Frequency's Cockpit Communications Study.

Abstract

During this study Frequency set out to discover and expose the existing pains in Cockpit Aviation Communications. Several incidents in the past, have emphasized possible deficiencies in daily communications between cockpit crew and their direct "outside" environment and actors. There are organizational, environmental, ergonomic and regulatory factors that contribute to misunderstandings and substandard interactions between the cockpit crew and their actors. Frequency's research shows that the underlying issue can be traced back to an overly complicated web of several different communication tools, needlessly complicating any interactions with the cockpit. A survey was conducted at a midsized airline, from the cockpit's perspective, to measure attitudes, barriers and inhibitions concerning the effectiveness of cockpit communications.

Introduction

Traditionally in commercial aviation a cockpit is seen as a confined area and the crew operating in it are seen to perform highly specialised tasks in an isolated and very structured environment. Throughout the years, other industries have picked up on the "cockpit-structure" of checklists and challenge and response philosophies, and have implemented similar workflows with success. Although, through trial and error over the past decades, airline cockpits have become the "safest" and most professional work environments known to date, nobody has looked at impact of information streams and communications between the cockpit crew and the outside actors. The question that needs to be answered at the moment is how do these interactions, and quite often the lack of them, affect the cockpit environment and what can be done to improve on this.

Method

Interviewees

The respondents/interviewees in this research were 45 current line pilots, of all ages, at a mid-sized airline. Each interviewee was asked to complete two Web-based questionnaires. SurveyMonkey was used to send out 90 surveys, of which 88 surveys were fully completed by the volunteers and returned. One candidate interviewee fell ill during the process and was unable to complete any of the two surveys.

Questionnaire Format

The questionnaire consisted of questions relating to analytical data gathering on cockpit communications and time pressures, multiple choice questions and multiple point scales on safety and time pressured communications.

The time attributed to completing a survey was calculated to be between three and five minutes each.

Procedure

The survey was distributed by first contacting each individual interviewee through the use of existing messenger apps like 'Telegram' and 'WhatsApp'. To reach the older demographic of the pilot body, within the chosen mid-sized airline, regular text messaging was used. Although initially a randomly chosen group of pilots were contacted, it was then decided that for the actual group of 45 interviewees all age groups needed to be represented. Once the target group achieved this requirement, 90 surveys were sent out with SurveyMonkey. Each individual interviewee was notified of the start date (25/06/2018) and the end date (23/07/2018) for completion of the survey.

Results and Discussion

The overall survey was split up into two separate questionnaires. The first questionnaire focussed on time pressures and the Business aspect of the airline. i.e. Can the plane depart on time if you do not have the right amount of information or stable lines communication. The second questionnaire focussed more on the Safety aspect. i.e. Can you safely perform the tasks needed, if you do not have the right amount of information or stable lines of communication.

The first questionnaire – 'Business'

For the 'Business' questionnaire, 45 surveys were sent out. A total of 44 completed surveys were returned. One survey was not returned as the interviewee in question fell ill during the time period that the survey was held.

When asked if pilots rely on the available communications system to perform economically efficient flights, a total of 84.09 % of the interviewees indicated that a strong correlation exists between economically efficient flights and a good communications system.

90 % of the interviewees felt that every minute spent (lost) on trying to contact actors outside the cockpit environment, reduced their time available to complete primary tasks.
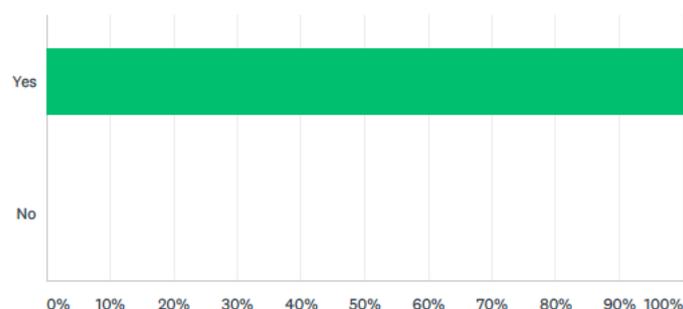

Figure 1: Influence of missing a time constraint

Furthermore, a full 100 % of the interviewees stated that missing a time constraint could lead to loss of economic targets, on time performance and consequently reduce safety.

Consequently, 93.18 % of the respondents rely heavily on the communications system in place for an on-time departure.
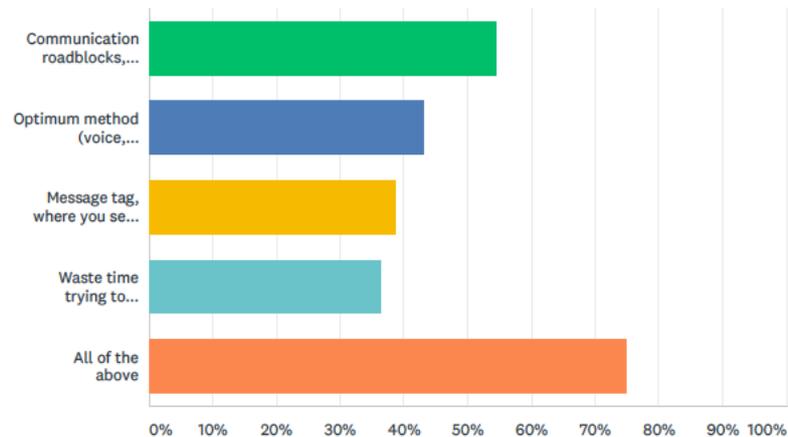

Figure 2: Barriers to an on-time departure

75 % of all the pilots involved in the questionnaire felt that all of the following issues, affected their ability to deliver an on-time departure and an economically efficient flight.

