

BOEING

von Karman Award Lecture

International Council of Aeronautical Sciences

Mark Jenks
Vice President, 787 Development
The Boeing Company
September 18, 2008

Building the Dream 787 DREAMLINER


Highlights 787 DREAMLINER

- 787 Overview
- Forming the International Team
- Global Technology Development
- Production Progress




COPYRIGHT © 2008 THE BOEING COMPANY

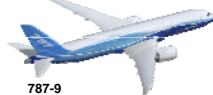
A Flexible, Efficient Family 787 DREAMLINER



787-8
210-250 passengers (three-class)
7,650 – 8,200 nmi | 14,200 – 15,200 km



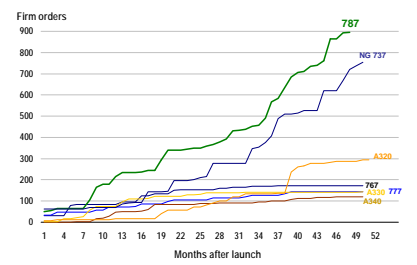
787-3
290-330 passengers (two-class)
2,500 – 3,050 nmi | 4,650 – 5,650 km



787-9
250-290 passengers (three-class)
8,000 – 8,500 nmi | 14,800 – 15,750 km

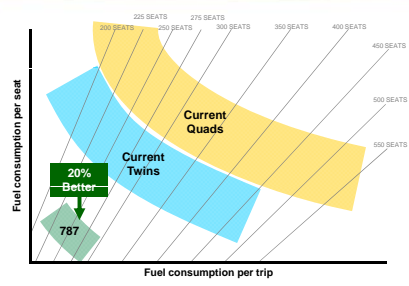
COPYRIGHT © 2008 THE BOEING COMPANY

Most Successful Program Launch in Commercial Aviation 787 DREAMLINER



COPYRIGHT © 2008 THE BOEING COMPANY

Opening a New Era in Fuel Efficiency 787 DREAMLINER



20% Better

COPYRIGHT © 2008 THE BOEING COMPANY


New Point-to-Point Routes Enabled 787 DREAMLINER

■ Vancouver	- Sao Paulo
■ Seattle	- Shanghai
■ San Francisco	- Manchester
■ Boston	- Athens
■ Tel Aviv	- Montreal
■ Munich	- Nairobi
■ Geneva	- Singapore
■ Dubai	- Taipei
■ Madrid	- Manila
■ Auckland	- Beijing



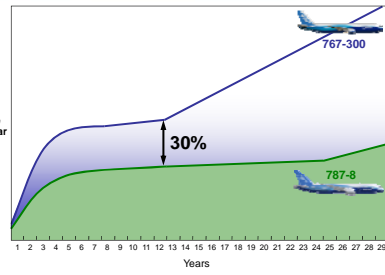
COPYRIGHT © 2008 THE BOEING COMPANY

787-8 Range Capability From Anchorage 787 DREAMLINER



COPYRIGHT © 2008 THE BOEING COMPANY

787 Maintenance Cost Advantage 787 DREAMLINER



30%

COPYRIGHT © 2008 THE BOEING COMPANY

An Airplane Passengers Will Enjoy

787 COMING TO YOU

- Larger
- More comfortable
- Cleaner air
- Lower cabin altitude
- Increased humidity
- Smoother ride
- Dynamic lighting
- More convenient
- Enables more non-stop travel
- Reduces trip time



COPYRIGHT © 2008 THE BOEING COMPANY

Setting New Levels of Environmental Leadership

787 COMING TO YOU

- Less fuel used
- Lower emissions
- Quiet for communities, crews, and passengers
- Fewer hazardous materials
- Less waste in production



COPYRIGHT © 2008 THE BOEING COMPANY

787 Program Schedule

787 COMING TO YOU



COPYRIGHT © 2008 THE BOEING COMPANY

Highlights

787 COMING TO YOU

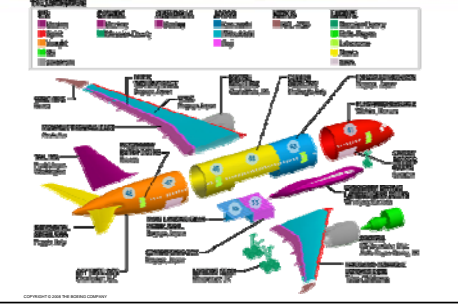
- 787 Overview
- Forming the International Team
- Global Technology Development
- Production Progress



