

Advancing the Role of DT&E in the Systems Engineering Process:

An Update on the NDIA Systems Engineering Division DT&E Committee

Co-Chair: Dr. George Ka'iliiwai, AFFTC Technical Advisor

Co-Chair: John Lohse, Raytheon

Co-Chair: Tom Wissink, Lockheed Martin

DT&E Background

DT&E needs to be a key component in the effective Systems Engineering process:

- Helps mature a system's design and measure its technical progress
- Provides assistance to program managers during system development lifecycle
- Verifies technical specifications have been met
- Evaluates a system's readiness for OT&E and controlling a system's life cycle cost.

These factors reinforce the need for an industry forum focusing on DT&E!

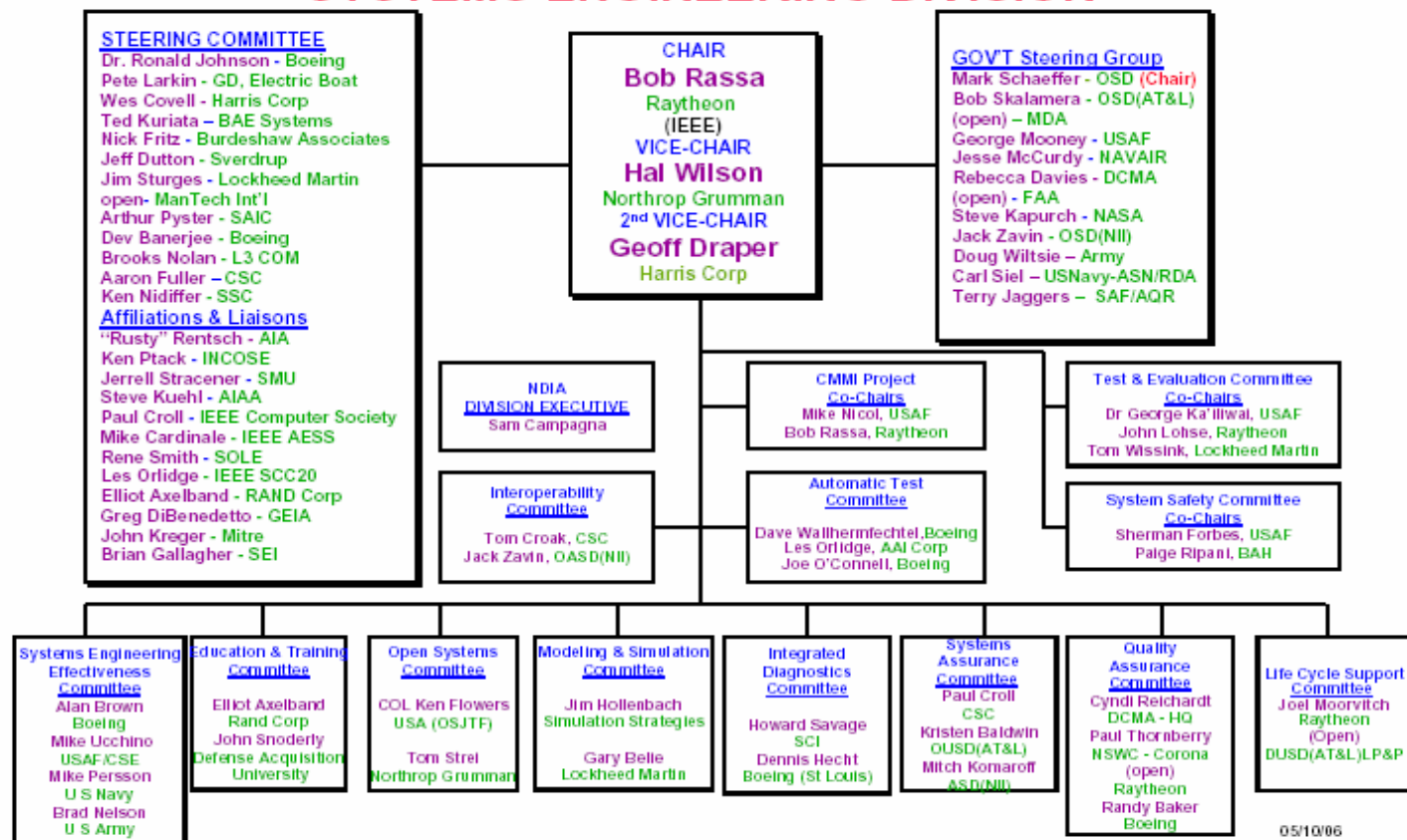
DT&E Committee

Envisioned as a result of the “Summit on the Role of Test & Evaluation in the Systems Engineering Process”

- Held August 2004
- NDIA SED announced creation of committee at the February 2005 meetings
- Initial meetings held to identify core members and develop committee charter
- Hosted a DT&E Panel at the 2006 T&E Conference
- Charter approved in May 2006 by Mr. Mark Schaeffer

NDIA SED Organization

National Defense Industrial Association SYSTEMS ENGINEERING DIVISION



DT&E Committee Mission

“To provide a forum where government, industry, and academia can share lessons learned, promote best practices, address issues, and advocate the role of Developmental Test and Evaluation in the Systems Engineering process. The primary purpose is determining successful strategies for incorporating robust and efficient Development Test and Evaluation methodologies and activities into a program's structure, reflect them in the systems engineering plan, and then executing according to the plan.”

