6311 and quote Block Booking Code 1019 UKF when making your reservation.
- **Seminar Dinner**
  Dress for Dinner - Black Tie
- **Cancellations/Refunds**
  Cancellations received prior to 23rd August 2004 will be refunded 50% of registration fee. Refunds after this date will not be given.

  If you are unable to attend why not nominate a colleague to take your place. If so, please advise the UKFSC Fairoaks office of any changes prior to the Seminar.

Seminar Registration Form

Please complete in full one registration form per person. (Photocopies accepted)

REGISTRATION INFORMATION

(Please print clearly)

First Name: _____ Surname: _____

Company: _____ Job Title: _____

Address: _____

_____

Tel No: _____ Fax No: _____ e-mail: _____

PAYMENT INFORMATION

Seminar Fee: £160 UKFSC Member ☐ £200 Non-UKFSC Member ☐

This includes the Seminar Dinner on the evening 20th September, lunch, refreshments and car parking. This does not include hotel accommodation - **please see 'Seminar Information' above.**

Payment is by Sterling cheque only. No credit cards are accepted. Bank transfer is available, details on request (please note an additional cost of £6 will be added to cover handling charges). The UKFSC is not VAT Registered.

Sterling cheques should be made payable to UK Flight Safety Committee.

- Do you plan to attend the Seminar Dinner on Monday 20th September? Yes ☐ No ☐
- Do you require a Vegetarian alternative? Yes ☐ No ☐

PLEASE SEND YOUR COMPLETED REGISTRATION FORM WITH YOUR CHEQUE TO:

UK Flight Safety Committee, Graham Suite, Fairoaks Airport, Chobham, Woking, Surrey, GU24 8HX.
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Confirmation will be faxed to you on receipt of your Registration Form and payment.

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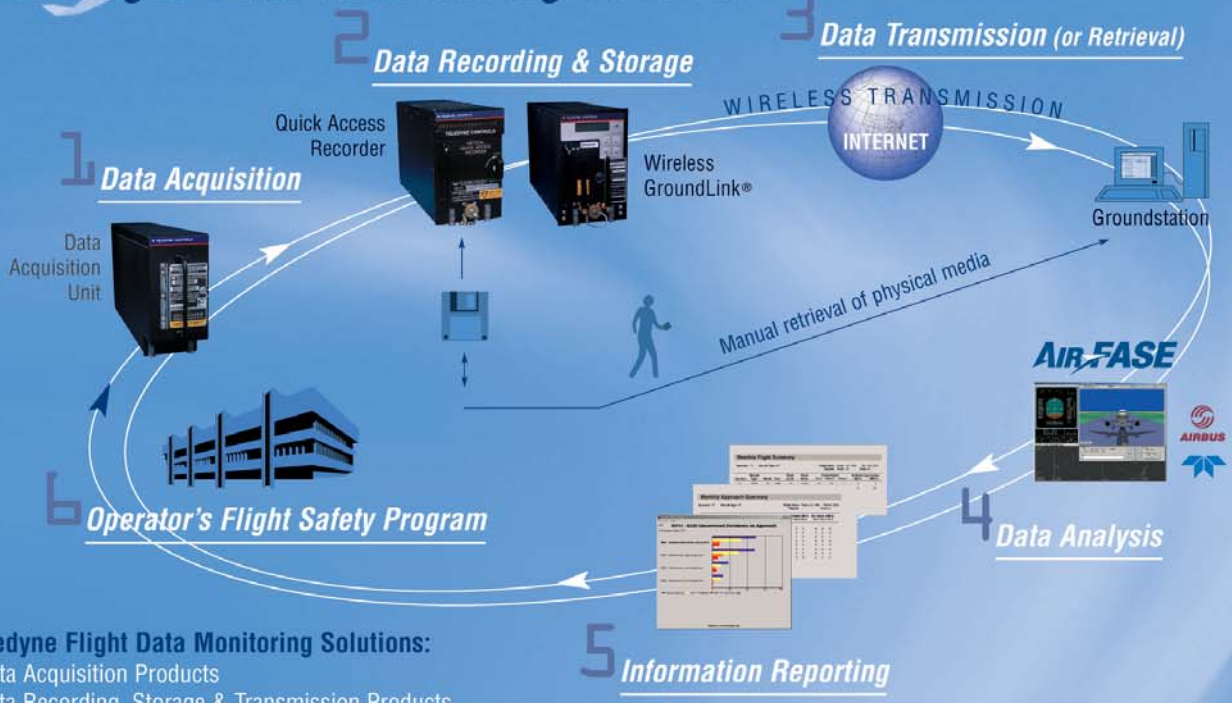

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- Flight Data Monitoring Services

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