focus

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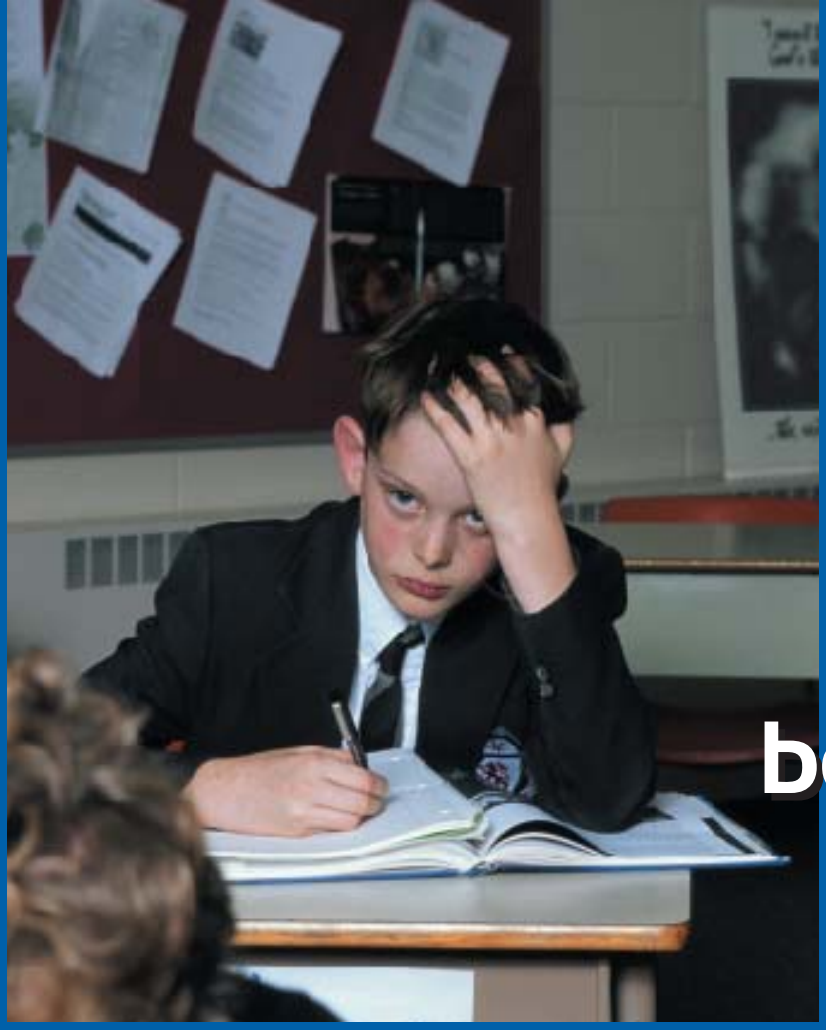

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contents

Front Cover: Boeing Business Jet

When have you done all that is “reasonably practicable” ?

Last year operators to the south of Spain were faced with the problem where passengers were purchasing cigarettes for use on their return to the UK. This is all quite legal and above board. In most instances these purchases were stowed in their baggage and carried in the aircraft hold.

What was not known was that some retailers were offering, as a sales promotion, gas lighters that were attached to the packs of cigarettes. These lighters fall into the category of dangerous goods and should not be placed in luggage that is carried in the aircraft hold.

This issue was brought to a head when a bag caught fire whilst in transit on a baggage trolley. Fortunately it did not catch fire whilst in the aircraft hold or go undetected until the aircraft was en route. This could have lead to a disaster.

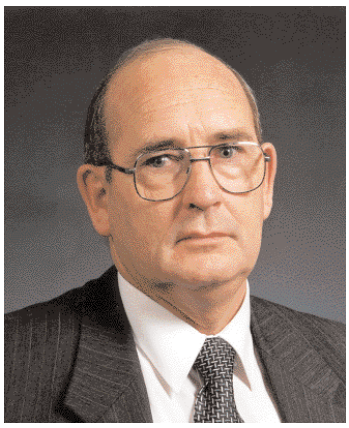
Immediately this incident was reported all operators to the area were notified and steps were taken to limit the risk. Passengers travelling to the south of Spain were briefed not to pack these lighters in the baggage for their return trip to the UK. They were advised to remove the lighters from the cigarette packs and to only carry one on their person. Their attention was drawn to the dangerous goods posters at check in. Some operators went to great lengths and expense to produce a pamphlet explaining the problem to their passengers and asking for their co-operation.

The cigarette manufacturers were contacted and asked for their assistance. They gave their full co-operation. However, these promotions were not those of the manufacturer but of the local retail outlets. All such promotions were removed from the duty free shops at the airport, but it was not possible to get the co-operations of all the stores in the towns and villages. There were no further incidents but aircraft were delayed when it was discovered that passengers were still carrying these lighters in the hold baggage.

We are all aware that departure delays have a knock on effect, they cause the passengers inconvenience and cost the operator money. Operators have an obligation to ensure that their operation is safe but with holiday charters the passengers are always changing and seldom return to the same place in consecutive years. There is therefore little chance that holiday passengers will become enlightened about the carriage of dangerous goods.

So where does the operator stand? At what stage can it be said that the operator has taken “all reasonable care” to ensure that dangerous goods are not carried aboard their aircraft.

With the onset of the summer season the last thing that the operators need is departure delays caused by dangerous goods being stowed in the aircraft hold. It is therefore necessary for every operator to make its own assessment of the risk and to take whatever measures it believes are necessary to ensure that it has taken “all reasonable care” in this regard.



Landing Accident Analysis

by: Captain Tom Croke

The recent publication of four reports, one by the Irish Air Accident Investigations Unit into an MD-11 over-run accident in Shannon, one by the Australian Transport Safety Bureau into a Boeing 747 over-run accident in Bangkok, and two UK Air Accidents Investigation Branch reports into Airbus 321 tail-strikes in London Heathrow set me thinking. I was immediately aware that, once again, these accidents happened in the "Landing" phase. When we consider that the IATA Safety Advisory Committee's Jet Safety Report - 2000 found that, when analysed, the Landing accidents for year 2000 showed 28 Human with 19 Environmental factors, compared with 7 Technical and 20 Organisational factors. This combination of human and environmental (mostly weather) factors seems to dominate in this critical phase of flight, landing.

When discussing this issue, in any forum in which I have participated, the consensus seems to indicate that there is an inability to train appropriately for the crucial phase from 200 feet above touchdown to aircraft stopped safely on the runway. The principle reason for this lies in the inability of simulators to accurately replicate this phase of flight, with all the variations that weather can produce.

Knowing this, what can be done to obviate or mitigate the obvious risks. In both of the over-run accidents and the two tail-strike accidents it would appear that at certain points in these events a decision to Go-around was appropriate or was changed. However, the crews continued the approach in a destabilised condition, often unaware of changes that occurred to selected functions (auto-speed brake/auto brakes), which had occurred consequent upon large power applications. The pace of operations, this close to the ground, allows little time to assess or remedy such subtle changes and the accident becomes inevitable.

In such situations what can be done? At that other fast-paced phase of flight, Take-off, the time-critical and often difficult decision to "Go" or reject the take-off caused many accidents and incidents. After careful analysis many manufacturers advised that operators should engender in their Captains a "Go-Minded" philosophy. This recommended narrowing the options that required a No-Go decision to a very few failures or conditions and that for all other situations the "Go" option was recommended, with the ultimate decision left to the Captain.

Looking at the accidents statistics it appears that many Captains are not "Go-around" minded, preferring to persist with approaches that would better be discontinued. To Operators, what culture do you nurture in your operation. For many, the culture is to engender Go-around up to, and even after, touchdown if required, but not after reverse thrust selection. Do you train for such an option? Some Operators, at Cat 1 minima decision height call "Continue", not "Land", emphasising that the approach will continue , with the continued possibility to Go-around, but that the option to land is now available. Is it time for Captains to be, not just "Go-Minded" but also "Go-Around Minded", where every approach is an approach to a go-around and a landing, if feasible, a bonus?

Flight & Cabin Crew Response to Inflight Smoke

Engineering design by airplane manufacturers, oversight by regulators, and maintenance practices by operators combine to minimize occurrences of smoke, fumes, and fire in the pressurised areas of airplanes. When smoke does occur, timely and appropriate action by the flight and cabin crews is imperative. Boeing has analyzed in-service smoke, fumes, and fire events and reviewed airplane systems and crew procedures for its commercial airplane models.

An in-flight fire or smoke event is a timecritical situation that demands immediate action by the flight and cabin crews. Cigarettes aside, any smoke in an airplane is not normal. Crew response must be timely and use available airplane controls and non-normal procedures.

To help ensure that appropriate steps are taken, the following issues need to be understood:

1. Operational consequences and safety risks of smoke events.

2. Analysis of past smoke events and review of crew procedures.

3. Recommended crew action for known and unknown smoke sources.

4. Capabilities for the remainder of the flight.

OPERATIONAL CONSEQUENCES AND SAFETY RISKS OF SMOKE EVENTS

Although most smoke events in the pressurized area of an airplane are resolved and rarely affect continued safe flight, landing, or egress, smoke is always a significant issue with operational consequences. These consequences include flight cancellations, flight schedule disruptions, air turnbacks, airplane diversions, declared emergencies, airport emergency equipment responses, airplane evacuations, accommodations for displaced passengers, diminished goodwill, and extensive unscheduled maintenance following non normal procedures such as overweight landing inspection, recharging of oxygen, and repacking of escape slides.

Direct crew response to smoke and fumes originating from readily accessible equipment, referred to as *known smoke*, is key to minimizing operational consequences. Timely and prudent crew response to smoke events of undetermined origin, or *unknown smoke*, minimizes risks during the remaining flight, landing, and egress.

