

30 Years of AQP

Lessons Learned

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Where were you in 1991?



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Advanced Qualification Program

SFAR 58 - October 02, 1990

AC 120-54 – August 08, 1991

FAR §121, subpart Y – October 03, 2005

Why AQP?

- By the late 1980's, human error had emerged as the primary cause of U.S. air carrier accidents.
- The FAA and industry agreed that more flexible training regulations would allow a more creative response to this new threat.
- The FAA adopted a modified version of the then-current military training methods based on front-end task analysis and backend data analysis: AQP.

Source (Presentation" Advanced Qualification Program, FAA Lessons Learned From 20 Years of AQP. Presented March 04, 2010, ICAO NGAP Symposium, Doug Farrow, Ph.D., Program Manager, AQP (AFS-230)



Aviation 1985 - 1990

1985

- 12 AUG 85 – Delta 191 crashes at DFW
- 12 AUG 85 – Japan 123 explosive decompression
- 12 DEC 85 – Arrow Air 1285 crashes in Gander

1986

- 28 JAN 86 – Space Shuttle Challenger explodes after launch
- 16 FEB 86 – China Airlines 2265 crashed during go-around
- 02 APR 86 – TWA 840 bombing
- 18 JUN 86 – Grand Canyon Air mid-air collision with helicopter
- 05 SEP 86 – Pan Am 73 hijacking

1987

- 04 MAR 87 – Northwest Airlinck 2268 crashed during visual approach
- 28 MAY 87 – Mathias Rust lands in Red Square
- 31 AUG 87 – Thai Airways 365 – crashed after stall
- 28 NOV 87 – South African Airways 295 – cargo fire and inflight break-up

1988

- 19 FEB 88 – China Airlines Flight 006 (747)
- 26 JUN 88 – Air France 296 airshow low pass crash
- 21 DEC 88 – Pan Am 103 bombing (Lockerbie, Scotland)

1989

- 08 JAN 89 – British Midland 092 crashed in Kegworth, England
- 19 FEB 89 – Flying Tiger 66 crashed on approach
- 24 FEB 89 – United 811 lands after cargo door failed in flight
- 19 JUL 89 – United 232 – Crashed in Sioux City Iowa after hydraulic failure

1990

- 25 JAN 90 – Avianca 52 crashed after running out of fuel
- 10 JUN 90 – British Airways 5390 – Landed after rapid decompression following captain's windscreen failing.
- 03 DEC 90 – Northwest 1482 & 299 collide on ground (DTW)

What is AQP?

- AQP is a voluntary, alternative method for qualifying, training, and certifying crewmembers and operations personnel, such as:
 - Pilots
 - Flight Attendants
 - Instructors and Evaluators
 - Dispatchers
 - Other operations personnel (as applicable)

Source: https://www.faa.gov/training_testing/training/aqp/



AQP Today

- 90% of Large 121 carriers (over 1000 pilots) utilize AQP
- 100% of Medium size 121 carriers (501-999 pilots)
- 5% of Small size 121 carriers
- **Over 90% of U.S. airline pilots train under AQP**
- 71 active FAR §121 airlines
 - 28 train pilots under AQP
 - 43 train pilots under §121 subparts N & O (Traditional)

Source: https://www.faa.gov/training_testing/training/aqp/



AQP

AQP is a systematic methodology for developing the content of training programs for air carrier crewmembers and dispatchers. It replaces programmed hours with proficiency-based training and evaluation derived from a detailed job task analysis that includes Crew Resource Management (CRM). AQP incorporates data-driven quality control processes for validating and maintaining the effectiveness of curriculum content. AQP provides an alternate method of qualifying and certifying, if required, pilots, Flight Engineers (FE), flight attendants (F/A), aircraft dispatchers, instructors, evaluators, and other operations personnel subject to the training and evaluation requirements of 14 CFR parts 121 and 135. The AQP encourages innovation in the methods and technology that are used during instruction and evaluation, and efficient management of training systems. The goal of AQP is to achieve the highest possible standard of individual and crew performance. A leading objective of AQP is to provide effective training that will enhance professional qualifications to a level above the present standards that are provided in parts 121 and 135.



