

## Network Integration Evaluation (NIE)

In FY13, the Army executed two Network Integration Evaluations (NIEs) at Fort Bliss, Texas, and White Sands Missile Range, New Mexico. NIE 13.1 was conducted October through November 2012 and NIE 13.2 was conducted April through May 2013. The purpose of the NIEs is to provide a venue for operational testing of Army acquisition programs, with a particular focus on the integrated testing of tactical mission command networks. The Army intends the NIEs to serve as a venue for evaluating emerging capabilities that are not formal acquisition programs. These systems, termed by the Army as “systems under evaluation” (SUEs), are not acquisition programs of record, but rather systems that may offer value for future development.

The Army’s intended objective of the NIE to test and evaluate network components in a combined event is sound. The NIE events should allow for a more comprehensive evaluation of an integrated mission command network, instead of piecemeal evaluations of individual network components. Conducting NIEs two times a year creates an opportunity for event-driven operational testing as opposed to schedule-driven testing. For example, if a system were not ready to enter operational testing at one NIE event, it would have the opportunity to enter testing in a subsequent NIE event. The Army intends to conduct NIE events approximately every six months for the foreseeable future.

### NIE 13.1

During NIE 13.1, the Army executed a Limited User Test for the Nett Warrior, an FOT&E for the Spider Network Command



Munition, and assessments of 22 SUEs. Individual articles providing assessments of Nett Warrior and Spider can be found later in this Annual Report.

### NIE 13.2

During NIE 13.2, the Army conducted an IOT&E for the Joint Battle Command – Platform, an FOT&E for Warfighter Information Network – Tactical Increment 2, and a Limited User Test for the Nett Warrior. Individual articles on these programs are provided later in this Annual Report. The Army also conducted assessments of three SUEs during NIE 13.2.

## NIE ASSESSMENT

NIE 13.1 and 13.2 were the fourth and fifth such events conducted to date. The Army’s execution of the NIEs has shown steady improvement over time. The Army has developed a systematic approach to preparing for and conducting NIEs, applying lessons learned from previous events. Overall, NIEs have been a satisfactory venue for conducting operational tests of individual network acquisition programs.

**Operational Scenarios and Test Design.** The Brigade Modernization Command, in conjunction with the Army Test and Evaluation Command’s Operational Test Command, continues to develop realistic, well-designed operational scenarios for use during NIEs. Additionally, the 2d Brigade, 1st Armored Division, as a dedicated NIE test unit, is a valuable resource for the conduct of NIEs.

The challenge for future NIEs will be to develop new and more taxing operational scenarios to reflect future combat operations.

To date, NIEs have focused primarily on scenarios that reflect Iraq/Afghanistan experiences, with combat predominately against dispersed irregular forces. Future NIEs should include more challenging and stressful combined arms maneuver against regular conventional forces. Such scenarios would place greater stress on the tactical network and elicit a more complete assessment of that network.

**Threat Operations.** An aggressive, adaptive threat intent on winning the battle is an essential component of good operational testing. The Army continues to improve threat operations during NIEs, particularly with respect to threat information operations, such as electronic warfare and computer network operations. Future NIEs should incorporate a larger, more challenging regular force threat. This threat should include a sizeable armored force and significant indirect fire capabilities, both of which have been absent in past NIEs. Furthermore, efforts

should be made to integrate appropriate unmanned aerial vehicles into the threat forces.

**Logistics.** The Army should place greater emphasis during NIEs on satisfactorily replicating realistic battlefield maintenance and logistical support operations for systems under test. Field Service Representative (FSR) support plans, maintenance and repair parts stockage, and the quantity and management of system spares do not accurately reflect what a unit will observe upon fielding. Easy access to and over-reliance on FSR support results in the test unit not having to realistically execute its field-level maintenance actions. Failure to accurately replicate “real world” maintenance and logistics support cause operational availability rates and ease of maintenance to be overestimated in NIEs.

