A Comprehensive Competency-Based Training Approach for Next Generation Aviation Maintenance Professionals

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1 March 2010, Montreal

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ICAO NGAP Symposium, 1-4 March, 2010

TOPICS

- A Global Maintenance Challenge
- Approach to training
- Aviation Accidents
- More restrictive legislation to improve safety
- Training availability demands
- The need for international harmonization in maintenance training
- Training professionals
- Questions

A Global Maintenance Challenge

- A Global challenge in the aviation industry is the growing shortage of a well trained and experienced maintenance workforce.
- Industry to create attractive job descriptions and career paths which appeal to skilled and motivated people
- Training Methodology & Solutions need to change

Traditional Schooling Approach

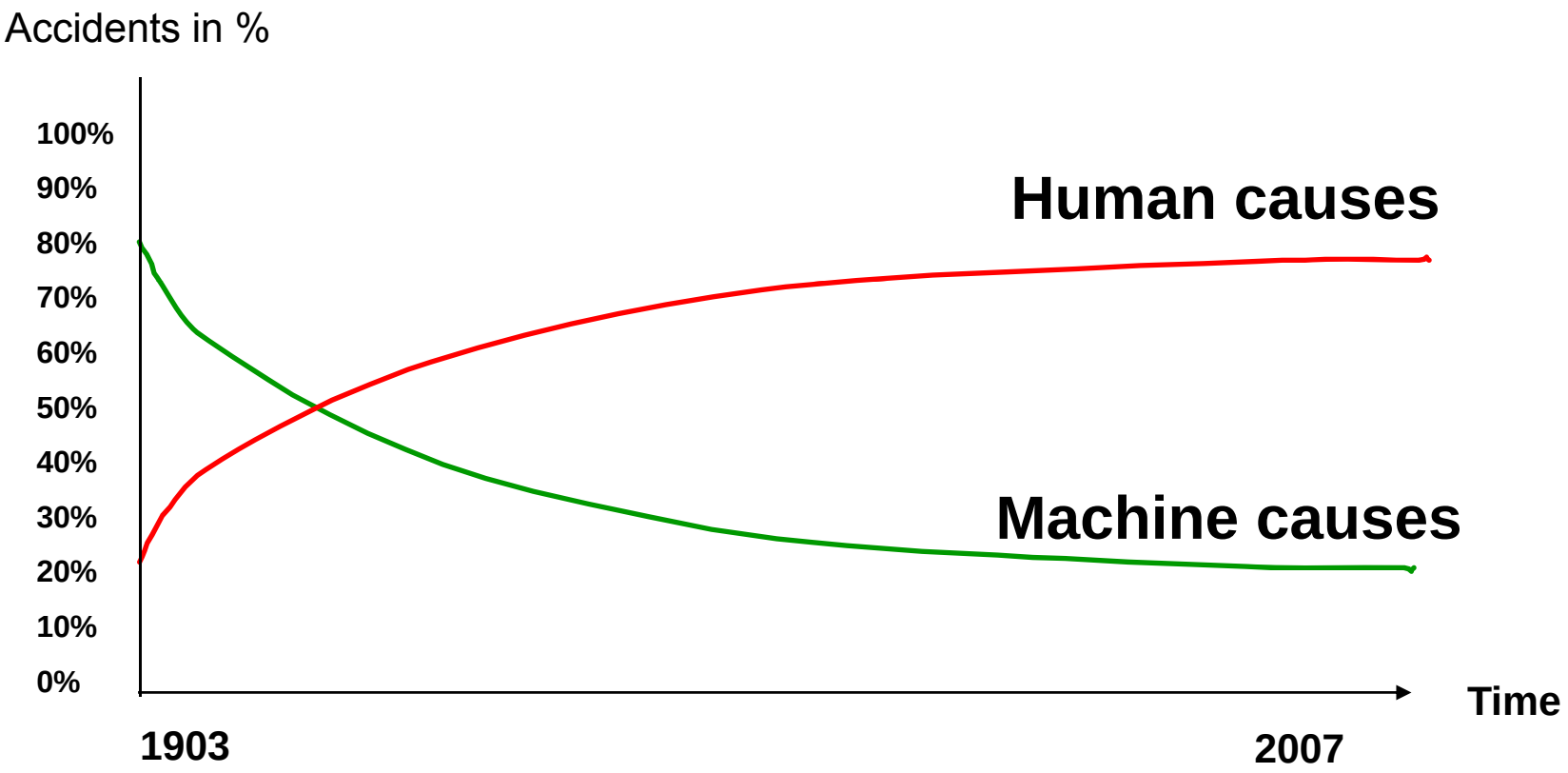
- Mostly based upon analysis of local needs
- Normally classic knowledge based training (efficient?).
- A more effective training system could be competency-based training for new trainees.