- Communication roadblocks, where you cannot connect to the person you need to.
- Optimum method (voice, message, photo, file) not always available?
- Message tag, where you send a message but don't know if it was received, so try another channel.
- Waste time trying to communicate on one channel unsuccessfully due to no "presence" feature? (i.e. where you can see in advance if somebody is available)

Moreover, 97.73 % of the respondents was convinced that the decision-making process and the ability to respond to disruptions was affected and delayed by the communication difficulties as outlined above.

As indicated by 63.64 % of the interviewees, in most of the disruption cases, valuable time is lost resolving communications difficulties instead of dealing with the disruption at hand.
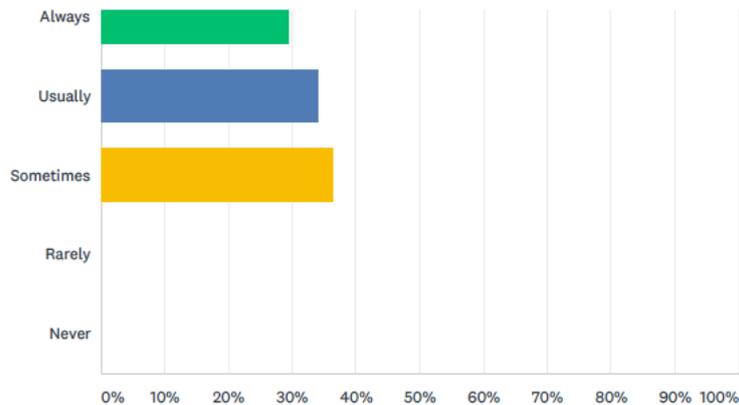
Figure 3: Valuable time lost dealing with communication issues instead of the actual disruption

While 100% of the respondents feel that all the little communication issues combined influence on-time departure and economic efficiency of flights negatively, 84.09 % of the interviewees state that all of the following options need to be available to deal and respond more efficiently while resolving disruptions:

- Being able to communicate with other without delays
- Being able to use the optimum method (voice, message, photo, file, …)
- Being able to communicate and collaborate in real time

The second questionnaire – 'Safety'

For the 'Safety' questionnaire, 45 surveys were sent out. A total of 44 completed surveys were returned. One survey was not returned as the interviewee in question fell ill during the time period that the survey was held.

To analyse the possible impact of a good communications system on 'Safety', one first need to establish the fact that to handle critical situations communications are needed. Hence, the respondents were asked if they relied on good communications for a safe flight. 97.73 % of the interviewees felt that this was the case.

Furthermore, the interviewees were asked if they were required to communicate with multiple parties, utilising several different forms of communication, during critical situations. 97.73 % of the respondents agreed with the above statement.
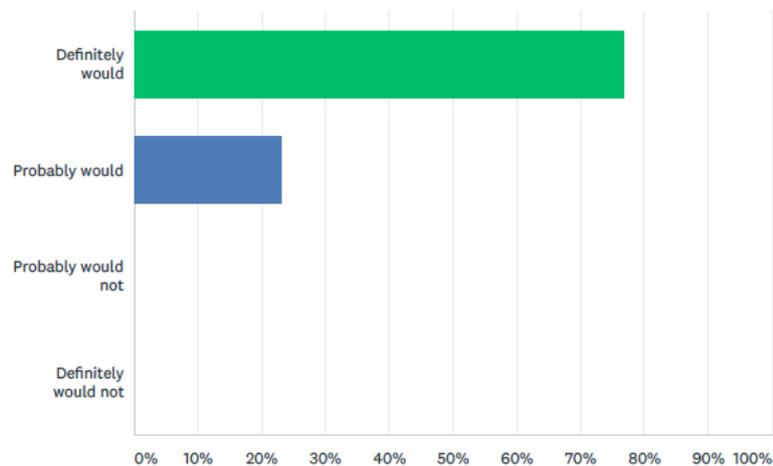
Figure 4: Time limited during critical situations