Based on past smoke events, Boeing and other air transport industry leaders are pursuing initiatives to further reduce the likelihood of in-flight smoke. In addition to enhancements to airplane design and maintenance (see "Aging Airplane Systems Investigation," *Aero* no. 7, July 1999), these initiatives include improvements to the procedures used by the flight and cabin crews during a smoke event in the pressurized area of the airplane.

ANALYSIS OF PAST SMOKE EVENTS AND REVIEW OF CREW PROCEDURES

Boeing performed an analysis of reported in-service events that involved smoke, fumes, fire, and overheating in the

pressurized areas of its airplanes between November 1992 and June 2000. Data were compiled for each model and included the following: the area affected in the pressurized area of the airplane, the smoke source perceived by the flight crew, the smoke source identified by the maintenance crew, the category of the smoke source, the airplane system or equipment involved, the means of detection (typically sight or smell by passengers or crew), and the effect on flight completion. (*Note:* The term *smoke* in the preceding list and in the remainder of this article refers to odors, smells, fumes, or overheating as well as visible smoke.)

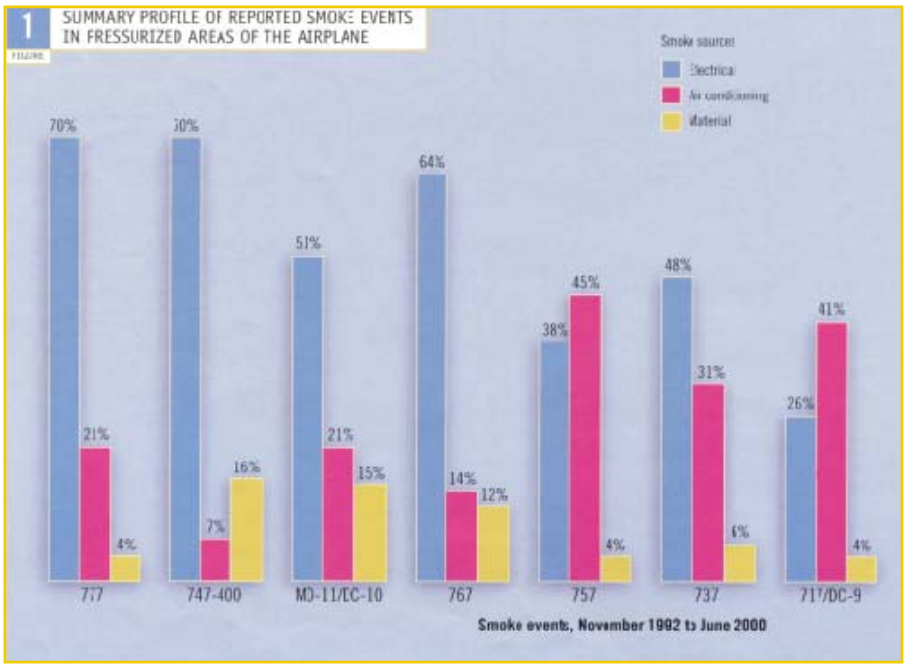


Figure 1

The smoke events under study were categorized into three classes: air conditioning, electrical, and material. Air-conditioning smoke events were cases in which incoming bleed air was contaminated, perhaps from engine oil or contaminated outside air. Electrical events were cases in which electrically powered equipment overheated or emitted smoke or fumes. Material events involved material that gave off smoke or fumes such as food burning in an oven, lavatory waste ignited by a discarded cigarette, or spilled chemicals in the cargo compartment.

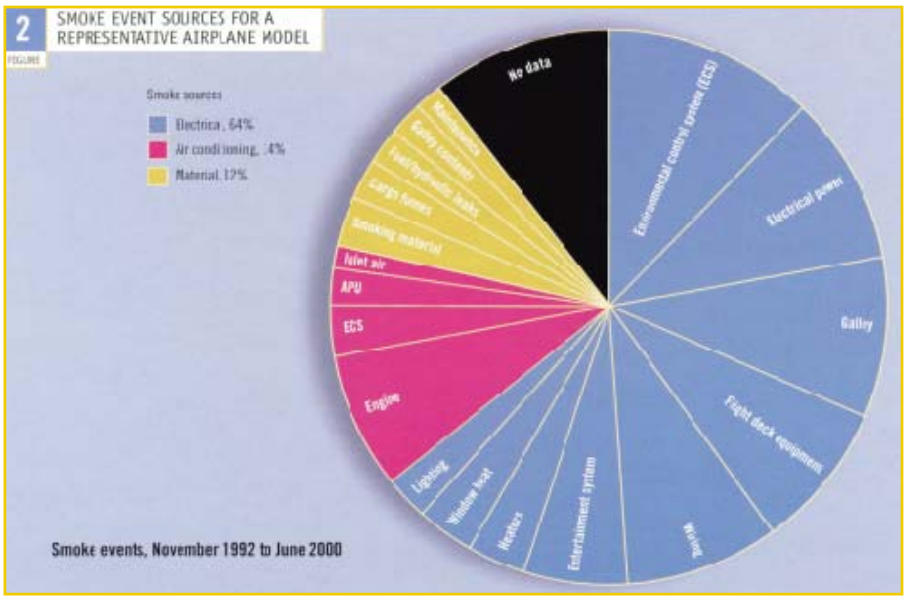


Figure 2

Figure 1 depicts a summary profile of air-conditioning, electrical, and material smoke events for each airplane model included in the study. This format enables comparison across airplane models of the three major smoke source categories. For each model, the number of events in each source category was divided by the total number of smoke events for that model, yielding the percentage contributions depicted in the profile. (*Note:* The three categories for each model may not sum to 100 percent because of insufficient information available to categorize an event.) The models in figure 1 are listed in order of airplane complexity, starting with the most complex on the left. Larger airplanes with more complex systems show a predominance of smoke events of electrical origin, compared with airconditioning and material smoke events.

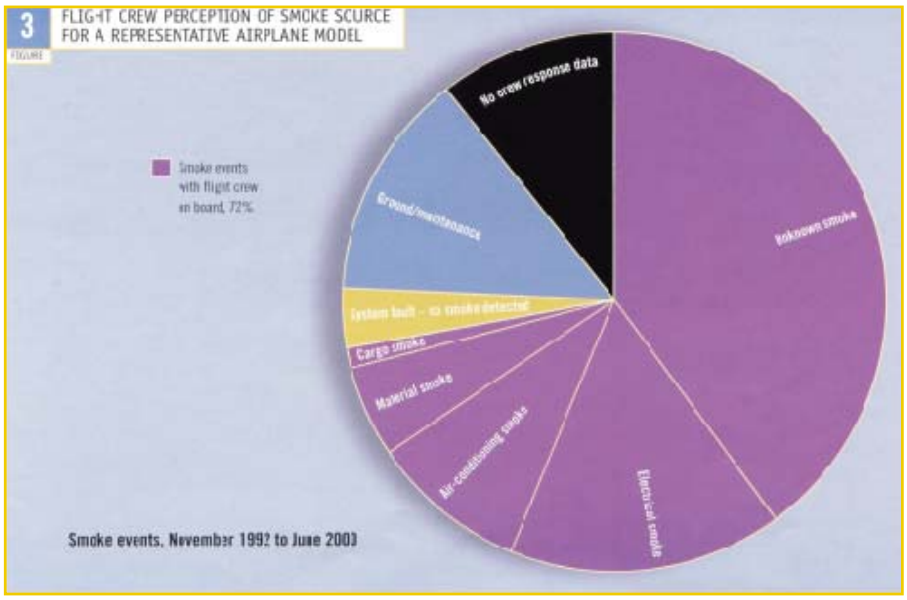


Figure 3

For each airplane model, the air-conditioning, electrical, and material events were subdivided by airplane system. Figure 2 illustrates such a detailed categorization of smoke event sources for a representative model. The subcategories within the electrical category include systems or functions such as environmental control, electrical power, galleys, and flight deck equipment. Presenting the smoke sources in percentages by airplane system or function allows comparison of multiple models with different fleet sizes, ages, and missions.

Data also were collected on how the crews perceived the in-flight smoke events on all models. The data were grouped in a structure similar to the flight crew *Quick Reference Handbook (QRH)* produced by airplane manufacturers and operators. Figure 3 shows such a portrayal for a representative model. Most smoke events occurred with the flight crew on board. For many in-flight events, flight crews took action consistent with having identified the smoke source, such as removing electrical power to (i.e., depowering) that equipment. There was a significant number of events in which crew actions suggest that the smoke source could not be identified while in flight. For smoke events in which the flight crew could not determine the smoke source, most were subsequently determined by maintenance crews to be of electrical origin.

RECOMMENDED CREW ACTION FOR KNOWN AND UNKNOWN SMOKE SOURCES

The Boeing *QRH* includes procedural steps for smoke, fumes, fire of air-conditioning and electrical origin, and smoke removal. When a flight crew has determined that smoke is of air-conditioning origin, the Boeing *QRH* procedure is to isolate the air source, halting the introduction of contaminated air into the pressurized area of the airplane. An example of air-conditioning smoke is from engine oil, followed by abnormal engine parameters and odor in the cabin and flight deck. Once the crew has isolated the incoming engine bleed air, continuing fresh air from another source should quickly improve cabin air quality.

When a flight crew determines smoke is of electrical origin, the Boeing *QRH* procedure is to depower the affected equipment. For example, if a flight crew sees smoke from a window-heating element, appropriate action would be to switch off that electrical equipment. An example of known smoke in the cabin would be a flight attendant seeing and smelling smoke from a coffee maker; after turning off electrical power to that galley, the smoke stops and subsequent surface temperatures are normal. The key to properly handling a known smoke event is for the crew to be confident of both the smoke source and the effectiveness of removing electrical power.

Known smoke sources.
Many smoke events involve smoke or fumes produced by equipment readily accessible to the crew. Often, the event source can be identified by direct observation, such as seeing smoke exiting a piece of equipment, tracing a

smell to its strongest location, or feeling an unusually warm surface.

