

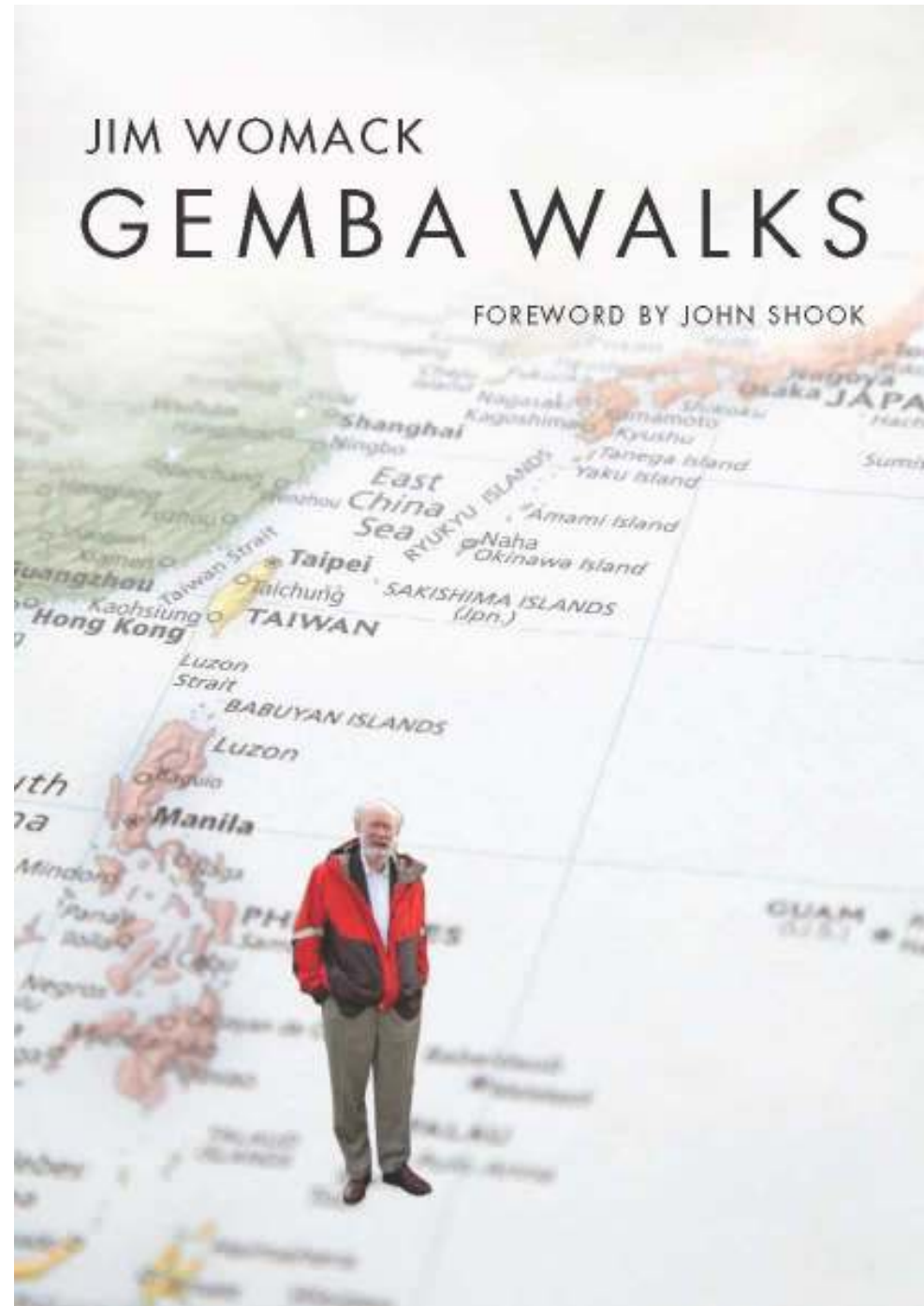
Who Am I?

- 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.

JIM WOMACK

GEMBA WALKS

FOREWORD BY JOHN SHOOK



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.