



**WORKING PAPER**

**DIRECTORS GENERAL OF CIVIL AVIATION CONFERENCE  
ON A GLOBAL STRATEGY FOR AVIATION SAFETY**

**Montréal, 20 to 22 March 2006**

**Theme 1: The status of aviation today**

**Topic 1.1**

**WORLDWIDE AND REGIONAL TRENDS IN AVIATION SAFETY**

(Presented by the Secretariat)

**SUMMARY**

The aviation industry has made tremendous improvements in the safety of international aviation. Nevertheless, recent events have shown that there are limitations to traditional approaches to safety and that new approaches are required to prevent the number of fatalities and accidents from rising as traffic increases.

Action by the Conference is in paragraph 4.

**1. INTRODUCTION**

1.1 In the last sixty years, tremendous improvements have been made in the safety of the international aviation system. From a rate of 4.48 passenger fatalities per 100 million passenger miles in 1945, the rate dropped to 0.04 in 1995. Thus, over a period of fifty years, the risk of fatalities to the flying public was reduced by a factor of 100.

1.2 In more recent years, safety was further improved. Using another measure, the rate of accidents involving passenger fatalities in scheduled air transport operations (excluding accidents caused by acts of unlawful interference) dropped from 0.12 per 100 000 flights in 1995 to 0.04 in 2004, a reduction of 66 per cent. In the same time period, the number of fatal accidents in all air transport operations involving fixed wing aircraft dropped from eighty-six to sixty-two, and the number of fatal accidents in scheduled airline operations decreased from thirty-one to twelve. The number of fatally injured passengers in scheduled air transport operations (excluding fatalities caused by unlawful interference) in 2004 was 208, the lowest number since 1945.

1.3 These significant reductions in the number of accidents and fatalities have taken place while traffic has increased by some 27 per cent from 1995 to 2004.

1.4 Accident numbers are not evenly distributed through the regions. To obtain a more complete picture, regional rates have been established using five-year averages due to the volatility inherent in the annual accident rates caused by the small amount of traffic in regions such as Africa and the Middle East. In these regions, annual accident rates depend heavily on the circumstances of a particular year and should not be used.

1.5 The five-year average rates show substantial differences. For example, Africa had a rate of some five fatal accidents per million departures for the period of 2000-2004. This rate is more than six times that of the world average of 0.8. This rate was also higher than the preceding five-year period of 3.6. The rate for the Middle East was 1.8, slightly higher than the rate for South America and the Caribbean with 1.7. The average rate for the Asia and Pacific Regions was 1, just above the world average of 0.8. Europe (0.6) and North America – United States and Canada - (0.4) had rates lower than the world average.

1.6 The overall improvements in the level of safety can be observed in the reduction of the world average fatal accident rate in scheduled air transport operations from 1.3 for the years 1995-1999 to 0.8 for the years 2000-2004.

1.7 Analysis of the accident data shows that the efforts to prevent Controlled Flight into Terrain (CFIT) type accidents have been successful. In 2004, for the first time since 1990, there were no CFIT type accidents involving aircraft over 27 000 kg. The number of CFIT type accidents involving smaller fixed wing aircraft dropped from thirty-nine in 1995 to eleven in 2004.

1.8 The success of the CFIT prevention efforts was such that for much of the decade 1995-2004 the reduction in the number of fatal accidents resulted largely from the prevention of CFIT type accidents. During the same period efforts to address other categories of accidents have not yet shown similar results. Without any new safety breakthrough, it is likely that the number of non-CFIT accidents will increase in line with increases in traffic.

1.9 The accident record for the years 2004-2005 appears to underline this concern. Compared to 2003, there has been an increase in the number of fatal accidents involving scheduled aviation. In 2004, there were twelve such accidents, compared to ten in 2003. For 2005, available data at the end of December indicate a total of twenty-one fatal accidents, a 75 per cent increase over the previous year and an 110 per cent increase over the year 2003.

