Developmental Test and Evaluation Committee
Results and Activities

Beth Wilson, Raytheon
Steve Scukanec, Northrop Grumman
Industry Co-Chairs

October 2013
DT&E Committee Current Structure
Since 2010

NDIA Systems Engineering Division

NDIA Test and Evaluation Division

NDIA DT&E Committee

- SED Committee Collaborative Projects
- T&E Themes For Conferences
- Project Results DT&E Themes
- T&E Themes & Issues
- NDIA Systems Engineering Conference (Q4) Collaborative Projects
- NDIA Test and Evaluation Annual Conference (Q1) Periodic T&E Committee-Focused Conferences Cooperation with other NDIA Divisions

DT&E Committee Focus: T&E initiatives aligned with SE, DT&E
## Summary of DT&E Committee Test and Evaluation Efforts

<table>
<thead>
<tr>
<th>DT&amp;E Committee</th>
<th>Topic</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DoD T&amp;E Policy Study</td>
<td>2006 – 2008: Workshops and Study Report Improving T&amp;E in the DoD Acquisition Process</td>
</tr>
<tr>
<td></td>
<td>Integrated Testing</td>
<td>2008 – 2010: Integrated Test Study NDIA presentations and tutorial ITEA journal article</td>
</tr>
<tr>
<td></td>
<td>RFP Language for T&amp;E</td>
<td>2010 – 2011: Comments for Update to OSD Guide Incorporating T&amp;E into DoD Acquisition Contracts</td>
</tr>
<tr>
<td></td>
<td>Cyber Testing</td>
<td>2013: Industry recommendations for cyber testing</td>
</tr>
<tr>
<td></td>
<td>Chief Developmental Tester</td>
<td>2013: Industry interaction with new role</td>
</tr>
</tbody>
</table>

**Completed** | **Current**
## Summary of DT&E Committee Systems Engineering Efforts

<table>
<thead>
<tr>
<th>SED Committee</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Software</strong></td>
<td>2009: SW T&amp;E Summit Recommendations</td>
</tr>
<tr>
<td><strong>Modeling and Simulation</strong></td>
<td>2011: Effective Use of Modeling and Simulation for T&amp;E</td>
</tr>
<tr>
<td></td>
<td>2012: Distributed Model-Based Testing</td>
</tr>
<tr>
<td></td>
<td>Future: T&amp;E Perspective for Modeling and Simulation products</td>
</tr>
<tr>
<td><strong>Performance Measurement</strong></td>
<td>2012: Leading Indicators for T&amp;E workshop</td>
</tr>
<tr>
<td></td>
<td>2013: Requirements Verification leading indicators report</td>
</tr>
<tr>
<td><strong>Architecture</strong></td>
<td>Future: T&amp;E Perspective for Architecture views</td>
</tr>
</tbody>
</table>
DT&E Committee 2013
Statistical Test Optimization

<table>
<thead>
<tr>
<th>Activity</th>
<th>Plans for 2013</th>
<th>Status/Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Test and Analysis Techniques STAT for T&amp;E</td>
<td>Examples of effective use of statistical approaches for test optimization (including DOE) for an implementation framework</td>
<td>White paper complete SE Conference track: 2012 and 2013 Working additional publications, MORS conference Nov 2013</td>
</tr>
</tbody>
</table>

2012 SE Conference summit/workshop thread
- Tutorials on Monday 10/22
- Presentations on Wednesday 10/24
- Synthesis Panel on Wednesday 10/24

Follow-on Results:
- DT&E Committee white paper (complete)
- National Defense Magazine
- ITEA Journal
- CrossTalk

NDIA SE Conference
October 2013
DT&E Committee 2013
Leading Indicator Metrics

<table>
<thead>
<tr>
<th>Activity</th>
<th>Plans for 2013</th>
<th>Status/Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrics (with Performance Measurement WG)</td>
<td>Provide more information on leading indicators for T&amp;E</td>
<td>Draft report Presenting results at SE conference</td>
</tr>
</tbody>
</table>

2012 SE Conference workshop
- Follow-on workshop with System Performance Measurement WG
- Focused on Requirements Verification not addressed in first report

