

The future of
aviation safety
under the impact of an
electronic environment

2012 ADF Symposium “Dispatch—The Big Picture”

Orlando, October 11, 2012

electronic?environment



Environment:

1. Flight Deck
2. Operations & Flight Dispatch
3. Aircraft
4. „Personal Items“
5. Aerospace Industry
6. Human Factors
7. LL

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1. Flight Deck

Electronic Flight Bags: “to enhance flight safety, improve efficiency and protect the environment.”



„Northwest Pilots Who Missed Airport Were on Laptops, Discussing Scheduling

Operating Regulation	Charts	Calculations	Documents	Charts and Documents	Unspecified	Total
Part 91	24				1	25
Part 121	3	30	3	1		37
Part 135	5					5
Total	32	30	3	1	1	67

From the April 2010 **Review of Safety Reports Involving Electronic Flight Bags**
<http://www.volpe.dot.gov/coi/hfrsa/docs/efb042010.pdf>

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2. Operations & Flight Dispatch

Flight Plans: “While all airlines use computerized flight planning systems, investing in a higher-end system — and in the effort to use it to its full capability — has significant impact on both profitability and the environment.”



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2. Operations & Flight Dispatch

Is No-Frills Carrier Ryanair Skimping on Fuel?

The Telegraph reported that the Irish pilots union claims that flight crews are under pressure from Ryanair to carry the minimum amount of fuel required under European regulations and that the European Cockpit Association said that pilots were being encouraged to make decisions based on “factors other than safety.”

