

## **Human Factors research in aviation**

Rolf Zon – Netherlands Aerospace Centre (NLR)

Recording bio-behavioural data is becoming less intrusive, less expensive and easier to apply in real life settings. As a result more data are available to support decisions or for training purposes.

The tools for bio-behavioural assessment which are used by NLR comprise amongst others: eye tracking, heart rate variability, actigraphy and EEG. Data from these tools is preferably combined with subjective data like questionnaires or debriefings and with performance data like amount of work that was accomplished, error rates, reaction times, etc.

Applying these tools in order to answer Human Effectiveness related research questions is done by NLR in commercial and military aviation in both the cockpit and air traffic control environments. NLR also executes these measurements in other domains like rail or road.

In the presentation the use of some of these tools will be discussed by means of sample projects, to name a few:

**Situational Awareness assessment in the cockpit.**

Situational Awareness is being aware of everything that is relevant in order to execute the full scope of your task. For example, the technical state of your aircraft, where you are, where you are going or the whereabouts of other traffic in the vicinity. What do we know about SA assessment? Can eye tracking contribute to that.

**Remote Tower Operations**

Remote Towers are air traffic control towers that are not physical towers with a direct view on the runways of an airport. They are control rooms that allow the air traffic controller to monitor and control traffic from a distance. In such an environment the windows from the tower are replaced by video based information, resulting in many different ways of how and when information may be presented to the air traffic controller. Can we measure the impact that such a new environment has on the air traffic controller.

**Adaptive Training through Brain Computer Interfacing (BCI)**

Exploratory study in using wireless, simple EEG devices to control the difficulty of the learning task (using helicopter controls in a PC simulation) by measuring attention level of the trainee.