The Army C4ISR Materiel Enterprise and Track 6 Overview

23 August  1100-1215
MISSION: The Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Materiel Enterprise (ME) optimizes support for Warfighters and other customers by synchronizing C4ISR materiel lifecycle functions in support of ARFORGEN resulting in superior technology, acquisition, fielding, training, logistics, and industrial base operations to build and sustain Army readiness, current and future, within resource constraints.

★ Highlights

• Second Largest Army Science and Technology Organization
• Manage 282 Major Acquisition Programs
• Fielded Equipment to 69% of AC units and Provided New Equipment Training
• Sustain 45K NSNs with over $808M in AWCF Spares Repair and Acquisition
• Maintain 150 Weapon Systems at the Depot Level and at Forward Repair Locations
• Provide our Allies with $4M in FMS Sales
• Support 325 Systems with 275 Software Releases
• Engineer the Information Technology for 535 MCA Projects
• Designated as DA CIO/G6 Execution agent for Army Interoperability Certification Testing

----C4ISR Materiel Enterprise: Transforming Cyber Capabilities----
Members of the Army C4ISR Materiel Enterprise

**Research and Development (AMC)**
- Jill Smith
  - Develops, adopts and adapts technologies to provide critical C4ISR capabilities

**Acquisition and Fielding (ASA(ALT))**
- BG N. Lee S. Price
  - Communications and Mission Command
- BG Harold Greene
  - Intelligence, Electronic Warfare, and Target Acquisition
- Terry Watson, Acting
  - IT Infrastructure, Communications and Business Systems

**Maintenance and Sustainment (AMC)**
- MG Randolph Strong
  - HW and SW maintenance and sustainment, interoperability testing, and information systems engineering for installations worldwide.
Track 6 Overview

Session 1: The on-going Network Integration Evaluation activities at Fort Bliss, and the Cyber considerations and impacts (Briefers: PEO C3T, PEO IEW&S, and PEO - I)

Session 2: Building and supporting a robust, secure, and responsive Army Enterprise Infrastructure that withstands Cyber attack (Briefers: PEO EIS and ISEC)

Session 3: Capability Set 13/14: what’s next for modernizing the tactical network and how we are addressing Cyber challenges (Briefer: PEO C3T)

Session 4: Future Cyber initiatives, addressing the changing operational environment and our need to operate in the cyber “sweet spot” (Briefer: CERDEC)

Session 5: Discussion of four interoperability integration efforts and the Cyber implications. The four efforts are: Afghanistan Mission Network (AMN); Air Ground Integrated Layer Exploration (AGILE) Fire exercise; Joint On-Demand Interoperability Network (JOIN)/Joint User Interoperability Communications Exercise (JUICE), and Host Based Security System (HBSS) Pilot (Briefers: CTSF, SEC, and PEO C3T)

Session 6: How we are optimizing Cyber Capabilities through Software Enhancements and Streamlined Logistics (Briefers: SEC, LRC, and TYAD)
Summary

Invite you to attend and engage in all Track 6 Sessions

Army Team C4ISR Material Enterprise: Transforming Cyber Capabilities
Network Integration Evaluation

LandWarNet 2011
Track 6, Session 1
23 Aug 2011
Network Integration Evaluation

LandWarNet Conference
Session 1 / Track 6
23 Aug 2011
WHAT IS THE NIE?

The Network Integration Evaluation (NIE) is a series of semi-annual evaluations designed to integrate and mature the Army’s tactical network

★ Primary purpose is to conduct parallel Operational Tests of several Army programs of record
★ Secondary purpose is to less formally evaluate developmental and emerging network capabilities
★ These exercises also assess non-networked capabilities

WHAT’S DIFFERENT ABOUT THE NIE FROM OTHER EVALUATIONS?

The Army is making significant changes to how we evaluate capabilities.