Hapag Lloyd at
Vienna,
July 12, 2000

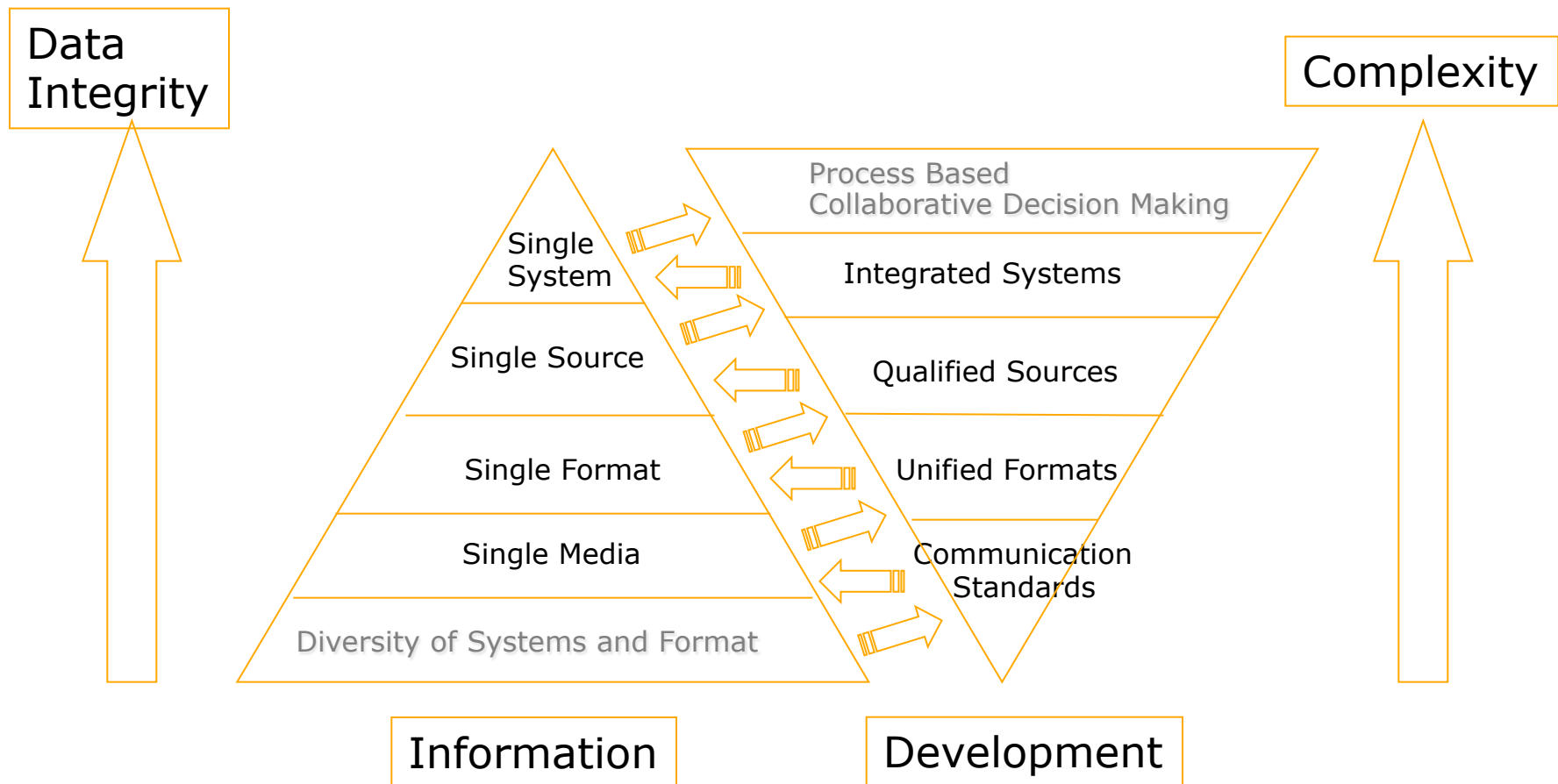


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2. Operations & Flight Dispatch

Challenge: To have all crucial data available in real time
in exactly the same quality and for all processes



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3. Aircraft

„The new airplane's use of electrical systems reduces fuel usage and increases operational efficiency.“



Hybrid AC and DC Primary Distribution Systems
(230 Vac, 115 Vac, ± 270 Vdc, 28 Vdc)

