

**ICAO Air Navigation Commission (ANC) - Industry**

**Third Meeting on the Global Aviation Safety Plan**

**ICAO Headquarters, Montreal**

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**Presentation by the**

**International Business Aviation Council (IBAC)**

Subject: Meeting the Controlled Flight into Terrain (CFIT)

and Approach and Landing Accident Challenge

Introduction

Mr. Chairman, I would like to thank you on behalf of the International Business Aviation Council (IBAC) for the invitation to attend this useful exchange between the Air Navigation Commission and the aviation industry. It is indeed a clear message that ICAO is open and positive in its stance towards fully involving the community in issue resolution.

I would like to say at the outset that IBAC is fully prepared to participate actively in airspace planning and safety standards development for the twenty-first century.

The theme for this meeting further testifies to ICAO's serious attention to one of its most important Strategic Objectives - namely to "respond on a timely basis to major challenges to the safe and efficient development and operation of civil aviation".

Although controlled flight into terrain is not a new issue, nor a new challenge, it remains a significant problem that warrants continued and aggressive attention by all of us in the aviation community. IBAC fully endorses ICAO's initiatives and remains prepared to help work towards constant improvement. Further, as I will outline in the next few minutes, the business aviation community intends to continue with its own programme for reducing the number of CFIT and approach and landing accidents.

The ongoing challenge

I mentioned that CFIT is not a new challenge. In fact, CFIT accidents have been occurring since the advent of controlled flight. This meeting celebrates the 50th anniversary of the Commission; yet, we should also celebrate the twenty-fifth anniversary of the first major thrust towards reducing CFIT accidents. It was in 1974 that first national regulations were introduced for Ground Proximity Warning Systems (GPWS); and 20 years since ICAO first introduced GPWS into its SARPS. For half of the half-century lifetime of the Commission, the prevention of CFIT has been a significant initiative of ICAO and other standards setters throughout the world.

Has the programme been successful? I don't think there is any doubt, but to say yes! Attention to CFIT accidents was not due to the whim of the GPWS inventor. An extraordinary number of CFIT accidents occurred in the latter half of the 1960s, when the number of accidents per year tripled

from an average in the vicinity of ten worldwide airline CFIT accidents per year, to approximately 30 per year by the early 1970s. Worldwide attention to the problem and the advent of GPWS has resulted in a significant improvement from 1973 to this day. Nevertheless, in aviation there is no room for complacency, and improvement must continue.

In business aviation worldwide, statistics indicate that there are roughly 4-5 CFIT jet aircraft accidents per year. Given the number of approach accidents for turboprop aircraft, it is probable that the CFIT numbers for those aircraft are somewhat higher. Unlike the transport category commercial sector, the number of accidents has not changed significantly over the years, partly because the rapid growth of the business aviation sector has resulted in an expanded number of operations. Given that there are approximately 20,000 business aircraft, this is a pretty good record. Nevertheless, we do not accept that improvement is not possible and we will continue our efforts to make this record better.

### Responding to ICAO's challenge

Responding to the challenge ICAO has put before us, we recently had a study completed to give us a better idea of the business aircraft accident profile. We wanted to know the trends and to determine if these trends would give us insight into where our thrusts for the future safety programmes should be placed. Some rather interesting numbers stood out.

Further to studies recently completed for other aviation sectors, there are very clear indications that accident rates vary significantly in different parts of the world. This is an important ongoing issue for ICAO, and further signaling the need for successful implementation of the recently launched Safety Oversight programme.

Overall, of the worldwide business aircraft accidents and major incidents, over a ten-year measurement period, 16.5% occurred on approach, and 44% occurred on landing.

There is a notable difference in the accident rate data between jet aircraft and turboprop aircraft. Jet aircraft have fewer approach accidents ( 12% of all accidents) compared to turboprop aircraft (20.4% of accidents); but jet aircraft have more landing accidents (53%) than turbo props (37%).

Only 5.6% of the accidents occurred when the weather was below published IFR minimas.

Roughly 1/3 of the approach accidents occurred in visual conditions and 2/3 in IMC.

A very high percentage of the turboprop accidents involved single pilot operations. (70.5%)

Other statistics are available from this study; however, these are just some of the figures that struck me as valuable in our programme to reduce CFIT and approach and landing accidents.

From a personal point of view, I have been keenly interested in the issue, as it has been 25 years since I conducted my Country's evaluation of the first generation GPWS equipment. The result of that study was a recommendation for rulemaking introduced in my Country in 1975.

It is interesting to note that when I did the study 25 years ago, even then the problem was not necessarily new. At the time I extracted a statement from an aviation psychology book, written in 1968, that described CFIT accidents as being caused by:" misjudgment, failure to follow approved procedures, breakdown in cockpit coordination, distractions and disorientation".

Perhaps the words have changed slightly, as we now talk of 'situational awareness' etc. However, the issues and problems are the same. Have we progressed? Certainly I believe we have.