Advantages of this adaptive evaluation concept include:

★ Integrated evaluations of capabilities rather than discrete evaluations
★ Higher frequency feedback loop with events twice per year
★ Full Brigade Combat Team (2/1 AD) serving as the Army’s test unit
★ Area of Operations is 12000 km² of complex and challenging terrain
★ Incremental establishment of the network baseline
★ The Business Case: Reduced costs thru efficiency and competition/Quicker cycle times/Rapid technology insertions

This is a new way of doing business – a fundamental change in how we deliver capabilities to our Soldiers
White Sands Missile Range, NM
2/1 AD Area of Operations
Operational Value of the Network
Networking to the Tactical Edge

Tier 1
Dismounted Operations in Complex, Restrictive Terrain

Network Capabilities:
• Mobile Ad Hoc Networking
• Dynamic Range Extension
• End-to-End Assured Communications

Network Benefits:
• Decreased operational risk and latency
• Increased situational awareness
• Adaptive Network Communications

Why NIE?
• Baseline the Objective and TPE Networks
• Fulfill C5ISR ONS Requirements
• Upfront, CONUS-based Integration

Tier 2
Mounted Operations with Wheeled or Tracked Vehicles

Tier 3
Fixed Infrastructure Supporting Operations
ASA(ALT) Team Structure

Enterprise IPT Structure
System of Systems Engineering Configuration Control Board

Product Domain IPTs
- Company CP
- Aerial Extension
- SA/SU
- Mobile C2
- TOC/TAC
- COE
- Fusion/ISR
- Dismount/Tactical Edge

Execution Organizational Structure
Fort Bliss / White Sands Missile Range

Network IPTs
- Initialization & Data Products
- Architecture/Vignette
- Routing & Transport
- Mission Command
- Cross Layer Optimization
- Net Mgmt

Operations
- BMO-ACQ
- INF
- ILS
- Test
- E&I

Staff Elements

SOS IPTs
- IA
- KM
- Requirements/Metrics
- Vehicle Integration
- CM
- MS&A

11 PEOs
35 PMs
18 IPTs
71 Safety Releases
330 Frequencies
3800 Soldiers
1100 Vehicles
12000 km²
200 FSRs
Context for Systems of Systems

**Typical program domain**
- Traditional systems engineering
- Chief Engineer inside the program; reports to Program Manager

**Transitional domain**
- Systems engineering across boundaries
- Work across system/program boundaries
- Influence vs. authority

**Messy frontier**
- Political engineering (power, control...)
- High risk, potentially high reward
- Foster cooperative behavior
## NIE Evaluations

### Network Maturation Over Time

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### Network Integration Evaluation

- **Network Integration Evaluation 11.2**
  - MSS LUT
  - JCR LUT
  - NIK LUT
  - HMS MP LUT
  - SPIDER LUT
  - ONS Systems
  - Developmental Network Systems
  - TPE Network Systems
  - Developmental Systems

- **Network Integration Evaluation 12.1**
  - GCSS-A IOTE
  - RR IOTE
  - Emerging Systems
  - Developmental Systems
  - Emerging Network Systems
  - Developmental Network Systems
  - NET/NEF

- **Network Integration Evaluation 12.2**
  - WIN-T Inc.2 FDTE
  - WIN-T Inc.2 IOTE
  - DCGS-A IOTE
  - HMS MOTE
  - ONS Systems
  - Adaptive Capability Insertions
  - Paladin PIM IOTE
  - LCMR IOTE
  - JSAM IOTE
  - APACHE BLOCK 3 FDTE
  - APACHE BLOCK 3 IOTE
  - NET/NEF

- **Network Integration Evaluation 13.1**
  - ONS Systems
  - Aerial Tier Bridge
  - NETT Warrior IOTE
  - APMI LUT
  - Gray Eagle - FOT
  - SPIDER IOTE
  - NET/NEF

### Increasing Industry NIE Participation

- Includes Emerging Systems; Initial Network Architecture Baseline

### CS 13-14 Integrated Network Architecture Baseline

### First Unit Equipped

- Full Industry Participation

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**Transcript:**

**Align Individual POR Developmental Testing**

**Includes Emerging Systems; Initial Network Architecture Baseline**

**CS 13-14 Integrated Network Architecture Baseline**

**First Unit Equipped**

**Full Industry Participation**
Connect the Individual Soldier and Advance Mission Command on the Move as we establish an Integrated Network Baseline.

