Factors influencing the causation
of accidents and incidents

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Abstract

The goal of this study is to identify and explain the MTO-factors (Man, Technology, Organisation) affecting the origin and the course of road traffic accidents and incidents. Human factors issues are essential to understand properly the aetiology of road traffic accidents, and in particular the possible mismatch between humans and technology. The study works from the assumption that an effective reduction of accidents and incidents requires a reduction of this mismatch, hence the need for identification and control of the factors that cause it. The methodology of this study is based on the principles of cognitive systems engineering, where the driver and his/her vehicle are seen as a joint cognitive system. To analyse the mismatch between the joint driver-vehicle system (JDVS) and its environment, a detailed description of the course of the accident is necessary. A special investigation team collects data from actual traffic accidents in the Gothenburg area during a six-month period, starting in the fall of 2003. In addition to studying accidents, another team will also collect data on incidents and near misses. The study of incidents can provide a broader perspective on risky driving and unsafe situations, and thereby complements the accident data. The study makes use of a Driver Reliability and Error Analysis Method (DREAM), derived from the more generic Cognitive Reliability and Error Analysis Method (CREAM). The method has been tailored for this project to uncover the main MTO factors in traffic accidents. The contribution of this study is to provide a model and a method for uncovering MTO factors in road traffic accidents. The method provides a base for system designers to understand in detail traffic accident aetiology, and from that basis to develop either new technology or redesign existing systems to minimise traffic accidents, for instance by preventing certain classes of initiating events from taking place.

Introduction

When a road traffic accident occurs, usually more than one factor contributes to the generation and development of the accident scenario. When these factors are analysed from a human factors perspective, the focus tends to be on factors such as