### **Real-Time Casualty Assessment (RTCA) Instrumentation.**

An essential component of good force-on-force operational testing, such as that conducted at NIEs, is RTCA instrumentation, which adequately simulates direct and indirect fire effects for both friendly and threat forces. Other key components of functional RTCA instrumentation, in addition to realistic weapons

engagements, include accurate time and position location tracking for all individuals and vehicles on the battlefield and a capability to centrally collect and store in real time weapons engagements, engagement outcomes, and position locations. This battle data collection and storage capability enables analysts to replay battles when conducting evaluations of system performance.

The Army has long recognized the need for adequate RTCA to support training, as exemplified by the use of RTCA to support its training venues such as the National Training Center. However, to date, the Army Test and Evaluation Command (ATEC) has used a fraction of the full capability of the RTCA instrumentation that it currently possesses to support operational testing at the NIEs. For instance, ATEC has not used the capabilities to replicate indirect fire effects and to centrally collect battlefield data in real time, despite the existence of a capacity to do so. ATEC should use its full RTCA capabilities for future operational tests in the NIE and initiate efforts to enhance RTCA instrumentation for future use.

---

## NETWORK PERFORMANCE OBSERVATIONS

The following are general observations of tactical network performance during NIEs. These observations focus on network performance deficiencies that the Army should address as it moves forward with integrated network development.

**Complexity of Use.** Network components, both mission command systems and elements of the transport layer, are excessively complex to use. The current capability of an integrated network to enhance mission command is diminished due to pervasive task complexity. It is challenging to achieve and maintain user proficiency. For example, what should be relatively simple tasks of starting up and shutting down systems require a complex series of actions by the operator.

**Common Operating Picture (COP).** Joint Publication 3-0, (Joint Operations) defines a COP as “a single identical display of relevant information shared by more than one command that facilitates collaborative planning and assists all echelons to achieve situational awareness.” With current mission command systems, units have multiple individual COPs (e.g., for maneuver, intelligence, and logistics) based upon the corresponding mission command systems, instead of a single COP that is accessible on one system. The Army is seeking to resolve this problem and these efforts should continue.

**Network Configuration.** The process for planning and loading a Soldier Radio Waveform network is cumbersome and time consuming. For example, during the Handheld, Manpack, and Small Form Fit – Manpack radio operational test in NIE 12.2, it took two Soldiers 2 to 3 days to set up and load all 46 Manpack radios and 96 Rifleman Radios in the test company. A single Manpack radio required up to 25 minutes to load the network plan, download cryptographic keys, and perform a communications check.

**Unit Task Reorganization.** Operational units frequently change task organizations to tailor for tactical missions. The process to update the network to accommodate a new unit task organization remains excessively lengthy and complex.

**Armored Brigade Combat Team Integration.** The challenge of integrating network components into tracked combat vehicles remains unresolved. Due to vehicle space and power constraints, the Army has yet to successfully integrate desired network capabilities into Abrams tanks and Bradley infantry fighting vehicles. It is not clear how the desired tactical network will be incorporated into heavy brigades.

**Signal Soldier Manpower.** The Army has added a large number of new network components without a corresponding increase in signal Soldiers to manage and maintain these components. This has considerably increased the demands upon the signal Soldiers who are available. There are currently insufficient signal Soldiers assigned to the brigade to effectively operate and maintain the increased number of network components. The Army should evaluate the force structure implications of adding a large amount of new communications equipment into tactical units without a corresponding increase in support personnel.

**Dependence on FSRs.** Units remain overly dependent upon civilian FSRs to establish and maintain the integrated network. This dependency corresponds directly to the excessive complexity of use of network components.

**Survivability.** An integrated tactical network introduces new vulnerabilities to threat countermeasures, such as threat computer network attacks and the ability of a threat to covertly track friendly operations. The Army should continue to improve its capabilities to secure and defend its tactical network.