EUROCONTROL

EDITORIAL

EUROPEAN ACTION PLAN FOR AIR-GROUND COMMUNICATIONS SAFETY

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Clear, unambiguous, timely, and uninterrupted communications are crucial to the efficient and safe management of air traffic. Not surprisingly, communications problems constitute a factor in many flight safety incidents.

The Air-Ground Communications (AGC) Safety Improvement Initiative was launched by the EUROCONTROL Safety Team in 2004, and is addressing communications issues identified in the Runway Incursion and Level Bust Safety Improvement Initiatives as well as other issues of concern such as call sign confusion, undetected simultaneous transmissions, radio interference, use of standard phraseology, and prolonged loss of communication.

A European Action Plan for AGC Safety will be launched in May 2006. Those organisations which contributed to and endorse this action plan are totally committed to enhancing flight safety by advocating the implementation of the recommendations it contains.

In parallel with the introduction of the action plan, EUROCONTROL is considering various strategies to reduce the incidence of call sign similarity. Individual strategies, or a combination of strategies, are being evaluated to assess their potential effect in reducing call sign confusion events.

The introduction of 8.33 kHz radios has, in combination with other programmes such as RVSM, enabled us to increase the capacity of the ATM system. However, aircraft which are not 8.33 kHz-equipped are now creating new hazards which need to be addressed.

In time, controller pilot data link communications (CPDLC) will supplement voice as the medium for communicating a large proportion of information, intentions, requests, and instructions between pilots and controllers, but voice communications will always have a role to play in tactical intervention and emergency situations.
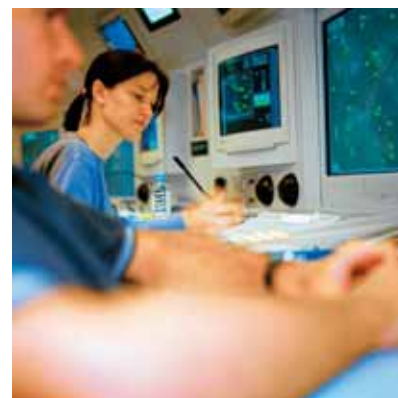
EUROPEAN ACTION PLAN FOR AIR-GROUND COMMUNICATIONS SAFETY

The European Action Plan for AGC Safety is the result of the combined efforts of organisations representing all areas of aviation operations.

The recommendations, when implemented, will assist in reducing the number of incidents, including level busts and runway incursions, where communication problems are a contributory factor. This will be achieved by consistent and harmonised application of existing ICAO provisions, increased awareness, and the adoption of best practice in air ground communications.

The recommendations are based on an analysis of over 500 air-ground communications safety events, suggestions put forward by over 300 experienced controllers and flight crew, and contributions from stakeholders including the FSF, ECA, IFALPA, IFATCA, ERA, and EUROCONTROL. Some recommendations concern standards, technology and awareness, but the vast majority concern best practice. Many experienced pilots and controllers may feel that some of the best practice highlighted in this action plan is basic professional knowledge which should not require reinforcement. Unfortunately, analysis of incident reports concerning air-ground communications safety suggests that what many may consider to be standard practice is not universal, and aircraft operators and ANSPs will find it useful to examine their training and standard operating procedures to ensure that this best practice is not taken for granted. ∎

STRATEGIES FOR REDUCING CALL-SIGN CONFUSION

The EUROCONTROL objective is to reduce call-sign confusion events by 80% by introducing strategies which are easy to integrate into existing processes, involve zero effort for ANSPs, minimal effort for aircraft operators, and reduce controller workload

Following a year-long study of existing practices for the allocation of call signs, rules and algorithms for qualifying call sign similarity, and deconfliction scenarios, a set of strategies for reducing call sign similarity are being considered by EUROCONTROL.

- **Strategy 0** – Creation of a Call sign Similarities Management Cell (CSMC) a small group working with the whole ATM community to reduce incidents of call sign similarity. A similar initiative in France has been a considerable success.

- **Strategy 1** – Internal detection and deconfliction process by aircraft operators, based on analysis of the recurring flight plan list (RPL) using software tools developed by EUROCONTROL. The great majority of call sign similarities involve aircraft of the same operator. Consequently, any programme which mitigates against call sign similarities prior to submission of RPLs will significantly reduce the likelihood of call sign confusion.

- **Strategy 2** – Deconfliction 2 weeks prior to the start of the IATA season, using software tools developed by EUROCONTROL. This strategy would identify call sign similarities involving aircraft of different operators.

