Development of Competency Based Training in Europe

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Presentation Outline

1. Setting the scene: global training challenges and ICAO’s and IATA’s requirement for competency based training

2. Competency Based Training aspects and examples

3. The Performance-Based Environment

4. A new approach to the training system and stakeholder roles

5. Rulemaking for competency based training in Europe
1. Global Training Challenges

- Industry growth and experience loss
- New and emerging technology, increased automation
- The need for effective Crew Resource Management
- Threat and Error Management
- Growing threats from growth and complexity of the system

IATA predicts that accident rates will increase if countermeasures including appropriate training are not put in place.
1. Global Training Challenges

• Outdated training
  ▪ Global civil aviation community accepts, that ab-initio training requires updating to equip pilots with the Knowledge, Skills and Attitude (KSA), that the airline industry needs today.

• IATA MPL guidance material concludes that new actions are needed:
  ▪ To embed TEM and CRM in all phases of training
  ▪ To transfer appropriate Knowledge, Skills and Attitude (KSA) competencies to students throughout ab-initio training
  ▪ To develop a data driven, output based training process
1. ATPL/MPL Ground Training Today

Driven by:
- the ATO and candidate focusing on multiple choice exams which:
  - only test a narrow range of outdated ‘define’, ‘state’ and ‘find’ LOs, and/or
  - measure a candidate’s ability to rote learn a question bank
  - encourage an attitude that guessing is expected and acceptable
- No requirement to train or assess to present industry needs.
2. Competency based training-courses

- ATOs need to provide competency based courses for CPL, IR, ATPL and MPL that:
  - facilitate understanding and application of knowledge
  - interweave TEM and CRM
  - instill professional attitudes and develop soft-, cognitive- and practical skills
  - are data driven
  - qualify pilots to perform at least to the required standard across the range of competencies
2. CBT-Instructors/assessors

- ATOs must provide instructor and assessor training, assessment and qualifications which:
  - Ensures the instructor/assessor has the knowledge, skills and attitudinal competencies required for that phase of training
  - Develops the instructor’s instructional competencies required to deliver the stated phase of an ATO’s competency based course
  - Assesses and qualifies the instructor to deliver the stated phase of an ATO’s competency based course
  - Provides assessor training, assessment and qualification, including inter rater reliability, for every phase of an ATO’s competency based course
2. CBT – The need for data

- Data is essential to enable ATOs to develop courses based on systems design methodology and work within a Performance Based Environment (PBE)
  - Training needs analysis
  - Emerging negative trends
  - Feedback on generic and individual course output

- Ideally, a resourced, independent shared repository for collection, analysis and distribution for data would be created
2. CBT- obtaining data

- Data required from:
  - All stages of ATO training, type and line training
  - LOSA, FODA or any other kind of FMD from operators
  - Occurrence, Incident and Accident Reports
  - Data from other aviation areas such as Engineering and ATC,
  - University and Industry research

- Managed in a central repository by EASA/qualified entity
- to be freely available to ATOs and NAAs for course design and oversight
2. SAMSYS Project
Quantitative risk assessment and their protective measures in aviation

- Research Project on quantitative measurement of risk
- Cooperation between German Universities and Lufthansa
- Development of valid Safety Performance Indicators
- Development and validation of counter measures
- Focus on pilot’s manual flying skills
- Randomly chosen pilots as a representative sample
SAMSYS - Safety Performance Index (SPI)
Quantitative risk assessment and their protective measures in aviation
eye tracking camera
1. Flight deck camera

2. Infrared camera for side stick handling
Preliminary data from 19 out of 57 participants show many different ways to grab the sidestick.
Recommendations SAMSYS I Simulator - Experiments

**Additional Simulator-Training is required:**

- Normal Type Rating is not sufficient:
- Side-Stick Handling
- Manual Flying Skills (e.g. raw data flying, basic pitch and power)
- Landing technique (turbulence, crosswind, gusty wind)
- Go Around Training (pitch-up illusion)
2. Key components for CBT

- A considerably broader training and assessment system, that is:
  - constructed and developed using systems design methodology
  - enabled through a performance-based environment
  - data driven to meet the wider range of KSA competencies that fulfill the real qualification requirements
2. Systems approach to course design

- Needs Analysis & Data
- Task Analysis
- Trainee Population
- Define Objectives
- Design Course
- Produce Course
- Deliver Course
- Evaluate Outcomes
- Evaluate Outcomes
- Course Design Production
- Analysis
- Evaluation
3. Performance-Based Environment (PBE)

- Performance Based Environment (PBE) would enable effective, flexible, evolving, high quality training and comprehensive assessment based on industry training needs-, risk- and safety analysis.

Systems design approach to course development

+ Competency based training

+ ATO Compliance and mature SMS with focus on training outcome
3. Oversight of ATOs in a PBE

- PBE will require new systems and skills for ATOs, Instructors, Assessors and Regulators

- Oversight by
  - Competent authority, or
  - A suitable Qualified Entity
    - Eases oversight burden on NAAs which may have insufficient resources
    - An independent, dedicated organisation specialising in the performance-based monitoring of ATOs
    - Could also take the function as data repository
4. Stakeholders in an evolving training system

- ATOs develop courses through a systems design methodology which includes output feedback
- EASA/NAAs to establish an enabling PBE
- Qualified Entities to support the NAAs/EASA to provide expertise and effective and efficient oversight
5. Rulemaking in Europe must:

- Set the scene/rules for the new competency based training system including oversight

- Require each ATO to:
  - Be at the centre of a dynamic and data driven training system, which determines its own goals and valid performance indicators to verify the achievement of the goals
  - Be responsible for its course design and quality of pilot output through a demonstratively effective SMS and compliance monitoring system
5. Next action items for EASA

- Include competency based training elements in the review of Sub-Parts J and K of Part FCL
- Prepare instructors and examiners for competency based training
- Create a qualified entity for the oversight of complex ATOs
- Coordinate and monitor the implementation of SSPs and their integration in the EASP
Thank you for your attention!
References and contacts

- IAAPS website:
  http://www.iaaps.info/

- EASA paper on PBE:

- SAMSYS (TU MUC et al im coop with DLH study):