



TRAINING & FLIGHT SERVICES

Next Generation of Aviation Professionals



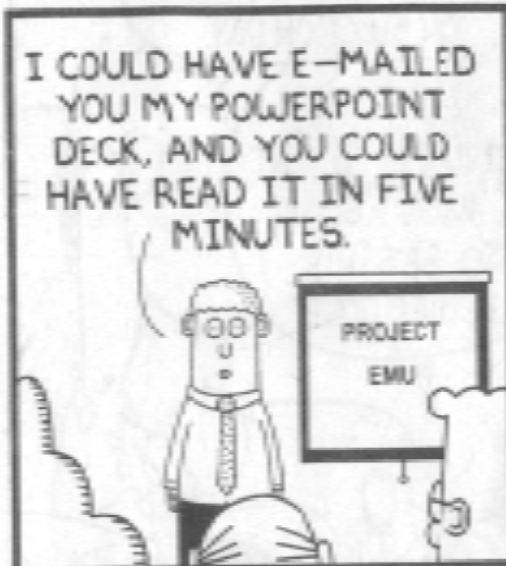
LIFECYCLE
SOLUTIONS

Workshop
1 March 2010

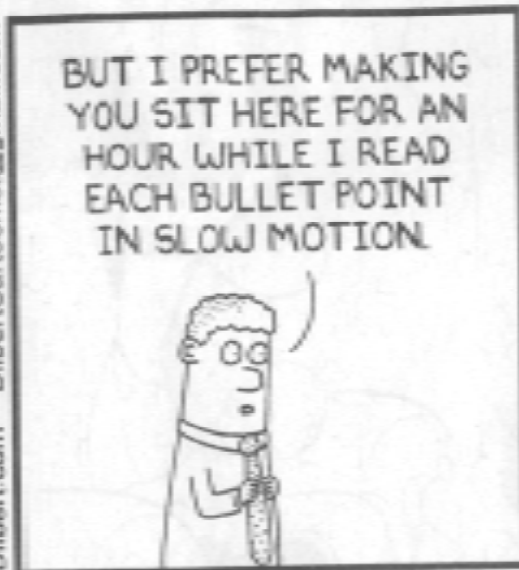
Hank Schaeffer
Manager, MT Regulatory Affairs
The Boeing Company
Training and Flight Services

C8 NWMonday | *The Seattle Times* | MONDAY, FEBRUARY 22, 2010

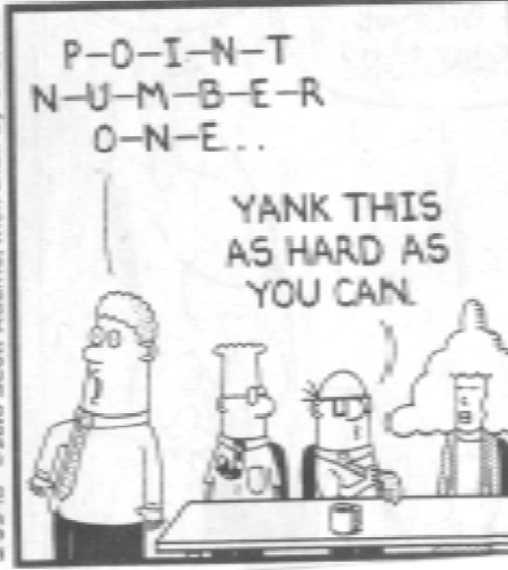
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Look Familiar?

- **Is a Mechanic Shortfall Looming?** (ATE&M, 2008)
- **Retiree Flood Waits in the Aerospace Wings** (Seattle Times, 10 Feb 2008)
- **Baby Boomer Retirements Could Trigger Aerospace and Defense Crisis** (Aviation Week, 12 March 2008)
- **Aging Jets Worsen Mechanics Shortage** (NY Times News Service, 1989)

Magnitude of the Shortages

- Airlines will need 25,000 new aircraft in the next 20 years in addition to the 17,000 existing commercial aircraft (AET&M, 2008)
- Studies show that we will need 480,000 new aviation technicians by 2026. (Boeing T&FS 2009)
- Average age of aircraft maintenance engineer/ technician/engineer in Europe is 40, and in the US, its 53 years of age. (Aviation Week, 2008)
- In 2017 the aviation personnel shortage in Canada will be equal to the 2008 Canadian aviation workforce. (NGAP Roundtable, 2009)

