Barriers and accidents: the flight of information

Thomas G.C. Griffin, Mark S. Young, & Neville A. Stanton
Brunel University,
Uxbridge, UK

Abstract

Situation awareness remains a contentious topic within the human factors community. This paper investigates the application *of information networks* (derived from the Event Analysis of Systemic Teamwork, EAST, methodology (Stanton et al., 2008) to *aviation incidents*. The information network is a novel way of expressing who, within a system, owns what information, and how is it being communicated around the network. Information networks capture the information present within a system at any given time. Through comparison within and across networks the passage of information into, around and out of a system can be studied. Accident data within general aviation have been accrued and generic information networks have begun to be developed for different stages of flight. This paper looks at a generic landing network and investigates the integration of probability data to establish causality within the network. Manipulation of the networks based on conditional probability theory is a possible predictor of error migration routes following the imposition of constraints or barriers on a system. More than just illustrating the information present within a system space, these networks offer the opportunity to identify where barriers can be placed to improve the flow of information. In this way, the networks envelop the various aspects of communication and information-ownership that are central to distributed situation awareness.

The evolution of information networks

The Event Analysis of Systemic Teamwork methodology (EAST; Stanton et al., 2008) offers a network model based approach to understanding complex multi-causal, multi-agent and multi-linear accident sequences. Originally developed to examine the role of actors and groups of actors within complex socio-technical systems, EAST has been applied to a number of domains, including rail (Walker et al., 2006), aviation (Griffin et al., 2007), and, 'command, control, communications, computers and intelligence' (C4i) scenarios in the military (Stanton et al., 2006).

In order to apply the EAST methodology to a particular system, three network types are created for 'snapshots' in time, and can then be animated over a time period to illustrate the changes within the networks. The three network types used within this methodology are Task, Social and Information (figure 1). For a full description of the creation and population of each of these networks, the reader is directed to Stanton et al. (2008).