Human reliability: analysis of procedure violations on traffic control of a light railway network

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Abstract

The purpose of this paper is to present a study that aimed to investigate the context in which violations of procedures took place, and to understand what resources were used by the traffic controllers to ensure the safety of the operation of a light railway network.

The methodology implemented consisted of two different phases. The first one was based on an ergonomic analysis of the traffic controller's job and their working context. Dispatchers were interviewed using a questionnaire for subjective assessment of working conditions, and video recordings were collected and scored to support debriefing interviews with subjects. The second phase consisted on the analysis of violations of operation and safety procedures, and the circumstances in which they occurred.

The methodology used, led to the identification of the major types of violations, as well as the unofficial strategies used by the dispatchers to cope with the unpredictability of controlling traffic. It was also established that the communication and cooperation between traffic controllers and their supervisors was a key element to ensure the reliability of this operation.

Introduction

The light railway sector in Portugal, has known a significant growth in recent years. On the one hand, this trend is motivated by an increasing quality demand on public transportation. On the other hand, when compared with heavy metro systems, tramway networks require a considerably lower infrastructural investment. However, the fast growth in the sector and its pursuit for higher safety and quality standards has brought profound job modifications for workers such as tramway drivers and traffic controllers (Wilson & Norris, 2005).

To ensure the necessary high standards of human resources reliability, working conditions must be improved and made suitable to a higher task complexity and increased cognitive job demands. Modern computer networks have made it possible to collect all the necessary information on a single system and control the majority of