Breakdown by Region

- Americas – 180,000
 - Europe/CIS – 120,000
 - Middle East – 20,000
 - Africa – 15,000
 - Asia-Pacific – 150,000
-
- Global Total – 480,000 needed by 2026
 - 28,000 new technicians per year (average)

Some Fundamental Questions

- What will we need from our future employees?
- What do they want from us?
- How can regulatory bodies help this situation in a global environment?
- How do we incorporate the new technologies with mature technologies in the license training?
- Should there be separate specialized training or included as part of the basic license?
- Do we need to re-examine the privileges for each license?
- How will we regulate training and qualifications for the wide range of aircraft ages and technologies?

Current Challenges

- New aircraft require new skills and knowledge
- Lack of harmonization in global regulations
- Global initiatives to update regulation/guidelines
- Any solution must involve an integrated solution involving industry (OEMs, Airlines and MROs) and the regulators.



Aloha Airlines flight 243 (NTSB/AAR 89/03)

- “FAA licensed Aircraft and Powerplant mechanics are not required to be knowledgeable in the maintenance and inspection of modern contemporary airplanes because the training curriculum has not kept pace with aviation industry technology.” (Finding #16, page 72)
- “Revise the regulations governing the certification of aviation maintenance technician schools and the licensing of airframe and powerplant mechanics to require that the curriculum and testing requirements include modern aviation industry technology.” (Recommendation, Class II, Priority Action A-89-55, page 74)



Example of Regulatory References

- ICAO Annex 1
- CAA-China, Part 66/145/147
- CASA- Australia, Civil Aviation Order 100.66/CAR 30
- EASA, Part 66/145/147/M
- FAA, Part 65/145/147
- TCCA, CAR 566

Global Initiatives

- ITQI – IATA Training and Qualification Initiative
- ICAO – NGAP – Next Generation of Aviation Professionals
- ATA 104 Update
- EASA NPA 2009/01 (21.039) – Operational Suitability Data

ATA 104 Update

- Rewrite to update this standard from the 1990s
- Insert consideration of new technologies
- Insert current next generation technologies
- Redefine standards for training documentation
- Planned publish date in 2010

Operational Suitability Data EASA 21.039

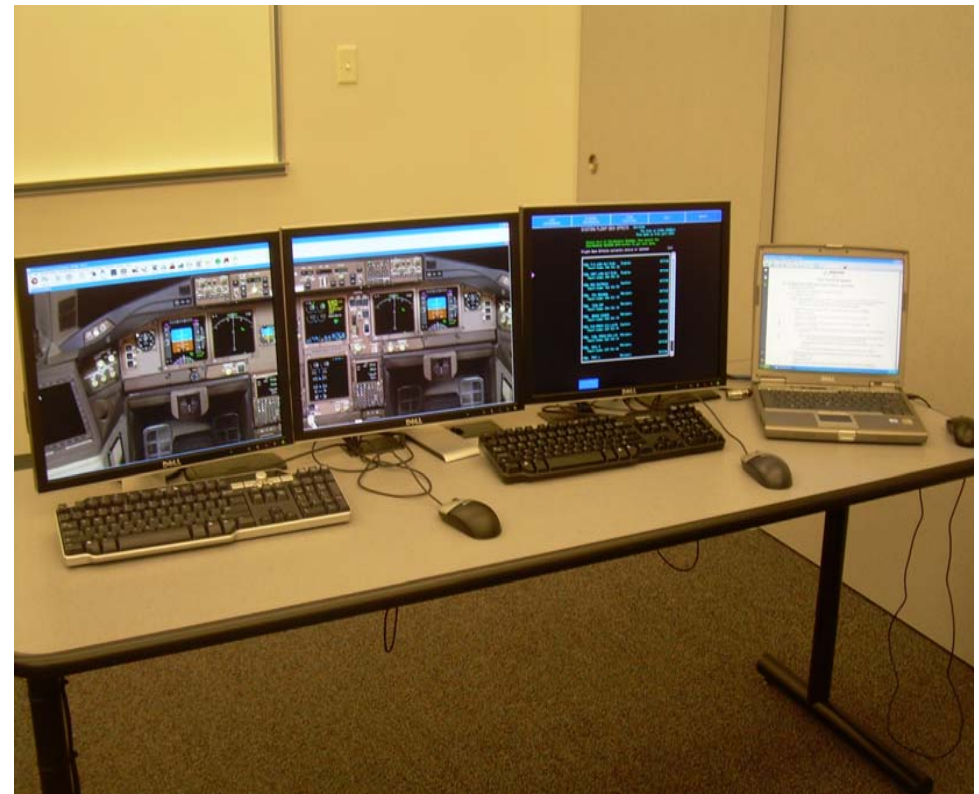
- EASA NPA 2007/07 (Opinion 05/2009) specified a set minimum training hour requirement for the B1, B2 and C courses (both Theoretical and Practical).
 - Also clarified definition of Practical/OJT training
- EASA wants to include OEMs in specifying the minimum required training
 - NPA 2009/01 started the dialogue on Operational Suitability Data (Certificate) and tied it to the OEMs
 - Work being done to define what is required in the “minimum training syllabus”
 - Would include latitude for new technology training requirements.