For a known smoke event confirming that the situation has been resolved is as important as identifying the source. The smoke or fumes must dissipate and any overheating condition must improve for the crew to be confident the situation is under control. Only if the crew can confidently identify the smoke source and confidently ascertain that the condition is under control should continuation of the flight be considered. Hand-held extinguishers ought to be at the ready, as the crew continues monitoring the equipment during the remainder of the flight.

Factors to evaluate in deciding whether to continue the planned flight include the level of confidence in identifying the smoke source, success in extinguishing the source, functionality of the remaining systems, success in removing cabin smoke, passenger distress, and position of the airplane along the intended route. Any combination of these factors may make a diversion or turnback the appropriate choice.

Completing a planned flight has its advantages given the significant operational costs of substitute equipment, schedule disruption, potential passenger compensation, and diminished goodwill. The best prospect for minimum disruption from a smoke event comes from crew training in responding to smoke, crew familiarity with smoke-clearing procedures, and direct power control to cabin amenities (e.g., an electrical power cutoff switch at each galley location). If the crew cannot confirm that a persistent onboard smoke or fire situation is completely resolved, however, Boeing recommends the earliest possible descent, landing, and evacuation of the airplane.

Unknown smoke sources.
A crew may not be able to identify a smoke source because of the location of the failed equipment or because of air circulation throughout the pressurized cabin. Unknown smoke sources include environmental control systems, equipment cooling fans, door heaters, plumbing heaters, avionics equipment, fluorescent lights, and wiring faults.

The serious consequences of compromised structural integrity, system function, or survivable environment warrant timely and prudent action by the crew. Review of historical data on the rare fire events that resulted in hull loss indicates that the time from first indication of smoke to an out-of-control situation may be very short—a matter of minutes. For this reason, flight crew actions when responding to unknown smoke must be timely and appropriate.

QRH procedural steps for addressing an undetermined electrical smoke source call for the removal of electrical power for specific systems not necessary for safe flight, landing, and egress. This accounts for the majority of systems with a significant history of in-service smoke events. Also, as directed by the Boeing *QRH* non-normal checklist, the crew should plan to land at the nearest suitable airport.

During the remainder of the flight, the crew should be alert to any new signs that suggest the smoke source and remain mindful of operational functions needed to accomplish the diversion.

Many unknown smoke situations are later attributed to electrical sources, substantiating the positive step of depowering specific equipment not necessary for the remaining flight, landing, and egress. Flight-critical systems do not have a significant smoke-event history.

CAPABILITIES FOR THE REMAINDER OF THE FLIGHT

QRH procedural steps to remove power

from affected equipment must ensure that sufficient system capability remains to accommodate adverse weather, a replanned route, and an approach into an unfamiliar airport. In-service data show that inordinate depowering of airplane systems beyond *QRH* procedures is not likely to be of benefit in an unknown smoke situation. Further, such action would significantly reduce airplane capabilities for the remainder of the flight.

During the study, several depowering strategies beyond current procedures were considered but ultimately not incorporated into the Boeing *QRH* non-normal checklists based on a risk-benefit evaluation. The elements of continued safe flight and landing were determined according to four safety requirements: controlled flight path, controlled airplane energy, navigation, and survivable environment. Conditions during the remainder of the flight could necessitate the availability of flight management system navigation, autopilot, multiple communication channels, first officer's displays, smoke detection, fire suppression, cabin lighting, and electrical power for removing smoke.

Exterior lighting illustrates the important difference between a prudent crew response and an inordinate depowering of airplane systems during an unknown smoke event. Equipment used for red anti-collision strobes includes high-energy components, such as a high-intensity flasher, and is an occasional source of smoke in the pressurized area of the airplane. From this standpoint, using the overhead switch to depower red anti-collision strobes may be beneficial during an unknown smoke event. Turning off all exterior lighting, however, would be an overreaction that would increase the risk of traffic conflict without commensurate likelihood of addressing the smoke source.

Without complicated troubleshooting type procedures, it is a practical impossibility to

depower all potential sources of unknown smoke without compromising necessary systems. The key to depowering potential unknown smoke sources while protecting necessary airplane functions involves balancing a series of risk assessments. Because the *QRH* must facilitate timely and prudent crew action appropriate for a broad range of scenarios, the *QRH* procedures cannot resort to a severely depowered electrical configuration. Boeing *QRH* procedures are developed with the understanding that, at a flight crew's discretion. additional action may be taken that is deemed necessary to ensure safe flight.

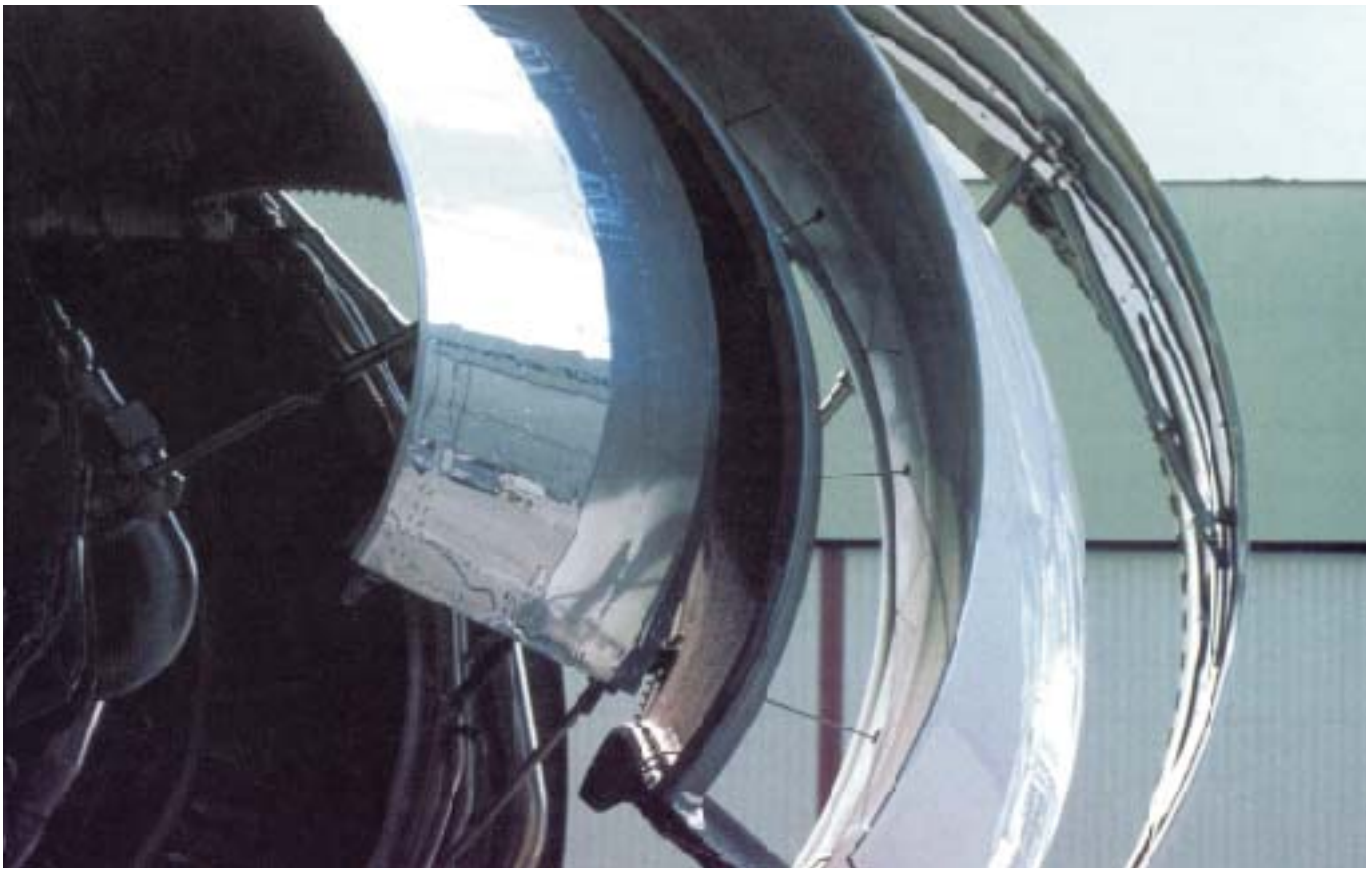
If a flight crew considers action beyond the *QRH* procedures, the action must be based on the particular situation and knowledge of airplane system operation. Procedural alternatives that may be reasonable near a familiar airport under visual meteorological conditions may not be appropriate in adverse weather or unfamiliar surroundings with a compromised airplane. The crew may also have additional flight deck effects or information beyond those explicitly identified in the *QRH* (e.g., tripped circuit breakers, synoptic information, or reports from cabin crew) that may assist in identifying the smoke source.

A flight crew in an extreme situation will benefit from airplane system knowledge that would be inappropriate to detail in time-critical procedures. For example, on most Boeing-designed two-engine airplanes, the right electrical bus powers a higher proportion of non-essential equipment, while the left electrical bus powers the higher proportion of flight-critical equipment,

The best response to an event of unknown smoke combines use of prudent *QRH* non-normal checklists and flight crew discretion based on the particular situation and a thorough knowledge of airplane systems.

SUMMARY

- Engineering design by airplane manufacturers, oversight by regulators, and maintenance practices by operators combine to minimize occurences of smoke, fumes, and fire in the pressurized ares of airplanes.
- When an in-flight smoke or fire event does occur, it can be a time-critical situation that demands immediate action by the flight and cabin crews.
- Crew should follow *QRH* procedures, which must be structured to allow flight and cabin crews to promptly respond to an in-flight smoke event.
- In known smoke events, direct crew response minimizes operational consequences, such as flight cancellations and air turnbacks.
- If a crew cannot confirm that persistent onboard smoke or fire has been completely extinguished, Boeing recommends the earliest possible descent, landing, and evacuation of the airplane.
- In unknown smoke events, a prudent crew response minimizes risk during remaining flight. Inordinate depowering of airplane systems is not likely to benefit an unknown smoke situation because such action significantly reduces airplane capabilities for the remainder of the flight without commensurate likelihood of depowering the unknown smoke source.
- Many unknown smoke sources are later determined to be electrical, substantiating the positive step of depowering specific equipment not crucial to the remaining flight, landing, and egress. Historically, flight-critical systems have not contributed to smoke events.
- In an extreme situation, a flight crew will benefit from knowledge of airplane systems that would be inappropriate to detail in time-critical *QRH* procedures.



