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IS THE POSSIBILITY OF A COSTLY AIRCRAFT BIRD STRIKE GROWING?

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Abstract

This paper considers airline fleet development, in terms of aircraft numbers, aircraft cycles and passengers/cargo carried. Industry sources project some buoyant fleet /traffic growth forecasts. For example, Boeing suggest that almost 9,000 new jet airliners (of which 25% will be wide body aircraft) will be required over the next 10 or so years or 20,000 over the next 20 years. The paper goes on to consider the potential costs of an aircraft bird strike". Based on Boeing projections, I calculate that the average cost per aircraft delivery as projected above, is around US$65 to US$70 million - some of course much higher - insurance values will probably increase even more (to US$200 million and above). An aircraft bird strike could become increasingly costly. With economic expectations rising worldwide, legal liability awards following an accident could be significant. And with the wide body content of the fleet projected to increase, there may be an increasing possibility of a major financial loss following an "aircraft bird strike".

Key Words: Civil aviation, Cost, Liability, Insurance.

Firstly things first - may I thank the IBSC for allowing me the opportunity to give this short paper and the opportunity to visit Amsterdam.

Bird Strike Committee, USA have gone on record in suggesting “there is about a 25% probability that a large jet transport will be involved in a fatal bird-strike related accident in the U.S. or Canada within the next ten years or so!"

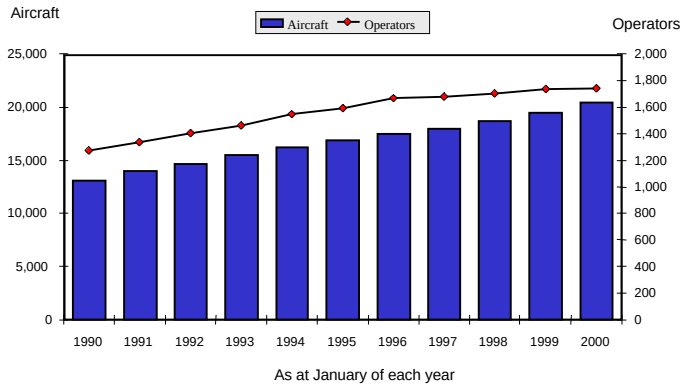
I cannot speak as an authority on bird populations although I understand Canada goose populations are growing. Commercial aircraft populations are certainly growing and with some costly aircraft being added to airliner fleets and legal liability award levels arguably on the up, I cannot but suggest the possibility of a costly (an increasingly costly) aircraft bird strike accident is increasing.

So let me first set the scene. The aviation industry is offering some buoyant fleet development/traffic growth forecasts. Between them, Boeing and Airbus Industrie reportedly delivered more than 900 aircraft during 1999, representing a record. It is however expected that (year) 2000 deliveries will be lower as Boeing have indicated they will be cutting back on production. In general terms, Boeing project that almost 9,000 new jet airliners (passenger and cargo aircraft of which again around 25% will be wide-body aircraft) at a cost of around US$585 billion, will be required over the next 10 years. Alternatively, slightly excess of 20,000 new aircraft airliners (passenger and cargo aircraft of which around 25% will be wide-body aircraft), at a cost of US$1.38 trillion, over the next 20 years. This equates to an average cost per aircraft of between US$65 million and US$70 million.

As economic expectations rise world-wide, an increasingly mobile population will expect to travel more widely, whether it be holiday, business, visiting relatives. Many will travel by air. Such demands will however need to be balanced against a number of factors, such as availability of airport capacity (as mentioned above), air traffic congestion and whether environmental concerns in the form of noise, emissions etc will allow for unbridled air transport growth. Will air traffic control be able to cope with increased traffic levels? As the fleet content and cycles increase, so must the chances of accidents increase?

