How Do You Evaluate the Performance of the Network?

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Technical Director, Army Evaluation Center
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ATEC Mission

Plan, conduct, and report the results of tests, simulations, experiments, and evaluations to decision makers in order to ensure our Army’s Warfighters have the right capabilities for success across the entire spectrum of operations.

Conduct rapid testing in direct support of the OCO Warfighter in order to provide capabilities and limitations of untested weapon systems issued directly to Soldiers conducting combat operations.
How We Fit

Independent Reporting
Mandated by US Code, OMB, and OSD

Legend
- T&E Policy, Funding, or Oversight
- Independent Reporting

Army Test and Evaluation Command
MG Dellarocco

Secretary of Defense

Director, OTE

Assistant Secretary of Defense (AT&L), Director Defense Systems/DD Developmental T&E

Under Secretary of Defense

DUSA

Secretary of the Army

TEO (T&E Executive)

Chief of Staff

Vice Chief of Staff

Army Test and Evaluation Command

Army Evaluation Center
BG Regan

Operational Test Command
COL(P) Richardson

ATC

DPG

WP

• CRTC
• TRTC
• YTC

WIN-T

Mine Resistant Ambush Protected (MRAP)

Stryker ICV

Under Secretary of Defense (AT&L), Director Defense Systems/DD Developmental T&E

MTA

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Battle Ready
ATEC - Understand Who We Are

- **Full Spectrum Testing**
  - Only test organization in DoD to encompass all phases of testing; developmental, operational & evaluation

- **Major Contributor to Army / Joint Acquisition**
  - Testing and Evaluating over 500 major systems annually
  - 1100 test events working daily
  - ATEC Forward – Forward Operational Assessment Teams in Iraq & Afghanistan

- **Large, complex organization**
  - Direct reporting agency
  - ~9,800 personnel (72 Ph.D.s) (29 Colonels)
  - 26 Locations, 17 States, Operating on 5.5 million acres (1/3 Army’s Land mass), Army’s only nuclear reactor
  - Competitive, efficient, operationally-focused, mostly reimbursable
  - $5.1 Billion capital investment in facilities/instrumentation

Testing everything from Rifles ….to National Missile Defense
Products We Produce

PLAN

WARFIGHT

USED FOR FIELDING RECOMMENDATIONS

AEC

System Evaluation Plan

TEMP Input

Capabilities & Limitations Report

OTA Assessment Report
OTA Milestone Assessment Report
OTA Evaluation Report
OTA Follow-on Report
System Analysis Report

OTC

OTA-Test Plan

Forward Operational Assessment Report

Safety Release
Safety Confirmation
Major Questions We Answer

Does it Work?

Is it Safe?

...How Do I Know?

EFFECTIVE

SUITABLE

SURVIVABLE
Major Questions We Answer

Does it Work?
Is it Safe?
...How Do I Know?

...and is it INTEROPERABLE?
What is a System of Systems?

Definition: a set or arrangement of systems that results when independent and useful systems are integrated into a larger system that delivers unique capabilities

*(DoD Defense Acquisition Guidebook (DAG) [2008]*)
Army Interoperability Organizations

OSD LEVEL

Secretary of Defense
- DDT&E
- DOT&E
- USD(AT&L)
- ASD(NII)
- DISA
- JITC

HQDA LEVEL

Secretary of the Army
- DUSA
- T&E Executive
- CoS Army / Vice CoS Army
  - DCS, G-2 Intelligence
  - DCS, G-3/5/7 Operations
  - ASA(ALT) / AAE
    - D-SOSE
    - SOS-I
  - PEOs PMs
    - CIO/G-6 Information Management
    - DCS, G-8 Resource Management

COMMAND LEVEL

AMC
- RDECOM
- CECOM
- CERDEC
- CSTF
- SEC

ATEC
- AEC
- OTC
- EPG
- WSTC
- ATC
  - RTC
  - WDTC
  - CRTC
  - TRTC
  - YTC

TRADOC
- ARCIC
- BMC

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Putting It Into Perspective

DEFINE & DEVELOP: R-8 to R-6

STEP 1
Understand Operational Capabilities
Identity Operational Conditions
Begin T&E Issue & Measure Development

STEP 2
Prioritize Capability Requirement

RO: ACCOUNT FOR CHANGE ENVIRONMENT
(Identify New Technology, CHUWEJU, Force Sizing)

Conduct Initial Risk Analysis
ATEC support of SOSE Technical Maturity Assessment
Review Operational Analysis Results
Understood Operational Effects Through Operational Analysis (M&S)

STEP 3
Select Capability Set COA
LW/G OOS

STEP 4
Focus on Capability Segments
Develop Test Cases ICW All Analytic / T&E Agencies