Tips on Minimizing Smoke Events

The following tips are based on the review and analysis of in-flight smoke events on Boeing airplanes between November 1992 and June 2000:

- Although not a serious risk for propagating fire, several events occurring immediately before or after airplane departure were attributed to engine or auxiliary power unit (APU) maintenance activity during the previous ground leg. Most operators have ground crew procedures for engine or APU runs following maintenance. For an operator with concerns in this area, a review of ground procedures that require engine or APU run may be appropriate.
- Some known smoke events are directly preventable. Paper may come into contact with hot lighting, either in the cabin or crew rest areas. Food may be left in an oven or a coffeepot heated while empty.
- Smoke or actual fire events have been initiated by repeated circuit breaker resets during ground troubleshooting. Even when performed on the ground, circuit breaker resets should be performed cautiously. Important considerations are the number of reset attempts, cooling time between reset attempts, and the stationing of maintenance crew monitoring for unusual sounds or smell.
- A flight crew may be able to identify unknown smoke as air-conditioning smoke based on subsequent indication. In an air-conditioning smoke event caused by leaking engine oil, the first symptom noticed by the crew may be the burning odor of unknown origin. Subsequent engine indications might clarify an abnormal engine situation, and the corresponding bleed air source can be isolated.

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UKFSC Legal Adviser's Column

by Peter Martin

Fuel Tank Safety

In May 2001 the FAA addressed, in a very comprehensive way, the issue of fuel tank safety in passenger aircraft.

Mandatory design, maintenance and operational changes aimed at minimising the flammability of aircraft fuel tanks are the cornerstones of regulatory amendments in the form of a Special Federal Aviation Regulation ("SFAR") issued early in the month by the Federal Aviation Administration.

Asserted by the FAA to be the most comprehensive fuel tank safety initiative ever implemented, the proposed action includes the setting of standards to minimise the potential for failures that could result in ignition sources in fuel tanks on both new and in-service aircraft.

Everyone recalls the crash of TWA Flight 800 in July 1996. Since then the FAA has been much concerned with the three fundamental areas that keep aircraft fuel tanks safe, namely, the prevention of ignition sources, fuel flammability and fuel tank inerting. A new FAA regulation affecting 6971 US transport aircraft, with 30 or more seats, will now require manufacturers to conduct a one-off design review of the fuel tank system of each model in the current fleet; the idea is that such review will ensure that no failure could create ignition sources within the fuel tank. In addition, specific programmes will be designed for tank maintenance and inspection and the development of maintenance and inspection programmes to ensure fuel tank safety.

Based on information to be provided by manufacturers, operators must then develop and implement an FAA-approved fuel tank maintenance and inspection programme for their aircraft. For aircraft designed with heat sources adjacent to the fuel tank, the standards require the manufacturers to reduce the time fuel tanks operate at risk by designing fuel tank systems with a means of minimising the development of flammable vapours in the tank or some other means of preventing catastrophic damage in the unlikely event ignition occurs.

The new rule becomes effective on 6 June 2001, just after this column is written, and manufacturers have just 18 months to conduct the safety reviews and to develop the programmes and systems outlined above. Operators will then have 36 months to incorporate an FAA approved maintenance and inspection programme into their operating procedures.

Early estimates of the cost of the initiatives indicate a cost of some USD 165M over 10 years. USD38M for the manufacturers review, changes to programmes for inspection and maintenance some USD 92M. Lost net revenue some USD24M and additional record-keeping some USD 10M.

Why does this information appear in your legal adviser's column you may ask? Because any failure to comply with the new SFAR is subject to penalty. Furthermore, if any fuel tank flammability-related accident occurs in the future, after full implementation, very serious liability issues will arise for regulator and regulated alike. So the development of all this in the US, and any similar programmes in the EC or elsewhere, will need watching carefully.

Regulation of Flying Displays

The tragic accidents at this year's Biggin Hill Air Fair (2nd, 3rd June), first to a Vampire and then to a Kingcobra, raise questions about the regulation of flying displays.

Members may be unaware that Article 70 of the Air Navigation Order provides a comprehensive scheme of regulation based on the need of the organiser to obtain from the CAA a formal permission in writing and to comply with any conditions imposed.

No person may act as pilot of a participating aircraft unless he has an appropriate pilot display authorisation and complies with any conditions subject to which it may have been given.

The permission is only granted to the organiser if the CAA is satisfied that he is a fit and competent person, having regard to previous conduct and experience, organisation, staffing and so on. Similar criteria apply in the case of the pilot display authorisation. Fitness and competence are clearly of critical and obvious significance.

It follows, therefore, that a heavy burden of responsibility for the safety of displays of flying falls not only on organiser and pilot but, also, on the CAA. There is nothing unusual in all this, obviously, but given the hazards known to be associated with the flying of vintage and veteran aircraft in the vicinity of crowds - over which they clearly must not ever fly - and over the areas surrounding airfields every precaution for the avoidance of risk must not only be taken but be seen to have been taken.

Only time will show what happened that weekend but, whatever the causes of these accidents, it must be assumed that further tightening up of the regulation of this activity will inevitably take place even though Article 70 is relatively new. There can be no room for complacency where the safety of the public is concerned and confidence will have been damaged by these two accidents in two days.

Crisis Aftermath - The Common Threads

by Linda Tavlin

Each time an aviation related crisis occurs, the world takes note as to how the company, primarily the carrier, handles the aftermath. There are usually two ways these events are analyzed. They either say that the company did a good job and the subject disappears in a matter of days or weeks at the most, or they say they did a very poor job and they never stop talking about it. Most people say they remember the company for doing a good job but they can not exactly state why.

Similarities and differences

In my twelve years working with companies both before and after disasters, I have seen some common threads linking those who are perceived to have handled things right as well as some common threads between those who are not so well remembered.

The three companies I would like to cite as companies who, generally speaking, are remembered for handling things right are Air France, Swissair and Saudi Arabian Airlines. I worked with Saudi Arabian Airlines on-site in Delhi after their tragedy in November of 1996 and I also had the opportunity to work with Air France and Swissair prior to their disasters. There are a number of things these companies have in common.

The first thing they have in common is that all of their plans are based on the reality of what happens in the aftermath of a crisis. They realize that there are many different levels of communication and reality will mandate the hands-on involvement of an organization's safety and quality departments. By safety and quality people I mean those working in the departments of operations or technical operations. Because the windows into a company are through the safety and quality departments, I will refer to them as safety and quality.

Five levels of communication

There are five levels of communication beginning at level one with the investigators. A crisis first and foremost is an investigation. The investigators of the host country have all the say-so regarding the crash. Under ICAO standards, company representatives who are a party to the actual investigation are required to be technically qualified.

The second level will be the regulators. An organization must keep flying and the regulators have the power to ground an aircraft (eg. Concorde), limit an organization's ability to perform maintenance, or ground an airline (eg. Valujet). When the regulators come into an organization to see what went wrong, they are going to go to the technical departments.

The third level will be the lawyers and insurance companies. When the lawsuits begin and the lawyers try and determine liability, your company employees will be subpoenaed to testify. It will be the employees from your technical departments who will be involved - safety and quality.

The forth level is communication with the families, relatives, survivors, etc. Each company has volunteers who act as care givers. These people are the first line of contact. The number one question they want answered is why did their loved one die. Caregivers do not have the answer to that question. The people with the answer to that question are those working hands-on with the investigation.

The fifth level is the media. Companies have their corporate communication departments. Each day the investigation team will meet and discuss the findings of the day. Corporate communication people, human resource people, etc., are prohibited from taking part in these meetings. Therefore, in order for the corporate communication people to get the information they need to do their job, they have to rely on the safety and quality people for their answers. They will therefore need careful briefing.

As you can see, reality dictates that safety and quality departments are involved at every level. If a corporate plan does not mirror this reality, it will fail.

Working as a team

I am not suggesting that any one level is more important than any other. They are all tied together under the umbrella of an investigation.

If you look at Air France, you will see that they have a crisis director who works hand in hand with the safety and quality departments. The physical location of their offices is in close proximity. During the Saudi Arabian Airlines investigation, the safety manager led the process. When Swissair organized training, it was done through their safety department.

These organizations treat the crisis as what it is, an operational event, not a media event. The media is just one party to the investigation. Those companies who have a strategy that treats a crisis as a media event run the risk of offending the investigators of the host country. There were many untruths leaked in Delhi in the early days after the crash of Saudi Arabian Airlines that put the blame for that tragedy on the Saudis. Although a company has many interests to protect, the number one priority for the Saudi team was to not offend the investigators of the host country by using the media to posture. In the end, the facts revealed that it was not

a tragedy caused by any deviation on the part of Saudi Arabian Airlines.

Crisis leaders

Their crisis leaders, whether they are in the safety department or in a separate crisis department, are inclusive. By that I mean that all elements of their plan come under one umbrella. They do not separate their plans into two parts - technical investigation and crisis management. By crisis management I mean handling the media and families. They try and provide as much information as is needed by all levels of the workforce that reality will require to be involved.

I have looked at, been briefed on and have been in contact with companies who have been seen to have done it wrong. I see some similarities between these companies.

Doing it poorly

First, they do not properly prepare for the reality of doing business in the various countries to which they fly.

Second, their safety and quality departments are excluded from being lead strategists in their crisis plans. They are placed in the position of having to ask permission for training, information, or communicating.

