

# Issues And Solutions Surrounding Safe Communication Practices In Aviation

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## Abstract

Effective communication is one of the most important aspects of safe flight operations because improper communication often leads to many destructive outcomes. This communication involves pilots, controllers, and operators, as well as the channels used to send and receive the information. Therefore, problems can occur on all these levels, and to prevent them or handle them, proper strategies are needed. In this regard, the following report has highlighted the major issues in communication and their possible solutions. It is further found that the most prominent issues regarding effective communication can be related to language barriers, incorrect terminology, ambiguous phrasing, untimely and incorrect transmission, and technology problems. To effectively deal with them, an efficient security management system should be implemented, and the concept of crew resource management should also be introduced.

## Introduction

According to Chatzi et al. (2019), the lack of communication is one of the most prominent factors behind accidents; as a matter of fact, around 70% of all accidents are caused by improper coordination between crew members. Very similar figures are also obtained regarding military aviation accidents, which further highlights the need to ensure effective communication (Chatzi et al., 2019). Moreover, according to Baugh & Stolzer (2018), miscommunication caused around 2,000 deaths due to plane crashes in the last 45 years. Similarly, around 81 commercial aviation accidents were reported by the International Civil Aviation Organization (ICAO) which resulted from communication breakdowns (Baugh & Stolzer, 2018).

There are different forms of problems related to communication; for example, they can be linked to the interaction of pilots in the cockpit, their communication with the air traffic control, and poor handling of communication equipment either by the crew in aircraft or controllers at the airport (Molesworth & Estival, 2015). The problems can also arise due to poor communication between native speakers and non-native speakers of the crew. Therefore, it is essential to highlight these problems and their solutions to avoid any adverse impacts in the future.

In this regard, the following paper investigates the different problems and challenges in safe and effective communication practices in aviation and attempts to outline the possible solutions to overcome them.

# Issues and Solutions

## Issues

Human error is one of the primary factors that lead to severe incidents in aviation, and there are many examples that prove this. Therefore, researchers and field experts have suggested many models and systems to effectively reduce human error in general as well as in advanced aviation operations. In this regard, one such model is Dupont's Dirty Dozen, which enlists the different factors that contribute to human error (Chatzi et al., 2019). Although there are several such elements both on the individual and organizational levels, the lack of proper communication is the most prominent aspect that leads to many challenges in aviation. Some other factors include lack of knowledge, distractions, complacency, fatigue, pressure, etc.

However, it can also be assessed that all such factors collectively contribute to the lack of communication, and thus, this becomes a major problem in smooth and safe flight operations. For example, if pilots are emotionally disturbed either due to some personal problems or because of any issue with the relevant organizational culture, they will not be able to handle any uncertain circumstances and thus will poorly communicate to have suggestions or recommendations from other relevant personnel as well.

Language barriers are also some prominent challenges in communication practices that can manifest in several ways (Baugh & Stolzer, 2018). For example, consider the example mentioned by Baugh & Stolzer (2018), "the plane's aural pull-up warning activated. '10 seconds before impact, the ground proximity warning system gave its alarm — in English. Just before impact, one crew member said to the other, in Chinese, "What does 'pull up' mean"?". And this is just one example of such accidents where the language barrier resulted in such destructive consequences. As Baugh & Stolzer (2018) mentioned, around 157 such accidents were caused by a low level of proficiency in the English language.

As far as the effects of ineffective communication are concerned due to any reason, they might have some serious implications. For instance, if the pilot is unable to receive the information about the clearance of the airport, it can develop depression and mental pressure, leading to poor decision-making of pilots. Similarly, if the pilot is unable to communicate with the management staff at the airport, it can affect all other flights and might sometimes have dangerous outcomes. The threat becomes more dangerous in the case of military operations.

From all the above discussion, it can be concluded that the loss of communication mostly happens in the following three circumstances.

1. When there are radio interferences leading to disturbing radio signals.
2. The improper use of different equipment for communication is either due to the lack of

knowledge or the negligence of the persons handling them.

3. The technical problems in the communication equipment.
4. The language barrier between the sender and receiver is either they don't understand each other or misunderstand, which both lead to very adverse consequences.
5. The inability of a particular crew member to understand the technical terms and, consequently, poor management of the different activities in the aviation process.

All these factors can have both temporary and prolonged results on the overall safety of the flights and thus must be addressed properly to investigate how they can be eliminated to the maximum extent. In this regard, the following section underlines a few solutions that can be used to improve the effectiveness of communication practices in aviation.