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AQP

- I. Instructional Systems Design (ISD)
- II. Data-driven
- III. Crew Resource Management (CRM)
- IV. Quality Management Systems (QMS)
- V. Innovation

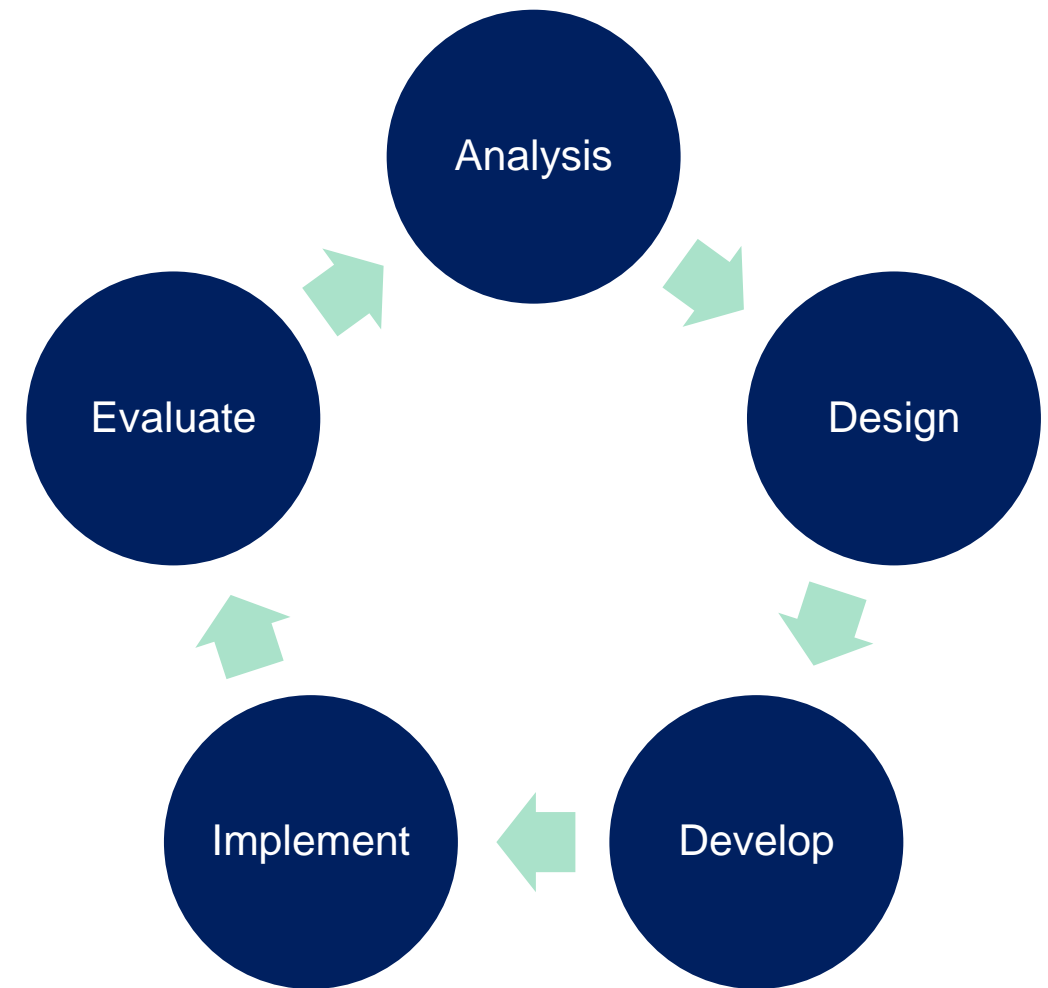




Lessons Learned

Instructional System Design (ISD)

- ISD is the DNA of an AQP.
- ISD brings structure and process to pilot training design and development.
- ISD overcomes personality-driven training program development.
- As ISD processes mature, training departments become more efficient.
- ISD leads to an agile training department.
- AQP carriers must invest in acquiring or developing ISD talent.



Lessons Learned

Crew Resource Management (CRM)

- CRM has evolved considerably since AQP was implemented in 1991.
 - Threat & Error Management (TEM)
 - Pilot Monitoring
 - EBT/CBT
- CRM is embedded in all AQP curricula (Qualification, CQ, Indoc, Instructor).
- AQP elevated CRM to the same level as any knowledge, skill, or attitude. It is trained and assessed in an AQP.
- CRM/HF Working Groups are integrated into ISD processes.
- Training & Safety data systems include CRM as a performance measurement.
- AQP ensures that CRM receives the continuous attention it deserves.

Data-driven Training

- If a training department wants to know how effective their programs are, they must collect data. For this reason, AQP requires data collection, analysis, and reporting systems.
- Data supports decision making.
- Data allows a carrier to propose innovative methods not included in the regulations.
- AQP's data-driven approach aligns with Flight Ops' management practices. Business leaders are well versed in operational data and expect it, even from the training department.
- Multi-factor data analysis requires educated personnel in the training department who become familiar with training and airline operational data over time.