Elimination of Pneumatic
Bleed System

Electric Wing
Ice Protection

Liquid Cooled Power
Electronics

Two 250 kVA Variable Frequency
Starter/Generators per engine

APU with Two 225 kVA
Starter/Generators

Adjustable Electric Air
Conditioning

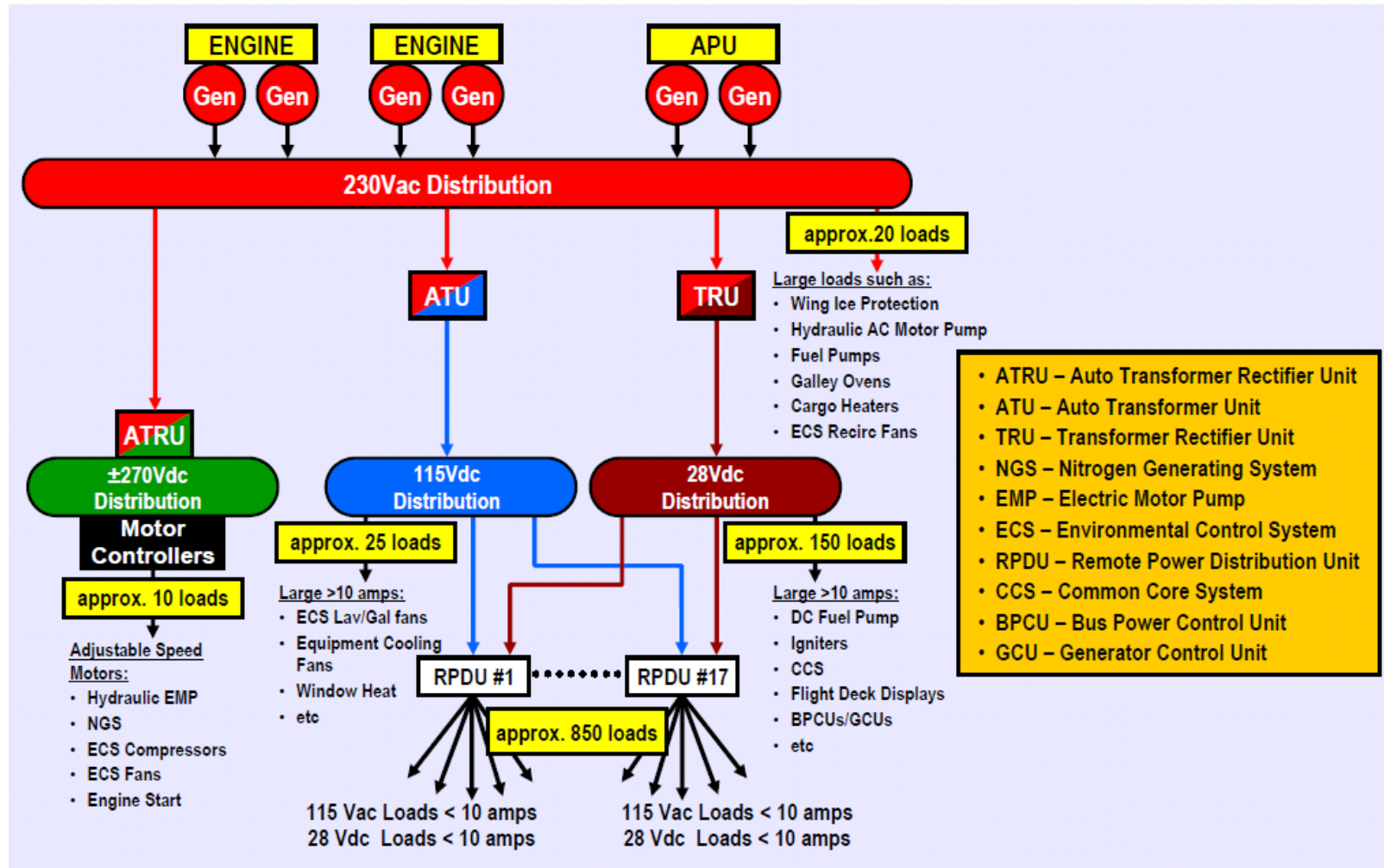
Adjustable Speed Motors
and Motor Controllers



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3. Aircraft



„...police and fire officials rushed to a baggage area at Narita airport after a curling iron powered by a lithium-ion battery caused a passenger's checked bag to burst into flames as it was being shuttled from an American Airlines jet to a connecting flight...”

Dell laptop explodes at Japanese conference



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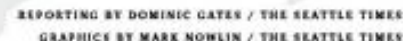


