



ICE: Ideal Cabin Environment

Dr David Ross

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(October 2005 – end September 2008)

ICE



To be the definitive study on aircraft cabin environments and passenger health

ICE Consortium



- **Aviation Health**
 - AGAI (LT)
 - Avitronics (GR)
 - DLR (DE)
 - Univ of Vienna (AT)
 - Univ. College & RFH (GB)
- **Environmental technology**
 - BRE (GB) – Co-ordinator
 - FhG (DE)
 - NLR (NL)
 - Univ of Oldenburg (DE)
 - Univ of Padova (IT)
 - Univ of Prague (CZ)
- **Airframer**
 - Airbus (DE)
 - EADS – CRC (DE)
- **Regulations/Medical Chair**
 - AHU – UK DfT/CAA (GB)

Why there is a need for ICE



- Widespread concern about the impact of flying on the health, well-being, and comfort of passengers - increasing because of:
 - Changing passenger demographics
 - Advent of ultra long haul services
 - Specific issues issued with flying such as cabin pressure
- Other studies provided major parts of the jigsaw – ICE is needed to combine, integrate and provide closure
- Project will address European SRA2 ‘Highly customer oriented air transport system’

Exciting developments

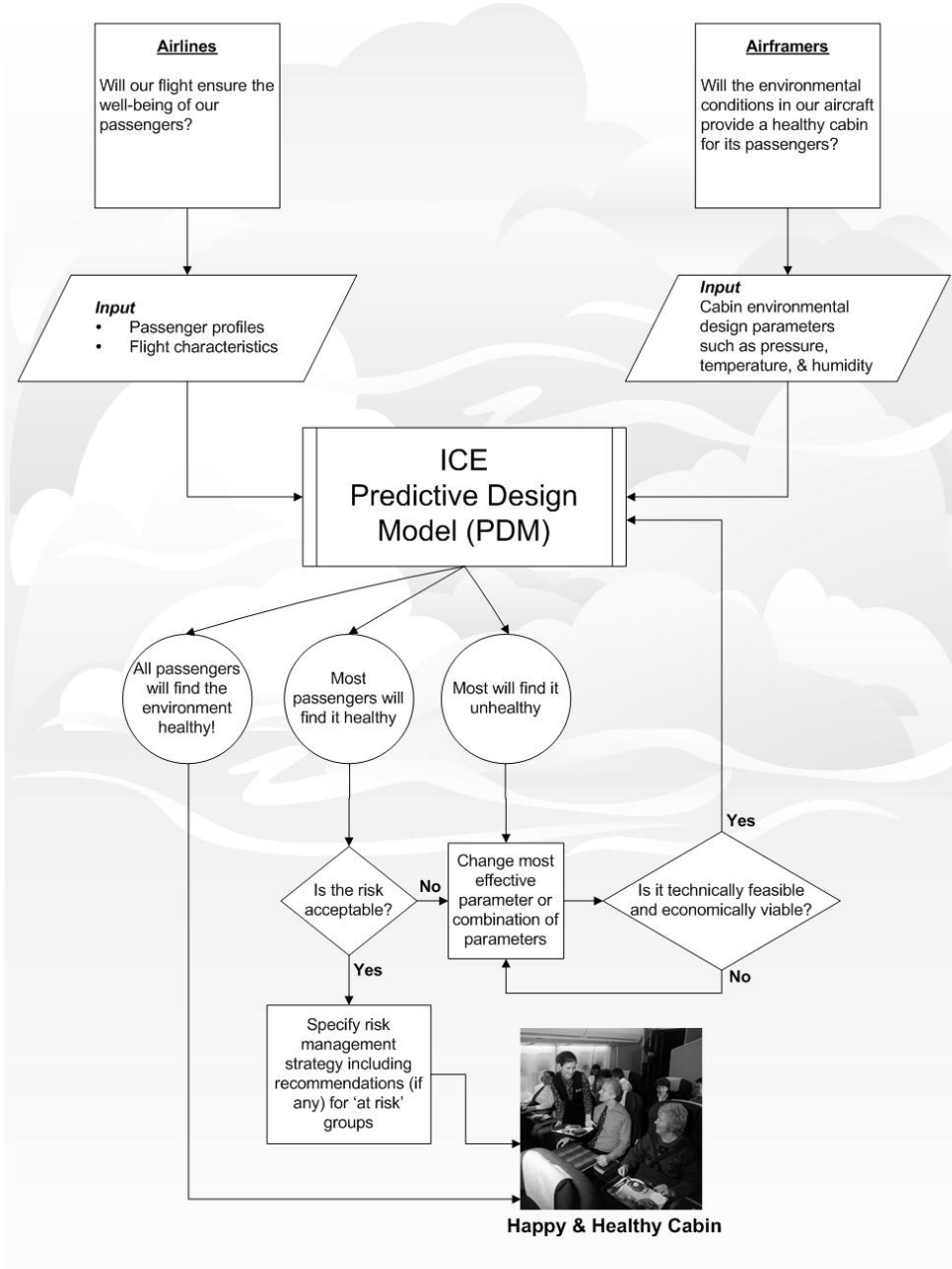


ICE has three main objectives



- Establish combined effects of cabin environmental parameters, including cabin pressure, on the health of passengers.
- Produce predictive design models (PDM) based on varying all relevant parameters including cabin pressure, to include synergistic, and other combined effects.
