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THE POTENTIAL FOR SIGNIFICANT FINANCIAL LOSS RESULTING FROM BIRD STRIKES IN OR AROUND AN AIRPORT

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Summary

Following a brief introduction, this paper contains a brief study outlining some arguments concerning the perceived need for maintaining an adequate "airport and/or air traffic control legal liability" insurance programme. It includes reference to known loses caused by bird strikes and an analysis suggesting that in an increasingly litigious world, bird dispersal measures must be vigilantly maintained.

Key Words: Liability, Insurance, Risk Assessment

INTRODUCTION

This brief study offers a simple review outlining our strong belief as to why there is a need, indeed an increasing need, for airport and air traffic control authorities to arrange the appropriate legal liability insurance covers.

We commence our study by considering the potential for loss i.e. may an airport and/or air traffic control authority be found legally liable in the event of:

[i] loss of, or damage to an aircraft

[ii] injury or death of passengers and damage to their property, or

[iii] third party injury, death of property damage

resulting from a bird strike - we review some known losses;

a brief review of potential exposures i.e. fleet composition, traffic development etc.- both current and forecast, and general aviation;

Having considered the potential for loss we identify some specific matters of concern, including potential loss scenarios, proposed changes to international protocols affecting passenger legal liability awards etc.

In summary, we hope our study will offer "food for thought"; airport and/or air traffic control legal liability insurance is necessary. In general terms, airport legal liability insurance is not expensive and considerable insurance capacity is available; limits of circa US$ 1,000 million and above are fairly simply arranged (subject always to satisfactory individual risk profiles).

Mr. J. Goglia of the United States NTSB recently hosted a review on the subject of bird strikes; may we perhaps take this opportunity of quoting his comment that "...escalating bird populations are an increasingly serious hazard to airline operations and merit aggressive efforts to combat their presence near airports..." An accident involving a Boeing 747 aircraft could result in over 500 passenger fatalities - is this so impossible? We must always remember that the only difference between the possible and the impossible is that the impossible is merely likely to happen less often! Subsequent insurance claims for the aircraft hull, passenger fatalities and any third party injuries and/or damage could result in a massive overall claim.

We suggest the arguments for buying adequate airport and/or air traffic control legal liability insurance will be found compelling; will any further persuasion be required?

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THE POTENTIAL FOR AN AIRPORT AND/OR AIR TRAFFIC CONTROL LEGAL LIABILITY LOSS RESULTING FROM A BIRD STRIKE

We open our study by asking three simple questions, namely;

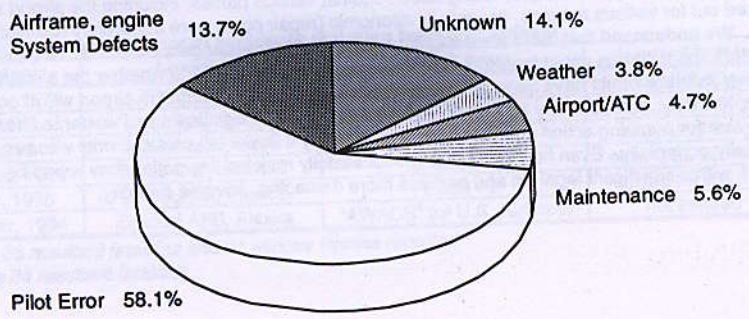
- **is the potential for loss real?**
- **do losses occur?**
- **can an airport and/or air traffic control authority be found legally liable following an accident?**

We answer in the simplest of terms, yes! **The potential for loss is real, losses have occurred and an airport or air traffic control authority can be found legally liable following an accident.** It is not just the daily regimen of slips and falls, collisions with glass doors etc. within an airport terminal that require an authority to purchase adequate airport legal liability insurance cover. The ever present possibility of debris on the runway, birds etc. with consequent threat to air traffic will always be a constant cause for concern and require vigilance in maintaining avoidance measures.

Ever increasing legal liability damages awards must be borne in mind; we note the recent damages award to a passenger involved in the 1989 British Midland Airways crash at Kegworth (involving 47 passenger fatalities) who became disabled as a result of the crash; the court awarded damages of £1,425,000 (or excess of US$ 2 million). Whilst this action doers not appear to involve an airport or air traffic control authority it quite clearly demonstrates award trends. International protocols regarding passenger legal liability award levels are currently under review; could any such review impact adversely on an authority? I understand that according to Japanese philosophy, recourse to litigation represents a fundamental failure in human relations; we in the United Kingdom are currently witnessing an explosion in the desire to seek legal remedies - everything now seems to have a monetary price as we seek the new Holy Grail, **compensation**. It has been observed that once the law starts talking, there is no stopping them. Oddly enough, even in these troubled times, some airports, including some of the larger ones, do not appear to purchase any cover; surely a false economy?