Potential Measures Identified:
- System Maturity Level
- Verification Requirement Maturity
- Technical Measures and Stakeholder Need
## DT&E Committee 2013 Cyber Testing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Plans for 2013</th>
<th>Status/Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyber Testing</td>
<td>Review what industry does for cyber testing, expand focus to include interoperability</td>
<td>Recommendations for Cyber Testing guidelines</td>
</tr>
</tbody>
</table>

### Guidelines for Cybersecurity DT&E

**1. Purpose.** These guidelines provide the means for DASD(DT&E) staff specialists to engage and assist acquisition program Chief Developmental Testers and Lead DT&E Organizations in... (continue reading on the next page)

### New Project: Participants Welcome!
## DT&E Committee 2013

### Chief Developmental Tester

<table>
<thead>
<tr>
<th>Activity</th>
<th>Plans for 2013</th>
<th>Status/Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Developmental Tester</td>
<td>Review service policies for new role and industry implementations</td>
<td>Propose model for industry interaction White paper T&amp;E/SE conference presentations</td>
</tr>
</tbody>
</table>

The Secretary of Defense shall require that each major defense acquisition program be supported by—

“(A) a chief developmental tester; and

“(B) a governmental test agency, serving as lead developmental test and evaluation organization for the program.

Coordinating DT&E activities
Insight into Contractor activities
Oversee T&E activities
Inform government PM about contractor DT&E results

New Project: Participants Welcome!
Summary

• DT&E Committee Alignment
  • Test and Evaluation Division
  • Systems Engineering Division

• DT&E Presence at SE Conference
  • Tutorials
  • DT&E Track
  • Statistical Test Optimization Track
  • Joint DT&E and SoS Track
  • Net-Centric Operations/Interoperability Track

• Current Projects – Participation Welcome!
  • New: Cyber Testing Guidelines
  • New: Chief Developmental Tester
  • Future: T&E as a stakeholder for modeling efforts
NDIA DT&E Committee
Summary of Accomplishments

2006 – 2012
DT&E Committee Current Structure
Since 2010

OSD SE
- Issues Identified
  - White Papers

NDIA Systems Engineering Division
- SED Committee Collaborative Projects
- NDIA DT&E Committee
  - Project Results DT&E Themes

NDIA Test and Evaluation Division
- T&E Themes For Conferences
- NDIA Industrial Committee on Test and Evaluation (ICOTE)
  - T&E Themes & Issues

OSD DT&E
- Discussion
  - White Papers, Journal Articles & Workshops

NDIA Systems Engineering Conference (Q4), Collaborative Projects
NDIA Test and Evaluation Annual Conference (Q1), Periodic T&E Committee-Focused Conferences, Cooperation with other NDIA Divisions

DT&E Committee Focus: T&E initiatives aligned with SE, DT&E
DoD T&E Policy Study

August 2006: DT&E Committee Kickoff

Policy Study:
“Improving T&E in the DoD Acquisition Process”
Industry T&E policy recommendations

Workshops:
August 2007
January 2008

Focus Areas:
1. Earlier contractor and tester involvement
2. Integrated DT/OT and DT operational relevance
3. Suitability

April 2008: Report Summarized Results:
10 Findings
15 Recommendations

2006-2008
NDIA SE Conference
October 2013
Integrated Testing (CT/DT/OT)
Implementation Framework
# Software Test and Evaluation
## Software Summit

### Announcing:
**SOFTWARE TEST SUMMIT/WORKSHOP**

Presented by the DT&E Committee & Software Expert Panel of the NDIA Systems Engineering Division

| SEPTEMBER 15-17, 2009 | NDIA.org/SoftwareTest |

**CONFIRMED SPEAKERS**
- Mr. Hong Niem, LGIS
- Mr. Rick Slack, SDD/S
- Mr. Adam Holcomb, Boeing
- Dr. Cohn Konac, Florida Institute of Technology
- Military and civilian Test Representatives Panel