Third, they separate their plans into two parts. First, the technical investigation and second "crisis management" (the families and media).

The mistakes made

Without identifying specific companies, let me just cite a few examples of mistakes made as a result of a plan that does not meet reality.

The first and most serious mistake a company can make is to preempt the investigators of a host country. It is never going to be the carrier or manufacturer who is the first to announce what did or did not cause the crash. A company runs the risk of being excluded from the investigation for doing this. Many countries have very complex political realities that further complicate what is already a complicated process. No one can change these realities and if a company does not appropriately prepare for them, it is not the fault of the host country.

Second, when a company has serious underlying technical issues that are going to surface - whether they have anything to do with the crash or not - they must have technical people as lead strategists in the communication plan.

Third, technical issues are nearly always the underlying reasons for these tragedies. If you want to convey credibility, you must have the highest-level technical person in your company talk about the technical issues. For example, if you look at an event and see that pilot issues are going to surface, you must have either the Chief Pilot, Vice President of Flight Operations, or Safety Manager as the lead communication strategist. You do not send a public relations person unless you want to send the message that you are trying to "spin" the issue. What would you think if a company sent a lawyer to speak? It creates the perception that a company is trying to hide something. The same sort of negative perception can be created by having a corporate communication person talk about serious technical issues with difficult follow-up questions.

Summary

In summary an organization needs a plan that meets reality. The reality is that the technical people, or safety and quality people, of an organization will ultimately have to answer for what happens. If a plan does not meet reality by making these people the lead strategists in the plan, the plan is going to have weaknesses. If a plan does not meet reality, it will not be the fault of the media.

Biography

Linda Tavlin has been an aviation communication consultant since April 1989. She helps professionals in the aviation industry communicate their message with expertise in issues including safety, quality, accident investigation, flight standards, manufacturing, security, air traffic and environment, both foreign and domestic.

Her knowledge expands beyond the United States and she has worked training carriers, manufacturers, regulators and accident investigators throughout the world. Her expertise has been sought by foreign carriers world-wide who have experienced the tragedy of an airline crash.

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Comfort and Style in the Air - The Safety Paradox

by Dr Simon Bennett FICDDS

The era of the 'super jumbo' is finally upon us. Reflecting the ever-upward trend in international air travel and the continuing popularity of hard-pressed hubs like Heathrow and JFK, Airbus Industrie have decided to press ahead with the development of the 555-seat A380. This is by any measure a large aircraft. Even in its most basic incarnation it is capable of carrying more passengers than Boeing's competitor, the 747-400 (421 passengers). As Airbus rightly point out, this size of aircraft offers new options and possibilities for operators and the travelling public, most of which (like me) have cut their air-travelling teeth on cramped and unimaginative coach-class accommodations. Realising that with the A380 they have the chance to 'change the canvas' of mass aviation transit, Airbus have let their imagination run riot, both in their marketing pronouncements and in the images they use to promote the new Leviathan. In one advertisement an A380 is depicted swooping low over a night-time city. The legend reads 'It doesn't just take you to your hotel ... it is your hotel'. This startling image and correspondingly strident assertion is accompanied by four graphics depicting the interior. The 'Reception' area is depicted as an airy atrium in the heart of the aircraft. In the graphic a cabin crew member addresses a passenger with the words 'Welcome to the Airbus A380, a member of the cabin staff will show you to your room ...'. In the second scenario a couple is shown relaxing in their 'bedroom/shower' space (needless to say the woman is shown actually having a shower). In the third scenario passengers are shown window-shopping in the on-board mall, while in the fourth scenario passengers are depicted enjoying a drink at the bar. The legend reads 'An aperitif perhaps? Champagne? Of course sir. We hope you enjoy your stay at the A380'. This last statement reinforces the image of the A380 as a 'flying hotel', wherein passengers may perambulate and selectively consume to their heart's desire (until, that is, their money runs out or their appetites are sated). The marketeers' rhetoric supports the notion of the new aircraft as a 'ship of the air'. Consider, for example, the following from the company's Commercial Director, John Leahy; 'Passengers will be able to wander around the A380 .... We foresee airlines installing reception areas, an atrium, duty free shopping and even a casino'. A potential launch customer, Virgin Atlantic, has equally grand visions. As their Head of Design, Dee Cooper, has said; 'From an architectural point of view, the most exciting thing about the A380 is its size .... It offers us a great chance to really throw out the design 'rule book''. With this in mind Virgin are considering even larger bars than on their current aircraft, showering facilities for all classes of ultra-long-haul passenger and even a gymnasium. Of course, the desire to replicate the grandeur and comfort of an ocean-going liner for the air-traveller is nothing new. The airships of the 1930s came pretty close to delivering ocean-liner standards of comfort and elegance. The Hindenburg's dining room, for example, covered 750 square feet. Its lounge contained a baby grand. Its promenade decks were 50 feet long. Later conventional aircraft aspired to the same ideal. The Short Empire Flying Boat, for example, had, according to the Imperial Airways Monthly Bulletin for December 1936, '... a surprising amount of space for promenading'. According to Hudson and Pettifer passengers praised the Empire Boats' 'speed and quietness and roominess'. Boeing's pre-war Clippers were, if anything, even more capacious, having a 'dining salon' and 'deluxe suite'. There were more prosaic touches, too, like the self-service area with its water cooler and disposable paper cups. Boeing continued to pander to passengers' hedonistic instincts after the war, the 377 Stratocruiser, for example, having a lounge-bar for 14 passengers. BOAC's enthusiasm for the aircraft was unbridled; 'Meet congenial companions in the lower-deck lounge. Retire to the privacy of a foam-soft berth (nominal extra charge)'. Boeing again offered operators the chance to match the elegance of the defunct transatlantic liners with the 747. Japan Air Lines (JAL) waxed lyrical about the possibilities. Here was a chance to persuade the passenger - through artifice - that s/he was not flying at all; '[The interior] has been arranged to give you the feeling of being in a tastefully designed living-room, rather than in the Economy Class cabin of a futuristic jet plane' ran JAL's advertising copy.

Thus Airbus, in seeking to persuade us that they have made a 'flying hotel' or 'liner of the air', are merely following a long tradition amongst manufacturers of seeking to offer an alternative to the unimaginative coach-class austerity of the modern jet. In doing so they are to be commended. I, for one, have had enough of sitting for seven trans-Atlantic hours with my knees in my chest, a baby bawling in my left ear and a rubber chicken lodged in my gullet. But there is another dimension to be considered - that of safety. The most obvious problem with allowing passengers to shower, exercise in a gymnasium, promenade, shop and sit in open-plan restaurants is persuading them to 'sit and strap' when the going gets rough. Furthermore, if there is more space, controlling what goes on in that space (illicit smoking, for example, or confrontations between passengers) becomes more difficult - unless aircraft are crewed to a level where monitoring and control of passengers can be guaranteed. To be fair, some operators are aware of such problems. Virgin's Dee Cooper, for example, offers the following solution; 'One way ... is to make the interior airy and spacious but carefully size the aisles and open spaces to discourage people from walking about'. This, however, judging by the Airbus advertisement described at the beginning of this article, does not accord with the manufacturer's vision. John Leahy explains that '... seat belts will be provided in all areas of the aircraft'. But what will those passengers who are caught mid-transaction in Duty Free or exercising in the gym or taking a shower or standing at the bar waiting to get served or playing roulette do in an emergency? As one correspondent to Flight International has written; 'In the event of clear air turbulence when the aeroplane suddenly sinks or is tossed around ... will the gamblers first run back to their seats or line up to cash in their chips?' If the manufacturer and operator are determined to persuade passengers they are anywhere but on board an aircraft (as in the case of JAL's 'flying sitting-room' or Airbus's 'flying hotel') surely it becomes more difficult for those crewing such aircraft to control their charges in situations of risk or danger? This, essentially, is the paradox of the perennial 'elegant air transportation' ideal. For all its woes (some of which are alluded to above) one of the distinct benefits of regimented, highly standardised coach-class travel is that charges are relatively easy to control and direct - especially in an emergency. For the most part passengers are in their seats, their lap belts either loosely secured or quickly fastened, their lifejackets an arm's stretch away, their oxygen masks poised above their heads and the requisite instruction card slotted in the pocket in front of them. Perhaps a more serious problem is that those ABPs deliberately checked-in to seats at exit points may be unable to return to their seats in an emergency. How would a hard-pressed cabin crew compensate for this?

The manufacturers' and operators' riposte to such concerns might be that, being responsible adults, passengers would act reasonably in an emergency: Given appropriate warnings they would, with a minimum of direction, seek out the nearest available seat and belt-up. Research has shown, however, that in a serious emergency even the most rational human being can behave 'irrationally'. What parent, for example, engaged in a little family shopping in the Duty Free or buying a 'carry-out' pizza for their brood would heed an urgent instruction to belt-up in-situ when they had left their children and/or partner in some other (perhaps far distant) part of the aircraft? Research has shown that in such situations individuals will seek out their offspring and other family members - just in case. Again the manufacturers' and operators' riposte might be that such acute emergencies are rare. I am sure that the captain and crew of the Kenya-bound British Airways 747 that came perilously close to disaster when a passenger grabbed its controls were not expecting such an emergency. And if Captain William Hagan and his crew were not expecting it, it is doubtful whether any of the passengers were expecting it.