By way of opening our study in very general terms, it is interesting to note that a recent Boeing Company report identified primary loss causes for 234 jet airline accidents, occurring during 1984 to 1995 inclusive; the primary cause of loss was identified as per Figure 1.

FIGURE 1. - Jet airliner accidents - 1984 to 1995 inclusive - by cause:



It will thus be noted that 4.7% of the accidents resulted from what may be considered airport and air traffic control related causes - split currently unknown.

It must be stressed that the foregoing applies in respect of airline losses only; it must also be borne in mind that airline traffic forms only a part of overall traffic levels; general aviation" activities are significant. Whilst the active commercial aircraft fleet stands at circa 24,000 aircraft, the active "general aviation" fleet (excluding China and the former Soviet Union) approaches 300,000 aircraft! We consider some fleet distributions later in this study.

Can bird strikes really be held responsible for aircraft accident/loss? Surely the chances of the total loss of an aircraft resulting from a bird strike are almost non-existent? Minor damage may perhaps be caused, but the total destruction of an aircraft with resultant passenger fatalities is surely something of a long shot? Nevertheless, it is a possibility, if perhaps distant possibility. If I might take an individual example, United Airlines reported that during 1995 , they experienced a bird strike every 18,000 aircraft cycles; we understand that whilst in the majority of instances these involved small birds with little, if any, resultant aircraft damage, the airline's senior engineer at their San Francisco base, estimates that annually, circa 33% of all damage to United Airlines aircraft is caused by bird strikes!

I am sure that a myriad of examples will be cited during the course of this week; may I perhaps mention one instance, which had the fates been less than kind, could have resulted in significant financial loss with the airport and/or air traffic control authority perhaps being included in any subsequent legal actions.

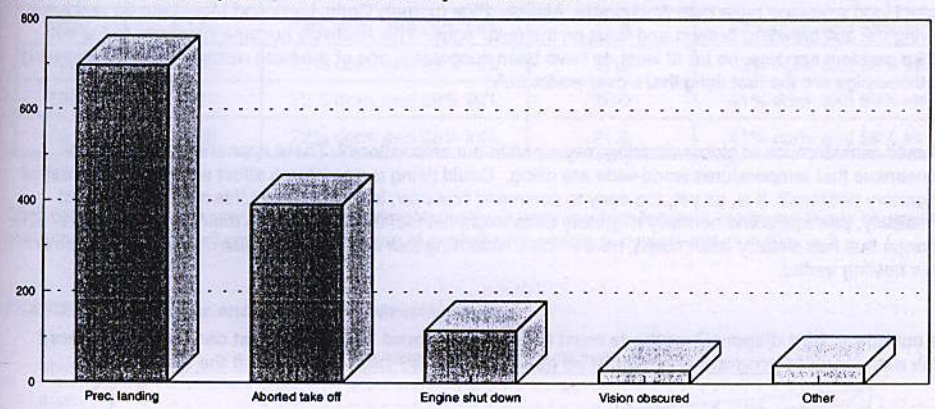
About a couple of years ago, a Boeing 737 aircraft was involved in an incident in North America; in this instance, it is important to note that the topography of the airport involved is such, that a vertical curve on the runway involved meant that the flight crew could not see the far end of the runway until they were approximately half way down the runway. The aircraft performed the standard take off run; however, as it was being rotated, the first officer sighted a large flock of birds (gulls) on the runway, apparently attracted by earthworms which had come to the surface at the end of the runway, following heavy rainfall the previous day. Estimates as to the number of birds varied although the general consensus suggests the flock numbered more than one hundred. The flight crew had no alternative but to continue the take off and with the aircraft approaching, the birds rose. It appears that approximately sixty birds either hit the nose, wings and landing gear or were ingested in the engines. The Captain immediately declared an emergency; control of the aircraft was maintained and a successful emergency landing was carried out; no one on board the aircraft was injured, nor was the aircraft substantially damaged.