## Solutions

Chatzi et al. (2019) highlighted that the effectiveness of communication between two parties depends heavily on the mode of communication and the experiences of both parties involved in sending and receiving the information. Therefore, it is necessary to adopt an efficient mode of communication that best aligns with the circumstances of both sender and receiver.

Some technical procedures that can be followed to avoid any possible loss of communication involve maintaining good radio discipline by ensuring that the crew members do not change the set frequency for the ATC communication. Similarly, the flight crew can handle the situation of a lost frequency signal if it is aware of different radio frequency ranges and is able to navigate them through the available navigation charts. However, the prior identification of all the standard procedures to actively respond to such situations is much needed to avoid any hustle or mismanagement at the time of such an event.

Moreover, to reduce the risk of runway incidents, more consistent information about the surface environment of the airport is needed. This includes better signage, visibility and traffic flows. However, better communication still plays a significant role in this regard because only through effective communication can the pilot and airport staff receive and send the updated information for their actions. This can also reduce the chance of human error, which, as described above, is one of the most persistent reasons for airport incursions (Oster et al., 2013).

Furthermore, operators, pilots, and controllers can follow a few general rules to avoid loss of communication and handle it effectively if it occurs. For example, the operators need to ensure that the cabin crew, flight crew, and ground engineers are aware of any kind of loss of communication and should announce it publicly. They also need to implement proper standard operating procedures for setting, copying, and cross-checking frequency changes and verifying that all the pilots follow them. They can also install different radio anti-blocking devices if they seem appropriate.

Similarly, pilots can also play an effective role in managing any kind of loss of communication. In this

regard, it is very usual to practice always asking for clarification of what information they are receiving by responding back to the sender every time. They should also wear headsets to ensure that they receive messages clearly and without any outside disturbance. They should also report any kind of frequency changes, irrespective of whether they create any kind of risk or not, to avoid any possible threat in the future.

Finally, the controllers also need to follow some SOPs, such as carefully listing the readback of RTF frequency changes to immediately correct any error and report any such changes through proper reporting channels. And if any kind of loss of communication is suspected, they should try other means of communication, such as relaying through other aircraft. Even then, if the contact is not established successfully, they should contact military authorities immediately according to the standard procedures. This can prevent any adverse consequences.

Moreover, since a person's interpretation of a particular message depends on his knowledge and experience, it is also necessary to avoid misunderstanding between sender and receiver. One active way of doing this is to actively ask for the receiver's feedback to ensure that he understands exactly what the sender means. Efforts can also be made on an organizational level to train the employees and provide them with the necessary common knowledge to understand each other effectively. Thus, enhanced cognitive abilities can lead to improved communication, especially when native English speakers and non-native English speakers are in contact with each other.

Similarly, as noted by Oster et al. (2013), to secure the line of communication between aircraft crew, their cognitive and physical abilities should also be enhanced as they are active source to reduce the chances of human error. This also requires more rigorous research on the topic of human factors to devise their training strategy based on the security protocols in aviation.

Another factor that can lead to safety, security and effective communication in aviation is the implementation of the Security Management System (SMS), which involves all the standard procedures and processes to be adopted by the aviation staff to ensure the security of all the crew members. This will also lead to a secure culture where all the relevant personnel will be actively responding to the circumstances according to set standards to ensure effective communication (Roelen & Klompstra, 2012).

## Conclusion

Miscommunication in aviation is a major threat to safe aviation operations, which can occur through various factors such as workload, the accent of the pilot or controller, quality of the audio signal, and failure to use standard operating procedures. Therefore, since all these factors result from different resources, it is not the responsibility of a particular person to ensure effective communication but all the relevant personnel. Therefore, to ensure the safety of flight operations, it is necessary to implement an effective security management system that includes strategies for effective

communication at different levels.

Furthermore, it is recommended that information being communicated between pilots and on-ground aviation staff should not be long as it can decrease the performance of the communication. Molesworth & Estival (2015) have empirically proved this. Also, the pilots should be facilitated as much as possible so that they do not suffer from any kind of mental disturbance or workload. Moreover, to improve the collaboration of crewmembers, the concept of Crew Resource Management can be introduced that makes all crewmembers responsible for their safety and thus motivates them to observe all necessary precautions while interacting with each other to avoid any misunderstanding (Cox, 2018).

Thus, the paper has provided insight into various issues and solutions surrounding safe communication practices in aviation and contributed to the ongoing research in this area.

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