

STUDY ON HOW TO INCREASE REPORTING IN AVIATION

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A future framework of tools for capturing, analyzing and integrating data from both humans and aircrafts has been suggested in the ongoing HILAS project. These tools rely on reporting from the operators. In interviews and questionnaires pilots gave their views on reporting culture and possible blocks and barriers as well as enablers for increased participation and self-reporting. The reasons for not reporting are due to organisational issues such as lack of relevant feedback, change initiatives and environmental factors such as access to tools, time and effort to file reports. These results are important implications for design of future reporting tools.

Reporting culture, self-reporting tools, feedback

1 Introduction

Aviation faces huge challenges and demands in the future for increased productivity and capacity as well as safety. Human error is often mentioned as a cause for over 70% of aviation accidents. Many errors contributed by humans in the system could have been avoided if human factors knowledge was better integrated in the system. Errors causing accidents are usually the active errors in operations. These errors are often subject to accident investigations. Reason (1997) discusses causes for accidents in terms of both latent conditions and active errors. It is many times the latent conditions in the organisation that under certain circumstances contribute to conditions that trigger active errors. Therefore knowledge of human factors issues behind the latent conditions are essential and need to be integrated earlier and through the whole life-cycle of the aviation system.

1.1 Safety management systems in aviation

There is a safety department in every airline. Directions on how to implement this, or several safety offices, is to a great extent regulated through legal bodies and due to heavy regulations. Safety management is similar in many airlines (Dijkstra, 2006). To acquire knowledge of latent conditions and human factors issues data is collected from operations. In aviation the safety management systems has long experience in collecting and analysing data. Currently, airlines use a range of paper and technology based tools to monitor and evaluate human performance and safety. Feedback from these tools is used to direct system safety improvements. Traditionally, these tools have divided into two types: those that focus on gathering human performance information using either self report or observer based methodologies (e.g. Air Safety Reports, Line Checks) and those that focus on gathering aircraft performance information (e.g. FOQA, Flight Operations Quality Assurance) (Cahill, Mc Donald, Ulfvengren, Young, Ramos and Losa, 2007).

The work in safety departments can be summarised as (Dijkstra, 2006): collecting and organising data, composing management reports, conducting investigations into

accidents or incidents and feeding line management with safety related information. The airlines then combine these data in an attempt to create a full picture about risks and threats to safety in the current system. These trend reports may take months to put together. Much information comes from operational personnel.

1.2 Safety culture

Reason (1997) writes that few things are sought after and yet so little understood as safety culture. However, he claims that safety cultures within an airline do affect its safety. A safety culture is seldom preferred on its own, what is really sought after is an effective safety culture. Reason further argues that a safety culture can be socially engineered by identifying its essential components and then assembly them into a working whole and discusses the main components of a safety culture. An informed culture is said to be a safety culture. An airline needs a good reporting culture in order to be informed! Blocks and barriers to reporting according to Reason (1997) is; the operators divulging their own errors, difficulty to see the value in reporting and that it is worth the while, and that the information actually is used and valued. Success factors are described to be due to for example confidentiality, rapid useful, accessible and intelligible feedback and ease of making reports. In addition a reporting culture requires a just culture and trust. It is necessary to have a non-punitive system if not misconduct has occurred. Dijkstra (2006) also discusses that confidentiality has consequences for collection of the data. Therefore he suggests that pilots' names always should be kept with the safety department and data may never be used against pilots unless there is a gross negligence or wilful misconduct. The fear of blame most certainly effects pilots' reporting frequency (ibid.).

Reason (1997) suggests that a reporting system may benefit from people being encouraged, even rewarded. He continues that the organization needs to be a flexible culture and finally an organisation must possess a learning culture and have the ability to act upon the information and make the right conclusions and make changes accordingly.

If the organisation fails to make improvements there is great danger that a reporting culture will be lost because of mistrust (Reason, 1997).