Shift in Emphasis

- “It is no longer adequate for maintenance personnel to be able to demonstrate technical knowledge of airplane systems so the (training and certification) emphasis shifts from “how the airplane works” to “how to work the airplane”
 - (Steve Pennington, Boeing T&FS, 2009)
- The global regulations need to reflect this shift in standards (mandatory times and required subjects/items), examinations, and fundamentally in the basic concept of both theoretical and practical training.

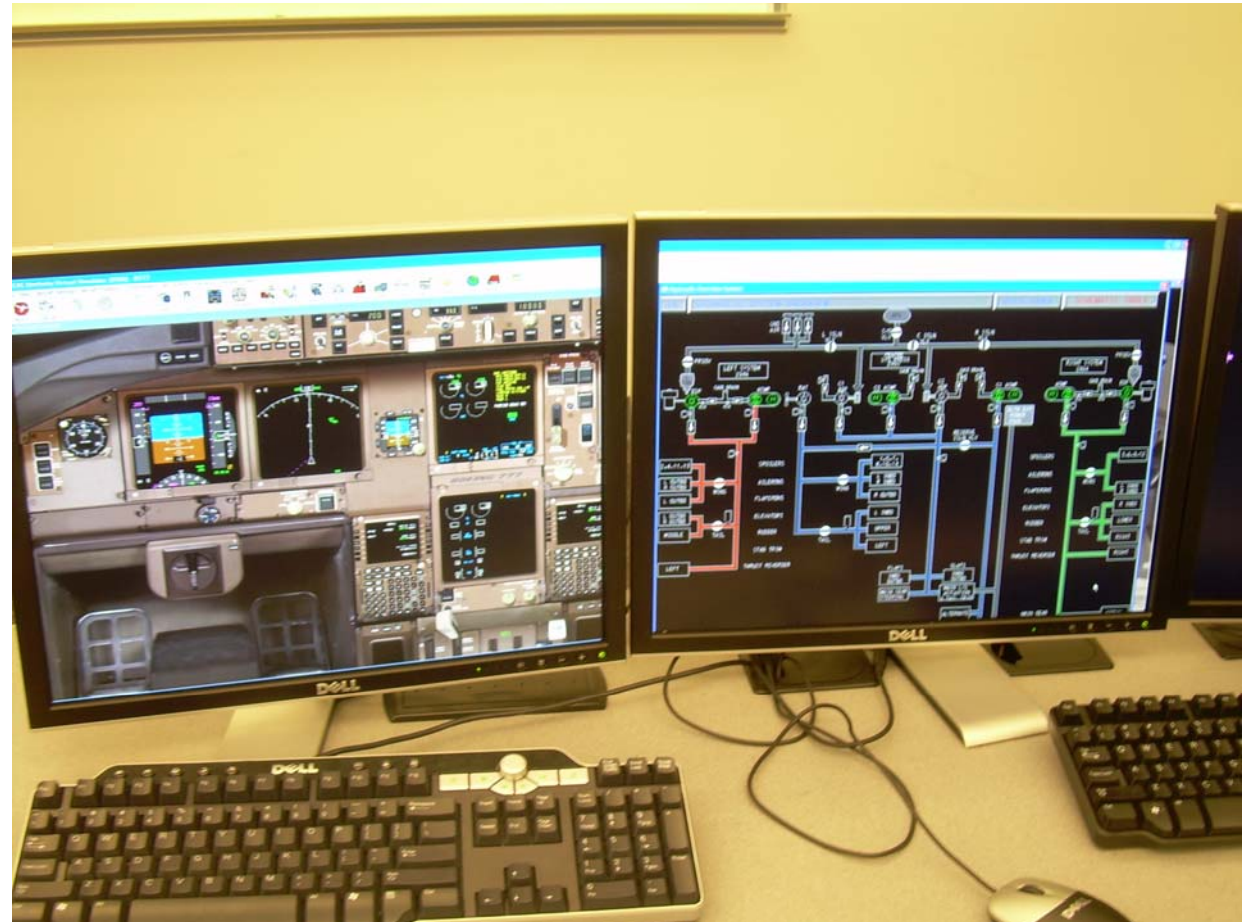
Off Airplane Training Devices

- **New synthetic training devices are required.**
 - **High fidelity simulation may be needed**
 - **Training time on the real airplane is becoming more difficult and more expensive**
 - **No one is going to take apart an operational aircraft in the name of training.**
 - **Need to have regulatory acknowledgement that the airplane is not the best device on which to conduct a greater amount of training.**



Realistic examinations

- The shift in emphasis is away from systems knowledge and much more toward systems integration and troubleshooting.
- Multiple choice exams are even dated for testing basic systems knowledge
- Synthetic Based Training (SBT) exams hold great promise as regulations allow



Practical

- EASA defines practical training in NPA 2007/07
 - “The objective of practical training is to gain competence in performing safe maintenance”
- Is this the only objective that the airlines desire?
- Practical training based on what?
 - 10 days
 - Competency based
 - What is accomplished?
- A great deal of practical is now integrated into the theoretical portion of the training.
- Credit should be given for practical training conducted in theoretical portions of the class

Specialty Training

- Advanced Composite repair
 - ATA 104 update
 - Is regulatory involvement required?
- Fiber Optic Training
- Aviation IT/Database Infrastructure



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Recognition for Previous Learning

- “Recognition of Previous Learning (RPL)”
 - Acknowledge similar training to meet certification standards