1.10 Similarly, the number of passenger fatalities in scheduled air transport operations for aircraft over 2 250 kg (excluding fatalities resulting from acts of unlawful interference with civil aviation) more than tripled, from 208 in 2004 to over 710 in 2005.

1.11 Several fatal accidents in August, October and December 2005 brought further public attention to the safety of civil aviation.

## **2. LIMITS OF REGULATORY SAFETY**

2.1 The traditional approach to safety reacted to accidents and incidents by prescribing measures to prevent recurrence often in the form of additional regulatory requirements. As a result for

many years, flight safety efforts focused on compliance with increasingly complex regulatory requirements. This approach worked well up until the late 1970s when it became evident that , with an overall fatal accident rate below one fatal accident per million flights, further safety improvements were becoming increasingly difficult to achieve using this traditional approach.

2.2 Given the forecast for sustained growth of air transport, a change in the focus of accident prevention efforts was necessary. In addition to a solid framework of regulatory requirements and approved procedures, a more proactive approach was necessary. That led to the development of new safety approaches with the emergence of human factors, a more scientific approach to risk assessment and the development of means of collecting and analysing vast amount of operational data. This effort continues today and conference will have the opportunity to discuss, under Theme 2 (Improving Aviation Safety), some of the key elements of such a proactive approach such as transparency and sharing of safety information, managing safety and enhancing safety oversight. Such a comprehensive approach, whilst already being applied by some States and some operators, needs to be applied on a worldwide basis.

### 3. CONCLUSIONS

3.1 Even though international civil aviation is a very safe mode of transportation, there are many challenges that need to be addressed in order to achieve a further reduction in the accident rate. Such a reduction in the accident rate is required to prevent the number of fatalities and accidents from rising as traffic increases, which could undermine public confidence in the safety of the global air transport system.

### 4. ACTION BY THE CONFERENCE

4.1 The Conference is invited to:

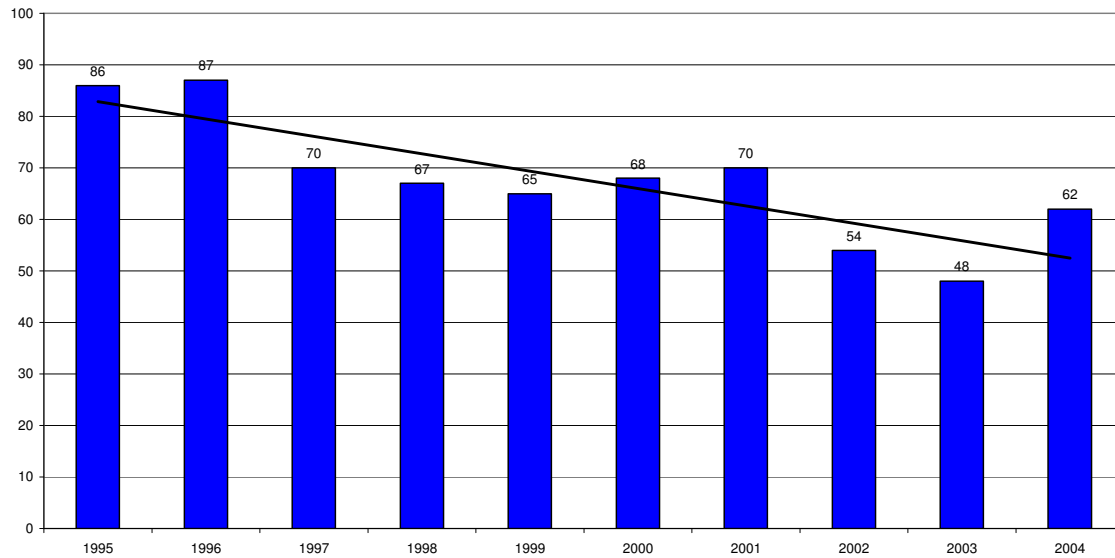
- a) note the information contained in this working paper and, in particular, the need to prevent the number of fatalities and accidents from rising as traffic increases;
- b) agree that further improvement of aviation safety requires a comprehensive and proactive approach to safety; and
- c) agree that such an approach should be applied by States and operators on a worldwide basis.

