

Designing safety into future Air Traffic Control systems by learning from operational experience

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Abstract

Learning from occurrence data is acknowledged as being important in a number of safety-critical domains, amongst which Air Traffic Control (ATC). The understanding derived from incidents can be used to make current operations safer, but also to improve the design of future systems, thereby creating a complete safety learning cycle that feeds back to the present and forward to the future. The SAFLearn project contributes to such a safety learning cycle in ATC, whereby lessons learned from operational experience are used to inform the design of the future systems developed at the Eurocontrol Experimental Centre (EEC). SAFLearn consists of four activities: collection, storage, analysis, and delivery. In the collection activity safety occurrence reports are first categorised according to a formal taxonomy, and then stored in a database. The analysis of safety occurrence reports by safety, human factors and operational specialists, results in the definition of lessons learned for specific EEC projects. These lessons are delivered to designers to support safety at different stages in the development of their projects, in the conceptual phase to evaluate whether current problems will be addressed, in the design phase to help prioritise design decisions, and in the testing phase to help evaluate the product. The process is first described and then illustrated through three examples.

Learning from safety occurrences

The importance of safety learning through occurrence data for safety management and safety improvement is widely acknowledged in a number of safety-critical sectors, such as civil aviation (Van Es, 2001; 2003), the chemical process and rail industry, as well as in domains such as anaesthesiology, pharmacy, and transfusion medicine (Van der Schaaf & Kanse, 2002). Through the collection, storage, analysis and exchange of safety occurrence data, safety professionals are able to build-up knowledge and gain an insight of the existing and near-term safety problems (Von Thaden & Wiegmann, 2001).