“Capability Set Life-Cycle”

Select Capability Set COA
LW/G OOS

STEP 5
“80% Solution”
Near Term Trades
“Good Idea” Cut Off

STEP 6
“NO Initiative”

CDD

STEP 7
Synch Capability Set
Synched w ARFORGEN

STEP 8
Approve Final Capability Set

OPF Development
Army Sourcing Conference
Army Equipping Conference

STEP 9
ARFORGEN Reset Schedule

STEP 10
BCTIE Anomaly Exercise

Current Baseline Network Capabilities
Enter Process

Phase I: Solicit Technology Candidates
(CIO/G6, PEQI, ASA(ALT), RDECOM, PMO, Non-PMO, Government, Industry & Academia)

Phase II: Technology Viability Review
(RDECOM, PEQI, PMO, G6, G8)

Phase III: Cooperative Technology Maturity and Integration CRADA
(RDECOM, PEQI, PMO, ATEC)

Phase IV: Integrated Technology Candidates
(PEQI, PMO, TRADOC, G3/5/7, ATEC)
(Across DODMLP)

PRO Integrated Technology Candidates

Network Summit

DP1

Proven Technology

Future Technology Transfer (PMO’s)

Capability Gain in POR Baseline

Enhanced Baseline Network Capabilities

Approx. 6 months

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Network Integration Evaluation (NIE)

What is the NIE?

… a series of semi-annual evaluations designed to integrate and mature the Army’s tactical network by placing a large number of emerging systems with Soldiers in operational scenarios.

What will NIE allow us to do? – Demonstrate Interoperability Early

… develop a single battlefield network able to push information to our Soldiers and link them to command posts, vehicles on-the-move and higher headquarters.

It’s a new way of doing business –
a fundamental change in how we deliver capabilities to our Soldiers
ATEC & NIE

Cooperative Effort:
Brigade Modernization Command
Director System of Systems Integration
Army Test and Evaluation Command

Network Evaluation TRIAD

Test Lead

Analysis Lead

Critical Support and Infrastructure
System of Systems: Test as We Fight

From: Platform Centric Testing…

To: A Network Integration Event
- Entire Brigade in the field
- Located at Ft. Bliss and WSMR
- Testing the Material along with the entire DOTMLPF

THIS IS NOT EASY!!
Example: WIN-T IOT

ATC overall responsible

Harvest Script

Harvested BLOBs

Quick Look

Pcap/Cap file Generator

Level 4 Report Generator

DataBase Translation

Level 3/4 Reports

Packet files

External "Custom" Database

Data Products/Deliverables

IHR BIR

AEC responsibility To Evaluate

Instrumented Network / CI data

Instrumented Network / SNMP / NMS data

Web WIN-T

Message / Packet Parser and Database Loader

ATC Parser Generated Data Model (PGDM)

1TB Every 12 Hours!

Manual Observation / Survey / Interview data

15

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NIE Evaluation roles

ATEC dotMlpf
- Focused on ability of materiel to meet user mission requirements
- Evaluate materiel performance criteria
- Assess materiel capability to meet and sustain operations during mission execution
- Evaluate Materiel effectiveness, suitability and survivability
- Provide Evaluation to Materiel Decision Authority

BMC DOTmLPF
- Focused on the ability to execute and sustain operations once deployed
- Establish criteria for mission success
- Assess mission success and identify Gaps and areas for improvement.
- Identify changes or capability gaps that can not be readily corrected (Analysis of Alternatives)
- Initiate changes as appropriate

TRADOC’s DOTLPF analysis should determine capability gaps which drive “M” solutions
Products From NIE

- Individual Reports
- Integrated Network Assessment
- DOTMLPF Assessments
- Product Recommendations
Alignment with Agile Process

Continuous Development, SoS Integration, Test, Certification

Virtual Development, SoS Integration & Test Environment

Gaps Identified
Sources Solicited

Continuous Cycle in Phases 0-I

Phase 0
Define Near Term Requirements
Lead: TRADOC

Phase I
Solicit Potential Solutions
Lead: ASA(ALT)

Phase II
Candidate Assessment
Lead: ASA(ALT)

Phase III
Evaluation Preparation
Lead: BMC/ATEC

Phase IV
NIR (BCTIE)
Lead: ASA(ALT)/ATEC

Phase V
NIE (INBE)
Lead: BMC/ATEC

Phase VI
Network Implementation Plan
Lead: ARSTAF
Efficiencies
Agile Process - NIE

• Combined Venue for T&E, Acquisition and Doctrine
  – Streamlines Evaluation
  – Direct User Feedback