Major parts traveling to Everett

City of origin

Everett

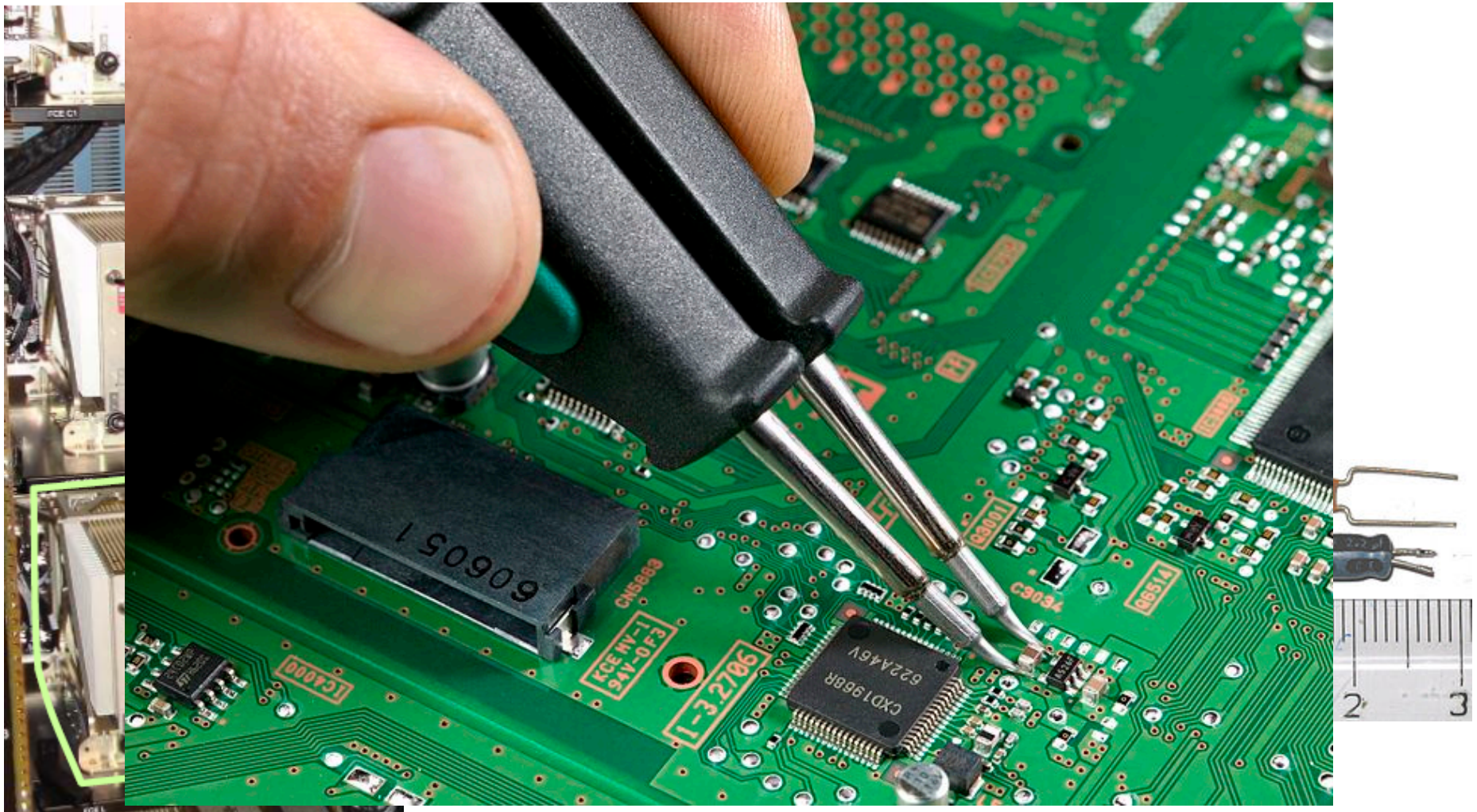
Planes traveling to be disassembled into larger parts



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5. Aerospace Industry



The „electronic“ equation

- One airplane
- Ca. 40 ATA systems
- Each has 3 electronic control boxes (ECB)
- Each has 4 PCAs
- Each PCA has 1,200 electronic components

=

576,000 electronic components o/b one airplane

Vs.

6-Sigma Quality Control

1 part in a million is „allowed“ to be defective

And...

What about the Software – 10,000 lines of code per ECB?



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5. Aerospace Industry



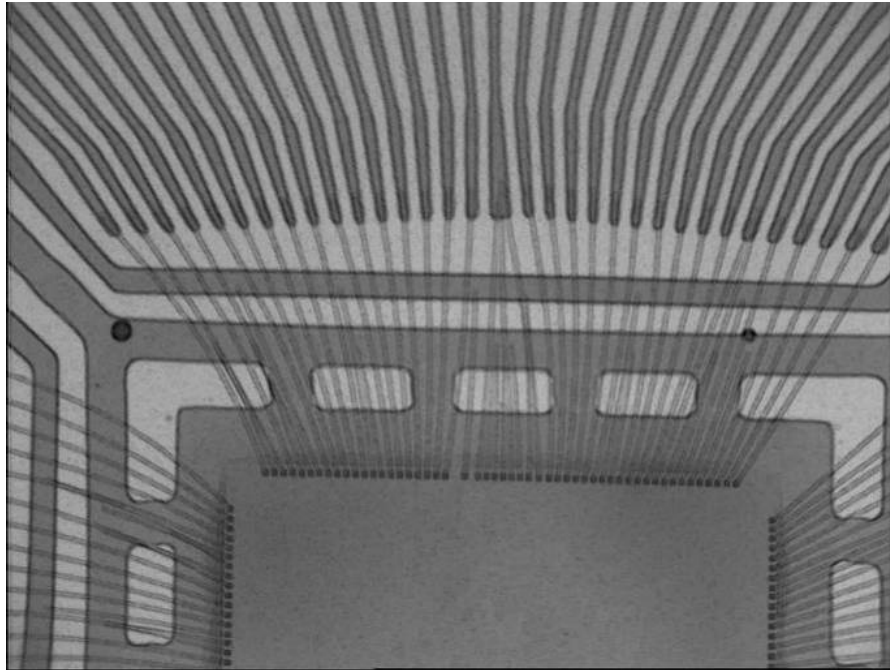
One is fake...