In the study I conducted a quarter-century past, I calculated that there were inherent safety benefits in GPWS; however, it was clearly the last line of defence. The margins were so tight that instant reaction by the pilot was an absolute necessity. We also know that, initially, there was some resistance to this new equipment, as the need for it was a clear signal that the pilot may be susceptible to error. Not all pilots like to hear that. At the time I noted in my report that until some mechanism was available to provide terrain mapping, the system would be limited in its capacity to prevent many controlled flight into terrain types of accidents. I said that, based on studying a number of terrain accidents to determine if the flight profile was such that the pilot may have reacted in sufficient time to avoid contacting the terrain. In many cases there would have been inadequate warning. Further, I had determined that the first generation GPWS was of limited value for smaller aircraft, operating over uneven terrain, and particularly during non-precision approaches where it was extremely difficult to fit the warning envelopes to the aircraft profile and flight dynamics

As we now know, terrain mapping has arrived, thus solving the many problems with the older GPWS equipment. The enhanced version provides timely information to the pilot, allowing for a controlled escape maneuver, with safe margins. The predictive new equipment now provides a valuable tool for small aircraft; furthermore, a recent announcement of a low cost version of EGPWS is welcome news to the small aircraft operators.

Nevertheless, as good as this equipment is, it is the position of the International Business Aviation Council that GPWS remains the last line of defence. As was the case 25 years ago, the best preventative medicine for terrain accidents is a well-trained crew, operating competently and professionally, in accordance with well written standard operating procedures. CFIT accidents generally result from human error; therefore any reduction in error will result in a reduction in exposure.

Most business aviation companies face a significant challenge that scheduled air carriers have the luxury of avoiding – routinely operating into unfamiliar airport environments. Business aviation does not always have the benefit of a schedule that allows for route checks and training into regularly used airports.

In response to this challenge, business aviation must ensure that flight crews are thoroughly trained and have a resource system capable of providing information on unfamiliar airports. Crews must be provided with information so that they can study and thoroughly understand the terrain features and to liaise with appropriate agencies regarding anomalies and challenges in the area.

Effective management systems are being developed by business aviation for flight departments. Highly professional flight planning service providers have evolved over the years that enable business aviation operators to adapt quickly and professionally to new environments.

A professional flight crew will have all of the pertinent information for the route of flight and will conduct a flight competently and professionally, thus eliminating errors and CFIT potential.

It is also evident from the data in our recent study that attention is required to reduce the number of landing accidents. IBAC encourages ICAO and other organizations to consider increasing the level of awareness and improvement in standards relating to safety in the runway environment.

#### 4. The business aviation action programme

This now leads me to outline the business aviation programme, or best practices. It is important for us to recognize the very significant and excellent work of the CFIT Task Force, with the

contributions of ICAO and the Flight Safety Foundation. IBAC also reviewed carefully the programmes of a number of private organizations, training services providers and airlines. The proposed programme evolved from a number of serious initiatives of the business aviation community, and others, in response to the CFIT and approach and landing accident challenge:

In the US a Joint Safety Analysis Team was formed to study the CFIT issue in response to the FAA's Safer Skies initiative.

In Europe, Canada and other parts of the world, business aviation associations put increased emphasis on the need for improving training.

Training organizations such as Flight Safety International developed comprehensive CFIT awareness programmes.

Manufacturers such as Allied Signal have been active in developing EGPWS equipment that will match the scope of operation for different aircraft profiles.

Excellent tools have been developed such as the CFIT checklist promoted by the Flight Safety Foundation.

IBAC's proposal for a 15 point programme to address the CFIT and landing and approach accident issue is as follows.

1. Training - is the cornerstone to improvement in the record of CFIT, approach and landing accidents. Business aviation encourages rigorous simulator training, with attention given to CRM and LOFT exercises. Emphasis is to be put on operation into unfamiliar airports. CFIT, approach and landing accident causes should be a part of the training programmes.

2. Charting - improvements are being promoted, with clear colour delineation of terrain features and contours.

3. Flight Planning - must be done using knowledgeable and experienced flight planning services, particularly when operating into unfamiliar airports.

4. Flight Data - requires thorough development, checking and re-checking.

5. Standard Operating Procedures - must be thoroughly developed and religiously followed.

Approach and Landing Briefings - are to be conducted thoroughly and well in advance of entering the approach environment.

7. Enhanced Ground Proximity Warning Systems – or other predictive terrain equipment, should be developed to match the operational and economic realities of the aircraft type and flight dynamics.

8. Information - regarding accident statistics must be provided to the business aviation community on a regular basis.

9. CFIT Risk Checklists – such as that developed by the Flight Safety Foundation, should be applied to evaluating risks.

10. Standardized Altimeter Setting - procedures should be established internationally.

Minimum Safe Altitude Warning Systems (MSAWS) should be installed at terminal areas where cost-effective.

Vertical Guidance Approaches – using GNSS, or other area navigation capability, should be implemented on an accelerated priority.

Vertical Guidance Lighting Systems – should be instituted as a standard at airports, particularly in remote areas where the lack of ambient references can cause spatial disorientation.

14. Runway Condition Reports – should be standardized internationally, both in format and dissemination methodology.

Safety Certification Standards for Airports – should be developed by ICAO on an accelerated basis, and the ICAO safety oversight audit programme should be expanded to cover airports as soon as possible.

Mr. Chairman, again, let me thank you for the opportunity to comment. IBAC remains prepared to help in any way possible with ICAO's valuable initiative.