• Enabled Concurrent Conduct of Formal Tests of Programs of Record
  – NIE 11.2 - PM Savings of $5.7M
  – NIE 12.1 – PM Savings of $2.0M

• JTRS Rifleman Radio OT in desert, urban and foliage in a single event

• Reduced the Impact on FORSCOM Units Tasked to support OT

Continue to Find Efficiencies
NIE 12.1 Evaluation

Lessons Learned in 11.2 Employed in 12.1

• ATEC SUE/SUT evaluators were integral part of at NIE 12.1 team during NET, OC Academy, and entire exercise
  – Boots on ground perspective enhanced expertise and skill set
  – Teamed with BMC, OTC and DOT&E counterparts to reduce impact on 2/1 AD, create synergies, and reduce/eliminate redundancy (ATEC focus: materiel evaluation)
  – Used existing evaluators (AST chairs) to eliminate redundancy /leverage expertise on program under evaluation
  – Directors/Division Chief visits to enhance expertise

• Capabilities enhanced/cost avoided with reach-back analysis to APG (RAM, etc)

• Coordinated common database access and Soldier survey plan to eliminate redundancy and enhance data availability
## 12.1 NIE LSS Strategic Projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Problem</th>
<th>Goal</th>
<th>Lead</th>
<th>Support</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce ATEC Personnel</td>
<td>There were 711 personnel on the ground to support 12.1 NIE</td>
<td>Optimize personnel requirements to support NIEs</td>
<td>ATEC G2/3/7</td>
<td>WSMR, OTC, AEC</td>
<td>13.1</td>
</tr>
<tr>
<td>Reduce Costs of Common Instrumentation</td>
<td>Instrumentation is a large cost driver, but only accounts for a small % of data</td>
<td>Create a process to define instrumentation requirements, identify how much instrumentation comes to WSMR and identify a common solution</td>
<td>ATEC TD</td>
<td>WSMR, OTC, AEC</td>
<td>13.1 &amp; 13.2</td>
</tr>
<tr>
<td>Improve Effectiveness of TEMP Reviews</td>
<td>Six month planning cycle for NIEs makes it difficult to properly plan</td>
<td>Optimize current planning process to drill down plan prior to NIE</td>
<td>AEC</td>
<td>OTC</td>
<td>13.1</td>
</tr>
<tr>
<td>Improve the SUE Test Support Team Process</td>
<td>During 12.1 NIE many SUEs went across the BN. Test Support Teams were not synchronized and added confusion.</td>
<td>Create a process to sync test support teams across BMC (ID requirements, roles and responsibilities)</td>
<td>ATEC</td>
<td>ATEC</td>
<td>TBD</td>
</tr>
<tr>
<td>Reduce the Costs of NIE Data Management Process</td>
<td>There were 156 data management personnel on the ground to support 12.1 NIE</td>
<td>Reduce personnel on the ground by 50%</td>
<td>OTC</td>
<td>WSMR, AEC</td>
<td>13.1</td>
</tr>
<tr>
<td>Military Data Collectors</td>
<td></td>
<td>JDI - leverage soldiers to collect data</td>
<td>OTC</td>
<td></td>
<td>12.2 &amp; 13.1</td>
</tr>
<tr>
<td>Consolidate ATEC Contracting Requirements</td>
<td></td>
<td>Will tie elements identified during 12.1 into current contracting project</td>
<td>ATEC TD</td>
<td></td>
<td>13.1 &amp; 13.2</td>
</tr>
</tbody>
</table>
Instrumentation / RAM Data Collection
Opportunities at NIE

• NIE Instrumentation priorities established by TRIAD in coordination with G3/5/7
  – All SUTs instrumented at NIE
  – Top priority SUEs instrumented, but most SUEs and other programs are not instrumented due to instrumentation and resource constraints
  – Non-instrumented SUE evaluations, leverage structured Soldier/leader feedback, trouble ticket system, and other non-NIE sources for assessment data

• Non-SUE: Entire BCT in field for NIE: provides potential opportunity for additional RAM data collection for other Programs of Record
  – Would require additional instrumentation investments
  – PM would have to fund
LSS Report Initiatives

**PLAN**
- System Evaluation Plan
- TEMP Input

**WARFIGHT**
- Capabilities & Limitations Report
- OTA Assessment Report
- OTA Milestone Assessment Report
- OTA Evaluation Report
- OTA Follow-on Report
- System Analysis Report

**USED FOR FIELDING RECOMMENDATIONS**
- Safety Release
- Safety Confirmation

- Similar 70%
- Page Count – 3000pps

**AEC**
- AEC OTC Plan

**OTC**
- OTA-Test Plan
- Forward Operational Assessment Report

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