

Crawl - Walk – Run

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This 'report from the field' outlines a new training and assessment framework introduced into a regional airline. The methods used to analyse the effect of the implementation have included surveys, analysis of pilots' rater training, historical and contemporary data analysis. Initial findings have been positive, with early findings identifying a greater emphasis on non-technical skills assessment. Further analysis on rater performance – reported in another study – has identified interesting trends appearing in how pilots of differing rank assess performance.

Situation

It was recognised that current Human Factors (HF) training and assessment was not fully meeting either company (exposition) or regulatory (pending) requirements.

Problem

Existing assessment methods were not enabling the effective measurement of non-technical skills (NTS); with analysis of historical company assessment data emphasising that examiners were primarily assessing technical skills (Manipulation and Knowledge reason codes predominantly used). This was occurring even with non-technical skills (NTS) criteria being available. To this end, it was identified the airline lacked a valid set of assessment measures for both technical and NTS. Furthermore, the airline had invested heavily in previous HF training, though there were concerns that the transfer between classroom based instruction and the flight deck was not proving effective.

Whilst approaches for technical and NTS training and assessment were abundant, little consistency existed. Nor were the approaches that were reviewed linked skills, that is, NTS viewed as separate to technical skills. This apparent lack of a coherent framework meant operational context was poor.

Another perceived issue was that while training staff were well versed in HF theory, due to problems outlined above, they were unable able to consistently establish links between theory and practise. Finally, it was evident, through crew reports, a non-standardised approach to briefing and debriefing was occurring. This lack of standardisation was seen to be hindering the uptake of HF concepts, and hence the fundamental learning process.

Requirements / Solution

There was a clear need to introduce an educational strategy that would (1) teach skill based HF training, where NTS and TS are taught as one, rather than the current divided approach; and (2) adopt a standardised assessment measure that utilised a single theoretical model.

These requirements would allow for a holistic assessment approach across the broad training framework. It was also envisioned that using a single model would allow for focused training, and, a common vocabulary. It was also hoped that using a simple and clear assessment measure, might improve rater-reliability. Finally, the HF model should also afford a more standardised briefing and debriefing framework, and, self-analysis tool.

Method

The company adopted the Model for Assessing Pilot Performance (MAPP) as the main theoretical framework for pilot assessment and training (Mavin & Dall'Alba, 2011). The MAPP is a holistic model, which does not separate skills using the traditional technical/NTS divide. Rather, the MAPP is a relational model, viewing skills as being connected, but also hierarchal (Figure 1). Mavin & Dall'Alba (2011) have argued that during assessment, examiners tend to assess pilots using essential skills, where poor performance in any of these areas are more likely to lead to a fail grade. Enabling skills, whilst fundamentally important, are used to improve essential skills.

The company adopted the MAPP to contextualise performance, however, for more fine grain assessment, a six by five assessment grid was developed. This consisted of the six criterion of the MAPP as the vertical dimensions and word pictures along the horizontal scale for various performance levels (1 representing 'poor performance' and 5 'very good performance'). The development teams aim was to derive an assessment grid with the MAPP on one side of an A-4 sheet of paper, and the assessment grid on the other.

In addition to the assessment grid, instructional material was standardised throughout the airline for all of the six criterion. For example, management is a criterion of the MAPP, and was therefore developed within the assessment grid. However, the airline did not have a standardised management model, nor had previous training considered how management could be taught. The development team

consequently mandated a model, FDODAR (fly aircraft, diagnose, option, decide, assign duties and review), as the standard management model. Furthermore, it was acknowledged, that current decision-making literature showed deficiencies in rule based decision models (Klein, 2008). As such, the strengths and weaknesses of the FDODAR model were outlined during training.

To familiarise all crew on the new approach to training and assessment, instructing staff underwent a 2-day classroom based HF workshops covering the MAPP, assessment theory, briefing and debriefing, and practice in assessing pre-recorded video scenarios. Line crew (captains and first officers) attended a 1-day classroom based HF workshop (abbreviated instructor course), which included assessing the performance of pre-recorded flight videos.

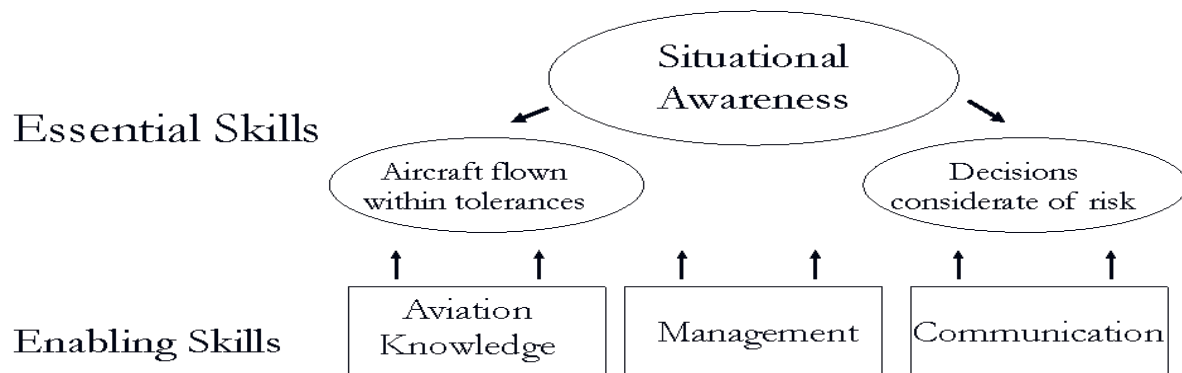


Figure 1 Model for Assessing a Pilots' Performance (Mavin & Dall'Alba, 2010)

Following ground based instruction, all crew were given a single 3-hour simulator training LOFT. During the briefing, crew watched a pre-recorded video of the exact non-normal they would experience in their first scenario, thus enabling them to view an almost ideal performance. Following a discussion about the performance with a flight examiner with reference to the MAPP, the crew were moved to the simulator where they were able to practice the non-normal, twice. The examiner assessed the crew mid way through the LOFT using the MAPP. The crew was then given an unknown power plant abnormal, for consolidation, though using similar process as developed in the previous session.

Results

There are two main studies currently being undertaken for this project. The first study is an investigation into what are the phenomena (or combination of phenomena) that pilot-assessors (irrespective of rank) identify as affecting flight safety? For a detailed review of the preliminary findings, see Mavin, Roth & Dekker (2012).

The second study is looking into the effectiveness of the new training and assessment methods. This study is being analysed using the Kirkpatrick's four-stage model of evaluation. Whilst this evaluation is still ongoing, preliminary data, whilst still anecdotal, is promising. Examples of already perceived positive impacts include: greater ability for examiners to define areas of performance deficiency and associated training needs; examiners having a clear and precise common language; line pilots better able to grade their own performance; ground based instruction having a higher transfer rate to the flight deck than was previously achieved. To quote a Line Captain on completion of ground training 'I can better see how I am as a pilot'. Whilst positive impacts are being measured, some difficulties have included: some pilots having difficulty understanding the concept of the MAPP; some examiners still having difficulty using the MAPP during debriefing; some pilots having difficulty implementing the FDODAR model during training exercises.

Conclusions

The implementation of the MAPP as the theoretical framework appears to have been beneficial for our airline. Whilst the full impact will take three years to measure, initial influences have been very positive.

References

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