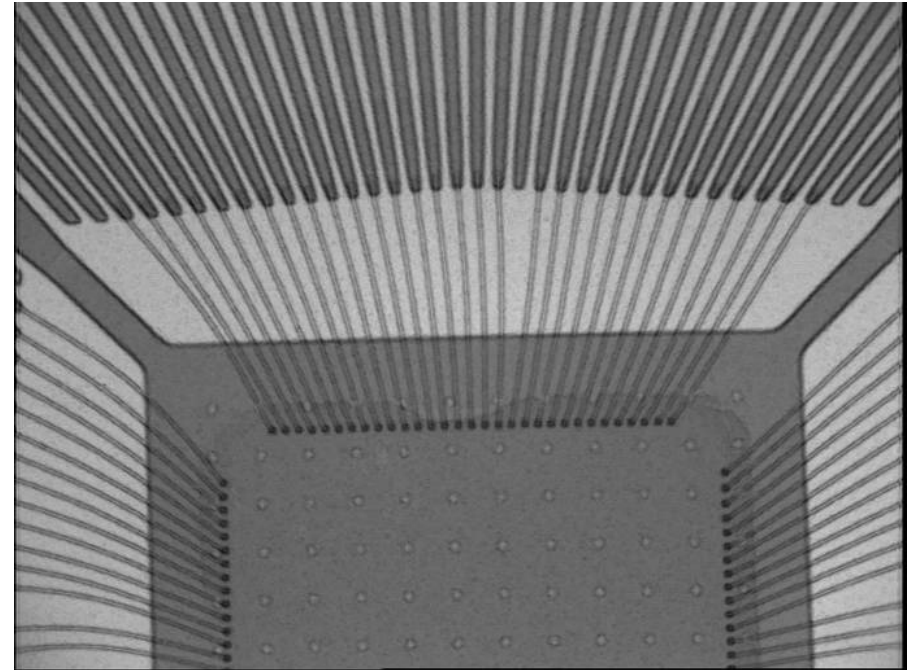
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5. Aerospace Industry



OEM



„handmade in China“



Completing the „electronic“ equation

One airplane

Ca. 40 ATA systems and 5 first tiers suppliers

Each has 3 electronic control boxes (ECB) and 10 second tiers suppliers

Each has 4 PCAs

Each of the four PCAs has 1,200 electronic components delivered by 50 OEM and other sources per one 2nd tier supplier

=

576,000 electronic components

And

Anything between 65 and 2,500 suppliers and OEM is „onboard“, virtually speaking



Suspected Unapproved Parts

You may submit a SUP report to FAA's Aviation Safety Hotline office.

To submit a report:

Call the Aviation Safety Hotline at 1-800-255-1111.

Email a report to the [Aviation Safety Hotline](#) office.

