



saercosafety

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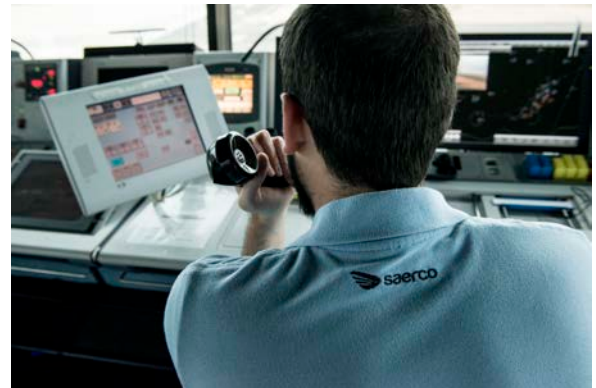
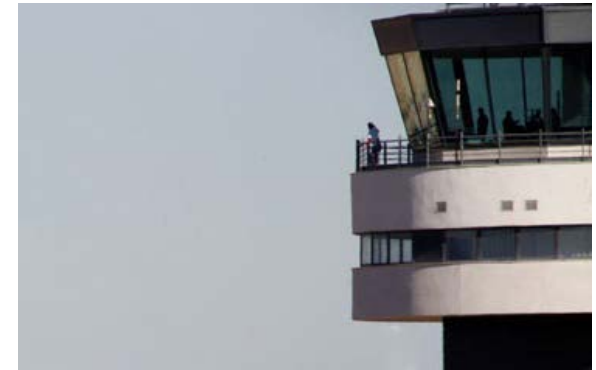
In the complex world of aviation, the interaction between ATS dependency and aircraft is treated as a critical element that goes beyond mere information transmission. It is an environment where each term, each instruction, and each response are precise aspects contributing to the safe and efficient operation of air transport. The importance of the correct use of aeronautical communications cannot be underestimated in the coordinated context of traffic management. From the use of standardized phraseology to the transmission of fundamental data. This bulletin analyses the essential and important elements of these communications, exploring how incorrect usage, even in an instant, could have a potential impact on safety.

International air transport requires a common language. The knowledge and proper use of aeronautical phraseology are increasingly essential as the number of flights continues growing. This phraseology is robust, evolving, adapting, and being corrected based on the experience gained during its use. It is a language shaped by recommendations derived from contributory factors and probable causes.

To understand aeronautical phraseology, it is important to know its origins. Communications have developed gradually as aviation has evolved and become more complex. There is no specific moment or singular event that marks the exact birth of phraseology, but it can be said that has evolved over time in response to the communication needs of aviation.

As civil and military aviation expanded in the 20th century, particularly following safety incidents, the need for establishing a standardized language for communication between aircraft and ATCOs/AFISOs became evident. The complexity of air operations, the necessity to avoid misunderstandings, and the internationalization of air transport led to the development of a set of standardized phrases and terms.

The ICAO has played a fundamental role in the creation and promulgation of aeronautical phraseology standards. As well as ICAO, multiple organizations mentioned throughout this newsletter, such as EASA and other Civil Aviation Authorities, have also contributed.



The proper use of aeronautical phraseology is fundamental in aviation for several critical reasons related to safety and operational efficiency. Here are some key reasons:

Quality and precision

Aeronautical phraseology provides a standardized language that helps ensure clarity and precision in communications between the flight crew and air traffic controllers. Using specific terms and phrases reduces ambiguity and ensures that instructions and information are transmitted unequivocally.

Reduction of communication errors

Misunderstandings and communication errors can have serious consequences in aviation. Standardized aeronautical phraseology helps to minimize the possibility of misinterpretations or confusion among the parts involved in the operation.

Efficient coordination

In an environment where time and space are critical, efficient coordination is essential. Aeronautical phraseology provides a fast and effective means to convey crucial information between the crew and air traffic controllers, facilitating safe and efficient air traffic operations.

Compliance with regulations

The International Civil Aviation Organization (ICAO) establishes standards and recommended practices for civil aviation worldwide. The proper use of aeronautical phraseology ensures that communications comply with these international regulations, promoting consistency and harmony within the global aviation community.

Training and evaluation

Standardization in phraseology facilitates the training of new pilots and air traffic controllers, as well as the ongoing evaluation of performance. Standardized procedures and phrases serve as the basis for training and competency assessments.

Aeronautical phraseology is regulated by various international norms and regulations. Two primary documents from the ICAO stand out, establishing standards related to aeronautical phraseology. One key document that sets standards for verbal communication in aviation is ICAO **Doc 444**. It establishes standards and recommended practices for aeronautical communications, including the phraseology to be used. On the other hand, the 'Manual of Radiotelephony' (**Doc 9432**) from ICAO provides guidelines on phraseology and verbal communications.

