Anforderungen des A380 an die Flughäfen
Anforderungen des A380 an die Flughäfen
13. Kolloquium Luftverkehr
Technische Universität Darmstadt
Dipl.-Ing. Michael Schwarz
Leiter Entwicklung Fluggastanlagen, Fraport AG
Darmstadt, 07.12.2005

The A380 is airborne...
...and Frankfurt Airport was ready for A380 trials on 29. October 2005
... and Frankfurt Airport will be prepared as A380 homebase

Public Relation Activities

A380 Model

In December 2004 the model of the A380 fuselage was opened for the public at Frankfurt Airport.

- It was installed in Terminal 1 as a permanent exhibition and is open to the public.
- Visitors find up-to-date information concerning the A380 and the preparations in FRA.
Public Relation Activities

Advertising Campaign

Creating acceptance for the building of the maintenance facilities is achieved by focusing the campaign on the fascination of the new „Super jumbo“.

Emotional messages are transmitted through picturing the new dimension in civil aviation:

- Largest passenger aircraft up to date.
- New quality in traveling, new ambiance, and new dimensions.
- Technical innovation.

Arrival of the A380 superjumbo at Frankfurt Airport on 29. October 2005
Frankfurt Airport is preparing for A380 Agenda

- Frankfurt Airport at a glance
- FRA on the way to a leading A380 hub
- The world of aircraft is changing
- Ground Handling A380
- A380 Airport Compatibility Tests
- Major infrastructure projects

Frankfurt Airport at a glance
Our History

From airfield operator in 1936 ...

... to manager of an international hub today.

In 2001 we became the first German airport operator to go public

The issue volume was € 904 million.
The stock was sevenfold oversubscribed.
**Our core business activities account for the largest shares of sales**

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Share</th>
<th>Revenue (mill. euros)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aviation</td>
<td>31%</td>
<td>626.2</td>
</tr>
<tr>
<td>Ground Handling</td>
<td>30%</td>
<td>608.1</td>
</tr>
<tr>
<td>Retail &amp; Properties</td>
<td>19%</td>
<td>373.9</td>
</tr>
<tr>
<td>External Activities</td>
<td>20%</td>
<td>389.9</td>
</tr>
</tbody>
</table>

FRA ranks among the top ten airports worldwide in terms of passengers...

<table>
<thead>
<tr>
<th>Passengers in 2004 (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Atlanta 83.6</td>
</tr>
<tr>
<td>2. Chicago 75.4</td>
</tr>
<tr>
<td>3. London Heathrow 67.3</td>
</tr>
<tr>
<td>4. Tokyo Haneda 62.3</td>
</tr>
<tr>
<td>5. Los Angeles 60.7</td>
</tr>
<tr>
<td>6. Dallas Ft Worth 59.4</td>
</tr>
<tr>
<td>7. Paris, CDG 51.3</td>
</tr>
<tr>
<td>8. Frankfurt 51.1</td>
</tr>
<tr>
<td>9. Amsterdam 42.5</td>
</tr>
<tr>
<td>10. Denver 42.4</td>
</tr>
</tbody>
</table>
... and the top ten in term of cargo tonnage

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>Cargo 2004 (m t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Memphis</td>
<td>3.55</td>
</tr>
<tr>
<td>2</td>
<td>Hong Kong</td>
<td>3.13</td>
</tr>
<tr>
<td>3</td>
<td>Tokyo Narita</td>
<td>2.37</td>
</tr>
<tr>
<td>4</td>
<td>Anchorage</td>
<td>2.37</td>
</tr>
<tr>
<td>5</td>
<td>Seoul</td>
<td>2.13</td>
</tr>
<tr>
<td>6</td>
<td>Los Angeles</td>
<td>1.90</td>
</tr>
<tr>
<td>7</td>
<td>Frankfurt</td>
<td><strong>1.84</strong></td>
</tr>
<tr>
<td>8</td>
<td>Singapore</td>
<td>1.80</td>
</tr>
<tr>
<td>9</td>
<td>Miami</td>
<td>1.78</td>
</tr>
<tr>
<td>10</td>
<td>Louisville</td>
<td>1.74</td>
</tr>
</tbody>
</table>

Frankfurt Airport – Our Home Base

- Area of 19 sq. km
- Approx. 80 flight movements /h
- 147 gates
- 187 aircraft positions

Every day (2004):
- 140,000 passengers
- 111,594 pieces of luggage
- 4,800 metric tons of cargo
- 404 trains at the airport railway stations
Frankfurt Airport infrastructure at a glance

Terminal 1

Frankfurt Airport infrastructure at a glance

Terminal 2
Frankfurt Airport infrastructure at a glance

- 2 Runways (25/07)
- Runway 18
- New RWY North West (planned)
- New Terminal 3 (planned)
Frankfurt Airport infrastructure at a glance

Inauguration: 2007
Capacity: 4 A380
45m high, 350m long,
49,000 sqm

FRA …
on the way to a leading A380 Hub
**FRA... home of the big ones**

Nearly 10% of movements at FRA are operated by B747.

Five years after EIS, 40 daily A380 movements are expected at FRA (B747 in 1975: 25 movements at FRA).

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**FRA... home of the A380**

- **LHR**: 6x
- **FRA**: 15x (possibly)
- **CDG**: 10x (possibly)
The world of aircraft is changing…
The world of aircraft is changing...
The world of aircraft is changing...

