Vigilance and the Price of Freedom

When we have to act as a concerned group or use a common convenience, such as mass transportation then individual freedoms come into conflict with collective rights. Co-opting and reciprocal security intrinsic to social interaction is being sought now more visibly in aviation and somewhat less visibly in other forms of transportation and communication. Perhaps in advancing security in their own realm, aviation professionals can set the common example. The fundamental challenges for human factors in security are to:

1. Devise ways of distinguishing what potential and actual sources of communal threat exist.
2. Provide valid and accurate assessment methods to distinguish such threats.
3. Indicate avenues of action by which threats can be excluded or rendered harmless.

To meet these challenges, we suggest three avenues to pursue in our collective efforts to combat terrorism:

1. Improve personnel selection and training
2. Design of systems to support sustained attention or vigilance
3. Possible control of aircraft beyond the cockpit alone.

In the present NAS, the pilot is in control and responsible, although control is also mediated by air traffic personnel who provide guidance and direction. Thus, the role of vigilance lies in the selection and the training of flight deck and ATC personnel to deny individuals who seek to usurp control nefarious purposes access to air traffic control facilities and the commercial flight deck. Since this function has yet failed, to our knowledge, political will is likely to be slow to react to this potential threat over known threats. Inescapably, concern has focused on public access to the flight-deck as this was the approach used by the September terrorists. In addition to physical barriers erected to exclude unauthorized individuals from entering secure areas, selection barriers must be erected for other individuals who work in the system and for whom the everyday vigilance of passenger control is easily circumvented.

Security background checks and cross-referencing with emergent National databases should provide help in this regard with support from human factors professionals who experience in dealing with the problem of information overload. Screening personnel with ground access to aircraft and control facilities as well as those who fly in a professional capacity or have privileged access (e.g., flight attendants, Federal Air Marshals) will be a Herculean task.

The field of Human factors considers the security problem as one of distinguishing signal from noise. In this context, the signal is the source of threat (a person or what he possesses) and the "noise" (or, more properly, the non-signal) all other forms of non-threats. Since the occurrence of threats are so rare, and non-threats so predominant, the detection process fits the scientific definition of vigilance (see Warm, 1984). A quintessential component of laboratory vigilance tasks is "event rate", or how often stimuli are presented to observers. In the case of passenger screening, this might be the number of people who pass through a detector per unit time. Embodied is event rate is "signal rate" or the proportion of events that are targets. In laboratory testing, realistic event rates are presented (e.g., one event every... continued on page 29...