- **Strategy 3** – Daily deconfliction process, using software tools integrated within existing processes. This strategy would identify call sign similarities involving aircraft filing flight plans at short notice. ∎

"NEGATIVE EIGHT POINT THREE THREE"

Occurrences of non-8.33 kHz-equipped aircraft entering 8.33 kHz airspace are extremely rare. Nevertheless, operational feedback shows that incidents can arise – for example when the flight crew puts a Yankee in field 10 of the flight plan, but does not notice that the radio has not been configured to operate in 8.33 kHz mode.
Peter Alty – the 8.33 kHz Programme Manager – emphasises that we cannot afford to become complacent about safety in the 8.33 kHz Programme.

Phased implementation

8.33 kHz channel spacing was introduced in the ICAO EUR Region to meet the demand for VHF assignments in the aeronautical mobile radio communication service band 118 to 137 MHz. Operations were introduced above FL245 in October 1999, and an expansion above FL195 is planned for March 2007.

Main hazards

From a severity viewpoint, the 5 main hazards due to 8.33 kHz are:

Hazard 1: Entry of an aircraft which is not 8.33 kHz-compliant into an 8.33 kHz sector.
The inability to tune to a 6-digit 8.33 kHz channel means that, ultimately, the pilot may not be able to communicate with the controller. If the pilot attempts to communicate on 25 kHz channels, then there is a risk of interference on the adjacent 8.33 kHz channels.

Hazard 2: Unplanned diversion of a non-8.33 kHz compliant aircraft.
This hazard occurs when an aircraft which is not 8.33 kHz-compliant is erroneously flight planned through an 8.33 kHz sector and the error is detected at a late stage. This hazard may result in additional workload, and the diversion itself may present a risk to other aircraft.

Hazard 3: Mistuning
The selection of the wrong channel or "mistuning" is also a hazard for 25 kHz channels. For 8.33 kHz channels, the addition of an extra digit can increase the risk of this hazard leading to communication problems and additional workload.

Hazard 4: Handling of State aircraft which are not 8.33 kHz-equipped
The handling of State aircraft which are not 8.33 kHz-equipped can lead to increases in controller workload, and this need to be taken into account in order to maintain safety levels.

Hazard 5: Incorrectly fitted radios
This hazard covers problems which might arise where a radio does not perform in accordance with the required specification.

Mitigation actions

Training and awareness activities are essential. Flight plan checking and the display of the 8.33 kHz equipage status to pilots are also vital. Just as important, however, is the need to agree and implement strategic actions such as:

- the need to establish an 8.33 kHz policy for State aircraft;
- the enforcement of mandatory carriage by individual States;
- the application of standard R/T procedures by individual States;
- subjecting all phases of the 8.33 kHz implementation to a thorough safety assessment.

"Negative Eight Point Three Three"

When a controller in a busy sector requests the flight crew to confirm its 8.33 kHz capability, the last thing he or she wants to hear is "Negative Eight Point Three Three". We clearly cannot afford to become complacent about safety in the 8.33 kHz Programme! ■

WILL DATA LINK IMPROVE AGC SAFETY?

More and more pilots are using data link systems to obtain departure and oceanic clearances or digital ATIS. Within a few years the use of data link for the transfer of control clearances will become the norm, and more and more data link services will come into service over the coming decade.

Controller-Pilot Data Link Communications (CPDLC) is a system for direct data link communication between the pilot (via the aircraft and an Air Traffic Control (ATC) centre) to the controller and vice versa. CPDLC means that routine air traffic instructions and requests are transmitted as data link text messages, replacing traditional voice communications. CPDLC allows air traffic controllers to manage a larger number of aircraft, thereby increasing the capacity of the ATM system, but…

Will Data Link improve AGC safety?

The answer is YES – CPDLC provides pilots and controllers with clear readable messages in a timely and unobtrusive manner to pilots and controllers, limits the probability of misunderstandings, provides a record of the messages, and makes call-sign-confusion virtually impossible (probability 10^{-12}). CPDLC will reduce the voice communication workload, allow the voice channel to be available for urgent tactical messages, and should help to create a calm operating environment.

Will Data Link replace voice communications?

NO! Voice communication is faster, more flexible and allows for emotion. Tactical messages and instructions requiring immediate action, especially within a TMA, will continue to be transmitted by voice communication rather than by data link for the foreseeable future.

Are there any issues associated with Data Link?

Potentially YES. A pilot's situational awareness gained by listening to calls to and from other aircraft on the same frequency is partially lost. However, this situation already exists in areas where ATC is conducted in two languages. The lost of situational awareness may be counterbalanced by the introduction of Cockpit Display of Traffic Information (CDTI) equipment. The pilots may spend more time "head down" handling data link communications rather than looking out for other traffic, but the introduction of carefully designed crew procedures will mitigate against this.

CPDLC will not solve all of the AGC safety problems but it does mitigate a number of voice communication hazards and short comings. ∎

For more information on data link and CPDLC, consult:

www.eurocontrol.int/cascade
www.eurocontrol.int/link2000