Type/task training approach

- Classic way looks efficient but evidence shows that it generally leads to low retention rate.
- Competency-based training is designed to increase knowledge retention by better understanding.
  (This training initiative should be industry driven and will need cooperation between regulators and training organizations).
- Use of Training Need Analysis (TNA) to build courses

  (*This might even be forced by future legislation)*

Human versus Machine Causes of Aviation Accidents



Financial impact of mishaps in maintenance

An example

In one airline with a fleet of 300+

- 203 recorded maintenance mishaps (3 year period)
- Resulted in 13,299 out-of-service hours
- Cost in repairs: **$16.5** million.

Excludes lost revenue, likely to amount to many more **millions** of dollars.

Other maintenance related costs

- An engine OEM estimated that each in-flight shut down costs **$500,000.**
- Data indicates that:
  - $**15-30,000+** for each hour of maintenance-related delay
  - $**80,000+** for each flight cancellation.
- One major airline estimates **$30 million+** per year for industrial injuries.

From authority side:

- An airline has being fined **$180,000** plus costs for an oil loss accident.

Competency based training

Three important factors that have an influence on a person's competency:

- Knowledge
- Skills
- Attitude

Competency based training

Competencies are general descriptions of the abilities needed to perform aircraft maintenance.

- Are described in terms such that they can be measured.

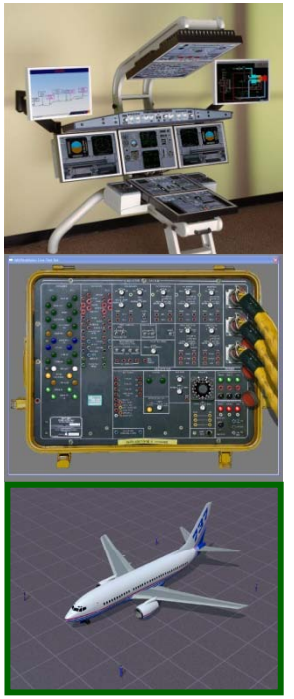
Competency based training

Terminal objective	Give a functional description of the system
Standard enabling objectives	▪ Describe the main function(s)of the system ▪ Name the system's main components / LRU's (if any) concerned by the inspection/check
Customized enabling objectives **(including the key points)**	▪ Describe the function of the Auxiliary Power Unit exhaust Function = to direct/release the Auxiliary Power Unit (APU) exhaust gas and decrease noise ▪ Name the APU exhaust main component('s) Main component = Exhaust duct

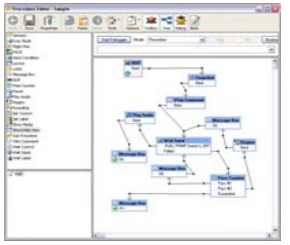
The new learning process supported with simulation

Examples of simulation systems are.

- Virtual Maintenance Trainer (A/C systems)
- Virtual test equipment
- Practical Assessment Tools (virtual aircraft)



Includes Learning Management Systems



The need of competency based training

We might expect the need of a different approach and more training requirements due to;

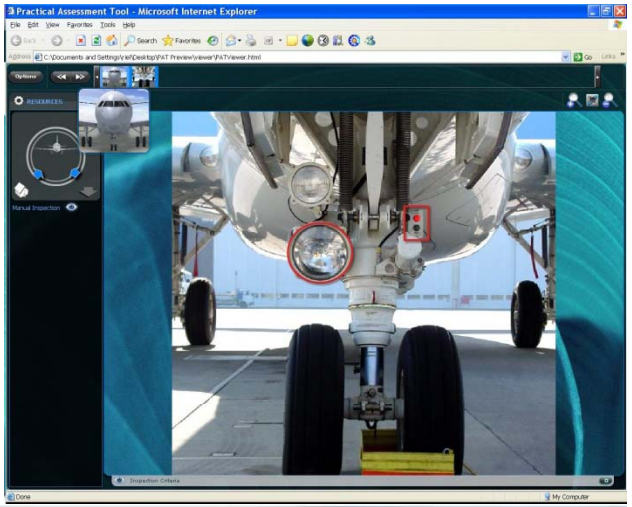
- Improved reliability in aircraft components and materials
- Improved more reliable aircraft materials

This results in fewer discrepancies, leading to less hands-on experience and troubleshooting skills learned by technicians.