We understand that the possibility of taking action against various parties, including the airport authority, was considered but for various reasons, essentially economic (repair costs were apparently relatively light), not pursued. We understand that there were slightly more than 100 passengers on board. Had disaster struck, the resultant financial loss could therefore have been very significant! As to whether the aircraft operator and/or their insurers would have been able to succeed in any action against the airport will of course, remain unknown; however, the monetary sums involved would have been significant and warranted serious consideration for pursuing action against the airport authority if it was felt said authority was responsible, either wholly or partially. Even had the authority successfully resisted any action they would be faced at the very least, with a significant legal bill and perhaps more damaging, adverse publicity.

In response to the question can an airport and or air traffic control authority be found legally liable following a bird strike accident, the successful action taken against Norwich Airport following the December, 1973 loss, caused by a bird strike, of a Falcon 20 aircraft highlights the possibility that an authority may be found legally liable. The Judge, in his summing up, noted that "...the Defendants owed the Plaintiffs *(the aircraft operator)* the common duty of care, that is, a duty to take such care when carrying on their activities at the airport as was reasonable in the circumstances...". After weighing up all the considerable amount of evidence, the Judge decided that the Defendants failed in their duty and that "...there must be judgement for the Plaintiffs for damages...".

Are bird strikes a rare occurrence? We have already commented on United Airlines' experience. Figure 2., based on ICAO supplied information and covering the period 1989 to 1993 inclusive, identifies the consequences of bird strikes by individual effect, quite clearly demonstrating that an airport and/or air traffic control authority must constantly monitor bird populations and take the appropriate measures to disperse flocks:

FIGURE 2. - The consequences of bird strikes by individual effect:



We have already mentioned the December, 1973 Falcon 20 aircraft loss. Was this really an isolated incident? Certainly not! Table 1. identifies some individual instances of aircraft total loss, including, where applicable, the aircraft hull insured loss amount, resulting from bird strike(s):

TABLE 1. - Some individual aircraft accidents resulting from bird strikes:

Date of loss:	Location:	Aircraft type:	Insured hull loss:
November, 1975	JFK, New York	DC-10	circa US$ 25 million
April, 1978	Gossellies, Belgium	Boeing 737	circa US$ 7.9 million
July, 1978	Kalamazoo, USA	Convair 580	circa US$ 600,000
September, 1988	Bahar Dar, Ethiopia	Boeing 737	circa US$ 20 million *
January, 1995	Le Bourget, France	Falcon 20	circa US$ 2.3 million
September, 1994	Elmdorf AFB, Alaska	"AWACS" (of U.S. Airforce)	not insured **

** there were 35 resultant fatalities and 21 serious injuries reported*
*** there were 24 resultant fatalities*

In overall terms, we are aware of at least 15 individual aircraft (12,500 lbs. or over and executive jet aircraft) crashes during the last 25 years which were attributed to bird strikes. Of general interest, an October 1995 accident attributable to a bird strike (a white backed vulture weighing 6 kg.) involved an Ethiopian Airlines, DHC-6 Twin Otter aircraft; 2 of the 17 passengers and 2 of the 3 crew members were injured.

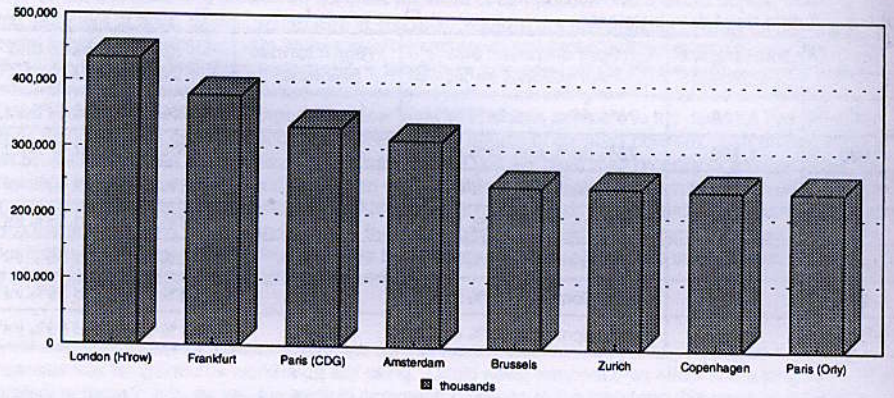
What of the culprits? Is the threat increasing or diminishing? In very broad terms, we suggest the threat must be perceived as increasing. Airline fleet development forecasts suggest some significant increases in aircraft numbers as we move into the next millennium; please refer to the comments included later in this study. Whilst it is difficult to provide an accurate measure of bird populations, it would appear that in general terms, numbers of gulls, geese, (mute) swans and other wildfowl are either stable or showing increases. An important and contributing factor to both increasing and newly resident populations, particularly here in the United Kingdom (and doubtless, elsewhere), is the growth in mineral extraction sites, an increase in the number of rubbish tips and established nature reserves. It is interesting to note that such sites may be situated in close proximity to an airport (the New York, JFK airport, adjacent to the Jamaica Bay Wildlife Refuge being such an example) and must therefore be a source of constant concern. Bird dispersal methods must be ever monitored and reviewed. I am sure most of you will have read recently of a rather charming (attempted and apparently successful) solution to the problem of bird strikes which has been developed at the Lake Hood seaplane base near Anchorage, Alaska. Pigs (namely Curly, Larry and Moe) take up residence during the gull breeding season and feast on the gulls' eggs. This relatively humane response to the bird strike problem appears, so far at least, to have been successful; one of the base users is reported as saying "...those pigs are the first thing that's ever worked...".

