STRESS

Human Performance neurometrics toolbox for highly automated systems design

PROJECT INFORMATION

PROJECT COORDINATOR: **Stefano Bonelli I stefano.bonelli@dblue.it**
DISSEMINATION MANAGER: **Martina Ragosta I martina.ragosta@dblue.it**

DURATION: **24 months, started in June 2016**

CONSORTIUM

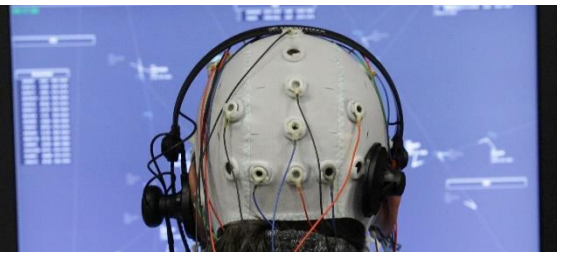
DEEPBLUE · ENAC Ecole Nationale de l'Aviation Civile · Sapienza Università di Roma · EUROCONTROL · Anadolu Üniversitesi

SESAR

This project has received funding from the SESAR Joint Undertaking under grant agreement No 699306 under European Union's Horizon 2020 research and innovation.

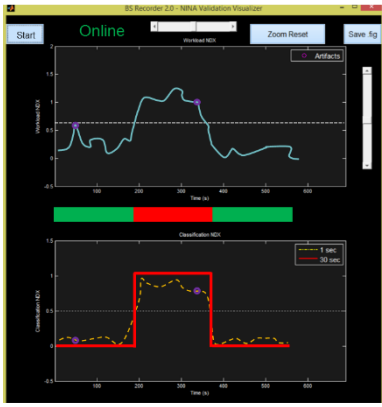
Human Performance Neurometrics Toolbox For Highly Automated Systems Design

To support the transition to higher automation levels in aviation, by addressing, analysing and mitigating its impact on the Human Performance aspects associated to the future role of Air Traffic Controllers



The European ATM system is expected to face challenging situations, with the growth of air traffic, the **increase of its complexity**, the introduction of innovative concepts and **increased automation**. The roles and tasks of air traffic controllers (ATCOs) will change in the future and it is vital to enhance the comprehension of human responses to their role changing, that is, from active control to monitoring of complex situations and managing unexpected system disruptions.

ATCOs performance is recognised to be impacted by several aspects such as stress, emotions, attentional resources available, attention focus and so on. In the recent years, the concept of **Human Performance Envelope** (HPE) has been introduced as new paradigm in Human Factors. Rather than focusing on one individual factor (e.g. fatigue, situation awareness, etc.), the HPE considers their full range, mapping how they work alone or in combination leading to a decreased performance that could affect safety.



At the EU level, there are projects currently addressing the research goal of monitoring the team performance, including monitoring some of the above aspects. However, most of these research activities focus on pilots and airplane cockpits. In line with this, there is a clear definition of the future scenario for pilots and of the corresponding HP implications, while a corresponding work on the ATCO role is still to be performed. STRESS deals with it.

STRESS HAS THREE MAIN OBJECTIVES:

NEUROPHYSIOLOGIC INDEXES

To identify and validate neurophysiological indicators for monitoring in real-time the controllers' mental state

AUTOMATION IMPACT

To use them to study the impact of advanced highly automated systems on controllers' performance

FUTURE AUTOMATIONS

To provide automation design guidelines to support human performance during safe transitions from high levels of automation to low levels, and vice versa

STRESS TIMELINE AND MILESTONES:

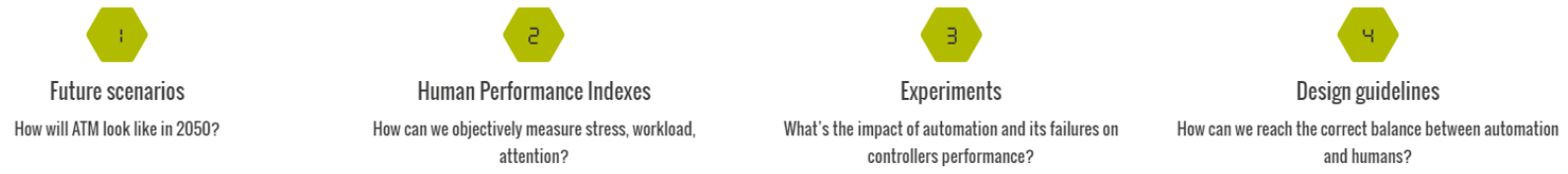
- Future scenarios, expected in October 2016
- Neurophysiological indexes, expected in September 2017
- HP envelope in future scenarios, expected in March 2018
- Automation design guidelines, expected in May 2018

THE STRESS CONSORTIUM:

The composition of the STRESS Consortium reflects the need to adopt an interdisciplinary approach, as follows:

- *Deep Blue* (coordinator) is a research and consultancy Italian Small Medium Enterprise (SME) specialised in human factors, safety, validation and scientific dissemination;
- *Sapienza University of Rome* provides expertise in the measurement and analysis of neurophysiological signals, and definition of indexes of human mental states and cognitive performance;
- *Ecole Nationale de l'Aviation Civile* (ENAC), the French National School for Civil Aviation, provides first quality access to ATM experts, as well as engineers and pilots, and a long-standing expertise in innovative interaction technology;
- *Anadolu University*, with the Faculty of Aeronautics and Astronautics, provides state-of-the-art synthetic training devices and flight simulators;
- *EUROCONTROL*, the European Organisation for the Safety of Air Navigation, provides quality experience in the application of Human Performance analysis to innovative concepts and background experience in stress and fatigue management.

PROJECT PHASES



TO KNOW MORE:

Project website: http://www.stressproject.eu/

STRESS is the follow up of another project on similar topics: http://www.nina-wpe.eu/ and http://nina.dblue.it/

Project contacts: Stefano Bonelli stefano.bonelli@dblue.it and Martina Ragosta martina.ragosta@dblue.it

This project has received funding from the SESAR Joint Undertaking under grant agreement No 699381 under European Union's Horizon 2020 research and innovation programme