

RESILIENCE OF AIR TRAFFIC CONTROLLERS IN CONTROL TOWER

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Abstract

The air traffic controllers in the control tower at an airport are responsible for the safe and efficient movements of aircraft on the taxiways and runways of the airport, and of aircraft in the airspace near the airport. In aerodrome Air Traffic Control (ATC), controllers always face inevitable disturbances, such as changing traffic situations, variability in the performance of pilots, variable wind conditions, and so on. However, controllers deal with these challenging situations to provide safe and efficient ATC services continuously. The aim of this study is to determine the resilience of controllers during their normal daily ATC operations. Multiple interviews with tower controllers and observations in the control tower at Chubu Centrair International Airport in Japan were conducted to investigate their working processes, including cognitive aspects. Their answers to the interview questions were analyzed from the perspective of Safety-II, that is, how they manage disturbances in their working environment to achieve successful ATC operations. The analysis results are described using the functional resonance analysis method (FRAM), modified for the description of three types of functions and situational factors: (1) basic functions for meeting the separation standards between aircraft, (2) threat factors, which could disturb the basic functions, and (3) response functions for managing possible negative effects caused by the threat factors. The FRAM model obtained visualizes the complex interactions among the functions and the situational factors in aerodrome ATC tasks, and it shows the essential role of performance adjustments of controllers for the proper functioning of ATC.

Keywords: Safety-II, FRAM, Air Traffic Control