The world of aircraft is changing...

Van der »Tante Ju« zum Super-Airbus
Die Größenevelopment der Passagierflugzeuge

Boeing 747
[1969]
Länge: 73,7 m
Passagiere: 434

Van der »Tante Ju« zum Super-Airbus
Die Größenevelopment der Passagierflugzeuge

[Diagram showing aircraft size comparison]
The world of aircraft is changing...

Ground Handling A380
Turnaround Time

Requirements of the airlines in terms of turnaround times and level of service.

All ground operation processes have to be balanced!

Driving factors for a short TAT:

- **Cabin layout** — its effects/commands boarding and catering
- **Direct upper deck boarding and de-boarding**
- **Direct upper deck catering and cleaning**
- **Fueling** with passengers on board is accepted
- **Boarding** at dedicated deck (optional but not a must)
Boarding and De-boarding A380
Required Ground Handling Equipment

Actually Not!

Ground Handling A380

Fraport has been in close contact with the entire aviation industry and GSE manufacturers since the early design phases of the A380 to:

- Ensure compatibility of the A380 with existing GSE and processes

Fraport works together with Airbus and the airlines in following ground operation working groups:

- A380 Upper Deck Access Working Group
- A380 International Standards:
  - IATA – IGHC and DIN /CEN Working Groups
- A380 Upper Deck Loader Working Group
- A380 Towing Working Group
Main deck door 1 & 2 separation comparable to existing aircraft

Ground Operations Overview

From the main deck down, the A380 requires similar servicing as existing wide-body aircraft

Ground Operations Overview

A 380 baseline ramp layout

All ground servicing equipment for baseline A380 pax version servicing exists today:

- Tow tractor
- Passenger boarding bridges
- Main deck catering vehicles
- Upper deck catering vehicle
- Main deck cleaning vehicles
- Lower deck cargo loader
- Lower deck bulk cargo loader
- Ground power units
- Pre-conditioned air
- Air start units
- Potable water vehicle
- Lavatory servicing
- Fuel bowsers
Ground Operations Overview
Pushback and towing

The pushback problem is solved!

Today’s ready solutions for pushback and towing:

- Fraport 55t – 70t Tractor
  Manufacturer: Kamag

- Airbus Finkenwerder
  Manufacturer: Goldhofer AG

- Airbus Toulouse
  Manufacturer: TLD France

- Fraport 55t – 70t Tractor
  Manufacturer: Schopf
Ground Operations Overview
Pushback and towing

Fraport’s first conversion towbar tractor
developed 2002 by Fraport and Kamag

Tractor weight:
- Deadweight without ballast: 40 t
- Deadweight with ballast: 55 t
- Ready for the A380: Deadweight with ballast: 70 t

A380
Airport Compatibility Tests
A380 Airport Compatibility Tests

Airport Compatibility Tests on 29. October 2005 at FRA

– Existing air bridges at Terminal 2 (E9) allowed Airbus to test parallel main deck and upper deck access (M1, M2 and U1)

– Compatibility tests comprised mainly the following issues:

  • Take-off and landing
  • Taxi Procedures
  • Towing
  • Fueling
  • Catering
  • Cargo Loading
A380 Airport Compatibility Tests
Boarding and De-boarding A 380 (Main and Upper Deck)

A380 Airport Compatibility Tests
Upper Deck Catering A 380
A380 Airport Compatibility Tests
Upper Deck Catering A 380

A380 Airport Compatibility Tests
Cargo Loading A 380
A380 Airport Compatibility Tests
Fueling A380

A380 Airport Compatibility Tests
Pushback and towing A380
A380 Airport Compatibility Tests
Pushback and towing A380

A380 Airport Compatibility Tests
Proud Project Teams
Major infrastructure projects

Besides the modifications for A380 the following modifications of existing terminal buildings are necessary for coping future demands:

- Product differentiation for high priority and leisure passengers
- Optimised retail concept
- Implementation of EU Regulations
Terminal 2

5 contact stands for A380
Terminal 2
New Boarding Bridges

Terminal 2
New Boarding Bridges - Sections
**Terminal 2**

New Boarding Bridges - Section

**Terminal 1**

CD-Pier

3 contact stands for A380
Terminal 1
CD-Pier - Facade
Terminal 1
Concourse B

3 contact stands for A380

Terminal 1
Concourse B – Level 2
Terminal 1
Concourse B – New Boarding Bridges
US-Airbase today

Terminal 3 in 2015
Frankfurt-Airport Expansion
Terminal-Masterplan-Concepts in April 2002

Frankfurt-Airport Expansion
Masterplan-Concept - Foster/NACO
Architectural Competition 2005
Third Prize – Gerkan, Marg & Partner, Hamburg

Architectural Competition 2005
Second Prize – Foster/NACO, London
Architectural Competition
First Prize – Christoph Mäckler, Frankfurt

Terminal 3
Inside Perspective of the Departure Hall
Terminal 3
Floorplan of Departure Hall and Retail Area

Terminal 3
Pier/Finger Concept
Design Terminal 3
Pier - Adaptable to Plane Size

Adaptable Bridges

Flexible Gate Rooms

Modular Gates

...thank you.

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eMail: m.schwarz03@fraport.de