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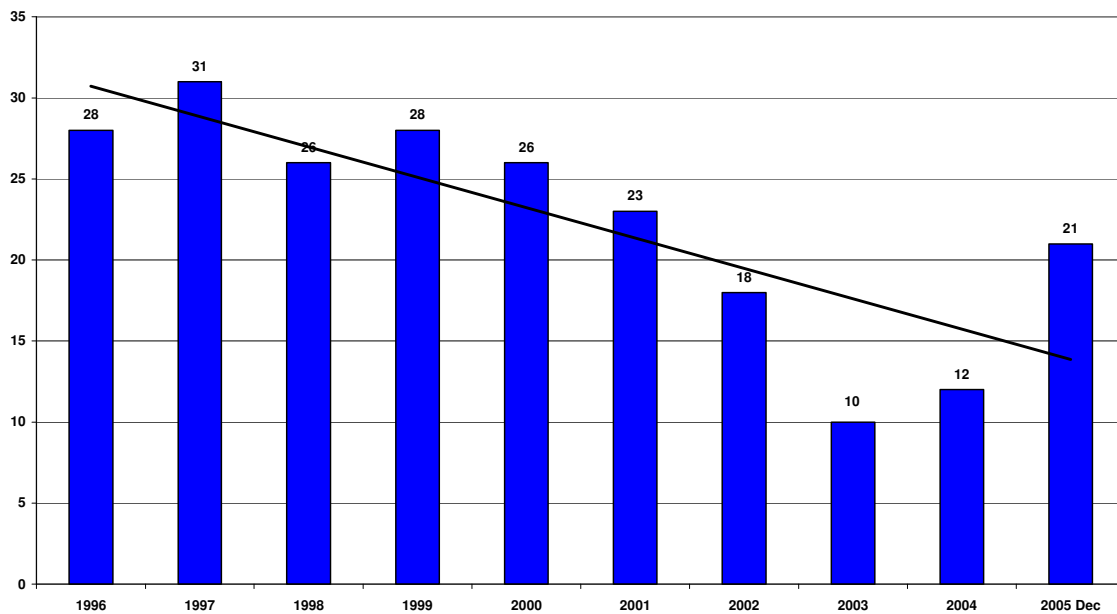


APPENDIX

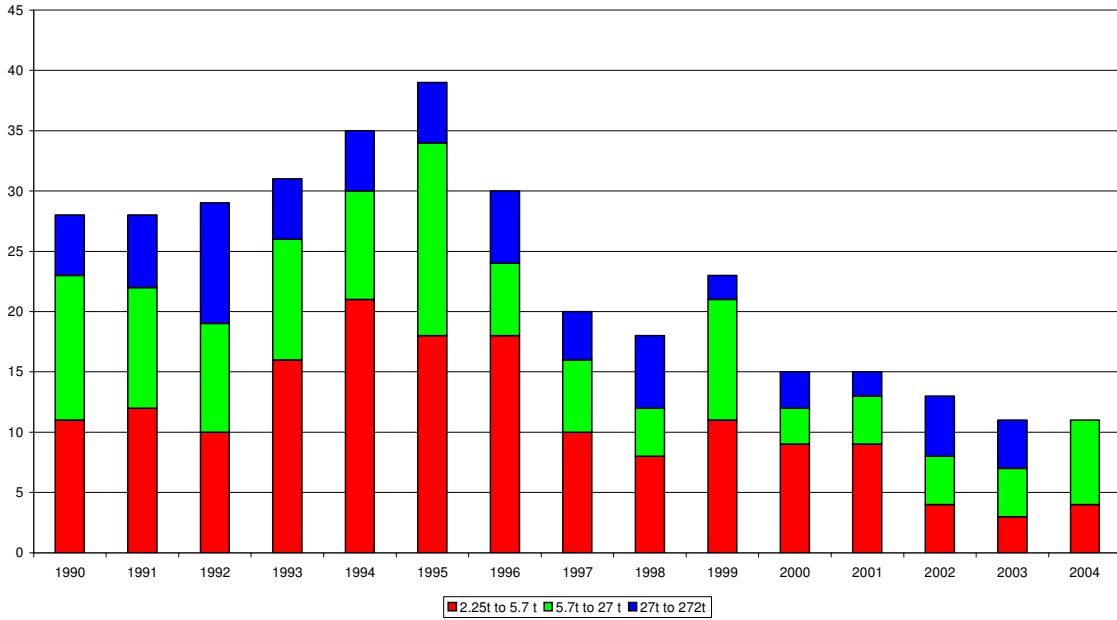
**Graph 1: Fatal accidents, all air transport operations, fixed wing aircraft over 2 250 kg**