As with all such debates, however, there is an 'up' side to the concept of the 'flying hotel'. Given recent concerns over deep vein thrombosis, allowing passengers to move around an aircraft, even to the point

where they can exercise in a gymnasium, is no bad thing (although it could be argued that those passengers most in need of exercise, like the elderly, would not use the gymnasium). Furthermore, allowing passengers to move at will through the aircraft might, in generating a more congenial and relaxed and less regimented atmosphere, alleviate tensions to the point where so-called 'air-rage' becomes less of a problem. And ultimately, what manufacturers like Airbus are trying to do is to make flying a more enjoyable experience. And who could argue with that? Ultimately, of course, a balance must be struck between the manufacturer's desire to offer something different (reflecting the passenger's desire for more comfort and greater freedom) and reasonable standards of personal safety. Those operators thinking of offering shopping malls and restaurants and luxuriant, soapy showers may well wish to consider what litigation might follow a passenger injury sustained during a bout of turbulence, where that passenger did not have enough time, or was unable to find, a vacant seat so s/he could belt-up? And at a more practical level it is worth pondering how, in an aircraft where passenger movement is, through the provision of out-of-seat amenities, actively encouraged, access to the environs of the flight deck can be monitored and controlled?

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Biography

Dr Bennett directs the Scarman Centre's distance-learning MSc in Risk, Crisis and Disaster Management at the University of Leicester, England. He has a PhD in sociology from Brunel University, London, and has been published in The Log and other journals. He is a Fellow of the Institute of Civil Defence and Disaster Studies.

Ford Air Transportation Europe

Stuart Yeomans - Quality Manager Engineering

The 1960s for the Ford Motor Company was a period of transition; the evolving European Market and Free Trade Area presented the company with two huge markets with reducing trade restrictions and expanding economies. At this time the main manufacturing centres in Britain and Germany were still developing on independent lines, designing their own cars, which often employed different engineering principles. The developing situation in Europe demanded that there should be rationalisation of the product range.

The new philosophy came to fruition in 1967 with the formation of Ford of Europe, charged with the task of coordinating all of Ford's European activities.

One bi-product of this organisation was a growing need by personnel to travel between the various national manufacturing and marketing centres around Europe. As part of the overall logistical plan it was decided to open an Air Transportation Department within Ford of Europe, dedicated to the travel requirements of the new company structure.

The choice of aeroplane for this new Air Transportation Department was influenced by the American operation which had been operating Gulfstream Is for some time; these were proven in service and well known to the management. A suitable Gulfstream I was found in Europe, operated by Shell Oil UK, a deal was struck and G-ASXT became the first aircraft of the new department.

At this point the department's first manager was appointed, who set about the task of appointing pilots and engineers and establishing a suitable base for operations. Because of its location and facilities, Stansted was chosen, an office and hangar accommodation was set up, and engineering assistance contracts put in place.

After a period of crew training, the manager decided that the department was ready to begin operations and at 08.05 on the 14th August 1967, G-ASXT departed for Cologne on Ford Air Transportation's first scheduled service.

The first full year of operations saw the department settling down to a smooth routine, establishing a high standard of service and reliability which the department has successfully maintained ever since. Operations during 1968 proved beyond doubt the value of the Air Transportation Department and indicated that more capacity would be required in the future. Consequently in March 1969 a second Gulfstream I was acquired, G-AWYF. This aircraft soon proved its worth and continued in service into the 1990s. The arrival of the second aircraft warranted more engineering coverage and two more engineers were

employed for minor inspections and rectification work, Marshall of Cambridge performing the heavy engineering.

The following year, the department entered the jet age with the acquisition of a Hawker HS125-400, G-AYFM. The department was now expanding fast in both operations and engineering, some 3,000 hours being flown during 2,143 flights carrying 23,000 passengers.
At this time the Ford Motor Company was increasing its range of cars and

introducing new manufacturing plants throughout Europe, all of which placed an ever increasing demand for travel across Europe. So much so that the Air Transportation Department found it increasingly more difficult to provide the capacity required. Throughout this period of intense activity the Air Transportation Department subcontracted some of the flights but it soon became apparent that if the department was to keep pace with these developments a new type of aircraft would be required.

During 1976 the search began for a suitable new aircraft type. Interest soon centered on the BAC1 11 a tried and tested British airliner powered by Rolls Royce engines. Two BAC1 11s were located that were operated by the Brazilian Air Force and successful negotiations resulted in the acquisition of G-BEJM and G-BEJW. Later, in 1977 a third BAC1 11 was purchased from the German airline Bavaria, G-BFMC, JW and MC then became the two commuter aircraft and JM was reconfigured into the VIP role. Once the BAC1 11s had settled down in service there was time to reflect on what was being achieved and what would be required in the future. There were still a few changes to take place; a third Gulfstream I, G-BRAL was transferred from Ford of America, the Hawker HS125-400, G-AYFM and a Gulfstream I, G-AXST, were disposed of as surplus to requirements. Ford Air Transportation entered the 1980s in good shape, with a rationalised and efficient fleet of five aircraft which was to remain unchanged for the next decade. A wide range of services was being offered by the department, with executive flights and scheduled services to Cologne, Valencia, Bordeaux, Liverpool, Maarstricht, Saarbrucken, Amsterdam, Cork, Cardiff and Coventry.

During 1981 Ford Air Transportation carried its 500,000th passenger since 1967, and in 1987 was presented with the gold award for occupational safety by the Royal Society for the Prevention of Accidents. At the end of 1988 the lease on the original Ford hangar was due to expire and the hangar which was built during world war II was to be removed to make way for a new taxiway. On 1st of July 1989 Ford moved into a new hangar, the old hangar being removed and reconstructed at the Imperial War Museum at Duxford, were it remains to this date.

Passenger figures continued to rise throughout the decade from 61,500 in 1981 to 81,000 in 1990 and by the end of 1990 Ford Air Transportation had more than justified its existence as an essential part of Ford of Europe.

The 1990s had begun well for Ford Air Transportation but there was now a feeling of change in the air as commercial pressures began to build, both from within the company and from the highly competitive world outside. The BAC1 11s had served Ford well but restrictions within Europe regarding the operation of older jet airliners, particularly with regard to the question of engine noise, indicated that some type of replacement aircraft would be required.

By the beginning of 1992 the search was on in earnest for replacement aircraft and this search ended when it was discovered that US Leasing, a Ford subsidiary

company, had two MD87 aircraft which had previously belonged to Midway Airlines. A leasing agreement was struck and the two MD87s were flown to Finnair for a C check, Bermuda was selected as the country of registration and VR-BOO and VR-BOP entered service. By early 1993 the two MD87s were well enough established to consider the sale of two BAC1 11 aircraft and the last scheduled BAC1-11 flight was made on 8th April 1993. After sixteen years of successful operations, G-BEJW and G-BFMC were put up for sale and in July both left Stansted bound for Kabo Air Services based in Nigeria.

The introduction of the MD87 aircraft had a profound effect on the schedules operated by Ford Air Transportation. Because of the 96 seat configuration it was possible to provide the same number of passenger seats while reducing the scheduled flights. The total number of passengers carried rose in 1993 to just under 83,000, the trend continuing during 1994 to almost 100,000 passengers. During the course of 1994 the department carried its one millionth passenger since operations began.

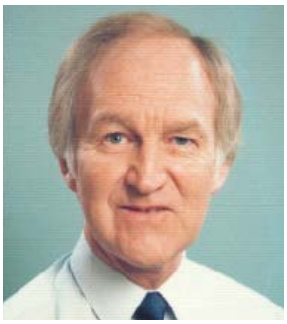
The sole remaining BAC1-11, G-BEJM continued to operate VIP flights supported by Gulfstream I, G-BRAL. Gulfstream I, G-AWYF, being now surplus to requirements, was sold to General Aviation Services based in Chicago during June of 1994; it had served Ford well for 25 years.

Ford Air Transportation continued to evolve. In April 1996 Gulfstream I, G-BRAL was sold to Transair based in Kinshasa, Zaire and is now believed to be in South Africa. Despite the decreasing number of aircraft the passengers carried continued to rise and broke through the 100,000 mark by a considerable amount.

In October 1997, the remaining BAC1-11, G-BEJM was sold to Twinjet who were acting on behalf of an Indonesian client, leaving the Ford fleet down to just the two MD 87s. At the same time an HS125 aircraft, G-JETI was purchased from Al Karafi, to provide the VIP service which was previously supplied by G-BEJM and G-BRAL and because of the small number of VIPs in Europe at the time this proved sufficient. However, as this situation changed there became a need for a larger VIP aircraft and in April 2000 a Gulfstream IV aircraft, VP-BIV was acquired.

At this time, a reassessment of the function of the service which Ford Air Transportation provided was undertaken and another change to the fleet was decided upon. At the time of writing this article, the two MD87s have been transferred to Miami Air International, who have a contract with the Federal Marshal's Office to transport prisoners. To replace the MD87s, two Boeing BBJs were ordered, delivered during the second week of January 2001. The training has been completed and entered service on 15th January 2001.

After this reorganisation, one thing that is certain is that the Ford Air Transportation's team of pilots, cabin staff, engineers and all who support them, will continue to maintain the exemplary standards of efficiency and safety which has been established over the years. We can with great pride say that in our 33 years of operation, to date, we have never had an accident or caused injury to any of our passengers.



SHAIRSPACE 2001 - Newcastle

By The Editor

On the 3rd May 2001 another in a series of SHAIRSPACE meetings was held at the Britannia Hotel, Newcastle Airport.

The meeting was organised by Wg. Cdr Guy Stockhill of the Department of Air Staff and co-chaired by Air Commodore Chris Moran (DAS) and Ed Paintin (Chief Executive, UK Flight Safety Committee)

Over 100 delegates from both civil operators and the military attended. A number of excellent presentations were made to introduce the delegates to various aspects of air operations taking place within Class G airspace. These included: An Airprox Summary for the Region, AWACS Operations and Procedures, Air Defence Operations and Procedures, Control in Class G Airspace, SPADEADAM Operations, Newcastle ATC and an illuminating presentation from Gill Airways.

Discussion during the meeting and afterwards was robust and the delegates had the opportunity to air their views and to ask questions on all the topics covered.

In general the evening was considered extremely good value and many contentious points were aired. Many good suggestions were made and these are being forwarded to the appropriate body for consideration.

