Shaping the Aerospace Workforce of the Future
eQualified Introduction
The Challenge: Special Process Skills

- Critical shortfall of qualified special process personnel is increasing difficulties with recruitment due to:
  - Aging workforce
  - Falling behind in relevant academic achievement

- Globalization has increased variability in knowledge, skills and abilities.

- Pressure to reduce time for new personnel to train and achieve adequate competency levels.

- Lack of qualifications for middle level employees in existing certification programs.

“A highly skilled and robust defense and aerospace workforce is essential...Yet today the industry faces impending retirements and a shortage of trained technical graduates while work and skills requirements become increasingly advanced – a challenging situation forecast to worsen in the next decade.”

Source: Aerospace Industries Association 2016
Global collaborative program for special process personnel qualification in the aerospace industry

Specializes in:
- Body of Knowledge (BoK) development
- Assessment development (written and practical)

Results in:
- Consistent global requirements for training and qualification
- Improvements in personnel capability
- Validation of personnel competency
  - Supports compliance to quality systems requirements (9100 8.5.1.2)
  - Industry recognised special process qualifications supported by Approved Training Providers
Evolution of eQualified

Honeywell
PRI administers Honeywell’s Source Certifying Agent examination program (900+ examinations p/a)

2009

First industry created Bodies of Knowledge (BoK) published (CP & HT)
2013

Transition to Webassessor online examination software completed
2015

Collins Aerospace
• 30 BoKs and 30 exams published
• First practical examination piloted

2017

2012
Agreement secured from aerospace industry leaders to transition to an Industry Managed approach

2013
First industry created Online Assessments launched (HT)

2014

2015
Transition to Webassessor online examination software completed

2016
First Training Organizations approved to meet Body of Knowledge content

2017

2018
Shaping the Aerospace Workforce of the Future
eQualified showcase events:
June 21 2018, London
October 25 2018, Pittsburgh

Composite Repair
Heat Treating
eQuaLearn

ABARIS TRAINING
### An Industry Managed Approach

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<td>AIR NEW ZEALAND</td>
<td>HONEYCOMB HONEYCOMB COMPANY OF AMERICA, INC.</td>
<td>SOLAR ATMOSPHERES</td>
<td>Honeywell</td>
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<td>KLM</td>
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<td>Barnes Aerospace (a business of Barnes Group Inc)</td>
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Logos of various companies such as The Boeing Co., Trescal, BAE Systems, MIL, Lockheed Martin, Raytheon, Honda, Cirrus Aircraft, eQuaLearn, and ACT Advanced Composites Training.
How Does eQualifed Work?

ASSESSMENTS
- Written & practical assessments aligning with BoK content

BOKS
- BoKs (curricula) created by technical experts
  - Operators/Technicians
  - Planners
  - Owners

TRAINING & PREPARATION
- Candidates prepare for assessments
- Approve 3rd Party Training providers – must align with BoK requirements
Structure

**eQualified Management Council**

- **Senior Executives**
- **Responsibilities:**
  - Operational oversight
  - Strategic development

**Bodies of Knowledge Panel**

- **Oversight Responsibilities:**
  - BoK approval
  - Process for Training Provider Approval

- **Technical Experts Responsibilities:**
  - BoK development and maintenance
  - Training Provider Approval

**Examination Panel**

- **Member Only**
- **Oversight Responsibilities:**
  - Assessment validation
  - Appeals

- **Technical Experts (Members)**
- **Responsibilities:**
  - Develop assessments

**BoK Review Boards**
- Brazing (Sub-Team)
- Chemical Processing
- Composite Repair
- Heat Treating
- Welding

**Exam Review Boards**
- Brazing (Sub-Team)
- Chemical Processing
- Composite Repair
- Heat Treating
- Welding
Path to Competency

Candidate

External Training Required?

Yes

eQualified Approved Training Provider

No

eQualified Body of Knowledge

Yes

eQualified Online Theory Assessment

No

Qualified Special Process Personnel

eQualified Practical Assessment
Based on IAQG PCAP 001, industry experts write special process Bodies of Knowledge (BoKs)

Free industry resource available on PRI website

Over 30 published to date

Industry technical experts collaborate to define required:

Knowledge
Skills
Personal Attributes
Experience
Non special process related requirements (e.g. Health & Safety)

Includes applicable international reference documents
Free to Download

eQualified Approved Training Providers

The eQualified program approves courses from Training Providers. Each approved course has been assessed by the appropriate Industry Review Board and is considered to be suitable for candidates who wish to receive training in the content of the applicable eQualified Body of Knowledge. By granting approval, the industry Review Board has judged that courses conducted by Approved Training Providers provide appropriate content for candidates who are preparing to take an eQualified examination.

https://p-r-i.org/professional-development/qualifications/bodies-of-knowledge/
**Body of Knowledge Levels**

**PROCESS OPERATOR/TECHNICIAN**

Understand and perform the hands-on operations of the special process.