COPYRIGHT © 2008 THE BOEING COMPANY

Partners Across the Globe Bring the 787 Together

787 COMING TO YOU



COPYRIGHT © 2008 THE BOEING COMPANY

KHI

787 COMING TO YOU



COPYRIGHT © 2008 THE BOEING COMPANY

FHI

787 COMING TO YOU



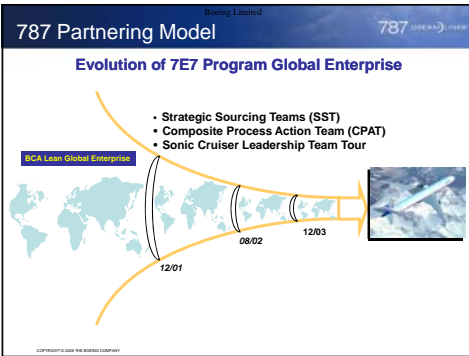
COPYRIGHT © 2008 THE BOEING COMPANY

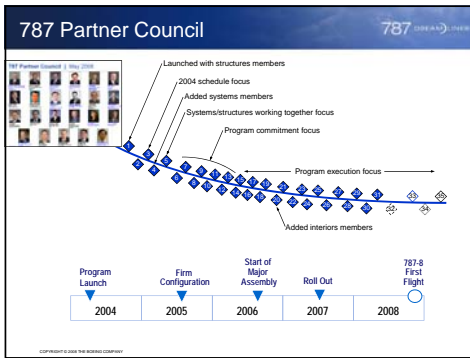
MHI

787 COMING TO YOU



COPYRIGHT © 2008 THE BOEING COMPANY





FHI 787 Handa Plant Celebration

787



COPYRIGHT © 2008 THE BOEING COMPANY

Highlights

787

- 787 Overview
- Forming the International Team
- Global Technology Development
- Production Progress



COPYRIGHT © 2008 THE BOEING COMPANY

Innovative Technologies

787

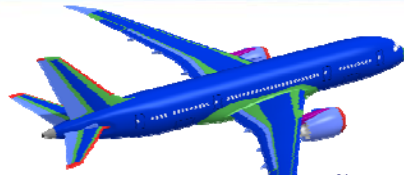
- Durable composites
- Smarter, more electric systems architecture
- Advanced aerodynamics
- Next-generation engines



COPYRIGHT © 2008 THE BOEING COMPANY

Composites Serve as Primary Structural Material

787



- Carbon laminate
- Carbon sandwich
- Other composites
- Aluminum
- Titanium
- Titanium/steel/aluminum