1.3 Development of reporting tools

In an EU funded project HILAS (Human integration into the life cycle of aviation systems) one of the overall goals has been stated as an Airline Performance Management System or Human-oriented Operations Management system (Annex 1, HILAS). Parallel research has been conducted in four strands: Knowledge integration strand (integration and management of human factors knowledge), Flight operations strand (flight operations monitoring and process improvement), Flight deck technology strand (human factors evaluation of new technologies applications on the flight deck) and Maintenance strand (monitoring and assessments of maintenance operations). The flight operations strand performs research on future innovations for airline flight operation management and a fully integrated framework of tools, both technical and organizational, is under development. Early in the project some high-level requirements were suggested for continuous performance management with the access of tools from cockpit including optional tools for continuous improvement activities as one important part of the system. Much combined and parallel research has contributed to the suggested framework.

It is assumed here that the success of much of the HILAS system relies heavily on the fact that pilots and other operators participate and use the system and especially the self-reporting tools.

From industrial settings it is known that despite that an organization is supporting the operators to give inputs, there are often blocks and barriers found that discourage operators to share ideas, complaints and suggest improvements that suppress innovative behaviour (Bessant, 2003).

In order to develop efficient reporting tools these blocks and barriers to participation and reporting need to be understood. It is suggested here that it could be interesting to investigate if common blocks and barriers found in other industries are also found in aviation. It is also of great interest to see if pilots agree on suggested blocks and barriers as well as success factors reported from literature earlier.

2 Objectives

Two studies were performed to investigate how reporting is done today within an airline and possible improvements of tools and how pilot participation may be increased.

The objectives are to investigate if common blocks and barriers found in other industries are also found in aviation. It is also of great interest to see if pilots agree on suggested blocks and barriers as well as success factors reported from literature. This research aim to investigate the question: What are common blocks and barriers as well as enablers for participation and reporting among pilots?

The results are assumed to give design requirements which will be applied in the development of the HILAS framework.

3 Methods

This research was conducted together with an airline within the HILAS network.

Existing reporting procedures and tools were analysed at an airline and two studies with interviews and questionnaires with pilots were performed.

Data from questionnaires were collected (5 captains and 8 first officers) to compare how common blocks and barriers known in other industries (Bessant, 2003) related to the reporting culture among pilots. A list of known blocks and barriers found in Bessants extensive industrial research (Bessant, 2003) was presented to the pilots. Pilots ranked if they agreed with a statement or not on a scale from 1-5. In total 28 statements were included. The results were analysed with a student T-test ($p < 0.05$).

An interview study was also performed with pilots (6 captains and 7 first officers). It was semi-structured interviews with questions regarding existing reporting tools and procedures, future technology for on-board reporting, self-reports and a combined human and aircraft performance monitoring tool under development. Only results regarding existing and future self-reporting tools and reporting culture will be reported here.

A lot of information sharing also takes place within the framework of the HILAS project, where participating researchers and airline partners are active. Deliverables and reports within the project share knowledge between strands as well as within the strand.

4 Results

4.1 Pilot interviews

In the operations manual it is clear that “any person observing an occurrence believed to affect safe operations” should file a report. Reports are filed on paper. The general occurrence reports are filed by everyone and then there are airline and authority specific reporting forms for bird strike, air traffic incident, aircraft accident/incident filed by captains and reports for cabins safety filed by pursers. Reports are filed confidentially, which means that names are kept to a small group within the safety department. It was clear that pilots see things everyday identified as weaknesses in flight operations one pilot said “not one day is what you expect”. Pilots often have an idea of how an issue could be solved but they do seldom share this with anyone or discuss it with colleagues and do not file a report on it! Most pilots agreed that they do report on incidents only, things they have to report on. No one said they had filed an optional occurrence report. A common way for suggesting changes and file complaints are to talk or write an e-mail to their chief pilot.