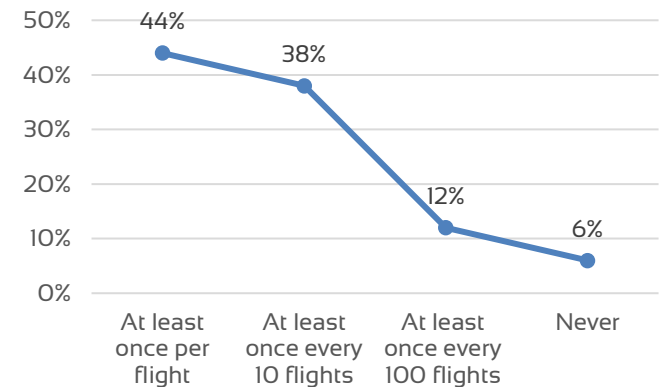
In some regions, organizations such as the European Union Aviation Safety Agency (EASA) issue regulations and guidelines related to aeronautical phraseology that apply to member countries.

Finally, each country has its own civil aviation authority that issues specific regulations and standards, which must side with the international standards of ICAO but may contain additional country specific requirements.

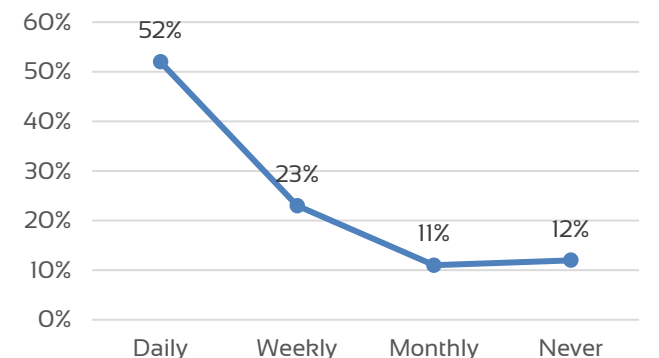
Between the years 2011 and 2014, the International Air Transport Association (IATA), along with other federations and associations, conducted a study on the use of non-standard phraseology (that did not comply with regulations) during flights. This was done with the intention of understanding the main communication and safety issues.

Below are the responses to two questions from the study that make think about that, as a significant percentage of pilots and controllers consistently experience situations where standard phraseology is not used.

Frequency with which **pilots** come across situations where ICAO standard phraseology is not used.



Frequency with which **ATC/AFIS** come across situations where ICAO standard phraseology is not used.



Contribution of inappropriate use of phraseology to the occurrence of an accident

The main objective of communications between the pilot and ATS personnel is the exchange of information in a context of mutual understanding. In this context, brevity becomes important, due to the use of a single frequency and numerous aircraft intending to use it. Therefore, it is essential for the ATCO/AFISO to know precisely the pilot's intentions, while the pilot must accurately understand what the ATCO/AFISO is communicating. At this point, the use of concise and appropriate phraseology becomes fundamental; it is necessary to employ precise words to ensure a complete understanding of the message. However, can an inappropriate use of aeronautical phraseology truly contribute to the occurrence of an aviation accident?

There are many problems that can lead to accidents or incidents, such as expression problems, reference problems, or issues in the readback process. Expression or language problems can be reflected in mistakes due to ambiguity or homophony.

For example, one potentially dangerous misunderstanding occurs in the case of misinterpreting 'two' with 'to':

- Controller: Descend two three zero zero
- Pilot: Ok. Three zero zero.

In this case, the pilot descends to 300 feet instead of 2,300 feet.



Another significant problem in communications that can affect safety are readback errors. In paragraph 3.7.3 of Annex 11, Chapter 3 of ICAO, it is stipulated that the controller has the responsibility to pay attention to the verification to ensure that the transmitted instruction has been properly understood by the crew. In the event of identifying discrepancies during verification, immediate action must be taken.

Summarising, the probability of accidents and incidents increases when situations arising from misunderstandings in communication occur, and these can be linked to the following aspects:

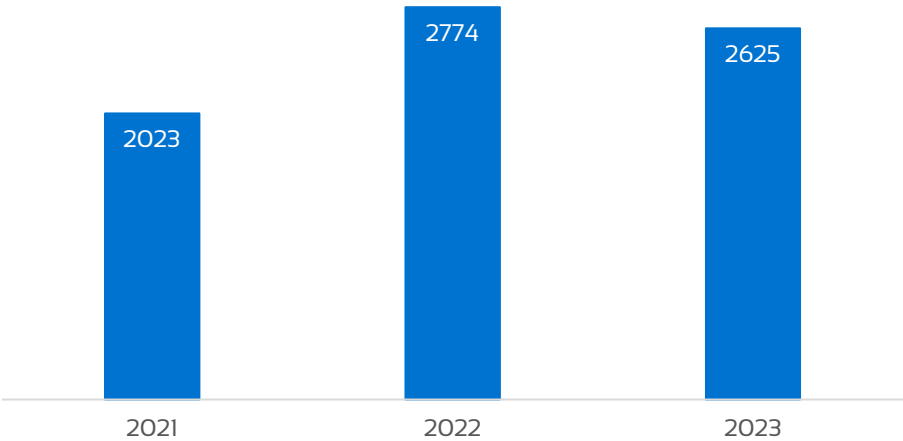
- Omission of standard phraseology by the pilot or ATCO/AFISO, leading to misinterpretations.
- Loss of parts of the message due to radio interference or frequency blockage.
- Confusion in aircraft call signs.
- Omission of part of the communication by the pilot, going undetected and uncorrected by ATCO/AFISO.
- Incorrect readback of communication by the pilot, without being identified by ATCO/AFISO.
- The pilot attributes a communication intended for another aircraft.

All the situations mentioned above can trigger safety incidents, such as airspace intrusions, loss of separation, AIRPROX, runway/taxiway incursions, among others.

MOR: Mandatory Report
VOR: Voluntary Report

Safety Reporting ATS SAERCO 2023 (first six months)		
MOR/VOR	Average time to report	Average time to MOR/VOR
1613	2:05:05	34:16:28

ATS reporting evolution 2021-2023



“Achieving a reporting system where proactivity is the norm is not easy, it requires the effort and commitment of the entire organization, especially the operational personnel”

SAERCO constantly exceeds the number of notifications it makes regarding events in the ATS/CNS/MET units, thanks to the continuous improvement of its notification tools and the active participation of all workers in this area. Observing the average notification times for the first semester of 2023, it is evident that SAERCO also strictly complies with the times required by AESA. The average time to report corresponds to the time it takes operational staff to report events to HQ, while the next column reflects the average time it takes HQ to forward all notifiable events to the SNS.

It is important to mention that the number of notifications presented in the year 2023 corresponds to the period from January to October, so it is likely that by the end of the year, the number of notifications recorded will have exceeded those in 2022. It is noteworthy that the number of notifications has experienced an increase over the years, primarily due to the incessant growth of operations. This is also a clear indication of SAERCO's evolution in terms of the notification culture and the recording of a greater number of events than were reported before.

It should be pointed out that, despite the increase in the number of notifications, the average reporting times have remained consistent. This demonstrates the effectiveness of SAERCO's notification system, serving as a crucial tool to enhance the safety level across all units.

*The number of reports in 2023 corresponds to the period from January to October.

Air Accidents/Incidents due to misunderstandings on frequency

Fortunately, occasions where misunderstandings in communication between controllers and crews lead to situations evolving into incidents or accidents are relatively rare. However, this danger consistently persists, and efforts must be made to prevent its occurrence to avoid repeating errors from the past, such as those that occurred in the incidents described below.

Accident in Mato Grosso, Brasil (2006)

In this accident, a Boeing 737 and an executive Legacy 600 were involved in a mid-air collision. Although not directly caused by misunderstandings on frequency, the lack of effective communication between controllers and the Legacy pilots could have contributed to the accident. One of the factors considered was the lack of proficiency in English among the controllers.

The organization responsible for investigating air accidents in Brazil (CENIPA) highlighted the following information in the accident report:

Insufficient training in standard English phraseology is observed in the communications between San José ATC and the Legacy 600. This lack of training is also evident in other phases of the flight.

Incident in Perth, Australia (2012)

This incident occurred between a Piper PA-42 lined up on runway 21 without takeoff clearance and a vehicle.

The vehicle did not comply with the instructions from the tower by the ATC, likely due to the incorrect use of standard phraseology. This resulted in the vehicle making a runway incursion when it was occupied by the aircraft.

In communications, there is a continuous use of non-standard phraseology, with instances where the vehicle did not understand the ATC instructions.

There was no actual conflict risk as the ATC detected the incursion, but this is a clear example of how the use of phraseology and misunderstandings on frequency can impact safety and the execution of ATC instructions.

In conclusion, the persistence of this threat requires constant attention. The review of past incidents underscores the importance of proper training in standard phraseology and how its incorrect use can contribute to risk situations, demonstrating the direct influence of communication on aviation safety. These examples highlight the need for continuous improvement of communication protocols and training to ensure effective communication between controllers and crews, thereby mitigating the risk of misunderstandings and enhancing operational safety in aviation.

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