



Enhancing our Competitive Edge: T&E to Meet the Pace of Need

Rick Baily
Vice President
Boeing Test & Evaluation
October 5, 2016

I was privileged to join you in 2012

What I said then....

- Testing at the Speed of Need is essential
- “Myth-busting” test programs are possible, with the right actions
- We know the secrets to success, but don’t always implement them properly

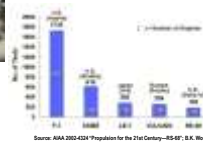



Testing at the Speed of Need
ITEA Annual Symposium

Rick Bailey
Vice President
Engineering & Mission Assurance
Boeing Defense, Space & Security
September 18, 2012

BOEING is a trademark of Boeing Management Company.
Copyright © 2012 Boeing. All rights reserved.

Myth-Busting Testing Programs Can Occur!



Source: AIAA 2012-4247 "Propulsion for the 21st Century—RS-01", S.K. Wood

Where are we going?... Consistent myth-busting execution

Copyright © 2012 Boeing. All rights reserved.

We already know the secrets to success...

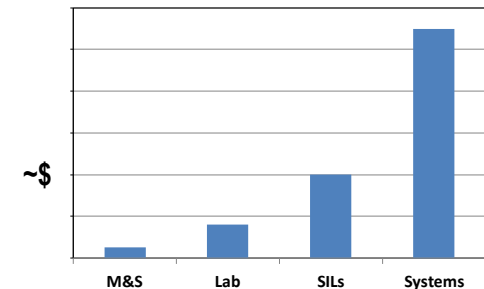
- Early Engagement
- Drive out risk to prevent late discoveries
- Lean & efficient, requirements-based test programs

BOEING is a trademark of Boeing Management Company.
Copyright © 2012 Boeing. All rights reserved.

All seem completely relevant today.....just accentuated even more!

I've learned more since then, leading BT&E

- The “shadow” of product design decisions is, indeed, long – T&E needs to engage to get the decisions right
- T&E must bring a robust “toolkit” to early-engagement system trades
 - “Know-how” is not sufficient
- Digital technologies are a powerful means of “shifting left”, but adoption may be more difficult than you’d think



Whatever my emphasis was before.....multiply it by 5 to 10!

Industrial Manufacturing Sectors, Particularly Automotive, Continue To Provide A Model

- Design modularity/reuse
- Simulation to reduce physical tests^{1,2}
- Design for Producibility³
- End-to-end verification (integrated product life cycle management)⁴

Ref. 1 Wired 4.09.15; Jordan Golson

Ref 2 Automotive News 6.30.16; Stephanie Hernandez McGavin

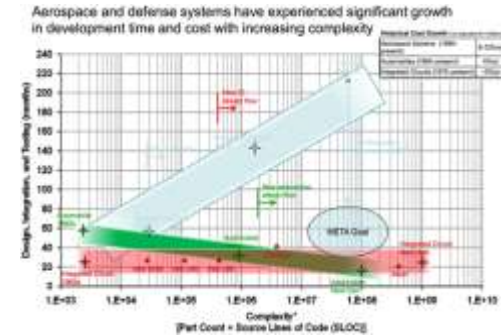
Ref 3 <http://corporate.ford.com/innovation>

Ref 4 BPIR.com 7.30.14

Replication Opportunity For Markets Facing Similar Competitive Pressures

DARPA Is Continuing To Invest To Advance And Transition This Model To Other Industries

- Established the DMDII to extend the Adaptive Vehicle Make (AVM) portfolio into defense and commercial industry
- National resource for U.S. industrial base to increase U.S. competitiveness by accelerating innovation in digital manufacturing
- Focused on developing novel model-based design methodologies, virtual manufacturing tools and sensor- and robotics-based manufacturing networks
- Crossroad of government, industry and academia
- \$12M in grants awarded in May 2016



[Digital Manufacturing and Design Innovation Institute](#)

- <http://www.darpa.mil/news-events/2014-02-05>

Boeing Is Applying Several Elements Of This Model

- Immersive simulation and design environment
- Digital virtualization of test and product equipment
- Integrated V&V planning



Investment Required To Meet The Pace Of Need

Call to Action 2016

2012

- We know the secrets to success
- Actions to overcome barriers are more in our control than we take credit for
- We make the difference in the outcome

2016

- Foundational “secrets” endure; toolkit is rapidly advancing
- Accelerating adoption and pace of change a priority
- Still true – T&E must help lead the change

It's up to us