The main reasons pilots have for not filing reports were that there was no point in doing that since: pilots agreed that there was too little feedback which gave them a sense that no one really was interested. Another issue was that the reports are tedious to fill out and there is little time to do so between flights. Many said that they used to file reports but had stopped because of the above reasons.

Suggestions for increasing reporting were to give resources to the organisation to handle reports and give feedback, to be able to see what others have reported, to be able to follow reports ways through the organisation, allocate time to crew to file reports. Pilots also wanted to know who has the mandate to make improvements on issues reported and would like to send the report directly to this department or person.

Availability and usability was discussed. All pilots agreed that the possibility to file both safety-related reports and optional reports on-board would be very positive and that they probably would report more frequently if this was possible. This requires, however, in most cases that flights need to be longer than 1.5 hrs to give enough cruise time to file reports before preparing landing. If reporting tools were available on internet reports could be filed from hotel rooms at destinations and even from home.

4.2 Blocks and barriers to reporting

Bessant (2003) acknowledges the difficulty for an organisation to reach higher involvement among operators. In his research he gives examples of common statements that describe blocks and barriers to establishing new behaviours concerning reporting, and active participation and involvement. Bessant’s data are mainly collected in an industrial setting with workers in production and manufacturing. In this study, however, pilots within an airline were asked to judge a total of 28 examples of Bessant’s blocks and barrier statements, whether they agreed with them or not.

There were only three statements considered **true** which described lack of feedback from the organisation!

- There’s no point – no one listens anyway.
- You file a report- and that’s the last you here of them...
- You only get back: We don’t have the time/money/people/or other resources.

The 13 statements considered **not true** described anxiety for individuals to speak up or not knowing how to formulate problems and which tools to use.

- I am not permitted to express opinions or offer ideas.
- I feel shy or anxious about offering an idea.

- I feel it is not my job - someone else's job.
- Nobody asked me to...
- I fear what other in the work force might say or do-peer pressure.
- What's in it for me?
- Lack of skills – I do not know proper ways to hand in suggestions or ideas.
- I do not have a tool for this type of reports.
- Only certain people feel empowered or authorized to innovate - the rest feel that it is not their job, or that they are not allowed to.
- Lack of ways for communication.
- Someone else must have already thought of it.
- I'll look stupid if I say anything.
- You only get back: We've never tried it.

In addition, captains considered it **true** that there is no time or space to make it happen - too busy doing the real job. And captains considered it **not true** that to keep your head down is the best way to get on here

5 Discussion

The goal with this research was to learn about an airline's reporting culture, reporting tools and procedures in use. Reporting is clearly not something pilots do in their everyday routine. Only mandatory incident reports are filed.

It is positive that so many of the listed blocks and barriers were not considered true! The pilots are in no way intimidated to speak up or lack ways to do so. They have no problem seeing that it could be part of their job and could be meaningful if they only trusted management to deal with reports and issues reported.

Much of the results duplicate other research on blocks and barriers as well as success factors for an effective reporting culture as described in the introduction.

New technology enables new solutions and tools for collecting data from flight crew and other personnel in the aviation operations. The pilots were very positive to on-board tools.

6 Conclusions

Results from both the interviews and questionnaires show that pilots see things everyday that are identified as process weaknesses but also that they have plenty ideas for problem solving and are not intimidated to speak up indicates that there is great potential to increase reporting and participation within aviation. However, based on the present study it is clearly indicated that in order to reach a higher number of reports and larger participation from the pilots the company needs to acknowledge the common blocks and barriers to reporting and participation that exists as well as enablers suggested by the pilot group to foster a more participative reporting culture. For example, enable more direct feedback from those responsible for the reported issue, to see what others report on, to trace issues reported in the organisation, to allocate more resources for departments to handle reports and give feedback as well as to show system changes and improvements based on reports.

The reporting tools needs to be easily accessible on-board and user-friendly to save time and effort to write them.

These results give implications for design for future reporting tools within aviation.

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