Should consideration of global warming play a part in our calculations? There appears to be a general consensus that temperatures world-wide are rising. Could rising temperatures affect some long established migratory patterns? It is, as yet, too early to comment; however, in the long term this must be a distinct possibility, perhaps some normally migratory birds might not feel the need to take their annual holidays? One change that has already been noted, here in the United Kingdom and doubtless elsewhere, is that birds are now nesting earlier.

In summary, bird dispersal methods must be ever monitored. Even the most carefully considered risk management programmes cannot be guaranteed to be 100% effective all the time!

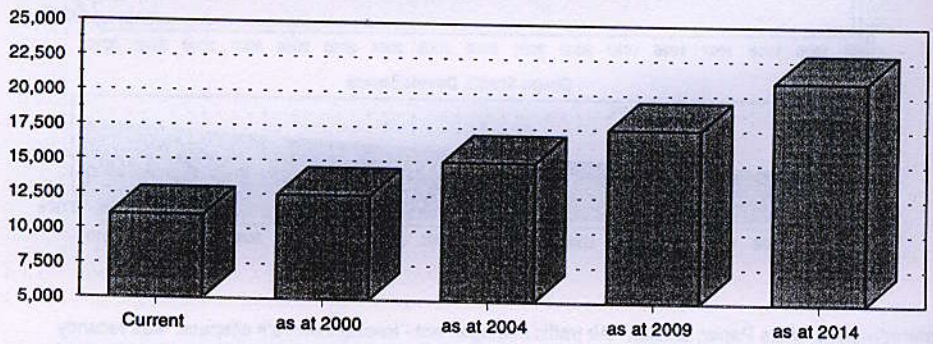
Additional evidence that traffic movements are moving ever upwards is demonstrated by some preliminary 1995 traffic figures provided by the Airports Council International (ACI). As a brief aside, affiliations to bodies such as the ACI and the International Federation of Air traffic Control Associations (IFACTA) demonstrate our interest in airport and air traffic control matters and ensure we enjoy continual access to .a wide range of statistical data. Figure 4. identifies reported 1995 aircraft movements at some of the major European airports; all results show increases over 1994 levels.

FIGURE 4. - Aircraft movements - some preliminary 1995 results:



To accommodate the forecast increases in traffic levels, some significant fleet development programmes are anticipated; current industry based indications suggest that the world jet aircraft fleet (excluding eastern built aircraft) will probably more than double within the next twenty years. Figure 5., based on published estimates, outlines our interpretation. To bring these forecasts to fruition will however require some considerable financial investment: according to Boeing, this will amount annually to excess of circa US$ 50 billion by the year 2004 and beyond.