Delegates were able to meet the key players in various organisations and in future will be able to make direct contact to discuss relevant issues.

The two main points that emerged from the discussions were:

(a) In general pilots did not fully understand the risks involved in flying in Class G Airspace, nor did they understand how the airspace was being used by others and

(b) Commercial operators that use Class G Airspace on a regular basis should conduct a thorough risk assessment of these operations to ensure that they fully understand the risk that they are taking by so doing.

SHAIRSPACE once again proved to be a resounding success and of great value to those Air Traffic Controllers and Aviators who made the effort to attend.

No Smoking

A 26-year old female passenger on board a transatlantic flight was arrested on landing for illegally head-butting a cabin crewmember.

The crewmember asked her to stop smoking on the non-smoking flight; the passenger refused and then head-butted the crewmember when she persisted.

Like a Fine Wine, We Improve With Age

Do you need to remove your glasses to properly see and read the overhead panel? Do you start to read back a clearance and, after concentrating on all the details in the clearance, find that you need to check the instrument panel to determine what your call sign is? Do you need bright sun on the map to read most of the small details - after you've removed your glasses? Are you thinking of buying a new headset - or better still, a new helmet? - After all, there can't be anything wrong with your hearing. Are you finding you don't have the stamina you used to? Welcome to the over 50 Club.

On the softball diamond I find that older age - maturity, experience and cunning - can still best youth, fitness and exuberance (some of the time). Experience counts a lot in the flying business where it can counteract to some degree (if properly employed) the slowing down of both mind and body. Age usually brings maturity and caution, and we use them to avoid situations with the potential for added stress, which may require rapid thought and action. "Superior pilots use their superior knowledge to avoid situations that would require their superior skills."

The ageing process produces predictable physiological changes. Programmed from birth, they start to appear when we are born and progress throughout our lives. For example, from about age 20 on, our metabolic process slows down. Ageing is a personal process, faster in some people than others, but it will affect us all in due course.

In the flying business, getting older can create some common and some unique problems. Knowing about them and understanding the effects can help us deal effectively with the process. Listed below are a few things to consider about ageing.

Affairs of the Heart

Heart disease is the largest single killer in our society today, and the risk of developing heart disease increases with age. Though age is by far the most important factor, it is not the only one. Other associated factors include family history, gender, high cholesterol, smoking, and diabetes.

Hypertension, or high blood pressure, is more prevalent the older we get, and untreated high blood pressure is related to an increased risk of strokes, with the risk doubling each decade after age 55.

Fortunately our aviation medical system keeps a close watch on problems of the heart, and medication available to Canadian-licensed pilots can, and does, control a large number of heart problems, such as hypertension.

Diabetes

Diabetes is a metabolic condition that results in uncontrolled levels of glucose in the blood. One type of diabetes is more common with increasing age, and early symptoms may go unrecognized for quite a long time. The onset of diabetes is very often accompanied by excessive thirst, frequent urination, weight loss, fatigue, blurred vision, and recurrent skin infections, such as boils. Long-term untreated effects include damage to the kidneys, cardiovascular system, arterial system and eyes, with blindness occurring periodically.

Vision

Our eyesight deteriorates with age, that is a certainty, and almost everyone will develop a condition known as presbyopia, a reduction in our ability to focus on near objects. If you find that your arms aren't long enough for you to read the map, you may be developing presbyopia! Have you ever wished that the overhead CB panel was a bit further away? Have you started to notice that more light is needed to read in low-contrast conditions?

As we age, the flexible crystalline lens of the eye hardens and loses its elasticity and, at the same time, the ciliary muscle that permits the lens to change its shape weakens and loses its tone. When the lens of the eye loses its range of adjustment, the image that the eye takes in is focused behind - rather than on - the retina, and vision becomes blurred. The retina is the thin layer of tissue composed of millions of visual cells that lines the inside back two-thirds of the eye and is comparable to a film in a camera. It receives light and sends tiny electrical impulses to the brain to give sight. Far-sighted people (trouble seeing close up) normally experience the problem before nearsighted people (trouble seeing far away). Presbyopia does not occur overnight, so the onset is not dramatic. Presbyopia progresses gradually over the years, and we tend to adapt to its gradual onset as opposed to becoming overly concerned. It becomes more noticeable as we approach 50. It is estimated that more than 140 million people in North America have varying degrees of presbyopia.

The speed of accommodation or, in other words, the ability to change focus from

near to distant, decreases with age. Have you noticed that it takes what seems to be a long time to focus on the instruments after having had your eyes out of the cockpit for a while?

Cataract problems (opacities in the lens of the eye) or glaucoma (increased pressure in the eye) increases with age. Both glaucoma and cataracts can reduce a pilot's visual sensitivity in low-contrast situations, decreasing our ability, for example, to pick out other aircraft against a background sky. It's a good plan for pilots of advancing years to have a thorough eye examination done every few years.

So you think that your night vision is starting to go but your day vision is still satisfactory? Well, there's a very good explanation for this condition. Night vision is often worse than daytime vision, and this is why your eye doctor checks your vision in a dark room. To accommodate the reduced amount of light in a darkened room, your pupils dilate to allow more of the available light in. The larger pupil forces the lens of the eye to work harder in order to focus an image on the retina. Thus, vision is worse at night in part because the eye has to work harder to do its job, and any impairment in your vision becomes more obvious. In addition, certain cataracts are apparent only when the eye is dilated, and this may be another source of night impairment. "The older we get the more sensitive we are to inadequate amounts of sleep. We tire more easily and rapidly and take much longer to recover. .

Hearing

Hearing loss resulting from unprotected exposure to high levels of noise will cause the majority of our loss, but there is a gradual change related solely to ageing. The natural loss (presbyacusis is defined as age-related hearing loss), which is genetically determined for each individual, is added to environmental loss, so protect what you have. We can take steps to protect our hearing by wearing suitable hearing protection, such as earplugs and/or a good quality headset or hearing defenders. Any time you are in or around helicopters without some form of hearing protection, you are causing damage to what may already be a damaged hearing system. Remember, noise-induced hearing loss will probably be permanent and typically occurs gradually over a period of time. If you need to raise your voice to be heard or are constantly asking people to repeat themselves, then you quite likely have suffered some permanent hearing loss, but the news is not all bad - you can still protect what you have left.

Mind

Sorry, but as we grow older we become slower at mentally processing information; that is a given. It becomes more difficult to absorb new knowledge, particularly that of a technical nature, and we quite often become less receptive to new concepts. We age, and so does our memory. Unfortunately, one of the first things to depart is the part we quite often like best. The episodic memory, the part that tells us what we did last night or where we parked the car, goes early, while the procedural memory, used for automatic actions/reactions, remains minimally affected for a long time. You are far more likely to forget where you put the car keys than how to drive your beloved Acura. The downhill slide begins in our 30s, but the difference in performance between the youngsters and the mature pilots is not attributable to a failing memory alone. It's a given that when people are asked to perform multiple tasks at the same time, performance on one task, and quite often all tasks, shows a marked decline. Older people have, through testing and research, shown an increased performance degradation over test groups of younger people of similar skills in multi-task situations. The age-related gap can, however, be reduced with practice and repetition.

Concentrating, remaining attentive, being interested in what one is reading or hearing, and finding ways to recall a fact or a person's name through word association- thanks Syd for the bit on roses - are methods of recharging a failing memory. Stress is another contributor to a failing memory and ironically, as we age, we also often take on more responsibilities and are placed under more stress. As a group, pilots are normally keen to learn new ideas and take on new challenges, and it is this attribute that aids us in keeping our minds young as the body ages.

There are no magic bullets for slowing or preventing memory loss, but some researchers have written about mental callisthenics or neurobics as a possible aid. Everything from changing your daily commute to work to brushing your teeth with the non-dominant hand may boost the production of brain chemicals called neurotrophins, which may help keep the brain sharp. Neurobics has not been studied in depth, but experts say there is little risk in trying them. The theory - that a more active brain is a healthier brain - has been documented in studies on animals.

As well, physical fitness appears to aid mental fitness. An ageing study on rats found that regular exercise boosted the production of cell-protecting neurotrophins in the brain. It has been reported that older people with poor cardiovascular health were three times more likely than

healthy people to have loss of cognitive function. It would seem that what is required is a fit body along with a fit and active mind.

From Sleep to Altitude

As we age, our reflexes and reaction times slow down. As discouraging as this may seem, it's not all bad and can, to a large degree, be compensated for. What we lose in reflexes, strength and reaction time, we make up for with experience, caution and preparation. There's an old adage that goes "there are old pilots and bold pilots, but there are no old bold pilots." While this is not entirely true, it is definitely true in that there is no substitute for experience.

The older we get the more sensitive we are to inadequate amounts of sleep. We tire more easily and rapidly and take much longer to recover from sleep deprivation than those who are 20 or 30 years our junior.

We require fewer calories to maintain our ideal weight. If that wasn't bad enough, our appetite for the tastier but far less-nutritious foods increases - you'll be happy to know that there is a scientific reason for that.

Our tolerance to alcohol in any form diminishes with age, and it requires less intake to feel the onset of the effects. There is also much more discomfort the next morning, which is quite likely a good thing.

The onset and effects of hypoxia are more noticeable as we advance in years. Hypoxia is defined as a state of oxygen deficiency in the body sufficient to cause an impairment of function. Hypoxia is caused by the reduction in partial pressure of oxygen, inadequate oxygen

transport, or the inability of the tissues to use oxygen. There are four sub-classifications of hypoxia, and the one that affects aviation the most is hypoxic hypoxia, which is a reduction in the amount of oxygen passing into the blood. It is caused by a reduction in oxygen pressure in the lungs, by a reduced gas exchange area, by exposure to high altitude, or by lung disease. Although the Canadian Aviation Regulations (CARs) stipulate that you may fly between sea level and 10,000 ft above mean sea level without supplemental oxygen, this does not mean that you will not suffer the effects of hypoxia at, say, 8000 ft. The greatest change in atmospheric pressure takes place in the first 8000 ft.