**2009**

<table>
<thead>
<tr>
<th>RFP Language</th>
<th>How Much Testing is Enough?</th>
<th>Lifecycle and End-to-End Software T&amp;E</th>
<th>Changing Paradigms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training &amp; Competency Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy, Guidance, and Standards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools, Automation, Methodologies, Process</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Software Test & Evaluation

**Summit/Workshop Results**

**Issues & Recommendations White Paper**

Joint Authorship of the NDIA System Engineering Division’s Software Industry Experts Panel and the Developmental Test & Evaluation Committee

Submitted: December 14, 2009

NDIA SE Conference
October 2013
## Industry Comments for Update: Incorporating Test and Evaluation Into Department of Defense Acquisition Contracts

### Recommendations from SW Summit

**Software Test & Evaluation Summit/Workshop Results**

**Issues & Recommendations White Paper**

Joint Authorization of the NDIA System Engineering Division's Software Industry Experts Panel and the Developmental Test & Evaluation Committee

Submitted: December 14, 2009
Test and Evaluation for Systems of Systems

2009: “Sleepless Nights”
List of Issues

2010: Workshop

2010: “Sominex”
Resulting Initiatives

2011: Best Practices
Wave Model

2012: Final Report
Effective Use of Modeling and Simulation for Test and Evaluation

Joint Meeting in August 2011

- Distributed Testing, the Joint Mission Environment Test Capability (JMETC) and the Test and Training Enabling Architecture (TENA)
- DoD M&S Community of Interest Data Management Working Group
- LVC Architecture Roadmap Implementation (LVCAR-I) Gateways Effort Applicability to T&E
- OSD T&E Working Group
- Raytheon Presentation on M&S for T&E
- Potential Topics for November AMSWG Meeting
Modeling & Simulation Collaboration
Distributed Testing

Benefits:
• Find integration issues earlier
• Test to learn in ‘safe’ environment
• Protect proprietary information
• Facilitate DT to OT transition
• Increase performance testing range in operating environments
• Support end to end studies throughout the program

Barriers:
• Security
• Lack of persistent network
• Early consideration of technical issues
• Perceived value
• Disconnect between the communities (M&S and T&E)

Recommendations:
• Harmonize the standards for M&S and Test for the life cycle perspective (HLA, TENA, Metadata)
• Create a framework for reusing and repurposing M&S through the product model
• Establish M&S as part of statistical test design
  • Determine what tests are conducted to acquire data for model validation.
  • Fewer test events with better models.
• Recommend the use of M&S to do I&T
• Recommend establishment of JMETC as a persistent node for industry to engage in MBDI&T

MBDIT Workshop Results

- Current State
  - Pockets of best practice utilize model based distributed integration and test
  - End to End Distributed Development Systems (various services)
  - Simulation Frameworks (various programs)
  - JMETC (various demonstrations)
- Use of MBDI&T is typically the exception not the rule

Captured Discussion Results
Inputs for NDIA DT&E/R&I&S meeting following week

Joint Meeting
August 2012

Joint Track
SE Conference October 2012
Metrics Collaboration
Leading Indicators for T&E

Workshop October 22, 2012

Table 1. Information Needs

<table>
<thead>
<tr>
<th>Highest Priority Information Needs</th>
<th>Other Information Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>(drivers for measures considered by breakout teams)</td>
<td>(not considered by breakout teams)</td>
</tr>
<tr>
<td>• Requirements</td>
<td>• Testability</td>
</tr>
<tr>
<td>• Interfaces</td>
<td>• Defects and Errors</td>
</tr>
<tr>
<td>• Architecture</td>
<td>• System Assurance</td>
</tr>
<tr>
<td>• Cost</td>
<td>• Process Compliance</td>
</tr>
<tr>
<td>• Schedule</td>
<td>• Work Product Progress</td>
</tr>
<tr>
<td>• Performance</td>
<td>• Facilities and Equipment</td>
</tr>
<tr>
<td>• Reliability</td>
<td>• Change Backlog</td>
</tr>
<tr>
<td>• Maintainability</td>
<td>• Review Action Item Closure</td>
</tr>
</tbody>
</table>

Follow-on workshop with System Performance Measurement WG
Focused on other information needs not addressed in first report


NDIA SE Conference
October 2013