Mail a hard copy to:

Federal Aviation Administration

Office of Audit and Evaluation

800 Independence Avenue, SW

Washington, DC 20591

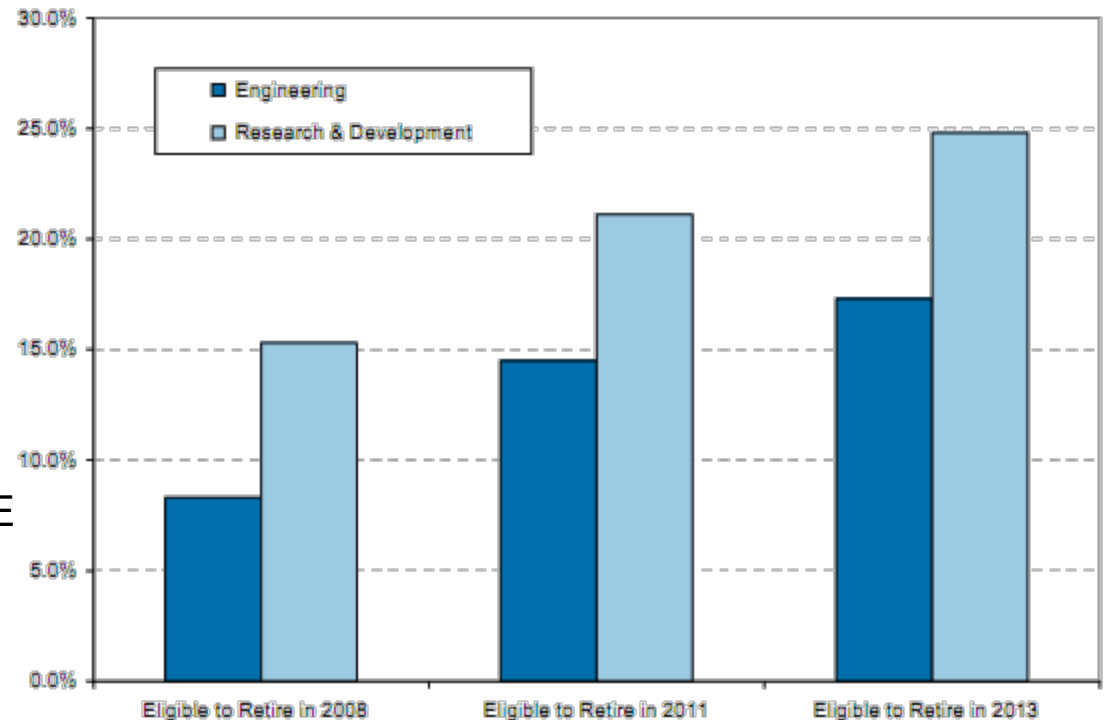
Attn: AAE-30, Room 911

<http://www.faa.gov/aircraft/safety/programs/sups/>



„Brain drain among Boeing's biggest challenges“

- THE AVERAGE AGE OF THE A&D WORKFORCE IS 45 YEARS OLD
- LESS THAN 25 % OF THE A&D WORKFORCE IS AGE 35 OR YOUNGER
- ALMOST 30% OF THE AEROSPACE WORKFORCE IS BETWEEN 50 - 59 YEARS OLD
- OVER 20% OF THE A&D WORKFORCE IS CURRENTLY ELIGIBLE TO RETIRE IN 2011 AND THAT NUMBER GROWS TO ~ 25% BY 2013



Source: Innovation in Aerospace & Defense, Charles River Associates 2/2010

United Airlines Exploring Viability Of Stacking Passengers Like Cordwood

CHICAGO—In its ongoing effort to cut transportation costs and boost profits, United Airlines announced Tuesday that it was exploring the feasibility of herding passengers into planes and stacking them like cordwood from floor to ceiling.

“Research shows that we lose millions of dollars each month by having them all sit upright in individual seats for the duration of the flight,” said CEO Glenn F. Tilton, speaking to reporters at United Airlines’ corporate headquarters. “However, if we were to remove these seats, we could just sort of stack them all in there, one by one, as they file into the plane.”

“If a 747’s maximum takeoff weight is



875,000 pounds, then we should be packing that plane with 875,000 pounds,” Tilton added.

For more, visit theonion.com

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3. Aircraft



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3. Aircraft

Airbus Replacing A380
Composite Wing Structures
With All Metal: Should Boeing
Be Concerned?