Quality Management System (QMS)

- A QMS comprises activities by which the organization identifies its objectives and determines the processes and resources required to achieve desired results.
- The QMS manages the interacting processes and resources required to provide value and realize results for relevant interested parties.
- The QMS enables top management to optimize the use of resources considering the long- and short-term consequences of their decision.
- A QMS provides the means to identify actions to address intended and unintended consequences in providing products and services.

Source: ISO-9000:2015

Quality Management System (QMS)

- AQP is a process-based methodology. QMS provides a framework by which to manage multiple interrelated processes associated with pilot training.
- A training-focused QMS integrates well with divisional and enterprise Quality processes and procedures.
- QMS principles align well with the other pillars of AQP.
- Audit programs such as LOSA and IOSA integrate well with QMS processes.
- QMS helps answer the “equivalent level of safety” question.
- Continuous Improvement is core to a QMS and to AQP.

Innovation

“The initial goal of the SFAR was to improve flight crew performance by providing alternative means of complying with certain current provisions in the Federal Aviation Regulations which may **inhibit innovative** use of some modern technology that could facilitate the training of flight crewmembers. The SFAR has **encouraged carriers to become innovative** in their approach to training. Based on the aviation industry participation and enthusiasm in AQP, the extension of SFAR 58 is necessary until the rulemaking process codifies AQP as a permanent regulation.”

Source: U.S. Federal Register Vol. 60, No. 180, Docket No. 25804, Notice No. 95-13

Lessons Learned

Innovation

- In AQP, “Innovation” refers to instructional methods and training technology.
- Instructional Methods:
 - Lecture ⇨ Guided Instruction ⇨ Facilitation
 - Introduce New Content + Homework ⇨ Flipped Classroom
 - Standalone ground school modules ⇨ Integrated lessons
 - Compliance Focus ⇨ Outcomes Focus
 - Activity-based Training ⇨ Evidence-Based Training methods (Colvin-Clark - 2010)
 - Place-based classroom learning ⇨ Blended Learning
 - Monolithic learning groups ⇨ Individualized learning
 - Inflexible learning content ⇨ Adaptive Learning

Innovation

- Innovation in training technology:
 - Overhead projectors and slide trays ⇨ Presentation tools
 - Computer-Based Training (CBT), Web-based Training (WBT), e-Learning
 - Increased use of video in training
 - Desktop simulation, Part-Task Trainers, Procedures Trainers, Fixed-based Simulation
 - Mobile Learning, Distance Learning, Microlearning, Game-based Learning
 - V/R, A/R, M/R, X/R
 - Adaptive Learning platforms
 - Electronic Performance Support Systems (EPSS)



Takeaways

Takeaways

- Maintaining two sets of training regulations has allowed and encouraged voluntary participants to exceed FAA standards.
- AQP did not realize it's full potential until training data analysis was meshed with operational safety data analysis.
- A dedicated FAA Headquarters Office was critical to the success of AQP.
- Joint approval by both headquarters and field offices is essential.



Source (Presentation" Advanced Qualification Program, FAA Lessons Learned From 20 Years of AQP. Presented March 04, 2010, ICAO NGAP Symposium, Doug Farrow, Ph.D., Program Manager, AQP (AFS-230)

Takeaways

- Independent analysis of air carrier AQP data by the FAA is a critical quality control step.
- “AQP is not for everyone”
- Instructor and Evaluator calibration training is mandatory.
- Instructors and Evaluators are the key to a successful AQP.

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Takeaways

- AQP is *more difficult* than traditional §121 N & O.
- AQP is *more expensive* than traditional §121 N & O.
- AQP is *more complex* than traditional §121 N & O.
- AQP requires *more resources* than traditional §121 N & O.
- AQP requires *more specialized skills and knowledge* than traditional §121 N & O.

- AQP is *hard...at first*.



Takeaways

- AQP is *more effective* than traditional §121 N & O.
- AQP can be *more efficient* than traditional §121 N & O.
- AQP is *more agile* than traditional §121 N & O.
- AQP is *more innovative* than traditional §121 N & O.
- AQP moves at the *speed of business*.
- AQP is *responsive* to airline and industry changes.
- AQP is *integrated* with other safety systems (ASAP, FOQA).
- AQP is *the norm* in the U.S.
- AQP produces *better pilots* who are *better prepared* to face the challenges of line operations.



Takeaways

AQP requires support from:

- Executive Leadership
- Flight Operations' Leadership
- Training & Standards Leadership
- Regulatory Authority (Local and National)
- Labor
- Instructors
- Evaluators
- Pilots



Going Forward



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Lessons Learned



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