**PROCESS PLANNER**

Capable of creating manufacturing processes and interpreting process procedures to conform to customer specification and requirements.

Capable of problem solving and resolving day-to-day issues.

**PROCESS OWNER**

Capable of writing, reviewing and approving processes, procedures and qualifications of Process Operators and Process Planners.

Capable of designing new processes and resolving issues among other levels.
Current Special Processes

**CHEMICAL PROCESSING**
- Anodizing
- Cleaning
- Etch & Etch Inspection
- Painting/Dry Film
- Plating

IN PROGRESS: Conversion Coatings

**HEAT TREATING**
- Aluminum Alloys
- Carbon and Alloy Steel
- Heat Resisting Alloys
- Pyrometry (Calibration and Test)
- Pyrometry (Process)
- Stainless & PH Steel
- Titanium Alloys

**BRAZING**
- Vacuum Furnace
  
IN PROGRESS: Torch Braze

**WELDING**
- Resistance (Spot and Seam)
- Laser

IN PROGRESS: Electron Beam

**COMPOSITE REPAIR**
- General Composite Repair Technician
- Aerospace Composite Bonded Repair Technician

IN PROGRESS: Metal Bond Repair

**COATINGS APPLICATOR**
- NEW: in collaboration with SAE G8 Organic Coatings committee.
## Published Bodies of Knowledge

<table>
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<tr>
<th>BoK List</th>
<th>Chemical Processing</th>
<th>Heat Treatment</th>
<th>Welding</th>
<th>Brazing</th>
<th>Composites</th>
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Planned for Development in 2019:
- Welding: Electron Beam Welding
- Composite Repair: Metal Bonded Repair
- Brazing: Torch Brazing

Correct as of February 2019
Future Special Processes

- Additive Manufacturing
- Calibration
- Coatings
- Composites Manufacturing
- Conventional Machining (CM)
- Electronics
- Materials Testing (MTL)
- Measurement & Inspection
- Metallic Materials Manufacturing (MMM)
- Nonconventional Machining (NM)
- Non Metallic Materials Manufacturing (NMMM)
- Sealants/Elastomers
- Surface Enhancement (SE)
Reviewed by industry technical committee (Review Boards) in a process which includes:

- Review of written training materials for alignment with BoK
- Facilities
- Instructors (knowledge and experience)
- Feedback from learners
- Practical training provisions

There is no charge to Training Providers for approval of their courses.
Industry Aligned Training & Assessments

**Industry Standards and Best Practices**
Selected by industry technical committee for inclusion in BoK
Example: AMS 2750: Pyrometry

**eQualified Bodies of Knowledge**
Collaboratively written and approved by industry technical committee
Example: Heat Treating Body of Knowledge: Pyrometry Process Planner

**Special Process Training**
Created based on the BoK by third party training providers or individual companies
Example: eQuaLearn Introduction to Pyrometry
Company internal pyrometry training program

**Special Process Assessments**
Created based on the BoK by Examination Review Boards
Example: HT Process Planner Theory Assessment
Verification of Knowledge

- **Online**
  - Multi-choice open book written examinations delivered via Webassessor:
    - Secure 24 hr global access
    - Question banks generate random individual Assessments

- **Practical**
  - Pilot recently completed for Composite Repair
  - Plan to expand to other special process areas as required

Successful candidates receive a Certificate of Qualification with 3-5 year validity.
Membership (Paid)

- Secures rights to influence and shape the content of the assessments
- Established to safeguard the integrity of the assessments
  - Enables program to limit access to assessments to only those organizations who have signed agreements to safeguard assessment content

Sponsors:
- Honeywell
- Collins Aerospace
- Rolls-Royce
PARTICIPATE:

Any Organization:
- Strategic development of eQualified through eQualified Management Council
- Contribute to technical content of BoKs Review Boards

Members:
- Review and approve content of Examination/Assessments (Practical and Theory)

IMPLEMENT:
- Download BoKs and utilise them free of charge:
  - Align training courses / assess operators capability
  - Support documentation of job functions and responsibilities
- Achieve Approved Training Provider status (free)
- Utilize the assessments
  - Validate competency of personnel
Where to Find More Information

- **Published BoKs:**
  - www.p-r-i.org/professional-development/qualifications/

- **Online Assessments:**
  - www.eQualified.org

- **eQualified Staff Contacts:**

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<tr>
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<th>Title</th>
<th>Contact Information</th>
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