

RESPONSE

REduced or Single Pilot Operation
iNcapacitation Safety Enhancement

Overview

RESPONSE will support pilots’ incapacitation transition monitoring and deliver an air-to-ground integrated Single Pilot Operations (SiPO) Concept of Operations (CONOPS) to enhance safe return-to-land procedures. This includes introducing the role of air-to-ground digital assistants to minimize the changes required when transitioning from dual-pilot operations to SiPO, including dealing with pilot incapacitation scenarios in the flight deck.

The project will deliver a technology enabler to detect pilot incapacitation and map cognitive states and degradation of human performance. The implementation of this technology will also impact Air Traffic Control (ATC) operators’ tasks and the role of human autonomy and digital assistants teaming to support workload reduction.

RESPONSE aims to:

- 1Increase the level of automation in the cockpit and ATC by means of digital assistants
- 2Enable SiPO in future SESAR demonstrators
- 3Increase safety by early detection of pilot incapacitation
- 4Mitigate the predicted global shortage of pilots and reduce operating costs
- 5Providing first application for machine-to-machine assistance

Pilot Incapacitation State Transition Monitoring

In order to capture multiple facets of the transition towards incapacitation, small-scale experiments and simulator studies will be carried out. Using state-of-the-art measurement methods such as electroencephalography sensors, functional near-infrared spectroscopy and eye-tracking systems, the project will deliver new insights on the pilot’s transition from being attentive to mentally fatigued.

Safe Return to Land CONOPS Evolution

The concept developed for the air-to-ground SiPO CONOPS will be demonstrated at CRIDA labs. Representative scenarios of safe return-to-land operations will be implemented, featuring collaboration between pilots and ATCOs with their respective digital assistants, using both controller working positions and cockpit simulators.