- Provide a European pre-standard, and design guides and practical recommendations for stakeholders.

ICE PDM





WP1: Knowledge integration

- Transfer results from CabinAir, HEACE & FACE
 - Stakeholder views – mid-term workshop, final Conference
 - Review impact of cabin environment on passengers
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- ➔ Synthesis of up to date knowledge
 - ➔ Identification of parameters that have greatest impact on cabin occupant health



WP2: Campaign design

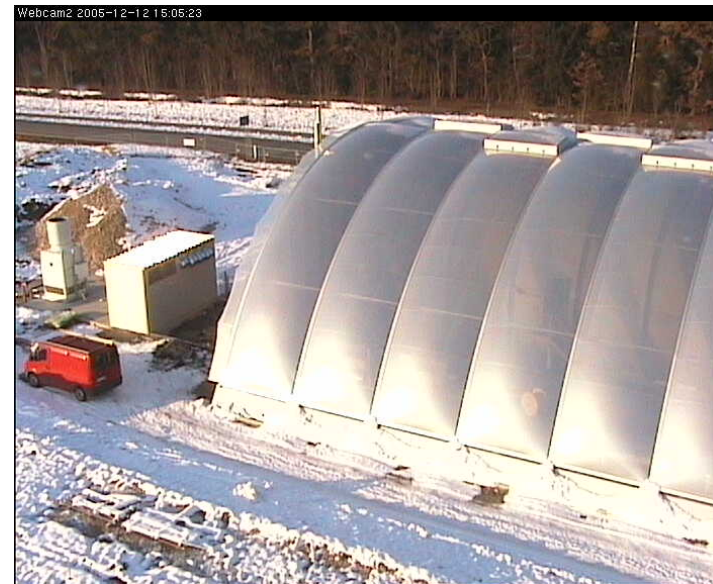
- Define target subject groups and flight conditions
 - Prepare pressurised flight test facility
 - Develop experimental design – environmental, physiological and psychological
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- ➔ Passenger profiles
 - ➔ Unique ground-based facility for aircraft cabin environments
 - ➔ Protocols for identifying health impact resulting from cabin environmental parameters



WP3: Flight campaign – ACE, FTF and in-flight

- Carry out structured studies of subjects in ACE and FTF
 - Monitor internal parameters, and record physiological and psychological responses of passengers
 - Carry out in-flight validation – pre- and during testing
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- ➔ Inclusion of cabin pressure in a realistic environment
 - ➔ Variation of parameters to define optimum human environment
 - ➔ Synergistic impact of cabin parameters