The number of operational airliners and airline operators has increased consistently over the past few years and as we have seen, this growth is projected to continue. The following chart (based on figures per Airclaim’s CASE data-base) tracks both airliner operator and fleet growth (western built aircraft only) since 1990 (at the beginning of 1960 the fleet (active/inactive) stood at circa 760 aircraft, 1970 at circa 5,100 aircraft and 1980 at circa 8,115 aircraft):

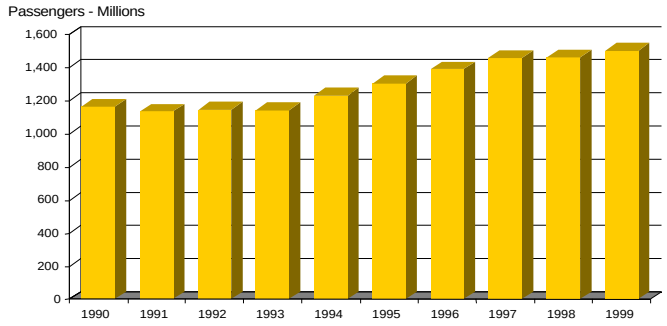
The World Western Built Airline Fleet (Jet, Turbo Prop and Executive Jet Aircraft) and Operator Development - 1990 to 2000 Inclusive



Traffic levels are predicted to show growth. ICAO projections suggest traffic increases (in rpk terms) of around 5% during 2000 and nearly 6% during 2001 (preliminary indications suggest the 1999 figure was up around 5% over 1998). Airbus Industrie's "Global Market Forecast – June 1999", projects that passenger traffic will grow at an average rate of around 5% during the next 20 or so years. Boeing, in their "Current Market Outlook – June 1999", project that passenger traffic will rise at around 4.7% over the next 20 years (cargo traffic is projected to increase at a rate of 6.4% over the same period).

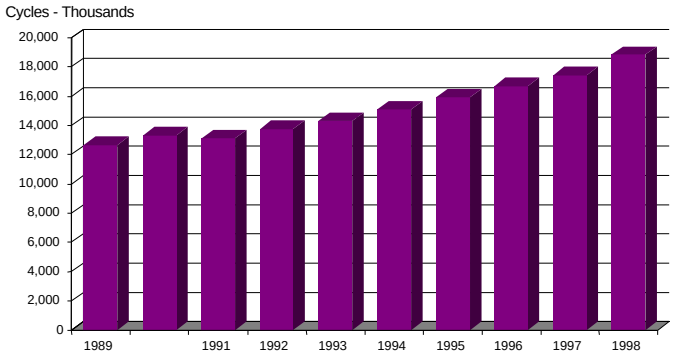
The following chart, based on ICAO promulgated material, identifies scheduled passenger traffic development since 1990; around 70% of all traffic involves domestic movements. As will be seen, the recent trend is generally upwards. Indeed, according to a late December 1999, ICAO press release, "in 1999 the number of passengers carried worldwide on scheduled passenger services exceeded one and a half billion for the first time":

Scheduled Airliner Passenger Traffic - 1989 to 1999 Inclusive per ICAO (1999 figures are preliminary)



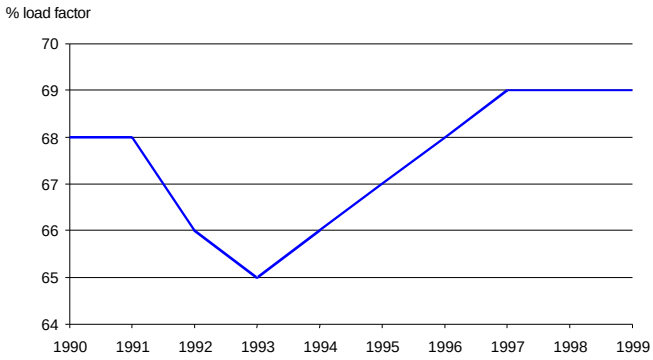
Aircraft movements are on the up – the following chart identifies my general understanding of jet airliner movements (1989 to 1998 - per Airclaim's CASA data-base) for western built aircraft:

Airline Cycles (Landings) - 1989 to 1998 Inclusive (Western Built Aircraft Only)