FIGURE 5. - The active world jet aircraft fleet - current and projected:



Similarly, some significant turbo prop fleet development is anticipated. Table 3. identifies our understanding of the make up of the world airline fleet as at January, 1996 (based on Airclaim's CASE database):

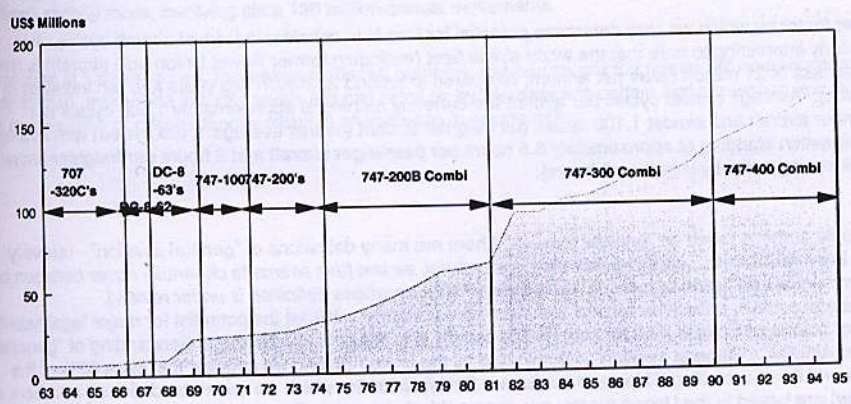
TABLE 3. - The current world airline fleet:

	Aircraft in service	Aircraft stored
Jet aircraft (excluding former USSR built aircraft)	11,044	360
Former USSR built jet aircraft	3,018	85
Turbo prop aircraft (excluding former USSR built aircraft)	4,862	265
Former USSR built turbo prop aircraft	3,650	37
Executive jet aircraft (non USSR built)	858	14
Totals	23,432	761

It is of course, the airline fleet composition that is of particular importance when considering airport and/or air traffic control legal liability insurance and the possibility of a major loss. We specifically identify two significant factors, namely (i) aircraft values and (ii) individual aircraft seating capacities.

Firstly, let us consider individual aircraft values. Figure 6, showing highest basic list prices, reflects the inexorable rise in aircraft values since 1963 (actual insured values are often considerably in excess of list prices once lease considerations etc. are taken into account - aircraft valued at US$ 250 million plus are currently being operated by the world's airlines!):

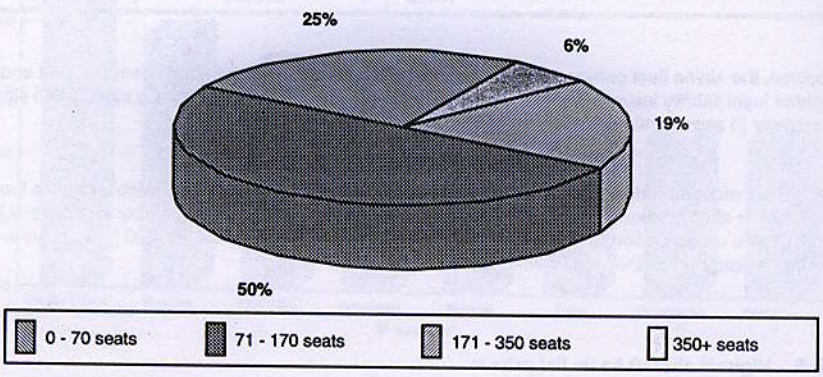
FIGURE 6. - Highest aircraft basic list prices:



These increasing values are reflected within the overall airline fleet insured value. Since 1986 the overall fleet value has increased by an extraordinary 200% (plus)! Our researches indicate that there are there are currently excess of 350 aircraft valued at US$ 100 million and over in operational service and slightly excess of 500 aircraft with a basic list price of over US$ 100 million each, on order to airlines

However, whilst aircraft insured values are an important subject for consideration, it is of course, the potential for resultant legal liability loss in the event of airline passenger injury and/or fatality which provides the major cause for concern. What of individual aircraft passenger seating capacities? Figure 7. demonstrates our understanding of the individual airline aircraft seating capacity breakdown of the current world jet/turbo prop fleet (excluding former Soviet Union built aircraft). It will be noted that approximately 6% of the world fleet of 16,000 plus aircraft are fitted with 350 (plus) seats, representing 9% of the airline jet fleet. Industry forecasts expect this figure will be considerably increased by the years 2014/15; perhaps to 20% or upwards i.e. circa 4,000 plus aircraft.

