National Forum on AM Education & Training

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How are you using (or planning to use) AM in your company?

Engineering

Safety Remediation, Visual Aids, Fit-Checks, Test, Prototype and Production Parts

Manufacturing Aids

Jigs, Fixtures, Molds, Place Holders, Test Equipment

Lean Business

Recognition and Reward, Plant Mapping, Demonstrators, Incentives, Facilities

Our AM applications benefit Engineering, R&D, Materials & Processes, Operations, Intellectual Property, Business Development, HR – we use and offer AM solutions across the business spectrum.

What types of applications show the most promise?

In general, best applications may be those resulting in most economic savings to Boeing or airlines that are our customers, but other benefits are equally valuable, such as safety and ergonomic improvements.

1. **Tooling** – the turnaround to produce jigs, molds, mandrels are the easiest savings to capture.

2. **Fit checks** – change avoidance has far reaching benefit downstream, and is largest use case outside of tooling

3. **Combined assemblies** for production parts/aids – components with any reduction in labor capture savings quickly

How successful are you in recruiting/hiring people with the right AM knowledge, skills, and experience?

We have been successful. AM hires are trained on the job at Boeing. Each successive month sees more new hires with first-hand experience in AM.

How are you (re)training your current workforce for AM? What challenges are you finding in doing this?

Boeing trains on the job, where individuals experienced in AM serve as instructors. We also keep our workforce current regarding AM industry and R&D through participation in:

- Conferences and workshops
- The Boeing Community of Practice
- Formal training with Oak Ridge National Labs
- Hands-on events and tours in our labs
- Demonstrations, competitions and desktop printing

We do not see one ideal AM engineer, but a team educated and trained in AM, composed of professionals specifically trained, and responsible for:

- Design
- Materials engineering
- Fabrication and post-processing
- Part inspection and validation

Primary challenges/concerns include:

- Safety related issues particularly in deployment stages
- Inspection and understanding of *effects of defects* in production
- Strengths of materials. Properties and chemistry
- Keeping the workforce accurately informed and updated on available materials, capabilities and developments as this technology continues to develop rapidly

What is the biggest challenge you face implementing AM in your company? Is it people, training, resources, materials, machines, standards, or something else?

We see the following challenges:

- **People**: educating technicians, engineers, managers, and executives; high school and college students, providing them with design rules, application guides, etc.

- **Materials**: wider choice, larger database for each material (fatigue, high & low temp), lower prices, more suppliers, wider range of property values

- **Machines**: faster, larger, more reliable and accurate

However, users like Boeing can contribute address above challenges by supporting or continuing supporting university and high school projects, working with AM industry, offering internships, and scholarships.