**Graph 2: Fatal accidents, scheduled air transport operations, fixed wing aircraft over 2 250 kg**

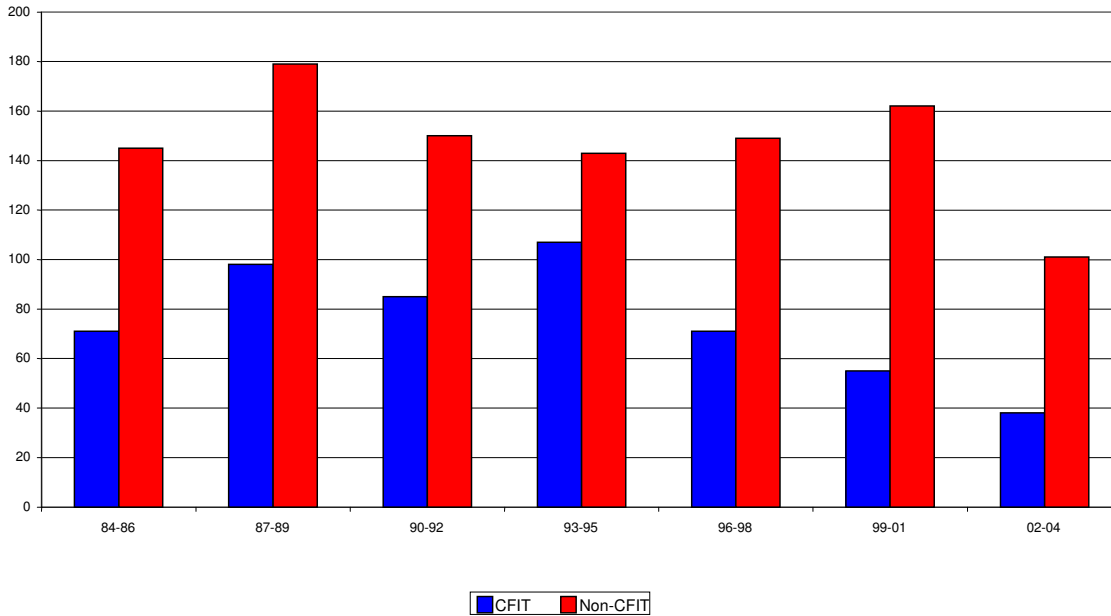


**Graph 3: Number of CFIT accidents, fixed wing aircraft over 2 250 kg in air transport operations, by mass, group and year**