COPYRIGHT © 2008 THE BOEING COMPANY

Evaluating Alternative Fuselage Architectures

787



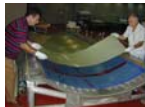
Composite Skin Stringer



Advanced Aluminum Alloys



Composite Sandwich Concept



Fiber Metal Laminates

COPYRIGHT © 2008 THE BOEING COMPANY

Initial Technology Development in Seattle

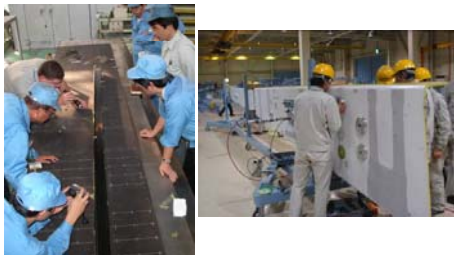
787



COPYRIGHT © 2008 THE BOEING COMPANY

Joint Spar Development

787



COPYRIGHT © 2008 THE BOEING COMPANY

Pre-Production Horizontal Stabilizer

787



COPYRIGHT © 2008 THE BOEING COMPANY

Side of Body Joint Strain Survey
- FHI, Utsunomiya

787



COPYRIGHT © 2008 THE BOEING COMPANY

Side of Body Joint Testing
- JAXA, Tokyo

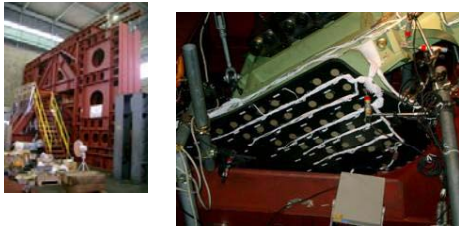
787



COPYRIGHT © 2008 THE BOEING COMPANY

Main Landing Gear Fitting Testing
- KOBELCO, Japan

787



COPYRIGHT © 2008 THE BOEING COMPANY

Combined Multi-Axial Loading Tests
- MHI, Nagasaki/Laboratory

787



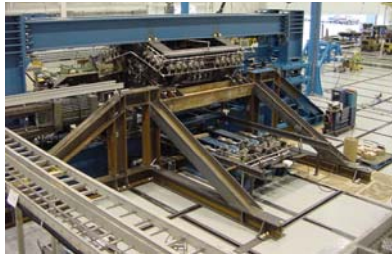
Test Set-up

COPYRIGHT © 2008 THE BOEING COMPANY

Combined Fuselage Pressure and Mechanical Loading Tests

787

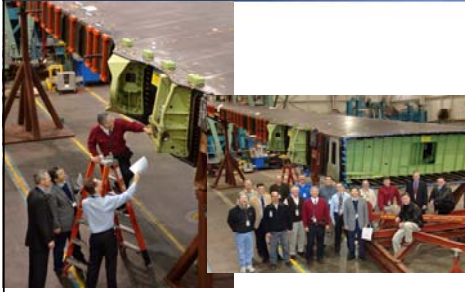
Russia, Seattle, Texas



COPYRIGHT © 2008 THE BOEING COMPANY

Wing Progress

787



COPYRIGHT © 2008 THE BOEING COMPANY

Test Lab

787



COPYRIGHT © 2008 THE BOEING COMPANY

Successful Section 46 Testing

787

- Extensive limit load testing complete
- Seven ultimate load conditions successfully run
- Loaded to 200% limit before failure



COPYRIGHT © 2008 THE BOEING COMPANY

Structures Testing Ongoing

787

Static testing

Drop testing

Copyright © 2006 The Boeing Company

Airframe Static Test to Verify Durability

787

- Second 787 airframe to be assembled in Everett
- Moved out of Final Assembly on April 25
- Testing to demonstrate structural stability even at rates 150 percent above most-extreme conditions expected in service

Copyright © 2006 The Boeing Company

Highlights

787

- 787 Overview
- Forming the International Team
- Global Technology Development
- Production Progress

Copyright © 2006 The Boeing Company

Lower Skin LM Machined in the Kobe Shipyards

787

Copyright © 2006 The Boeing Company

World's First Commercial Composite Wing

787

Copyright © 2006 The Boeing Company

Section 47 Layup Mandrel

787

Copyright © 2006 The Boeing Company

Wing Ceremony

787

Copyright © 2006 The Boeing Company

Delivery Ceremony of First Raked Wing Tip

787

February 16, 2007

Copyright © 2006 The Boeing Company

Production ramp-up

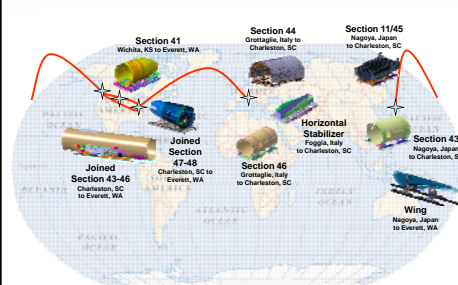
787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

Dreamlifter Route Structure

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

747 Induction

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

LCF Progress

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

LCF Progress

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

LCF First Flight

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

Dreamlifter Progress

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

787 Final Assembly Factory Flow Everett, WA

787 COMPLETION



COPYRIGHT © 2008 THE BOEING COMPANY

