

Domestic Nuclear Detection Office (DNDO)

31st Annual International Test and Evaluation Symposium

Maximizing Testing Efficiency

Kenneth Maddox

Deputy Assistant Director for T&E
Systems Engineering and Evaluation Directorate

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Homeland
Security

DNDO Mission and Roles

The U.S. Department of Homeland Security (DHS) Domestic Nuclear Detection Office (DNDO) is tasked to improve the United States' capability to detect and report unauthorized attempts to import, possess, store, develop, transport, or use nuclear and other radioactive materials in the United States, and to further enhance this capability over time.

The Systems Engineering and Evaluation Directorate (SEED) within DNDO acts as the primary testing agent for DNDO programs. The T&E division of SEED is the primary T&E organization responsible for ensuring that the technical and operational requirements are evaluated by performing rigorous T&E of DNDO-mission related technologies as they are developed, deployed and implemented.

Typical Challenges

- **Testing in a commercial first environment**
 - Office of Procurement Operations Challenges (Request for Information, Request for Proposal...)
 - Black Box testing (Unknown Trade Space)
 - ANSI Standards, Mil Stds, verses ORD Requirements
- **Poor requirements (that are finalized at the last minute)**
 - How do you validate requirements?
 - Are the requirements “Testable”?
 - Requirements Creep (linkage to the ORD & MNS?)
- **Program schedule driven timelines vs event driven timelines**
 - Program Management Office Priorities (Schedule, Cost, Performance)
 - Unrealistic Schedules (Testing through Reporting)

T&E Best Practices

Disciplined, Codified Practice DNDO Operating Instruction -1

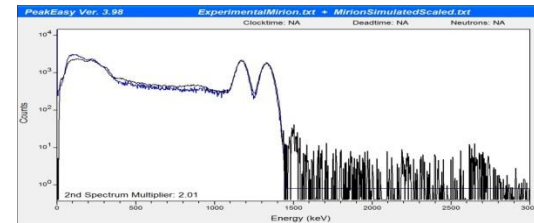
Road Map to Successful T&E:

- Review Process (Milestones)
- Test Planning
- Test Execution
- Analysis
- Reporting



Optimized Test Design using Modeling and Design Of Experiments:

- Predictive Modeling
- Verify sample size
- Determine influence of variables



Normalization of Tests

Provide an accurate characterization of:

- Test Environment
- Detector Response Functions
- Detector behavior.



Knowledge Management

Applying Data Reuse:

- Test and Evaluation Data Archive Repository (TEDAR)
- Lexicon (Naming Convention)
- Manifest (Ordered Data Format)



Automated Data Collection

The DNDO Automated data collection systems provide test data that is:

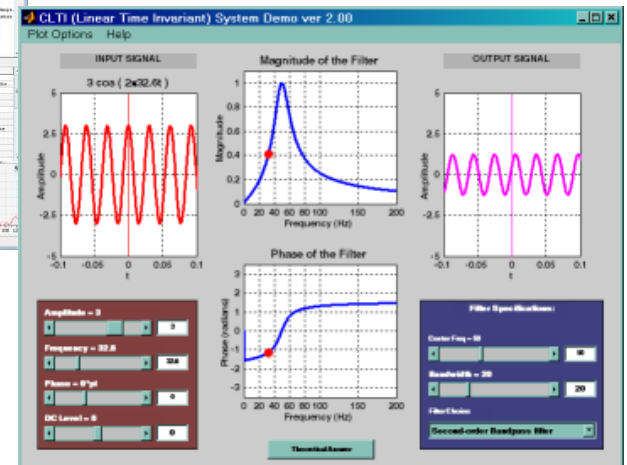
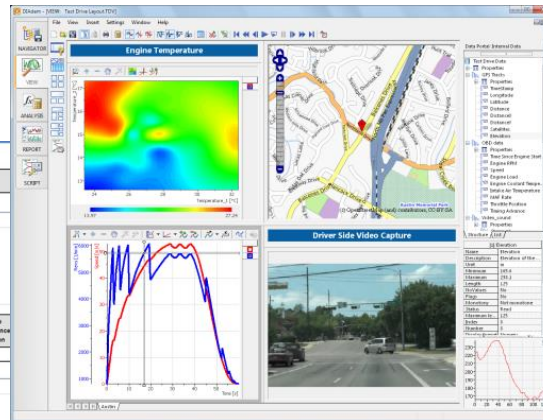
Defensible	Accurate	Repeatable	Efficient	Controlling
Verification & Validation	Quick Response	Quick Reports	Reduced Footprint	Requirements traceability



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Optimized Data Analysis through Visualization

- Data visualization has become an invaluable tool for data analysis because it has allowed the following:
 - Near real time visualization of collected test data
 - Use visualization tools to trace requirements
 - Provide standard graphs, tables, and charts on site to expedite reporting



T&E Road Map



- Modeling and Design of Experiments

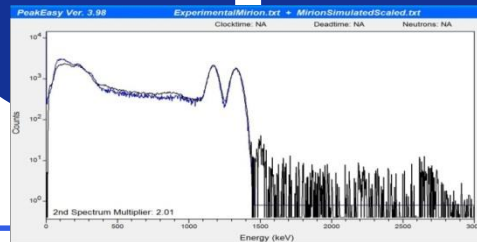
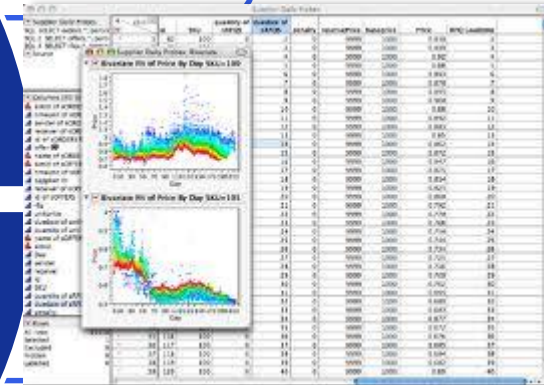
- Automated Data Collection



- Test and Evaluation Data Archive Repository



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- Data Visualization



AT THE END OF THE TEST DAY, IT IS ALL ABOUT THE DATA!