Challenges for Aviation Psychology

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Abstract

Since early experiments using the ‘Cambridge Cockpit’, human factors studies have played a prominent role in ensuring safety and effectiveness in aviation. Traditionally, factors affecting aircrew performance — such as workload, flight deck ergonomics, and environmental stressors — have received greatest attention. With the rapid growth in civil air traffic, the adoption of new air traffic management practices, and the introduction of new technologies, the focus of aviation psychology research is changing. There is growing interest in all the personnel contributing to safety, particularly air traffic controllers. Moreover, technological developments, central among which is increasing automation, present both opportunities and new threats that must be addressed. They also fundamentally alter the nature of skill requirements, with implications for selection and training. This paper summarises significant new research initiatives, and describes future challenges for aviation psychology.

Introduction

It is widely recognised that human error is implicated in many aircraft accidents (see, for example, Jorna, 1997; Chappelow, 1999). The objective of aviation psychology is to increase the safety and efficiency of flight, despite developments such as rapid growth in civil air traffic and the requirement for military aircrew to perform more demanding missions under all-weather conditions.

The ‘Cambridge Cockpit’, a rudimentary research simulator, was constructed in the 1940s to support some of the earliest work on aviation psychology. For several decades, attention was given largely to the factors influencing aircrew performance. Gradually, however, it has been acknowledged that many other personnel play an important role in flight safety and that the problems that they face are worthy of study. Air traffic control is now the subject of much human factors research, and errors committed by maintenance crew are attracting increasing interest (e.g., O’Connor et al., 1997; Walter & Kanki, 1996).

Aviation systems

As in the analysis of any complex human-machine system, it is convenient to consider the interaction between the human operator and a) the system, b) the