

Health Effects in Aircraft Cabin Environment

HEACE

Objectives

The project aims to achieve a better understanding of the health and comfort impact of the work environment inside aircraft on flight and cabin crew and therefore indirectly passengers. This understanding will be translated into improvements, to be promoted by defining appropriate schemes and measures (e.g. improved guidelines) for aircraft design. European manufacturers and airlines will thus be provided with clearer concepts and assessment tools with respect to the cabin and cockpit environment, in order to increase “friendliness” of this workplace. This will mean direct benefits in relation to health and comfort, achieved by improving the overall quality of the cabin environment for crew and passengers. In addition, indirect benefits are expected through reduction of errors due to poor environments, thus supporting the safety of passengers and crew in this important means of transport.

Description of the work

The multidimensional state of comfort perception is reviewed, in particular with respect to health, well-being, and the requirements for a supportive travel environment. Crew performance in the cabin and cockpit environment is assessed and end-users’ needs at the workplace identified. Health-related environmental input and output data are the basis for in-flight and mock-up test settings. In-flight data are acquired for mock-up refinements. Series of measurements with test-subjects, cabin crew and flight crew are carried out in flight and in particular in mock-ups for determination of the relevant physical, psychological and medical parameter sets that describe health, comfort and performance at an aircraft workplace. A statistical data analysis is carried out after appropriate pre-processing, including training of ANN structures, in order to develop a Human Response Model. The investigation provides improved tools for the design of a better and safer workplace in aircraft, and will foster the definition of metrics and guidelines for a general improvement of the cabin and cockpit environment.

Expected results

- Review environmental effects on health and comfort with respect to travel environment.
- Identify end-users requirements.
- Evaluate environmental and health-related data for in-flight and mock-up test procedures.
- Identify test-setting constraints.
- Provide experimental data base from tests in mock-ups and in-flight.
- Evaluate data with statistical tools and ANN structures.
- Develop a Human Response Model for comfort inside aircraft.
- Provide methodology to obtain comfort and health data, guidelines and tools for the evaluation and design of cockpit and cabin environment.

Partners

- Oldenburg University, Dept. of Physics, Acoustic Group (Co-ordinator)
<http://www.physik.uni-oldenburg.de/Docs/aku/>
- University of Patras, Laboratory of Fluid Mechanics and Energy (LFME)
<http://lfme.chemeng.upatras.gr/>
- University of Vienna, Institute for Environmental Health
<http://www.univie.ac.at/umwelthygiene/>
- EADS Deutschland GmbH, Corporate Research Center
<http://www.eads.net/eads/de/index.htm>
- itap GmbH
<http://www.itap.de>
- Paragon Ltd
<http://www.otenet.gr/paragon/>
- Building Research Establishment Ltd (BRE)
<http://www.bre.co.uk/>
- Centro Italiano Ricerche Aerospaziali S.C.p.A. (CIRA)
<http://www.cira.it/>

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