Considerations for Conversion to Digital Radiography

Hello Guests & Attendees

Blair O'Connell, Senior Quality Manager, Digital Resp. Level III Element Rancho Dominguez

22 Years experience in Nondestructive Testing. 2 Years with Element

Worked for a major Aerospace supplier in Portland OR

RT ASNT Level III, Non Film Level III certification, Rolls Royce, Safran, Pratt & Whitney, and GE

6 years experience in Operation Management (Annual budget responsibility of 28M)

Trained in Lean Manufacturing methodology

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What we do

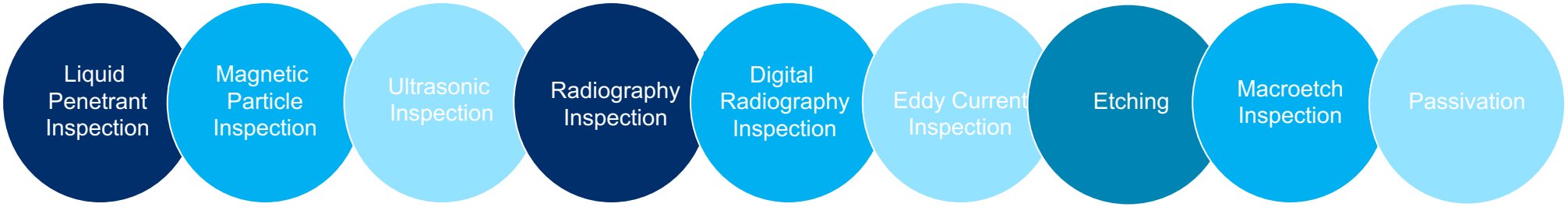
Element provides a comprehensive range of nondestructive testing and etch services on all of the materials, components, systems, structures and engines utilized in most commercial aircraft in service today.

As the largest independent testing company operating in the global Aerospace sector, we support the increasingly complex technical and commercial challenges that our clients face, from R&D to production and in-service.

Our applications include:

Aero structures	Airframe Systems	Engines
▪ Air fuselage	▪ Actuators	▪ Fan blades
▪ Center fuselage	▪ Shock struts	▪ Compressor blades
▪ Nose section	▪ Brakes	▪ Turbine blades
▪ Fasteners	▪ Wheels	▪ Vanes
▪ Fittings	▪ Fuel systems	▪ Cases
▪ Seals	▪ Avionics	▪ Combustors
▪ Wing leading & trailing edge	▪ Pumps	
	▪ Valves	
▪ Slats and flaps	▪ Seals	

Our NDT and Etch Processing services include:



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Discussion disclaimer:

- Presentation is in very general terms.
- The topics discussed are from a casting perspective
- Component material experience is based on Ti to Cobalt based super alloys
- The term “Customer” in this presentation is synonymous with internal (Quality, Engineering, Operations, etc.) and external customers (Suppliers, Manufacturers & Primes)
- Training and Certification section includes NAS 410 perspective
- Procedure design considers aerospace requirements and aerospace customer expectations
- Your results will vary

What we will discuss:

- Should we make the move to Digital
  - Yes this is a “We” decision
  - Include your decision making owners in the process
- Who is our customer base and what is their product
- Which Digital technology do we pursue
- What equipment & software do we choose
  - Understand what is in the Quote and Proposal
- Procedure design, approval, and implementation
- Training & Certification of Personnel
- Monitoring and Long Term Stability

Should we make the move to Digital

- What is our motivation to pursue the addition of this technology
  - Corporate/Management decision
    - Is this for your organizations needs
  - Customer need or expectation
    - How many customers need or will need digital
  - Industry move to digital
    - Will your organization be left behind based on your industries move to digital

Who is your customer base and what is their product?

- What does your businesses customer base look like
- Is the base large enough or varied enough to support a move to digital
- Is there more than one customer who is interested in digital
  - What format CR/DR/CT
  - Is there compatibility between materials to be tested
- How many varied parts will run on digital and what are their volumes
  - What is theoretical capacity
- How many customers are available to share in the cost

Which digital technology do we pursue

- CR/DR/CT
  - CR can be similar to film in terms of process
    - This is a + and –
    - Image Plates should be considered a consumable
    - Image file size can be very large
  - DR can provide superior image quality
    - This too is a + and –
    - Technology can show “too much”
    - Technology can be significantly more expensive if not well thought out
    - Consider expandability in terms of the product to be tested and testing capabilities
  - CT the “all in one” digital method
    - Most expensive but most versatile
    - Significant image storage challenges

What equipment and software should we choose

- Once technology is chosen, who is the right provider
  - Be sure to seek multiple quotes and proposals
  - Be sure to understand what is, and is not, in the proposal
  - Does your customer have a preferred technology provider
    - Are there synergies with your customer that you can take advantage of
- Not all software may be alike
  - Is it intuitive
  - What will training of your workforce be like
  - Think of all of the movements R-click, R-click = $$
- What other services do they provide
  - Training of personnel
  - Ability to be a liaison with your customer base
  - Technique/Procedure design
- Be sure to include your IT team or provider

Procedure design, approval, & implementation

- General enough to cover a large band of technology possibilities
  - Narrow enough to cover specifics required by customers
  - Verify customer specifications that address “special process”
    - Utilize appendices and attachments
  - Submittal and approval process can be time consuming
  - Take time to set process check lists for
    - Output monitoring
    - Long Term Stability

Training & Certification of Personnel

- What will your team be held to
- What training program makes best sense to get the team
- How do you plan your training and certification so it doesn't
  - Limit your current production
  - Remove too many resources at one time
- Pick the right Group “A”
  - They will grow the rest of the team
  - Make sure you are planning for a flexible work force

Output Monitoring and Long Term Stability

- Baseline system monitoring design is key
  - What is your test envelope
    - Super Alloys
    - Titanium
    - Carbon Fiber
    - Ceramics
    - Castings
    - Weldments
- Consideration for phantom or RQI designs
- Key to understanding where you are in terms of control
  - What can go wrong will go wrong
  - Helps to understand the effects of replacing or repairing components
- Understand your customers expectations

What we covered:

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- Procedure design, approval, and implementation
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The certainty of Element

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Questions