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USE OF PRESELECTED MESSAGES IN AIR-GROUND RADIO COMMUNICATIONS

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Abstract: *The increase of aircrafts that are involved in the air traffic, as a consequence of increasing air operators and aircrafts that they operate on daily basis, has lead to the intensification of air-ground communications.*

There were no few situations when because of the misunderstandings of radio messages, the airborne flight safety was severely damaged, fact that lead to the flight accidents that had as a result the loss of human lives, the aircrafts destruction and damage other goods situated on the ground.

A solution for the improvement of air-ground radio communication is the usage of preselected messages, which combine their eloquence with the shortest duration of presentation.

The messages will be reproduced in a phonic and graphic mode (voice & text message).

This can be relatively easily realised, by using, within a "combined system" the existing equipment.

a. on board:

- Radio-connection stations
- IFF (identification friend or foe)
- GPS (global position system)
- TCAS (traffic collision avoidance system)

b. on ground:

- Radio-connection stations
- ground radars

By using this solution the air space will become more and more safe.

Keywords: *communication, misunderstanding, message, preselected.*

1. INTRODUCTION

To ensure flight safety, aircraft will maintain constant radio contact with air traffic control units (ATC).

Each airport has a different radio frequency, and larger airports have several, for planes which are approaching, those near the airport, and those on the ground. When a pilot wishes to talk to the air traffic controllers at the airport, he simply sets the radio to this

frequency, and only someone else on the same radio frequency will be able to hear the conversation. This prevents too much overcrowding on the airwaves. If the pilot then needs to talk to someone else on another frequency, he will let ATC know he is leaving their frequency, adjust his radio, and talk to someone else.

2. RADIO COMMUNICATION

2.1 Air-Ground Radio communication weaknesses. The increase of aircrafts that are involved in the air traffic, as a consequence of increasing air operators and aircrafts that they operate on daily basis, has led to the intensification of air-ground communications.

In air-ground communications using a standardized system of expression

A misunderstood message from the ground-based air traffic controller, can cause a crash.

In 1951 English was designated for international aviation use.

Throughout the world, all aviation radio communication officially takes place in English. The only exceptions to this are transmissions between private pilots and unqualified radio operators at small airfields which do not expect to have any international traffic. These may use their own mother tongue.

Native speakers of other languages have as much difficulty using English as English-speakers would have trying to use theirs. A complicating factor is the existence of 38 dialects and numerous varieties of English. Even those who seem to speak English perfectly can make fatal errors, as did the Dutch pilot in Tenerife in 1977.

Often regarded as one of the worst aviation disasters in history involved the tragic deaths of hundreds, and the mad rush to regulation. On March 27, 1977 a PanAmerican 747-121 and a KLM 747-206B collided on the runway in low visibility. However, the cause of the accident is mostly blamed for the misunderstandings between ATC, and the pilots aboard the planes. When the KLM airplane was in position and holding, the co-pilot asked for a takeoff clearance. Air Traffic Control gave the clearance instructions, but never explicitly said they were cleared for take-off. When the co-pilot read back the clearance, he stated that they were now 'taking off' Again, without the explicit wording of 'cleared for takeoff' When the controller responded back with the words 'Okay' the pilots then regarded this as further clarification that an original clearance had been given. When KLM was on the takeoff roll, the Pan

American plane and the controllers both radioed at the same time, canceling each other's calls that the KLM should not take off yet. KLM never heard the radio call and continued resulting in a crash that killed hundreds.

Once the investigations were completed, it was concluded that the most probable cause of the crash was the ambiguity of the English language that led the KLM pilots to believe that they were cleared to takeoff even without a clearance. The use of a non-standard phrase 'Okay' was the likely culprit in solidifying the KLM crew of their take-off clearance. Limited visibility, of course, was an issue, but was not the cause of the ambiguity.

2.2 A possible solution. A solution for the improvement of air-ground radio communication is the usage of preselected messages, which combine their eloquence with the shortest duration of presentation.

The messages will be reproduced in a phonic and graphic mode (voice & text message).

Using preset radio messages requires the existence of a database of radio reports (according to radiotelephony manual) both aircraft and ground (ATC units)

Essentially using preselected messages will be such:

-Depending on aircraft position in space, the board will display the appropriate radio

-This message will be received by the ATC unit with which the aircraft is in radio contact

-On the ground (ATC unit) the message will be displayed and will play sound

- It will also be displayed reply

-Reply will be sent to the aircraft

-The response message board will be displayed and will be played sound

-On board will be displayed message of confirmation

-Message of confirmation will be sent to ground

This can be relatively easily realised, by using, within a "combined system" the existing equipment.

a. on board:

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- TCAS (traffic collision avoidance system)
- b. on ground:
 - Radio-connection stations
 - ground radars

- avoiding situations in which the crew did not understand the message
- speed of message exchange
- ease of use combined communication system
- safety radio calls

3. CONCLUSIONS & ACKNOWLEDGMENT

There are solutions to increase air traffic safety. This is one of them.

Advantages of using combined radio communication system:

- ensure a fast radio communications between aircraft and air traffic control units
- is avoided crowded radio talks
- ensure the accuracy of message
- remove misunderstanding due to linguistic peculiarities

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