**Road to Integrated Network Baseline (Test-Fix-Test)**

**NIE 12.1**
- CS 13 (WNW) BDE and 1-35 AR
- CS 13 Bridge (ANW2) 1-1 CAV
- Legacy Compatibility (1-6, Fires, STB(-), BSB)
- Air-Ground Integration
- Industry-Provided Capabilities
- Non-Network SUEs

**NIE 12.2**
- CS 13 (2-1 AD, 101st)
- Legacy Compatibility (AVN Sust BDE)
- Classified network
- Air-Ground Integration
- Industry-Provided Capabilities
- Non-Network SUEs

**NIE 13.1**
- Integrated Network Baseline
- Industry-Provided Capabilities
- Non-Network SUEs

Includes:
- Emerging Systems
- Initial Network Architecture Baseline

**Aligned Individual POR**
- Developmental Testing

**Increased Industry NIE Participation**
- First Unit Equipped

**Full Industry Participation**
SUE Candidate Selection Overview

Assessment B1Ns
- Upper Tier/HCLOS/SATCOM
- Soldier Connectivity
- NetOps
- Aerial Tier
- Cellular/Soldier Radio
- Gateway/Bridge/Router
- Mission Command/Fusion/Integration
- Other

Technical Interchange Meeting (TIM) review of 55 Government Candidates
Industry Candidates 74 Candidates submitted from industry
Candidate Selection Organization

Candidate Oversight Committee:
- PEO I (Lead)
- ASA/ALT
- PEO I-DPEO NW
- G-3/5/7
- G-6
- TRADOC/BMC
- MC COE
- ATEC
- PEO C3T
- ASA (ALT), SOS

Advisory Committee:
- PEO I (Lead)
- BMC
- G-3/5/7
- PEO SOLDIER
- PEO C3T
- PEO CS&CSS
- ATEC
- G-6
- CTSF
- G-2

Factor I: Operational Value
- MC COE (Lead)

Factor II: Technical Value
- CERDEC (Lead)
- PEO C3T

Factor III: Integration & Interface
- PEO C3T / PEO I (Leads)
- PEO I
- PEO C3T
- ATEC
- G-6

Factor IV: Burdens
- PEO I / LOG / BMO
- PEO I
- PEO C3T
- PEO SOLDIER
- G-6

Factor V: Maturity
- CERDEC (Lead)
- CERDEC

All Stakeholders Fully Represented and Engaged
WHAT THE NIE MEANS FOR THE ARMY:

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

We are no longer justifying network integration and modernization activities to the particular interests of programs of record.

We are providing integrated, end-to-end capabilities to the networked leader.

“I see these NIEs not as evolutionary events, but as representing a revolutionary new approach that will potentially change how we provide new capabilities in the future.”

(VCSA, NIE Media Roundtable, 23 May 2011)
Network Integration Evaluation

LandWarNet Conference
Session 1 / Track 6
23 Aug 2011
**ASA(ALT) Team Structure**

*Partnership between ASA(ALT), G3/5/7, PEO-I, PEO C3T, BMC, 2/1AD, ATEC and others*
Network IPT Overview

Overview

- Cross PEO membership and other supporting organizations
- Network IPT Mission is to focus on five core functional areas: Transport, Routing, Mission Command, Network Operations, and Network Initialization
- Individual IPTs formed for each core functional area of focus
- Work began anew with change to 2/1AD and IPT structure took effect in Feb 2011
- Regular and as needed meetings to support NIE/NIR OPTEMPO and priorities driven by the SOSE IPT and CEB
- Validated Architecture and Vignette IPT products based on Network Structure
Overview

