

15th SYMPOSIUM ON HUMAN FACTORS IN AVIATION MAINTENANCE

CHAIRMAN'S WELCOME ADDRESS

BREWERY CONFERENCE CENTRE, TUESDAY 27TH MARCH 2001

1. Good morning ladies and gentlemen and welcome to the 15th Symposium on Human Factors in Aviation Maintenance and what I'm sure will be an enjoyable and extremely rewarding three days.
2. When I was invited to open this conference and told it was to be held in a brewery I, of course, immediately said yes. My only regret is that I won't be staying for the three days to find out how much you discover of the brewery! I remember when I was in the private sector ~ we held our meetings with analysts, journalists and institutions here and ~ providing the meeting started at around 11.00 am ~ there were never any problems in getting a good attendance; it would be wrong of me to draw any conclusions!

But perhaps it has some influence on the wonderful attendance today of 330 delegates and speakers from 30 countries

3. These symposia have been running since 1989 but it is only fairly recently that they have expanded to become international, hosted alternately by the FAA, Transport Canada and the UK CAA. In fact, this is only the second symposium of this series to be held in Europe, so I would like to offer a particular welcome on behalf of the FAA, Transport Canada and the CAA to everyone, from both sides of the English Channel, as well as those from further afield.
4. The history of this event is interesting in itself. It was born out of the Boeing 737 Aloha Airlines accident in 1988 and the NTSB report that not only highlighted the ageing aircraft issues, but also shone a light on the human factors issues in maintenance. The FAA sponsored a two day meeting to discuss the subject of human factors in aviation maintenance and I would like to quote Tony Broderick at that time from the FAA who welcomed then just 32 delegates to that first event by starting his address with; I quote:

"There is considerable interest today at the FAA in the subject of aircraft maintenance and inspection. I personally am very excited about the fact that people are willing to spend their valuable time to get together and talk about something which, it is fair to say, we know little about. We in the FAA are not sure where this interest will take us but hope that it will this take us somewhere that we would rather be, compared to where we are today."

5. Well this 'interest' has taken us a very long way indeed. It has spawned research specific to the aviation maintenance domain, the development of human factors tools, changes to requirements and a better understanding of the "human impact" in the aviation maintenance system. This work over the last twelve years has brought us as far as London today and it is not by chance or fancy I suspect that the theme for this years symposium is 'Practical Solutions for a Complex World'. The environment within

which we all work is both dynamic and complex, producing and magnifying the opportunities for maintenance errors and mishaps.

6. Whilst flight crew errors still tend to dominate the aviation safety statistics, the general trend is that there is a relative improvement. Unfortunately, it is the opposite with maintenance errors. Ten to fifteen years ago these tended to be considered a minor issue in terms of aviation safety as a whole, but are now a significant contributor that cannot be ignored. It is a great credit to all concerned that on the face of it perhaps a rather dull subject ~ which of course it isn't ~ can generate such a level of interest and importance ~ hence your attendance today.
7. If we consider what I have just said and couple this with the international effort to reduce the fatal accident rate the time was never more ripe for an event such as this. Its goal is to educate and encourage the adoption of practical human factors tools and good principles and so make our industry as safe as possible.
8. Although we in the CAA are a domestic regulator, aviation is, of course, a global business. Therefore when we recently undertook a comprehensive study of fatal accidents over the last ten years it covered the world's operations. The results show that, although the number of fatal accidents involving large passenger aircraft has remained reasonably steady, if safety levels do not continue to improve then, as movements rise, so could the accident rate.
9. This would not be an acceptable outcome to either the industry or indeed the travelling public. It would not take long for confidence in air travel to be eroded if we were to see frequent major accidents. Attempting to reduce this accident rate therefore takes up much of the work undertaken by regulators such as ourselves throughout the world.
10. The CAA for their part have amongst other things produced guidance material on Safety Management Systems and Human Factors in Aviation Maintenance. The fruits of this work have been passed to other National Aviation Authorities and ICAO so that they can benefit and influence the aviation maintenance community on an international scale. Research projects have also been started on key subjects such as fatigue in maintenance personnel and the development of safety health measurements in aircraft maintenance organisations.
11. If we study accidents and incidents over the past ten years, we see that the vast majority have a prime causal factor that involves a human action. Indeed, according to the Flight Safety Foundation this may be as high as 70%. There is also no indication that this figure is reducing. The issue runs right from the flight deck to further back in the chain, through maintenance and even initial design. We, the National Authorities, have a responsibility to those who work in the industry and to those who travel by air, to ensure maintenance standards and awareness of the importance of maintenance is fully recognised and those who conduct these vital maintenance roles are fully trained and are as professional as in other parts of the industry.
12. Although advances in technology mean that much of the work previously undertaken by pilots, air traffic controllers and others can now be automated, there will always be vital actions that need to be taken by a fallible human. Bearing all this in mind I think we can safely conclude that human factors is of vital importance if we are to improve

safety throughout our industry. I note that yesterday and today in London a conference covering Human Factors in Air Traffic Control is being held and again demonstrates the importance of Human Factors.