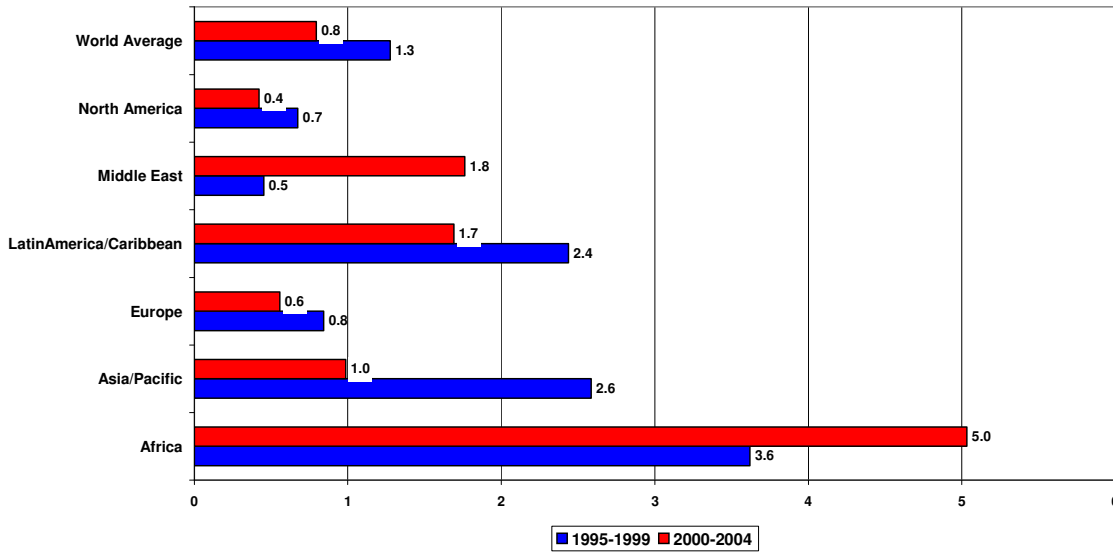


**Graph 4: Number of fatal accidents related to CFIT versus other accidents - fixed wing aircraft over 2 250 kg in air transport operations - long term averages, five year periods**

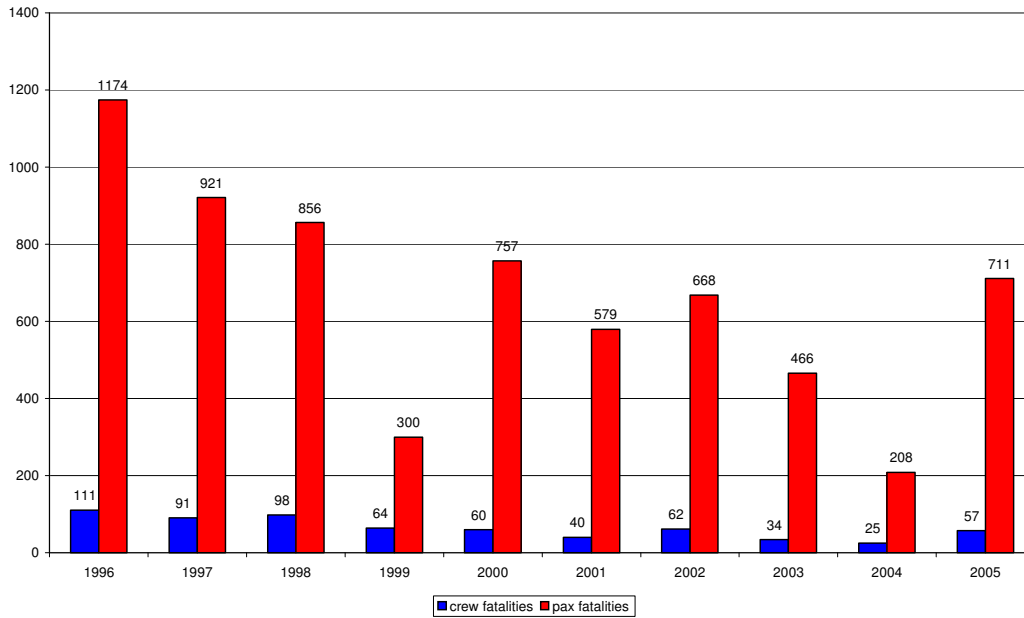
CFIT and other accident categories  
Fatal accidents - airline ops



**Graph 5: Rates of fatal accidents per million departures in scheduled air transport operations by region, fixed wing aircraft over 2 250 kg, regional affiliation based on the State of the Operator of the accident aircraft**



**Graph 6: Passenger fatalities, scheduled air transport operations, excluding fatalities related to acts of unlawful interference with aviation**



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