

**Dr. Hans-Gerhard Giesa**

Head of C&C Human Factors and Operations

**Dr. Jörg Cremers**

Expert Cabin Aeromedicine, Health & Comfort

## **Airbus Human Factors Contributions to an Accessible Aircraft Cabin**

Washington, D.C.  
August, 17<sup>th</sup> 2016

## 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).

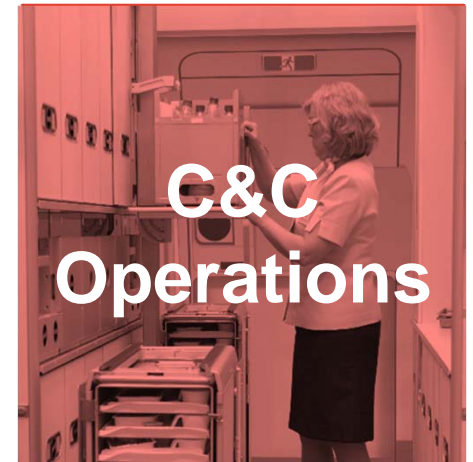
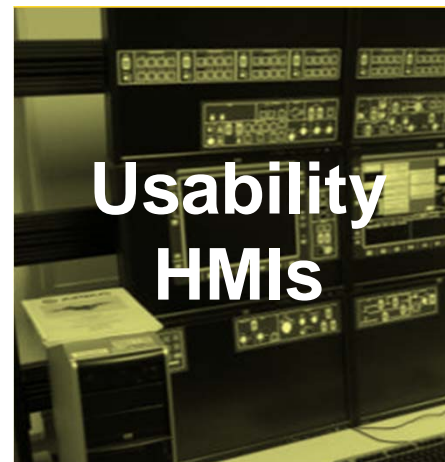
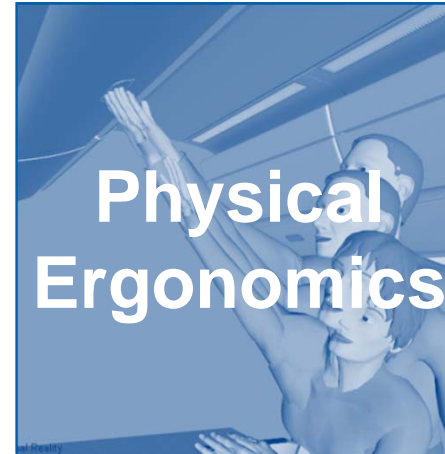


## Cabin & Cargo Human Factors at Airbus (2/2)

### 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



## Human Factors Methods

Analysis

Observation

Questioning

Measurements

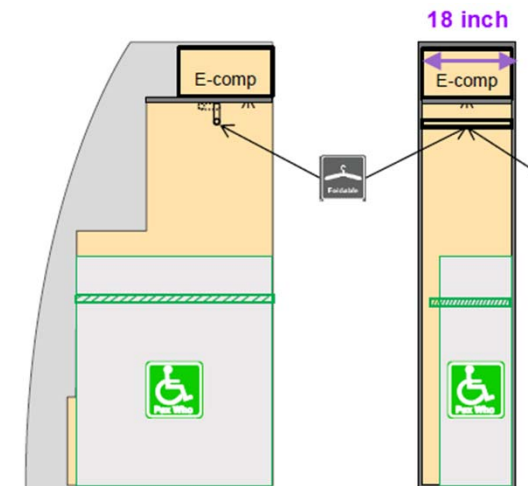
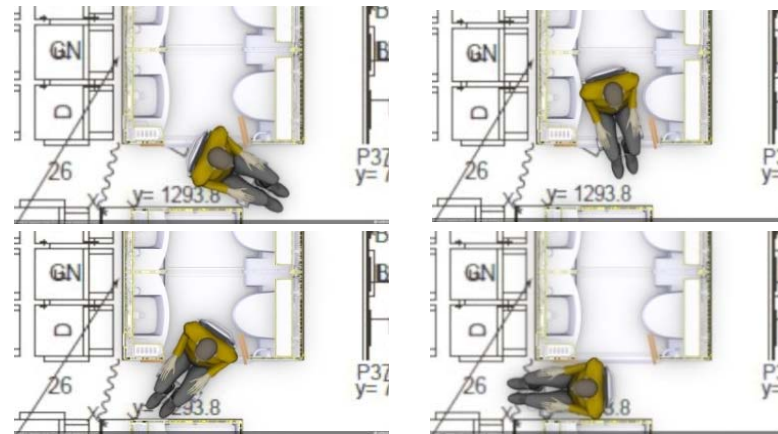
Participation of end-users is key!