Some of the other items that will affect the onset of hypoxia include smoking, blood donations, haemorrhaging, anaemia, certain drugs, chemicals, carbon monoxide, high g forces, prolonged sitting in one position, cold temperatures, positive pressure breathing, narcotics, chewing tobacco, and alcohol.

Can We Do Anything?

It would be nice, but we can't stop the clock. Cheer up, all is not lost. Studies say that exercise is the key to coping with many problems associated with ageing. Exercise, in addition to increasing our tolerance to the abuse we sometimes deal to our bodies, also helps us control hypertension, heart disease and diabetes. Three hours in the gym daily is not required - walking regularly, say four to five hours a week, is one of the best forms of exercise.

Good eating and drinking habits will also contribute to a longer life and more time in the air.

"Superior pilots use their superior knowledge to avoid situations that would require their superior skills."

Give your medical examiner a comprehensive briefing on how your health has been since your last flight medical, and don't leave anything out. Many of us have reasons to be grateful when medical conditions we were unaware of surfaced and were treated before significant problems developed. Although time marches on and we can't stop it, there are steps we can take to slow down the rate. Being prepared for the coming changes we can expect and compensating for them is half the battle. Using those years and years of experience to make an honest assessment of our fitness and listening to what others are trying to tell us is also a step in the right direction. Remember, a healthy diet and regular exercise will help us say "I am fit to fly" for a few more years.

Reprinted with permission from Aviation Safety Vortex – Issue 4/2000

DPs: What Are They?

by Capt J.C. Findlay - Air Force Advanced Instrument School

I don't want to go off on a rant here, but have you heard the FAA now uses new nomenclature for IFR departures? The change is needed and welcome, but there are a few things the USAF aviator needs to know about using them.

The background on this change starts with the C-130 crash in Jackson Hole, Wyoming, in 1996. It was (again) brought to the FAA's attention that corporate knowledge on SIDs and published instrument departure procedures was low. The mishap also highlighted some shortcomings on the design end of IFR departures as well.

What the FAA found was that published instrument departures and SIDs were developed by two different groups of professionals, and each group emphasized different criteria when developing their respective products. As a result, the information portrayed was not standardized. Specifically, a TERPs specialist built published instrument departure procedures strictly for obstacle avoidance. They were never built for things like noise abatement or for an ATC-preferred traffic routing.

SIDs, on the other hand, were built by air traffic controllers strictly for things like preferred ATC routings, simplifying clearance delivery procedures and noise abatement. They were then checked by a TERPs specialist to ensure they would also provide for obstacle clearance on departure. The problem was that there was a lack of standardization in building them and that obstacle clearance was often an afterthought. The problem with published instrument departure procedures is they are often so complex and confusing that they are virtually impossible to fly by looking strictly at the textual description of the procedure.

The FAA has decided to fix this problem by combining SIDs and published instrument departure procedures into one entity. The combination will be called DPs, short for Departure Procedures. This involves some major changes for the FAA, but the pilot will use them exactly the way we use the current system. This will, however, require a little education on our part.

What is now happening at the FAA is that qualified TERPs specialists will produce all DPs. They will produce departures for both ATC purposes and for obstacle avoidance. The DPs built specifically for obstacle avoidance will be called

"obstacle DPs." That sounds a lot like the old published instrument departure procedure, doesn't it? In fact, you use them the same way.

If you are cleared as filed and there is an obstacle DP for the runway you are departing from, you are expected to fly the entire obstacle DP, then to your first filed point. (This is an Air Force requirement unless you filed another DP from the field.) The most notable difference between the old published instrument departure procedure and an obstacle DP is that complex obstacle DPs will be depicted textually and graphically. You will see this transition happen slowly.

User groups can speed up the process by requesting that the FAA build a graphically depicted DP for a particular airport/runway. If an airport has an obstacle DP for any runway at the airport, there will be a "Delta T" symbol on each approach plate for the airport. If the obstacle DP is graphically depicted, there will be a reference to it in the front of DoD/NOS approach books under the non-standard minima and obstacle departure procedures section.

What used to be called a SID is now also called a Departure Procedure, or DP. You will use them just as you used a SID. You may have a DP in your clearance whether you filed one or not. The controller must include the name of the DP in your clearance even if you filed it (e.g., Tribe 63, you are cleared as filed, via the Birmingham Three departure to Randolph AFB, climb and maintain 3000'). DPs built for ATC purposes will always be depicted graphically, just as SIDs were. They will be found in the same places you found them when they were called SIDs.

This new verbiage for IFR departures should not be a big concern for the educated aviator, but that's just my opinion; I could be wrong. Take care and fly safely.

Reprinted with permission from United States Air Force, Flying Safety Magazine, July 2000.

Book Review

HUMAN ERROR BY DESIGN

Author: Dr Simon Bennett FICDDS

In the media 'feeding frenzy' following an air crash the need to apportion blame can lead to the scapegoating of pilots" alleges Dr Simon Bennett in his latest book Human Error - by Design? In his first major book on the subject Dr Bennett explores this somewhat unsavoury trait, suggesting as a solution the application of a 'systems' approach to air crash investigation. The systems approach, grounded in holism, holds that the underlying causes of an event can only be revealed through an examination of all possible contributory factors. These would include, in the case of an air crash; weather, cockpit design, flight crew, cabin crew and maintenance staff training, the quality of the aircraft's operations manuals and check-lists and fidelity of air traffic control instructions. Asserts Dr Bennett; "Because the aetiology of an air crash is often highly complex, involving numerous factors that conjunct in obscure and unpredictable ways, the only acceptable response is to adopt a holistic approach. Systems thinking offers us the best chance of revealing the underlying causes of disaster. Unless we understand these causes, the same thing will happen again. That is something the public does not want and the industry is desperate to avoid". Dr Bennett's research in the field of aviation safety is sustained by his personal love of flying (he is a glider pilot) and in-situ research with a major British airline - research that involves him flying 'jump-seat' on numerous European services. "European airspace is damn crowded. Its a great place to learn!" says the Flying Doctor. The book, which costs £14.95 (+£2.50 P&P), is available from Perpetuity Press, PO Box 376, Leicester, LE2 1UP. info@perpetuitypress.co.uk 0116 221 7778

Passenger Assault

A B777 enroute from Newark to London diverted to Bangor when a 38-year old Moroccan passenger began causing trouble on the flight. He allegedly assaulted not only other passengers, but members of the cabin crew as well.

Assault to Child

A male passenger pleaded guilty to charges of assault onboard a recent transatlantic flight. The flight was in cruise over the Atlantic when the passenger assaulted a seven-year-old girl.

He was sentenced to six months in prison, fined $5,000 with interest and was required to pay $400 in restitution to the girl's parents.

FOCUS Subscription Application

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UK FLIGHT SAFETY COMMITTEE

ANNUAL SEMINAR 2001

GEARING UP FOR SAFE GROWTH

10/11th October 2001
The Radisson Edwardian Hotel Heathrow

Seminar Objective

This Seminar focuses on evolving safety strategies to meet this forecast growth. Resources like Infrastructure, Facilities and especially Trained Personnel, will need to be committed to provide continued safe solutions.

Programme

10TH OCTOBER 2001

1530 – 1700 Registration
This will take place in the Hotel Foyer

2000hrs Seminar Dinner
with After Dinner Speaker

11TH OCTOBER 2001

0800 – 0845	Registration
Session Chairman - **Capt.Steve Solomon, Airtours**	
0900 – 0910	Opening Remarks **Chairman UKFSC**
0910 – 0920	Keynote Speech **Rt.Hon.The Lord Clinton-Davis PC**
0920 – 0940	Expansion with Safety **Capt. Roger Whitefield - BA**
0940 – 1010	Regulation and Legislation - Who has the Plan? **Peter Hunt - CAA-SRG**
1010 – 1040	Crisis Resources I - Pilots **Capt. Paddy Carver - CTC Aviation Group**
1040 – 1100	*Refreshment Break*
1100 – 1200	Crisis Resources II - Engineers **Ron Graham - SFT Aviation** **Tony Ingham** **Gp.Capt. Julian Young - RAF**
1200 – 1220	Controller Mathematics 2+2=5 **Kathleen Nuttall - GATCO**
1220 – 1245	Discussion
1245 – 1400	*Lunch*
1400 – 1420	Safety at Airports - Mind the Gap! **Paul Kehoe - London Luton Airport Operations Ltd**
1420 – 1450	Service Supplies - A Challenge for the Future **Florian Preuss - Virgin Atlantic**
1450 – 1520	Summary **Peter Martin - UKFSC Legal Adviser**
1520 – 1550	Discussion
1550	Closing Remarks **Chairman UKFSC**

Delegate Fees (Including Dinner): UKFSC Members £125 - Non-UKFSC Members £250

SEMINAR INFORMATION

- **Hotel Accommodation**

  Hotel Accommodation is not included in the Seminar Registration Fee. A rate of £135 (including breakfast & VAT) has been negotiated with the Radisson Edwardian Hotel. If you require a hotel booking form please contact the Fairoaks office.

- **Seminar Dinner**

  Dress for Dinner is formal.

- **Cancellations/Refunds**

  Cancellations received prior to 21st September 2001 will incur a 50% cancellation 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 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: ☐ £125 UKFSC Member ☐ £250 Non-Member

This includes Dinner (10th October), lunch, refreshments and car parking. This does not include hotel accommodation – please see above Seminar Information.

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 Wednesday 10th October? 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
Tel No: +44 (0) 1276 855193 Fax No: +44 (0) 1276 855195 e-mail: ukfsc@freezone.co.uk

Confirmation of your registration will be faxed to you on receipt of your Registration Form and payment

UNITED KINGDOM FLIGHT SAFETY COMMITTEE

SEMINAR 2001

GEARING UP FOR SAFE GROWTH

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