- Cross PEO membership and other supporting organizations
- TOC and Command Post IPT Objectives:
  - Document, Manage & Control Bde to Co CP Configuration as a Platform
  - System Engineering of the CP to evaluate Size, Weight & Power (SWaP) Trade-offs of new systems; infrastructure performance
  - Conduct TOC SoS Integration Training to baseline and confirm configuration data
- Regular and as needed meetings to support NIE/NIR OPTEMPO and PEO-I requirements
  - Permanent presence required at FBTX/WSMR iot enable success for the unit and the exercise
  - Pace of operations demands daily involvement by decision makers
- Contributed to Architecture development and documented the “as tested” CP configurations during NIE 11.2 execution
- Coordinated and executed all CP support throughout the duration of NIE/NIR
PdM CPS&I teamed with PEO-I to build the Company Command Post Prototype for NIE 11.2, Jan – Jul 11.

- The material solutions were determined by existing POR systems that would meet the directed requirements, and take into consideration the Signal FAA
- PEO C3T & PEO-I worked hand in hand to complete a rapid CoCP Prototype and deliver the system to WSMR for testing in six weeks.
- This teaming effort ensured the senior leadership could look at a product that meets all the TCM requirements to assist in the decision making process.
- The CoCP Prototype is safety released and has been provided to 2/1 AD, BN 1-1 Charlie Co to be used in the NIE/NIR for user feedback.
- By teaming with PEO-I we have been able to combine resources, deliver a fully integrated product, and gain high level visibility while addressing the needs of the soldier.
NIE Architecture Products

FY11 BCTIE/INBE Architecture activities:

- **System Architecture Feeder Data:**
  - Composite Brigade Force Structure & Equipping (BMC)
  - 2/1 AD Horseblanket (BMC)/ BOI (PEO-I)
  - Capstone Vignettes and Scenarios (PEO-I)

- **Systems Architecture – Initialization WG (C3T)**
  - Systems Architecture Review (SAR)
  - Network IPR

- **Tactical Operations Center Laydown Diagrams – Command Post WG (C3T)**

- **Routing Description Diagrams – Routing WG (C3T)**

- **Transport System Tracker – Transport WG (C3T)**

- **Data Products/Network Configurations**

- **NETOPS analysis and virtualization package**
Co Chaired SoSE biweekly meetings
  • Addressed cross IPT concerns/issues
  • Cross IPT coordination and collaboration

Chaired the Network IPR

Delivered, loaded and supported network configurations

TOC/Command Post Engineering/Integration
  • Battle Command System of System Integration Training
  • CoCP development

Surged FSR, Engineers, and integrators to FTBX and WSMR
  • On the ground engineering (on the fly fixes)
  • Troubleshooting
  • Provided Engineering at the Network Integration Support Center (NISC)
Lessons Learned

★ Need additional Planning and execution manpower
★ Additional Network IPT WGs needed
  • Voice
  • QoS
★ Slipping Key Milestones can equal day for day slip in overall schedule
★ Closer coordination with BMC, Unit and SOSE IPT
★ Locking down SUEs early is key decision in developing the Network Architecture
★ Cross IPT coordination and collaboration is key
★ Including generic IP/dataproducts placeholders for late changes/additions to the architectures
★ Identification of key system dependencies during pre-planning events
★ Laboratory testing prior to NIE deployment
Questions?
Network Integration Evaluation

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Partnership between ASA(ALT), G3/5/7, PEO-I, PEO C3T, BMC, 2/1AD, ATEC
Fusion, ISR and Sensor IPT Overview

Focus on End to End Solution

COLLECT
- High Definition over Standard Definition EO/IR sensors
- Additional Sensors
- Common interfaces

TRANSPORT
- Defined / Established dissemination Arch
- Interfaces to existing Networks
- Releasability of data

PED
- US SIPR is limited to US Only
- CHAT Supporting INTEL/OPS
- Policy & IA Impacts

CHAT
- Defined / Established dissemination Arch
- Interfaces with existing networks
- Network accreditation