DT&E Committee Key Objectives

- Support Revitalization of Systems Engineering (SE)
- Improve understanding of the relationship between the SE process and DT&E activities:
 - Promote effective DT&E activities as fundamental to the SE process
 - Improve understanding and use of robust and efficient DT&E approaches
 - Improve understanding and use of modeling and simulation in DT&E
 - Identify DT&E activities for Capabilities Based (System of Systems) Acquisition
 - Identify best practices for integrated DT&E programs addressing partnerships among government, industry and academia
 - Identify barriers to effective and efficient DT&E activities
 - Recommend DoD policy and guidance changes to improve DT&E and remove any barriers to effective DT&E

DT&E Committee Key Objectives

- Improve understanding of the relationship between the SE process and DT&E activities: (con't)
 - Address capabilities and requirements for Government, Industry and Academia major Test Facilities
 - Develop recommendations of specific DT&E processes and activities to include in a program Systems Engineering Plan (SEP)
 - Work to improve linkage and relationships between the SEP and the Test and Evaluation Master Plan (TEMP)
 - Promote processes, activities and change intended to improve delivery time and effectiveness of acquired capabilities provided to the warfighter, via a strong partnership and appropriate integration of DT&E and OT&E activities.

Committee Representation

- Organizations represented in DT&E Committee
 - DoD
 - AT&L/DTE, DOTE, DISA,
 - Services
 - Air Force, Navy, Army
 - Laboratories
 - Lawrence Livermore National Labs
 - Industry
 - Boeing, Lockheed Martin, Raytheon, SAIC, CSC
 - Academia
 - DAU

Meetings to Date

- Committee Kickoff Meeting, August 22 2006
 - Created list of DT&E Issues
- Committee Meeting, October 23, 2006
 - Discussed committee involvement in NDIA T&E Division Conference in March 2007
 - Accepted OSD Tasker on providing input for Defense Acquisition Guide revision regarding DT&E best practices

DT&E Areas of Concern

- Relationship between SE and DT&E organizations and process? What is the right balance?
- How do we move operational testing elements earlier into the development process?
- How to integrate the Test & Evaluation attributes through-out the development life cycle.
- How do we reduce cost and become more efficient at completing the development cycle including test?
- Understand the overlap between certification and DT&E.

Key DT&E Initiatives

- Need to focus on the systems engineering process for DT&E
- Combining DT and OT
- How to quickly field technology
- Issues related to software testing and software quality, as well as how they relate to software assurance.
- Test Engineering training and education in Academia and the public/private sector
- Test automation tools and techniques
- How does acquisition affect testing
- Etc...

List of DT&E Issues

1. T&E shows up too late to influence designs
2. Do T&E in an integrated environment (throughout the lifecycle)
3. Certification vs. T&E
4. T&E is a tool to support the design environment
5. Ensure Funding profiles allow for early T&E involvement (and throughout the lifecycle)
 - Government needs real cost/schedule numbers to help develop a successful funding profile for it's acquisition programs. Success could be defined by a shorter development cycle a successful OT and transition to production.
6. Sustainability - understand it and help ensure it as part of DT&E (before OT&E)
 - Sustainability is becoming a Pentagon hot button
7. What is the optimal mix of test resources by lifecycle phase (how to contract for the right balance of resources)
 - How do we balance the test resources/facilities across CT/DT/OT activities
 - How do we define in contract terms use of Government facilities and/or Government use of Contractor facilities.
 - How does the Government contract account for the right balance of testing resources and facilities?

List of DT&E Issues

8. Industry Perspective on Testing innovations/techniques
 - Government use/understanding of innovative contractor test techniques
9. Better use of field data to reduce testing and test costs
 - Use of fielded system data to support acquisition decisions?
 - Embedded instrumentation
10. Clarification of the definition of DT&E (should be used to improve the product)
11. What are the roles that make up DT&E
12. How do we integrate the T&E roles with the SE roles better
13. Test automation tools and techniques
14. Improve the acquisition process to more appropriately involve T&E
 - Test Strategy and TEMP's are government documents which like the requirements documents are not mature during the acquisition process. How could we fix this?
15. Intersections of SW/System Assurance, SE, M&S and T&E committees

Additional Comments

- Committee missing Key people to develop an Action list
 - Army T&E
 - Air Force T&E
 - MDA
 - DISA
 - Agency T&E leads
 - How do we get the right people involved?
- DAU comment - PM course teaches PMs the value of test. However in practice other competing priorities continue to push testing resources to the right.

DT&E Committee Future

- Path Forward
 - Conduct regularly scheduled committee meetings in conjunction with the SED meetings
 - Increase DT&E awareness in the SE community by conducting and participating in workshops, conferences, and forums
 - Increase participation in the NDIA Systems Engineering Conference
 - Support the NDIA Test & Evaluation Division Annual Conference
 - Increase DT&E awareness to other SED Committees
 - Actively work the DT&E Committee objectives throughout the year to provide timely feedback to the SED for action

DT&E Committee Future

- Next Meeting is tentatively the week of December 10th in Washington area
 - Feb 2007 – DT&E Committee meeting in conjunction with SE division meeting
- Systems Engineering Conference
 - October 23 to 26, 2006 at the Hyatt Islandia, San Diego, CA
 - Test & Evaluation in Systems Engineering Track held Tuesday afternoon, October 24 and Wednesday morning, October 25
 - A total of 8 presentations to be made
- March 2007 – Support NDIA T&E Conference in Hilton Head, S.C.

- Perspectives of DT&E IN Systems Engineering
 - Future committee meetings will invite OSD, Services, Industry, and Academia to present their perspectives on DT&E in Systems Engineering and the issues they face
- Winter Activities
 - Discussion on committee activities between the Systems Engineering Conference in October and the next Systems Engineering Division meeting in February 2007