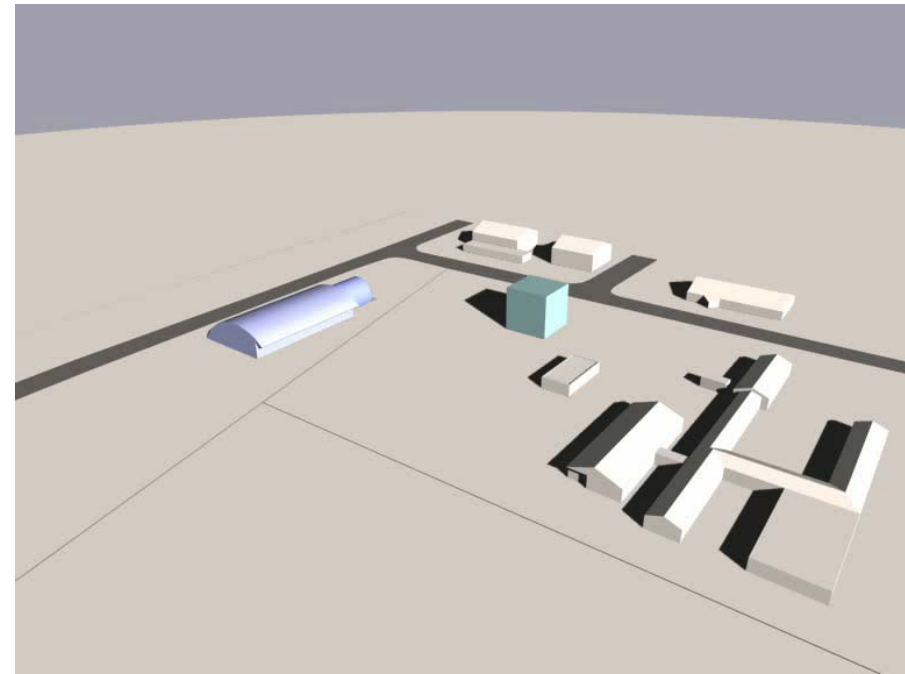
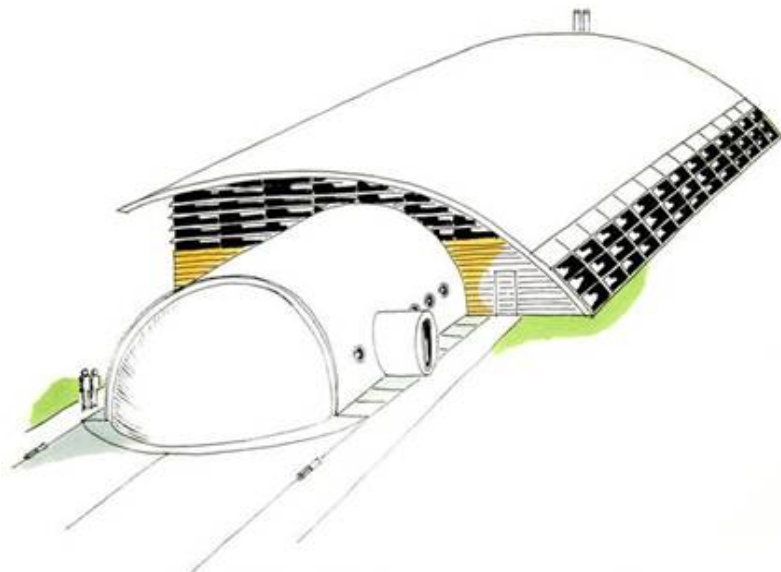
ACE & FTF