100 % of the interviewees states that while resolving critical situations they have experienced a time limitation to comply with.
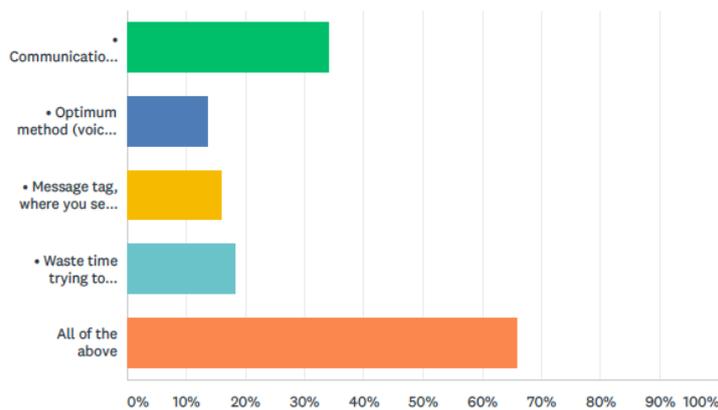

Figure 5: Barriers while resolving critical situations

65.91 % of all the interviewees felt that all of the following communication issues do occur while dealing with critical situations:

- Communication roadblocks, where you cannot connect to the person you need to.
- Optimum method (voice, message, photo, file) not always available?
- Message tag, where you send a message but don't know if it was received, so try another channel.
- Waste time trying to communicate on one channel unsuccessfully due to no "presence" feature? (i.e. where you can see in advance if somebody is available)

72.73 % feel that in the majority of cases the decision-making process and the ability to respond to critical situations is delayed by the above outlined communications issues. A full 100 % of the interviewees is convinced that the above listed issues are at least in some of the cases present.
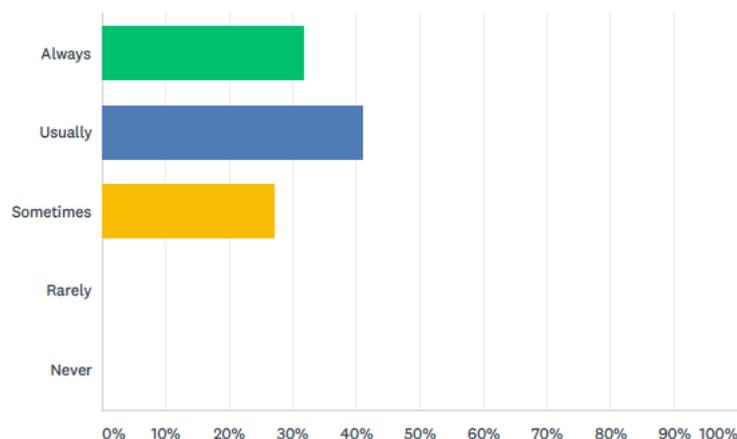

Figure 6: Delay to respond to critical situations

97.73 % of the pilots stated that valuable time is lost resolving communication issues instead of the dealing with the critical situation. Moreover, 95.45 % feels that in the majority of the cases all these communication issues combined decrease the safety of the flight. A full 100% of the interviewee states that this is the case in at least some of the critical situations.

88.64 % of the interviewees state that all of the following options need to be available to deal and respond more quickly in relation to resolving critical situations:

- Being able to communicate with other without delays
- Being able to use the optimum method (voice, message, photo, file, …)
- Being able to communicate and collaborate in real time

At least 62.79 % of the interviewees feel that the a more sophisticated communication system would save at least 15 minutes or more on any given work day.
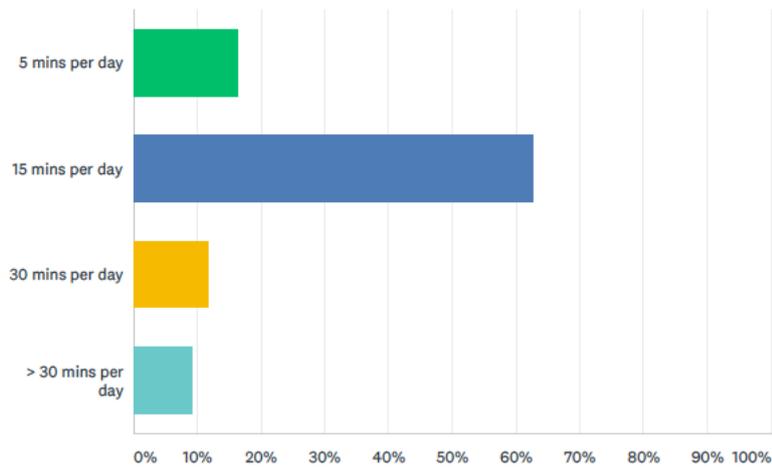
Figure 7: Minutes lost per day due to inadequate communications

Conclusion

When we look at the overall questionnaire we can conclude that both surveys indicate that there is a strong correlation between time pressure and a good communication system.
In the 'Business' aspect this translates into being able to use the right tool of communication at the right moment as to minimalize any delays and achieve on-time performance resulting in more economic efficient flights.

While we look at the 'Safety' aspect it shows us that where time is of the essence in critical situations, a good communication tool is invaluable to the cockpit crew to resolve the issue at hand and to complete the necessary tasks in a safe manner.

Furthermore, it is important to note that 83.72 % of the interviewees state that a more sophisticated communication system can at least save 15 minutes a day on any given working day for each interviewee individually.

To conclude, we can state that time pressure is the red line throughout the daily operations of a cockpit crew's tasks and the correct communication tool at the correct moment can attribute a lot to the safe, on-time performance of every flight.