Airbus Human Factors Contributions to an Accessible Aircraft Cabin

Washington, D.C.
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Cabin & Cargo Human Factors at Airbus (1/2)

• Human Factors at Airbus is considered as a key competence and is covered by specialists teams located in the relevant domains.

• The task of the Cabin & Cargo Human Factors Team is to
  • ensure that our cabin & cargo products and services meet the needs and expectations of the users (operational crews and passengers) and
  • allow a maximum efficiency of operations for the customers (airlines).

• The team consists of specialists covering various disciplines (ergonomics, psychology, aeromedicine, engineering, usability).
Cabin & Cargo Human Factors at Airbus (2/2)

The C&C Human Factors & Operations Team

• provides Human Factors competences and skills,
• defines Human Factors requirements and operational architectures,
• provides design support,
• performs evaluations based on Human Factors methods and principles.

HMI: Human-Machine-Interface
Human Factors Methods & Tools for Evaluations

Human Factors Tools
- Virtual Reality
- Simulators
- Mock-Ups
- Cabin

Human Factors Methods
- Observation
- Questioning
- Measurements
- Analysis

Participation of end-users is key!
Validation & Verification of DOT requirements for cabin layouts in the customization process

<table>
<thead>
<tr>
<th>DOT §</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>382.21</td>
<td>50 % of seats accessible in each seat class (BC/YC+/YC)</td>
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<tr>
<td>382.63</td>
<td>Lavatory accessible for persons with reduced mobility</td>
</tr>
<tr>
<td>382.65</td>
<td>On board wheelchair: stowage and use</td>
</tr>
<tr>
<td>382.67</td>
<td>Passenger Wheelchair (13”*36”*42”) stowage in cabin</td>
</tr>
</tbody>
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PRM: Persons with Reduced Mobility
Application of HF Tools and Methods in Development Process

Virtual Reality Analysis

Tests with users

User Tests in Hamburg 2011
HF Involvement in Research Projects to Improve PRM Accessibility

Tests with aging suits

“Hamburg Chair” to enhance accessibility for existing lavatories
Mock-up test with 3 wheelchair users and 2 assist persons
Very promising results with positive feedback from the users
Next steps:
- 2nd test on aircraft (tomorrow)
- Detailed wheelchair specification
Test of the Hamburg Chair Technical Session Tomorrow (1/2)

- Hands-on at aircraft and user-test
- Observation, Questioning and Expert Judgements
- Feedback from
  - Wheelchair user
  - Airlines
  - Experts
## Test of the Hamburg Chair Technical Session Tomorrow (2/2)

<table>
<thead>
<tr>
<th>NR</th>
<th>Task Description</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>1</td>
<td>Cabin Crew to prepare Hamburg Chair for PRM transport in cabin</td>
<td>Hamburg Chair handling safe &amp; perception of Hamburg Chair</td>
</tr>
<tr>
<td>2</td>
<td>Transfer of PRM from seat to Hamburg Chair</td>
<td>safe transfer</td>
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<tr>
<td>3</td>
<td>Cabin Crew to transport PRM to lavatory</td>
<td>safe transfer</td>
</tr>
<tr>
<td>4</td>
<td>Cabin Crew to prepare lavatory for access</td>
<td>sufficient space in front of lavatory &amp; privacy</td>
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<tr>
<td>5a</td>
<td>Independent use of lavatory by PRM</td>
<td>accessibility, privacy, suitable interior</td>
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<tr>
<td>5b</td>
<td>Use of lavatory by PRM with assistant</td>
<td>accessibility, privacy, suitable interior</td>
</tr>
<tr>
<td>6</td>
<td>Prepare Hamburg Chair and user for transfer back to cabin seat</td>
<td>Hamburg Chair handling safe &amp; perception of Hamburg Chair</td>
</tr>
<tr>
<td>7</td>
<td>Cabin Crew to transport PRM back to cabin seat</td>
<td>safe transfer</td>
</tr>
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Q & A