13. We work in a vibrant and growing business, where the role of the individual is paramount to safety and success. But it is also that individual whose actions, or indeed in-action, can cause an incident. This is particularly the case in maintenance personnel who have always figured prominently in human factors work.
14. Following several high profile incidents in the UK our domestic industry took the issue of human factors in maintenance extremely seriously. It's now over ten years since a British Airways BAC1-11 aircraft had a windshield failure, resulting in the captain being partially sucked out of the cockpit window. The resulting AAIB investigation found that when the windscreen had been replaced, before that flight, 84 out of the total 90 bolts holding the screen in place were of the wrong diameter.
15. In 1993 an Excalibur Airways Airbus A320 experienced consistent uncommanded rolls to the right during its first flight after a flap change. Again the AAIB recommendation laid much of the causal factors down to maintenance errors.
16. Thirdly came the British Midland Boeing 737 flight in 1995 which safely diverted into Luton following a loss of oil on both engines. The AAIB found that covers on both engines had not been refitted following an inspection, resulting in the loss of almost all the oil from the engines.
17. Between them all three incidents showed classic human factors issues. Confusing manuals, failures to use approved procedures, time pressures, staff shortages and inadequate pre-planning.
18. Much work has been undertaken since these incidents by both industry and regulators to address the issues raised. Maintenance staff now undertake human factors training, maintenance programmes and manuals must take into account human factors principles, and a United Kingdom Human Factors Combined Action Group was set up. One of the latest moves is to encourage maintenance organisations to adopt internal maintenance error management systems. In the right culture these systems can lead to full and frank reporting of human factors issues within an organisation allowing remedial action to be put in place.
19. However, although maintenance remains at the forefront of human factors work, there are still areas to be addressed.
20. Indeed, the US investigative agency, the National Transportation Safety Board, has said that, of 16 accidents it investigated in early 1999, over six were due to maintenance errors. We frequently hear from maintenance personnel of their worries due to working shifts and long hours. New European working hours legislation may address some of these issues. However, the acknowledged world-wide shortage of aerospace engineers,

together with the new European legislation will both introduce new pressures into this area.

21. As an industry, we need to address the shortage of maintenance engineers ~ a year ago when there was a joint Royal Aeronautical Society/CAA Conference conveying to industry our concerns about the shortage and what it would lead to ~ there were some who felt we were over-reacting. I do not think that feeling exists today ~ it is a reality and we have to address it. Tomorrow is too late. If it is of such importance we have to find ways of making maintenance engineers come into this industry where there is commercial stability with employment and “seduce” them away from the other apparently more glamorous areas for perhaps they are only more glamorous in the short term.
22. So clearly, as the agenda suggests, there is no shortage of topics for discussion and I believe over the next few days, you will be talking about crisis management, fatigue, duty time limitations and careers in aviation maintenance.
23. Whilst this symposium is labelled as ‘human factors’, we must keep in our minds that a key objective of maintenance management is safety. Safety Management Systems, of which human factors is a part, are not something new, and are not passing fads. They are not going to go away. Both Safety Management Systems and human factors are key elements of the ‘safety system’ that we must learn about, adopt the principles and institutionalise them so that they become ‘the way of doing normal business’. Whilst of course we need to talk we need “more doing” if we are to make the necessary improvements in safety that industry and the travelling public demand and are entitled to.
24. There is no doubt around the world public transport safety is going to have a higher profile and the best way to continue to build public confidence in aviation is by the thoroughness and professionalism in what we do.
25. As I mentioned earlier we have today around 335 delegates and speakers from 33 different countries, truly making this a major international event. A good example of industry and the regulators working in partnership to enhance safety.
26. I sincerely hope and expect that you will all enjoy the next few days and take away with you knowledge, experiences and tools in your ‘toolbox’ that you will fully utilise in your organisations to make aviation transport even safer. Tony Broderick talked about moving to where we want to be; I will finish by saying let us move to where we have to be; if we make significant progress on the way forward then these three days will have been time well spent. I wish you a really successful conference.
27. Can I hand over to one of the real professionals in this business ~ Ken Smart, head of our AAIB, to give the keynote address.