FTF – Flight Test Facility



- Location
 - 30 km south of Munich (Germany)
 - Near the Bavarian Alps

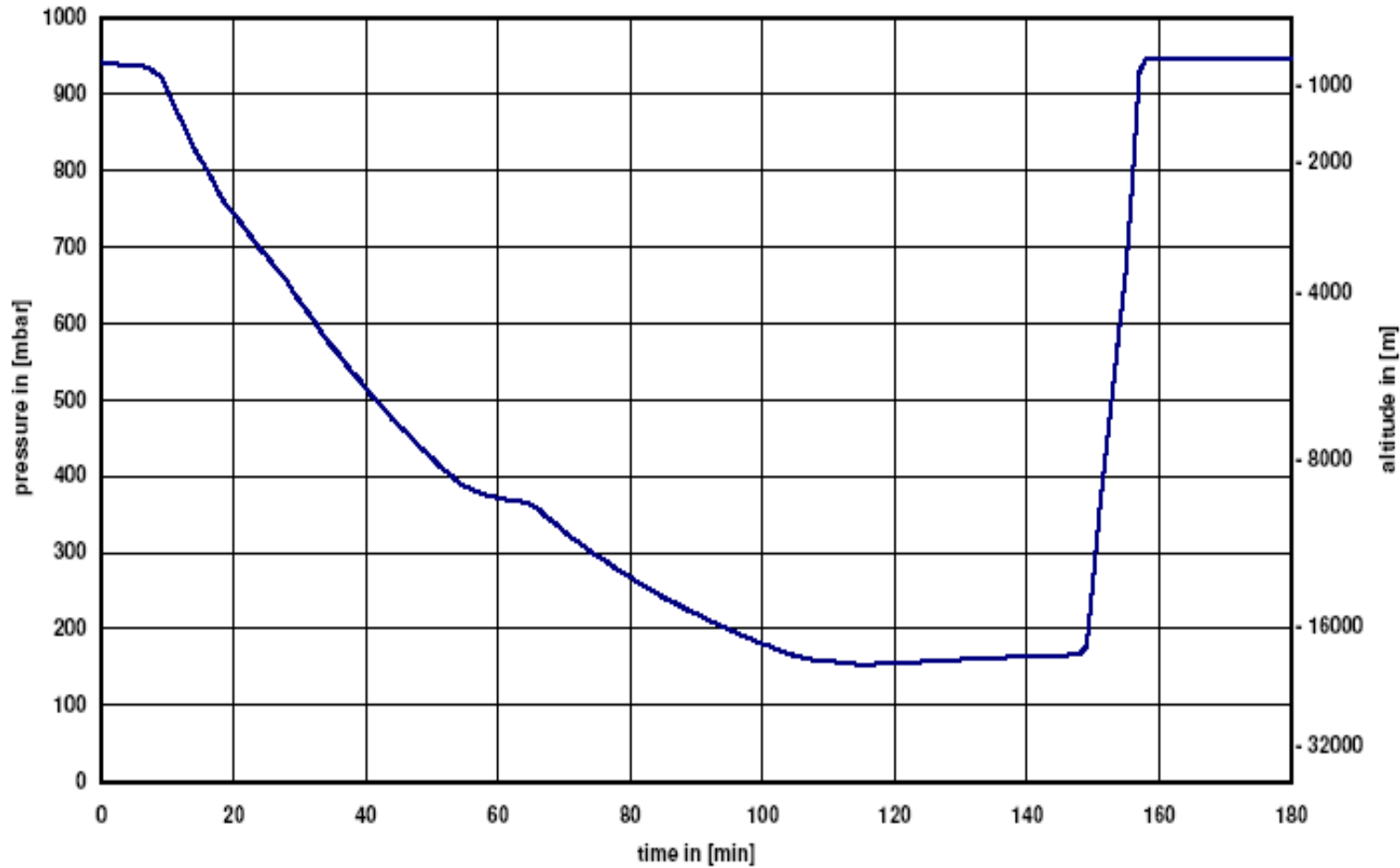


FTF: 16. Jan 2006



FTF:







WP4: Building data engine

- Create electronic database to handle and process very large data sets
 - Import data and automate verification
 - Identify parameters that impact significantly on health and well-being of occupants
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- ➔ Automated electronic database
 - ➔ Validated datasets for generating human response models
 - ➔ Identification of dominant controlling parameters

WP5: Human impact and optimisation



- Identify individual and combined effects of parameters on occupant health
 - Develop parametric, and health-based models to quantify this
 - Provide optimised envelope of cabin parameters for occupant well-being
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- ➔ Predictive design models for passenger health and well-being
 - ➔ Recommended optimised levels for parameters – including cabin pressure

WP6: ICE recommendations and standard



- Develop technical and operational recommendations
 - Participate in Standards and Regulatory bodies – ECAC/APHI and ASD-STAN
 - Develop draft pre-Standard
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- ➔ Provide guidelines for cabin environment design strategies
 - ➔ Provide recommendations for stakeholders
 - ➔ Provide draft European pre-Standard

ICE will meet these three main objectives!



- Establish combined effects of cabin environmental parameters, including cabin pressure, on the health of passengers.
- Produce predictive design models (PDM) based on varying all relevant parameters including cabin pressure, to include synergistic, and other combined effects.
- Provide a European Pre-Standard, and design guides and practical recommendations for stakeholders.

Contact details



Dr David Ross
BRE
Garston, Watford
Herts. WD25 9XX
U.K.

T: +44 (0) 1923 66 4505
E: rossd@bre.co.uk