# Human Factors Contribution to PRM Accessibility for Serial Programs

Validation & Verification of DOT requirements for cabin layouts in the customization process

DOT §	Requirement
<b>382.21</b>	50 % of seats accessible in each seat class (BC/YC+/YC)
<b>382.63</b>	Lavatory accessible for persons with reduced mobility
<b>382.65</b>	On board wheelchair: stowage and use
<b>382.67</b>	Passenger Wheelchair (13"*36"*42") stowage in cabin



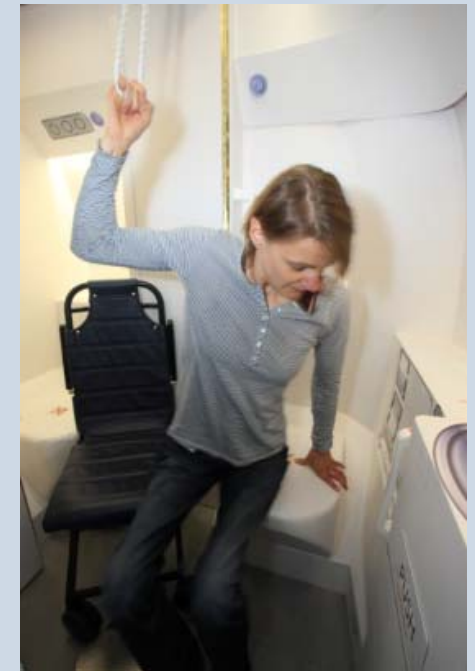
PRM: Persons with Reduced Mobility

# 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



## Hamburg Chair Test at Airbus 04 August 2016



- 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

## Observation Sheet Human Factors On-board Wheelchair

Date:

Observer:

Type of Aircraft:

Type of LAV:

Location:

Space in front of lavatory:

Transfer Type: PIT ☐ PAT ☐ IT ☐ DT ☐

PIT	Pivot Independent Transfer
PAT	Pivot Assisted Transfer
IT	Independent Transfer
DT	Dependent Transfer

Wheelchair Type:

Remarks Test Environment:

Summary Test Conclusion:

© Airbus Operations GmbH 2014. ALL RIGHTS RESERVED. CONFIDENTIAL AND PROPRIETARY DOCUMENT.

1/2

### Part 1:

Topic	Test Criteria	Observations	Comments	Judgement
Cabin Crew to prepare Hamburg Chair for PRM transport in cabin	1) Hamburg Chair handling safe 2) Perception of Hamburg Chair			
Transfer of PRM from seat to Hamburg Chair	1) Safe transfer			

## Test of the Hamburg Chair Technical Session Tomorrow (2/2)

NR	Task description	Criteria
1	Cabin Crew to prepare Hamburg Chair for PRM transport in cabin	Hamburg Chair handling safe & perception of Hamburg Chair
2	Transfer of PRM from seat to Hamburg Chair	safe transfer
3	Cabin Crew to transport PRM to lavatory	safe transfer
4	Cabin Crew to prepare lavatory for access	sufficient space in front of lavatory & privacy
5a	Independent use of lavatory by PRM	accessibility, privacy, suitable interior
5b	Use of lavatory by PRM with assistant	accessibility, privacy, suitable interior
6	Prepare Hamburg Chair and user for transfer back to cabin seat	Hamburg Chair handling safe & perception of Hamburg Chair
7	Cabin Crew to transport PRM back to cabin seat	safe transfer

Q & A

© Airbus Operations GmbH. All rights reserved. Confidential and proprietary document. This document and all information contained herein is the sole property of Airbus Operations GmbH. No intellectual property rights are granted by the delivery of this document or the disclosure of its content. This document shall not be reproduced or disclosed to a third party without the express written consent of Airbus Operations GmbH. This document and its content shall not be used for any purpose other than that for which it is supplied. The statements made herein do not constitute an offer. They are based on the mentioned assumptions and are expressed in good faith. Where the supporting grounds for these statements are not shown, Airbus Operations GmbH. will be pleased to explain the basis thereof. AIRBUS, its logo, A300, A310, A318, A319, A320, A321, A330, A340, A350, A380, A400M are registered trademarks.