Lean Thinking for Flight: The Long View

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Who Am I?

• Founder and CEO of LEI, 1997-2010.
• Senior Advisor to new CEO John Shook.
• Author, mostly recently of *Gemba Walks*.
• Gemba walker to grasp the situation and learn! (“Go see, ask why, show respect.”)
• Long-time observer ( > 1990) of lean thinking in aerospace by gemba walking.
Who Are You?

• Line managers of processes in a variety of production & maintenance organizations.

• Staff experts in continuous improvement and operational excellence.

• Consultants (out-sourced staff experts) in continuous improvement.
Lean in Aerospace: A Long History

- Training Within Industry in World War II. (Where Toyota got its ideas for standardized work.)
- Rapid development cycles in WWII.
- Forgotten as soon as volumes/projects plummeted after the end of the war.
- Followed by a return to craft practices in operations and development.
Production & Maintenance by 1990

Typical work cycle:

✓ Look for parts.
✓ Look for tools.
✓ Look for prints.
✓ Look for help.

Smart people doing work-arounds to get the job done, eventually..... (vs. job-an-hour with little traveled work in 1944.)
Product & Process Development by 1990

• Development cycles extending for a decade (vs. months for P-51).

• Large fraction of the time consumed in work-arounds for broken processes.
(Re) Introduction of Lean Thinking > 1990

- Value
- Value Stream
- Flow
- Pull
- Perfection

(= “Purpose, process, people”, after a bit of kaizen!)
(Re) Introduction of Lean Thinking > 1990

• First in operations:
  ✓ Parts (e.g., Parker & Aeroquip).
  ✓ Then systems (e.g., Pratt).
  ✓ Then airframes (e.g., Boeing).

• Then in maintenance and repair.

• More recently in product development.

• Never in airline operations?
Where We Are Today

• No “lean” aircraft/network designs.

• Major advances in flight management (UAVs + free flight), but no changes in sight in logic of commercial operations. (Legacy and budget carriers fighting to a standstill with more consolidation.)

• Slow pace of military development outside UAVs, with long, long, long life cycle programs and service lives.
Where We Are Today

• Remarkable safety is a given.

• Industry now focused on cost, cost, cost in an age of high fuel prices and intense competition with a commodity product.

• Surely “lean” can help?
Where Lean Stands Today

- Lots of tools: 5S, visual controls, andon, poka-yoke, kanban, VSM, A3, obeya, yokoten, kaizen, etc., etc.
- Deployed by staff CI groups.
- With….very limited results.
- Consequence: In most of aerospace’s design, production & maintenance, start-to-finish times & costs have barely budged, yet we have knowledge to do vastly better!
What’s the Problem?

• A massive disconnect between tools and management.

• Lean tools need lean management to have much effect.

• Yet “modern” management is the norm in the flight industry.
Modern Vs. Lean Management

• Vertical vs. horizontal.
• Authority vs. responsibility.
• Results vs. process.
• Bosses give answers vs. ask questions.
• Plans vs. experiments.
Modern Vs. Lean Management

• Formal education vs. gemba learning.
• Staffs improve processes vs. line.
• Remote decisions vs. gemba with facts.
• Standardization by staffs vs. line.
• Go fast to go slow vs. go slow to go fast.
The Work of Management

Modern:
• Mostly formal plans & budgeting plus work-arounds for things gone wrong.

Lean:
• Gaining agreement on what’s important.
• Counter-measuring problems.
• Enabling basic stability.
• Creating the next generation of managers.
The Long View

• The future of lean in aerospace – the concern of the Lean Flight Initiative – depends on deploying lean management practices to gain the full benefit of lean tools.

• Many experiments will be needed – in the spirit of PDCA.

• Lean advocates – now mostly mid-level staffs – need to lead not wait!
The Long View

• We can all play a role by sharing our experimental findings and doing Check/Study and Act/Adjust together.

• This is the practical work of the LFI.

• My colleagues at LEI & 16 affiliated lean institutes around the world wish you luck.

• We can’t do the work but we can share our knowledge.