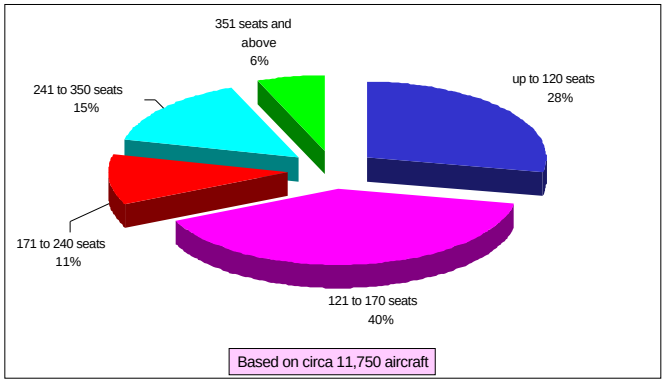
Optimum use of aircraft will become increasingly essential so any review of this nature must consider load factors. Unfortunately, owing to the number of operational airlines, definitive statistics are difficult, if not impossible to promulgate, so any offered view must be considered selective. The following chart offers a historical view (1990 to 1999 inclusive – the 1999 figure is preliminary and subject to confirmation) of (scheduled) passenger load factors, per ICAO – as will be noted, following the early 1990's glitch, the trend is steadily upwards:

Scheduled Airline Passenger Load Factors - per ICAO - 1990 to 1999 Inclusive (1999 figure is preliminary)



The number of wide-body jet aircraft (i.e. Airbus A300, Airbus A310, Airbus A330, Airbus A340, Boeing 747, Boeing 767, Boeing 777, DC-10, MD-11 and L1011 aircraft) has increased annually since the introduction of the Boeing 747 into commercial service during the early 1970's. The following chart, based on the currently operational western built passenger jet airliner fleet of 11,250 aircraft or so, shows a distribution by aircraft seating band – around 21% of the aircraft are wide-body types:

The (western-built) Active World Passenger Jet Airliner Fleet Banded by Seating Capacity

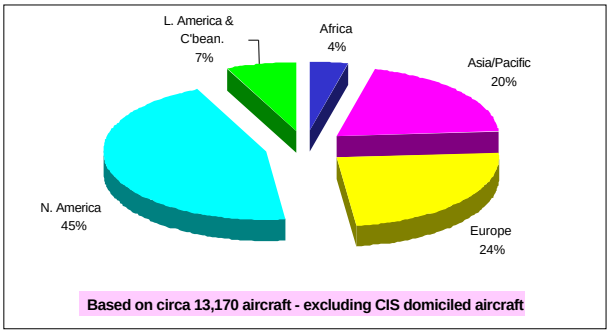


Fleet projections suggest that as we move into the 21st Century, either effective January 2000 or January 2001, dependent on your point of view,

there will be a move towards the introduction into service of aircraft offering individual aircraft seating capacity of up to 1,000 seats. According to a December 1999, Airbus Industrie press briefing, the economic viability of the proposed Airbus A3XXX aircraft has been established and it is hoped the aircraft will enter service by 2005. However, if, or as perhaps I should say, when, these new larger aircraft are to become operational, there will be some considerable demands on individual airport infrastructure, including perhaps, the strengthening of runways, taxiways and apron areas. New boarding bridges might need to be installed. Airport modification costs might be significant although it is understood that some of the newer built airports, such as Munich, Denver and Kansai, will require few modifications.

I close this brief fleet development view by considering the current world fleet in terms of geographical distribution – once again concentrating my attention on the active jet airliner fleet (both passenger and cargo type aircraft):

The (western-built) World Active Airliner Jet Aircraft Fleet at January 2000 - By Geographical Distribution



Prior to considering the potential financial consequences of an aircraft bird strike, perhaps I should take a couple of minutes to consider the impact of aircraft bird strikes. The following table, based on ICAO supplied information, identifies the consequences of significant bird strikes by individual effect whilst excluding incidents with no known effect. The results quite clearly demonstrate that the airport and/or air traffic control authority and/or airline must constantly monitor bird populations and ensure the appropriate measures are taken to deter and disperse individuals and flocks. Since as I understand it, only a limited number of member' State's respond, the above figures might perhaps be increased by say 10% (perhaps more) to take account of experience in these non-reporting States?