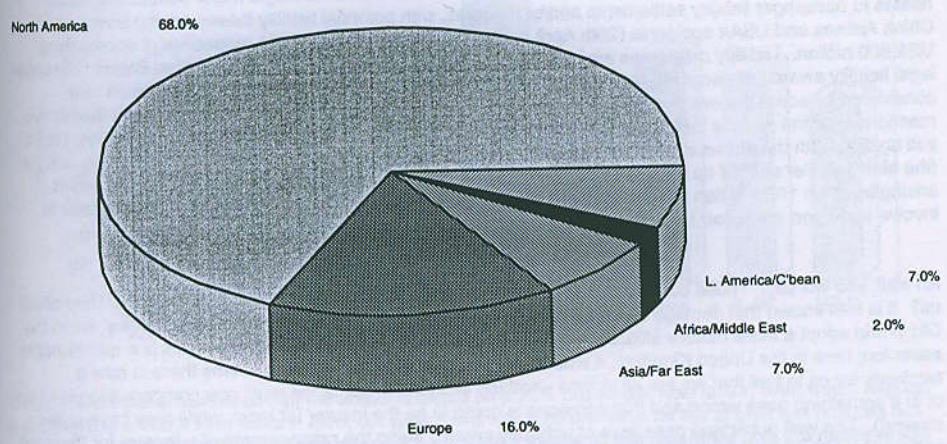
FIGURE 7. - The world jet and turbo prop airliner aircraft fleet - seat distribution:



Another factor by which we may determine potential for loss is to consider individual aircraft cycles. It is particularly interesting to note that the world airline fleet (excluding former Soviet Union built aircraft) is now flying excess of 31 million hours per annum, compared to around 22 million five years ago (an increase of 40% plus). Average annual cycles per aircraft are currently running at approximately 1,500 cycles per passenger aircraft and almost 1,100 cycles per freighter aircraft (overall average 1,405 cycles) with average daily utilisation standing at approximately 6.5 hours per passenger aircraft and 3 hours per freighter aircraft (overall average slightly less than 6 hours).

We should perhaps touch on "general aviation" (there are many definitions of "general aviation" - our very simple interpretation is ... *aerial observation, agricultural, air taxi [this seems to cheerfully hover between both the commercial and "general aviation" camps dependant on whose definition is under review], corporate/executive, private/recreation and instructional activity* ... Whilst the potential for major legal liability loss is of course much less than for commercial activity, it is sensible to offer our understanding of "general aviation" activity . "General aviation" is dominated by the United States; we suggest that circa 63% of the active world fleet (excluding China and the former Soviet Union for which we understand aircraft numbers are fairly low) are based in the United States; our geographical viewpoint, Figure 8., identifies our understanding of the world-wide distribution (the 68% figure for North America includes 5% for Canada):

FIGURE 8. - The current active world general aviation fleet (based on an estimated circa 280,000 aircraft):



Of the foregoing, we suggest that slightly excess of 80% are piston engine aircraft, circa 4% turbo prop aircraft, circa 3% jet aircraft, circa 5% rotor wing aircraft with the balance relating to various other types. Our data base further suggests that the world-wide "general aviation" fleet (excluding China and the former Soviet Union for which activity is, we understand, minimal) currently operates for circa 40 million hours annually, perhaps slightly more, involving circa 120 million annual movements.

Increases in aircraft values, **increases** in aircraft numbers and particularly the number of operational wide body aircraft, **increases** in traffic levels are met head on by **increases** in certain bird population levels - could this combination of circumstances result in an **increase** in accidents?

WHAT IS THE POTENTIAL FOR LOSS - IS THE SKY THE LIMIT?

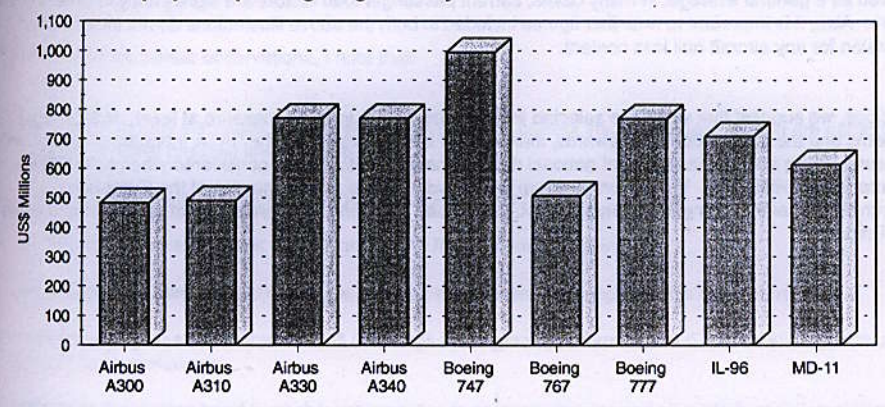
1994 calendar year airline loss levels were the highest on record and the single major contributing factor relates to passenger liability settlements and/or reserves, with potential liability losses arising from just the China Airlines and USAir accidents (26th April, 1994 and 8th September, 1994 respectively) approaching US$ 600 million. Liability exposures are of considerable concern to airline insurers; United States passenger legal liability awards are edging ever upwards with US$ 2.5 million (perhaps higher?) per person now considered by some the average (initial) reserve (with similar levels for Japan?). With regard to the (above mentioned) China Airlines loss we understand that relatives of some 121 passengers who died have filed a suit against both the airline and aircraft manufacturer claiming slightly more than US$ 2 million a passenger (the airline earlier offered up to US$ 154,000 a person). We have already mentioned the recent award arising from the 1989 British Midland Airways crash at Kegworth. Whilst none of these actions appear to involve an airport and/or air traffic control authority they quite clearly demonstrate award trends.