 - Recognition for experience/competency
 - Most regulators have some form of this for military technicians
 - Offshore technicians may get credit toward certification
 - Entry criteria for technicians from other technology trades



Older Aircraft Training

- **Mature Aircraft**
 - While updates occur, many “non computer, non-glass, non-high-bypass fan” aircraft are still flying in commercial aviation
- **Aging Aircraft issues**
 - Is new technology/training/qualifications required to meet this need?
- **Can't overlook previous generation of aircraft**



Regulatory Challenges

- **Fundamentals must be taught and tested**
 - **Establish the basis for follow-on training**
- **Advanced simulation devices are also becoming a necessity.**
 - **Simulating modern troubleshooting systems resident in aircraft**
 - **Acceptance that hand's on training may be on a desktop simulator**
- **Acceptance of synthetic training devices as a viable means of practical training and assessment**
- **Update knowledge and practical assessment criteria to include modern technologies**
- **Balance next generation and mature technologies in regulatory oversight**

Final Comments

The Safety Board believes that exacerbating the difficulty in the inspection tasks of airline maintenance personnel is the fact that the FAA approved training for aircraft maintenance technicians contains material that is largely irrelevant to the tasks that licensed personnel will actually perform in an airline environment. For example, 14 CFR 147, which governs the certification of maintenance personnel, requires students in FAA approved maintenance schools be knowledgeable in such topics as wood airframes, airframe fabric repair, and application of paint and dope.

In a time when the FAA is certificating air transport aircraft with fly by wire technology, composite materials construction and computer self monitoring capabilities, the words computer and composite do not appear in the required curriculum subjects among airframe systems and components in 14 CFR 147, Appendix C. (NTSB/AAR-89-03 - Aloha Flight 243, page 56).

Questions?