Year	Precautionary landing incidents	Aborted take-off incidents	Engine shut-down incidents	Other incidents	Total reported incidents
1989	125	88	26	14	253
1990	173	91	36	7	307
1991	97	63	28	14	202
1992	216	97	17	29	359
1993	86	53	9	11	159
1994	189	122	31	34	376
1995	249	142	16	74	481
1996	264	152	24	93	533
1997	231	122	14	114	481

I have mentioned that the wide body content of the airliner fleet is increasing. The following table, which identifies some individual aircraft total losses resulting from aircraft bird strikes, includes two incidents involving wide body aircraft, namely an Airbus A300 (with 185 passengers and 10 crew on board) and a DC-10 arcraft (with 128 passengers and 11 crew on board). In the event, neither accident resulted in any fatalities.

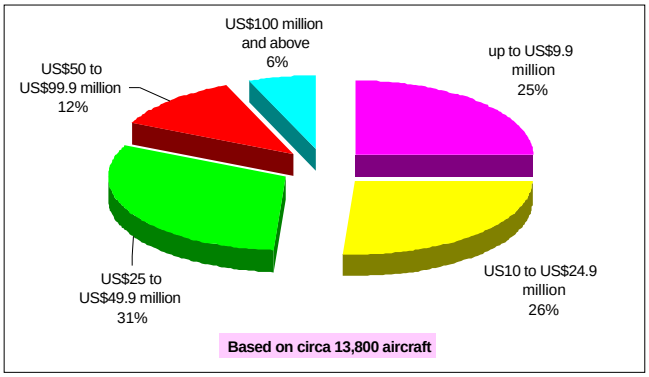
Loss date:	Location:	Aircraft type:	Bird species:	Fatalities:
Oct., 1960	Boston, USA	L 188 Electra	Starlings	62 fatalities
Nov., 1962	Maryland, USA	Vickers Viscount	Whistling Swan	17 fatalities
March, 1973	Atlanta, USA	Lear 24	Cowbirds	7 fatalities
Nov., 1975	JFK, New York	DC-10	Gulls (various)	None known
April, 1978	Gossellies, Belgium	Boeing 737	Wood Pigeon	None known
July, 1978	Kalamazoo, USA	Convair 580	Sparrowhawk	None known
Sept., 1986	Madras, India	Airbus A300	Black Kite	None known
Sept., 1988	Bahar Dar, Ethiopia	Boeing 737	Speckled Pigeons	35 fatalities
Dec., 1991	Maasi-Mara, Kenya	Piper PA31	White Headed Vulture	9 fatalities
Jan., 1992	Maasi-Mara, Kenya	Cessna 401	Marabou Stork (?)	7 fatalities
Jan., 1995	Le Bourget, France	Falcon 20	Lapwings	10 fatalities
Sept., 1995	Elmendorf, USA	“AWACS”	Canada Geese	24 fatalities
Oct., 1995	Addis Ababa, Ethiopia	Twin Otter	White Backed Vulture	None known
July, 1996	Eindhoven, Holland	Hercules	Starlings/Lapwings	34 fatalities
July, 1996	Aktion, Greece	“AWACS”	a large black bird?	None known

Let me now consider the financial view. Individual aircraft are now insured for US$200 million and above. I understand that the highest valued aircraft (in insurance value terms) currently in operational service has an insurance value of around US$225 million. An increasing number of insurance programmes include provision for high value aircraft - an analysis of 1999 airline insurance