Ah well, you will say. These comments apply to the United States and the Far East - why should they affect us? It is well known that damage awards in the United States can involve fairytale figures; surely, we in the Old World adopt a more mature attitude to the question of damage awards? I suggest this is a questionable assertion; here in the United Kingdom, it would seem increasingly so. Sadly, it seems there is now a tendency for us to feel that we are all victims - nothing is our fault; someone must pay compensation (and lots of it) if something goes wrong and that someone is going to be the insurer (at least, while they have some money!). The well publicised case here of unhappy parents suing the management of a theatre for "trauma" suffered by a three year old child taken to see a production of Peter Pan, despite a warning issued by the theatre that the play was unsuitable for children below the age of 7 (a fact of which the parents were apparently aware) highlights an increasing insanity and inability to accept personal responsibility.

It is perhaps appropriate that we consider the important proposed changes to the international protocols affecting passenger legal liability awards i.e. the "IATA Intercarrier Agreement". It is not necessary to reproduce the proposed agreement in full; merely to note that in essence, the purpose of the Agreement is to waive any existing passenger liability limitations [Warsaw etc. Conventions] so that *...recoverable compensatory damages may be determined and awarded by reference to the law of the domicile of the passenger...* By this simple device, the world finally becomes the oyster of the United States legal system. It is intended that the new agreement become effective either by 1st November, 1996 or the date of signing by the respective governments. A number of airlines have already signed their agreement. As to how this proposal will affect liability exposures under airport and/or air traffic control legal liability covers remains to be seen although it seems likely there could be some impact at least, particularly in the event of an accident involving United States domiciled passengers outside the United States. There will doubtless be many complications to resolve if this proposal becomes effective (i.e. initial indications suggest that defining domicile will provide hours of fees for the lawyers); as with all things, will the legal profession be the ultimate beneficiaries? It could be argued perhaps that the waiver of liability limits could dissuade plaintiffs from attacking other parties including airport etc. authority's in a move to circumvent Warsaw etc. limitations; conversely however, might such a development result in increased pressure on airline insurers to subrogate against an airport? An airline itself, following loss, might wish its insurers to take the appropriate legal measures to ensure that their (the airline) claims record reflects their own fortunes and is not blackened by the perceived failures of others.

If we make the assumption that the average passenger liability award in the United States now stands at circa US$ 2.5 million a person, even a limit of US$ 1,000 million any one loss appears potentially inadequate. Figure 9., presented perhaps as a scare tactic as much as anything else, identifies the major current production aircraft, showing potential cumulative losses following a total loss based on a 70% passenger load factor (with 100% passenger fatalities) and a settlement of US$ 2.5 million a passenger:

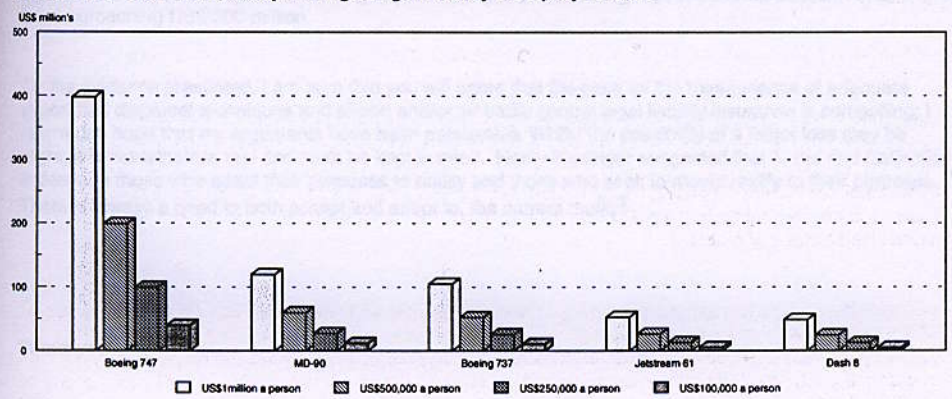
FIGURE 9. - Some projected passenger legal liability loss scenarios:



It must always be remembered that the above is based on a 70% passenger load factor; what would happen in the event of a 100% load factor? Also, our projections make no provision for the aircraft hull (insured hull values can touch US$ 250 million) and any third party liability losses; in this regard we note the recent An-32 accident in Kinshasa, resulting in considerable loss of life on the ground. Similarly, there were 43 ground fatalities and a further 11 persons injured following the 1992 El Al Israel Airlines, Amsterdam accident. Additionally, we must always bear in mind that the foregoing illustration reflects claims assuming United States related exposures; awards elsewhere are not necessarily so high (yet!).

To enable us to view an overall picture, Figure 10. shows potential cumulative losses for some of the popular aircraft currently in service based on a number of average award levels, once again assuming a 70% passenger load factor (it must be borne in mind that it is essentially the loss of a high passenger capacity jet aircraft that provides the greatest exposure for the airport and/or air traffic control authority);

FIGURE 10. - Some selected passenger legal liability loss projections:



It is important to note that whilst we make reference to aircraft passenger load factors of 70% this must be viewed as a general average; in many cases, current passenger load factors are significantly in excess of this figure. Also, it is important to note that figures included in both the above illustrations do not include any provision for any aircraft hull loss content.

To close, we suggest that whilst the selected limit may be based, in some measure at least, on local legal systems and the level of domestic awards, international initiatives such as the "IATA Intercarrier Agreement" will surely bring about a narrowing of national distinctions and must be fully considered when selecting the appropriate liability limits. We in Europe seem to daily witness the many tentacles of the European Commission merrily tickling away; like it or not, will we see a general standardisation of legal systems within the Union?

CONCLUSION

To summarise my earlier observations, I note that:

- airport legal liability insurance is relatively inexpensive and current insurers capacity levels are generally adequate to meet required levels of liability;
- individual insured aircraft values now touch US$ 250 million!
- the wide body aircraft content of the world airline fleet is ever increasing;
- in general terms, bird populations, gulls, geese, (mute) swans (and legal eagles?) are increasing;
- might changing weather patterns result in changes to migratory patterns - bird dispersal strategies must be constantly reviewed;
- there is an increasing trend to seek legal remedies to compensate any and all misfortunes - international passenger legal liability protocols are under review - passenger legal liability awards are generally increasing - will courts be increasingly sympathetic to the plaintiff?

The best laid plans of mice and men do sometimes go astray; our vision, particularly these days, is sometimes obscured by detail and we miss the obvious! Is the sky the limit? New developments in engine manufacture (i.e. the GE 90 and Rolls Royce Trent engines) should help alleviate the problem, at least in part; even so, the bird strike problem will surely remain with us for as long as aircraft are flying.

Let us now offer a possible future loss scenario, set in the United Kingdom. The "IATA Intercarrier Agreement" is in force and a Boeing 767 aircraft (insured value at circa US$ 75 million) carrying 200 passengers crashes on take off as a result of a bird strike, 150 passengers are killed, 30 suffer serious disabling injuries and 20 walk away uninjured. Taking the recent Kegworth award as our bench mark let us assume a slightly more modest award of US$ 1.5 million a person for passengers who became disabled; an average award of perhaps US$ 1 million to the dependants of each fatality (this allowing for a few United States domiciled passengers); excluding any third party exposure, our proposed scenario results in an overall loss approaching US$ 300 million.

On the evidence presented, I am sure that you will agree that the case for the maintenance of adequate airport bird dispersal techniques and airport and/or air traffic control legal liability insurance is compelling; I very much hope that my arguments have been persuasive. Whilst the possibility of a major loss may be slight, it is nevertheless real and must be kept in mind. Henry Kissinger suggested that "...the real distinction is between those who adapt their purposes to reality and those who seek to mould reality to their purposes...". There is always a need to both accept and adapt to, the current reality!

Thank you