Need to Address the Glass to Glass Solution – Not about the Eaches

- Force Structure to Exploit Data
- Need for common tools for exploitation
- Coalition Fight
Execution

- Planned the FMV architecture for the event - replicated C5ISR ONS architecture
- Assisted with the planning and execution of network extension via sensor platforms – leveraged C5ISR ONS Yuma characterization
- Provided on site engineering support for duration of exercise
- Loaned TPE equipment:
  - BETSS-C
  - RAID
  - PGSS
  - Scorpion UGS
  - PSDS2
  - Vbrick Encoders with baseband package
  - Motorola PTP radios
Lessons Learned

★ Intel not driving BDE/BN level operations – effects network load and utilization:
  • Need more robust scenario and OPFOR
  • Continue to press towards classified environment

★ Unit’s AUG TDA does not reflect all equipment TRIAD is requesting: Aerostats, RAID Towers, etc.

★ DA did not fully resource the AUG TDA: BETSS-C, RF-7800Ws, etc.

★ BMC and BDE were not aware of the IPT structure or their role in planning and executing the NIE/ NIR

★ Too many SUEs and NETs with no collective training or TTPs for collective employment

★ Need to develop process to carry forward successful SUEs into the force: directed requirement, contracting method, development, procurement, fielding, and sustainment
Network Integration Evaluation

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★ JTRS had 3 systems in the test; GMR, HMS Manpack and HMS Rifleman Radio with total of 4 products
  • 1 Product line System Under Test (SUT) & 2 Systems Under Evaluation (SUE) & 1 System Under Customer Test (CT)
  • HMS MP (SUT)
  • GMR (CT)
  • JWNM (SUE) Note: Part of GMR System; Evaluation is a Separate and Distinct “Operational Assessment” by OPTEVFOR
  • HMS Rifleman Radio (SUE)

★ JTRS Networking Waveforms
  • Wideband Networking Waveform (WNW)
  • Soldier Radio Waveform (SRW)

★ JTRS Equipment and Network Services
  • GMR = 47 (25 in NIKs, 13 HMMWV, 1 Caymen, 7 Transit cases, 1 Aerostat)
  • HMS MP = 32 (32 for LUT: 22 mounted, 9 dismounted, 1 transit case)
  • HMS RR = 36 (26 for LUT w/Android + 10 for Capstone w/Land Warrior)
  • JWNM = 2
Network Integration Kits w/ JTRS
- 22 integrated w/ MATV
- 3 integrated w/Caymens

Each Contain:
- 1 GMR
- 1 HMS (Manpack)

Integrated JTRS Radios
- 13 GMRs installed in HMMWV
  - (M1165’s an M1151’s)
- 1 Caymen integrated with GMR + MP
- 8 GMRs in standalone Transit Cases for TOC’s
- 1 Test Bed Aerostat (TBA) with
  - 1 GMR
  - 1 Manpack
Lessons Learned

★ Notable JTRS Highlights:

- Manpack performed two-channel, simultaneous voice and data LOS/BLOS
- Rifleman Radio transported networked voice and Position Location Information (PLI)
- MP and RR interoperability using SRW
- Network Managers planned the missions and monitored the active network
- GMR on WNW provided tactical networking across the brigade.
- Integration of GMR and GMR/NIK with several platforms demonstrated SRW, WNW, EPLRS, SATCOM, SINCgars, and HF within the same form factor.

★ NIE Areas Needing Improvement:

- **Network Management:** Network configuration time – cumbersome planning process.
- **Architecture:** Inadequate time to groom systems to ensure performance meets objectives.
- **Equipment:** Insufficient quantity or product available in time to support testing.
- **Platform/Vehicle Integration:** Seek improved ease of use and suitability.
- **Training:** Seek improved training and stress proper COMMEX and Pilot Test importance.
- **Vignettes:** Evaluate and incorporate new TTPs to take advantage of new network capabilities.
- **Assessment:** Metrics collected from the instrumentation need to be used in order to fully evaluate network performance and gaps.
Questions?