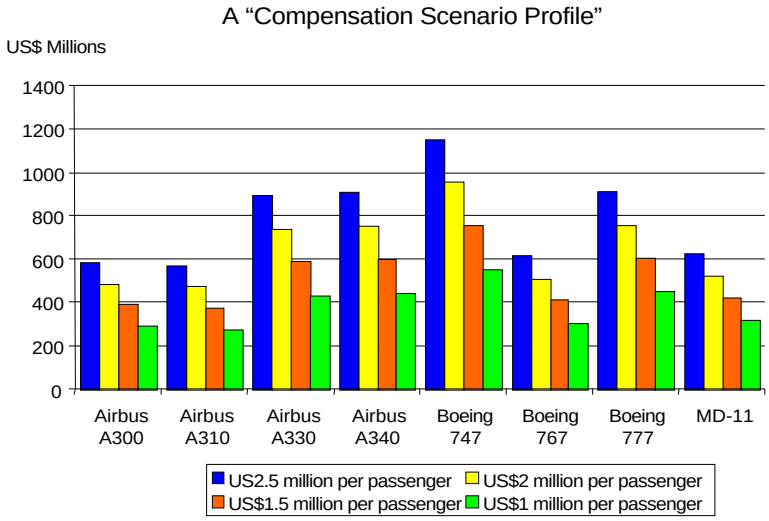
programmes indicates that around 26 such programmes include provision for aircraft with values of US$200 million and above. Whilst the number of aircraft with insurance values of US$200 million and above will currently be fairly low, numbers must increase as more new generation, high valued aircraft, enter service.

Whilst I am unable to provide a definitive view of the world's airliner fleet by insurance value banding, I am able to offer a general indication based on "current market values". The current chart considers western built jet airliners (active/inactive) by taking suggested individual “current market values” per aircraft type/variant, and grossing it up by around 25%. The average “mark-up” was derived from a study we developed comparing “market values” against “insurance values”. Whilst this simple rationale cannot provide a definitive view it does at least allow us to gain a very general understanding:

The (western-built) World Active/Inactive Airliner Jet Aircraft Fleet - Banded by Aircraft Value (calculated at “current market value” plus 25%) - as at January 2000



Whilst the destruction of an aircraft hull can be expensive, it is however potential legal liability awards that offer the gravest cause for concern. The following chart identifies various potential “cumulative compensation” claims for some of the current operational aircraft types. These potential claims, based on an aircraft total loss and assuming a 70% passenger load factor (as we have already seen, ICAO confirm a 69% load factor for scheduled airliner operations) are calculated by taking the basic aircraft list price plus selected (across the board) passenger award levels. I do however, exclude any third party injury or property damage compensation award projections. Although it is not really appropriate to single out any individual aircraft type, exposures resulting from a Boeing 747 accident arguably offer the "worst case" scenario -our records indicate there are around 800 Boeing 747 passenger aircraft currently in service:



Could an accident cost excess of US$1 billion? I hear you ask whether this represents an exaggeration. Well, not necessarily so. Whilst I am unable, for confidentiality reasons, to identify specific losses, incurred insurance claims for a number of losses, indexed to 1999 US$ values, have exceeded US$500 million. A loss of US$1 billion and above would not appear impossible - and as the world airliner fleet grows in number it arguably becomes increasingly likely.

I close these brief comments by noting that whilst the likelihood of a major aircraft accident is perhaps unlikely, although certainly not impossible (please refer to this paper's opening paragraph) the so called, hidden costs of aircraft bird-strikes, are of constant concern, particularly to aircraft operators. In the event of an accident/incident, the aircraft operator may be saddled with a number of unexpected costs (they are referred to hereinafter as "indirect costs"). These may perhaps arise following a precautionary landing (such as a return to airport), an aborted take off or an engine (single or multiple) shutdown. Factors contributing to these "indirect costs" might include:

- the cost of re-routing passengers (this might include the cost of complementary tickets issued to disadvantaged passengers to make up for any inconvenience)
- the cost of passenger and/or crew accommodation, refreshments etc. (in the event of a delay in excess of circa 12 hours all on-board food has to be replaced)

- costs incurred to replace dumped fuel
- costs incurred to bring in replacement aircraft and/or engines (these are of course dependant on aircraft availability)
- loss of revenues
- contractual penalties i.e. for late delivery of cargo
- any inspection costs
- additional maintenance costs
- additional airport and/or air traffic control charges (including storage charges)
- relocation of crews, cost of replacement crews
- loss of confidence and perceived damage to the “good name” of the airline i.e. resulting in cancellations, loss of revenue and extra expenses incurred to restore the “good name” etc.

Ladies and gentlemen - thank you for your time and patience.