Current Regulatory Response

New legislation for maintenance and maintenance training does become more restrictive aiming to improve safety.

Also, this does create additional need for a different approach to training delivery and call for a modernization of training solutions.
(e.g. distance learning / e-learning)



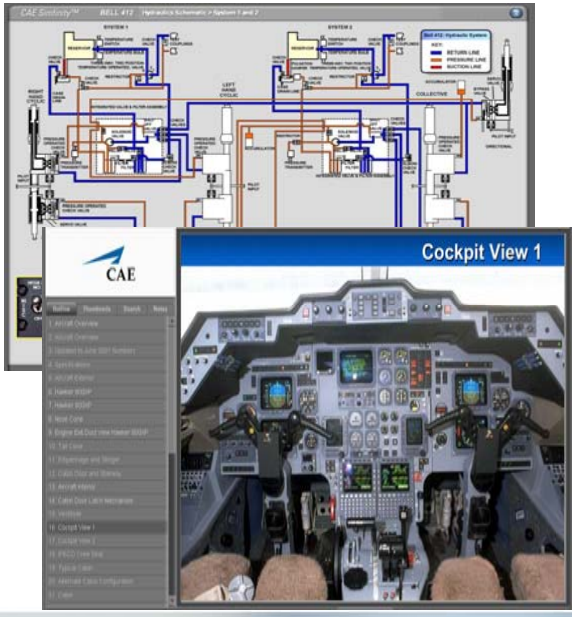
Preventing increase in training costs

To prevent increase in training costs and student travel technology can help.

One of the possible solutions can be found in WEB based training.

This can be in the form of;

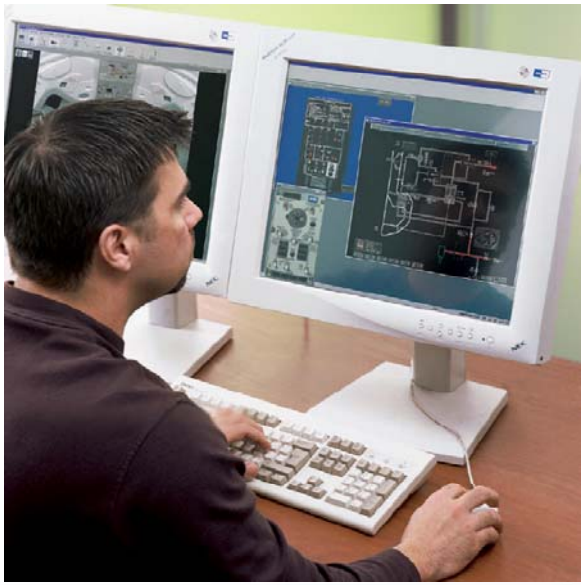
- self-paced courses
- virtual instructor based courses.



Training availability demands

There is a demand that training should always be available for:

- refresher training,
- recurrent training,
- continuation training.



A need for international harmonization of maintenance

The gap between the growing need of modern training solutions must be closed through realistic cooperation with the aviation authorities globally, by creating ICAO documents that would address the international harmonization of:

- Licensing of Maintenance Technicians,
- Maintenance training regulations,
- Maintenance regulations effecting operations.

The industry will need to support this effort.

Industry and Regulators need to co-operate

The industry will need to co-operate with aviation authorities to develop guidance and regulations

(e.g. the
European Aviation Maintenance Training Committee
for EASA)

The professionals in maintenance training

Another key factor in this training approach will be the development and building of training professionals.

- Subject Matter Experts (SME's)
- Instructors (teachers),
- Examiners (theory)
- Assessors (practice)

The professionals in maintenance training

- They will need to change and adapt to the new methods, which will allow them to cope with the new and high demands of the future training environment.

- Credentialed instructors will need to invest in their instructional knowledge and modernize their approach to students and their training.

CAE does contribute globally

- Being a member of the aviation industry, CAE does contribute and participate in various working groups around the globe, in cooperation with authorities to modernize and improve training solutions, legislation & regulation.

- This will facilitate more efficient and effective training methods, as well as support higher safety within the aviation industry.

Conclusions

- Attracting new maintenance professionals:
  a continuous challenge for the industry
- The need of global harmonization of maintenance regulations
- Modernize training to improve efficiency and effectiveness
- Competency-based training:
  a new approach to create a higher retention rate of the training material.

  - more efficient trouble shooting
  - positive impact on aviation safety
  - shorter duration required to train skilled technicians

Questions

THANK YOU

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