Human Integration in the Life-cycle of Aviation Systems
HILAS

Nick McDonald
For HILAS consortium

HILAS is an Integrated Project supported by the European Commission RTD programme (Aeronautics and Space)
The HILAS consortium

- Integrated project with 40 partners
- 13 European countries + Israel, China
  - Manufacturers
  - Airlines
  - Maintenance organisations
  - Research institutes, universities
  - RTD companies
- Critical mass to exert European and global leverage
- Initiated 1st. June 2005 to last 4 years
Core management team

- Trinity College Dublin (co-ordinator)
- Smiths Aerospace
- Thales Avionics
- JRC
- Aircraft Management Technologies (AMT)
- Easyjet
- SAS Braathens AS
- NLR
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## Humans in systems integration

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<td>Integrated system design - ‘system of systems’</td>
<td>Information systems link people and technologies in seamless processes crossing boundaries</td>
<td>Complex systems deliver operability for customer and society</td>
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System integration in aviation

Human Integration into the Lifecycle of Aviation Systems
# Models of ‘humans in the system’

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**Human Integration into the Lifecycle of Aviation Systems**
HILAS - 4 Strands of RTD activity

Design    Operate    Maintain

Knowledge Integration

Human Integration into the Lifecycle of Aviation Systems
Flight deck technologies

Select display & control technologies

Run experiments using HF design & evaluation tools

Integrate technologies in applications on simulator

Strategic drivers:
- Reduced crew concepts
- Flight & ATM environment
- Improved safety & reliability

Human Integration into the Lifecycle of Aviation Systems
Flight operations

- Current Flight Ops. performance monitoring systems (e.g. LOSA) do not provide a clear trajectory to changing the operational system.
- HILAS is developing a performance management tool to integrate performance monitoring and process improvement:
  - Link human performance and flight technical data
  - Integrate human factors requirements in process redesign
  - Identify risk parameters to guide management action
  - EFB (Electronic flight bag) platform with on-ground d’base functions
- Target 2 operational phases in system development:
  - Flight – approach and landing
  - Ground – pre-flight actions and aircraft release/turnaround
- Develop, validate and trial system with 6 European airlines
Maintenance

• Origin of Human Factor problems
  – upstream processes of planning & supply
  – complex co-ordination of parallel tasks

• Integrated Maintenance Management System (IMMS)
  – Comprehensive support for process improvement
  – Task support for technician (including VR)
  – Competence requirements
  – Quality & Safety functions
    • Performance reporting
    • Incident management
  – Feedback for design improvement

• Standardisation of methods
  • Improve, develop & integrate existing methods
Operational risk management in flight ops. & maintenance

Gathering evidence
- Performance reports & Technical data
- Investigations & Audits

Business drivers
- Incidents / events
- System threats
- Corporate threats

Generating Requirements
- Social & operational process analysis
- Risk assignment
- Requirements:
  - Competence
  - Task & process redesign
  - Organisation change
  - Technology innovation

Implementation
- Decision & action
- Monitoring & evaluation

Human Integration into the Lifecycle of Aviation Systems
What HILAS will deliver

• HF evaluation of new applications for technologies
• Flight operations and maintenance
  – Process & performance improvement
  – Quality & safety oversight
  – Standardised methods
• Knowledge resources
  – Exchange and transformation - ‘knowledge broker’
  – Competence & capability maturity
  – Contribution to innovation
Thank you

- www.hilas.info