

THE ARMY'S DIGITAL REVOLUTION 2.0: EVALUATING THE RANGE OF POSSIBILITIES

Text and Photos
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Armored vehicles and support vehicles from the 2nd Brigade Combat Team (BCT), 1st Armored Division, convoy from Fort Bliss, Texas, to the brigade's initial base camps at White Sands Missile Range, N.M. Inset, a solar-powered camera maintains surveillance on the perimeter of Company C, 1st Battalion, 6th Infantry (1/6 Infantry), as one of the systems being tested by the Network Integration Evaluation (NIE) exercise 13.1.



As the sun broke over the desert scrub brush at White Sands Missile Range, N.M., the 2nd Brigade Combat Team (BCT), 1st Armored Division, was sucking up its power—exploiting a supply line that delivers everywhere.





Above, SSG Michael Constantine from the 1st Battalion, 35th Armor (1/35 Armor) charges his Nett Warrior Handheld End User Device with a solar panel kit. The handheld device is the dismantled soldier's component of the Warfighter Information Network-Tactical (WIN-T) system, the primary system being evaluated by the NIE. Right, the smartphone-based device gives soldiers an array of information and communications capabilities in a small package.

SSG Michael Constantine from the 2nd BCT's 1st Battalion, 35th Armor (1/35 Armor), had laid out a mat of solar panels and was charging his tactical "smartphone," which isn't a phone in the conventional sense: You can't tweet, update Facebook or even make a call on it. It is, however, based on an off-the-shelf cell phone, and it can receive and transmit an array of tactical information over a secure communications network using the Rifleman Radio. Known as the Nett Warrior Handheld End User Device, it is the primary dismantled component of the Warfighter Information Network-Tactical (WIN-T), which is the backbone system currently being tested and developed by the Network Integration Evaluation (NIE) series.

SSG Constantine explained that the solar panel kit could recharge half of his platoon's Nett Warrior batteries to 100 percent strength in eight hours. The platoon also had a portable quiet generator about the size of a cinder block that could augment the platoon's





Solar panels power a perimeter security sensor component of the Combat Outpost Force Protection System (COFPS) under NIE assessment.

recharging needs during darkness under a power management evaluation conducted during the NIE.

Meanwhile, at another 2nd BCT unit, the 1st Battalion, 6th Infantry (1/6 Infantry), solar panels were recharging equipment to test perimeter security technology, known as the integrated base defense system, another NIE assessment area. Five systems were under formal testing during NIE 13.1, and 17 others were evaluated.

The 2nd BCT had deployed from its home base at Fort Bliss, Texas, rolling vehicles down the superhighway tank trail that connects the two posts and establishing positions at the south end of White Sands for the ramp-up period of NIE 13.1, which was conducted in November and December. (The numerical designation stands for the first of two NIEs that will be held during fiscal year [FY] 2013.)

The NIE series started in the summer of 2011, and 13.1 is the fourth evaluation to be held. NIE is akin in scale and development importance to the Task Force XXI Advanced Warfighter Experiment (AWE), which began at the National Training Center, Fort Irwin, Calif., in 1997 and was conducted by the 4th Infantry Division.

Infantrymen from 1/35 Armor file into position for tactical drills during the ramp-up phase of NIE 13.1 at White Sands Missile Range.



SSG Thomas Peterson from Company C, 1/6 Infantry, monitors feeds from the COFPS, nicknamed "Kraken"—a mythological sea creature—because the system integrates radar, surveillance cameras, unmanned sensors, gunshot detection and remote-controlled weapons.



AWE started the Army's digital revolution and put the systems in place that were invaluable for conducting combat operations in Afghanistan and Iraq after 9/11. Among the systems that AWE produced are the Force XXI Battle Command Brigade and Below command-and-control system and its vehicle-mounted variant known as the Blue Force Tracker, which are currently ubiquitous within the Army.

Aside from 15 years of general technology advancement, the simplified difference between the two evaluations is that the AWE employed a predetermined set of systems and used the evaluation to help work out the bugs, technically and doctrinally. NIE evaluates a wide range of technology available from government and civilian industry developers and tests selected systems on the basis of what they could do to expand



Above, the self-contained Tactical Communications Node (TCN) is the switchboard that provides tactical network communications at a battalion tactical operations center (TOC). Right, soldiers from 1/35 Armor train on dismounted movement to contact battle drills while wearing protective gear for the simulated munitions ammunition being used.





SFC Joshua Jones, Troop A, 1st Squadron, 1st Cavalry (A-1/1 Cavalry), communicates with his platoon's dismounted squads from his Stryker vehicle as the soldiers train at a White Sands Missile Range mock village during NIE 13.1.

Army and individual soldier capabilities, building capability sets as it goes, which incorporate further advancements. The test capability set and subsequent fielding set can change to some degree every six months with the findings from each NIE.

BG Randal Dragon, commanding general of the Brigade Modernization Command, explained, "Traditionally, we've determined that we need a capability based on a concept, then we develop, through a series of approaches, that capability into something that we can put in soldiers' hands. In many cases, there may be three to five years from the time that we come up with a concept until we produce something that we can offer soldiers. Then we'll



MATVs—mine resistant ambush protected all-terrain vehicles—from the 2nd BCT, 1st Armored Division, relocate to a new position at White Sands Missile Range. The lead MATV is an NIE command vehicle variant.

walk through the formal test and evaluation process, which may take another couple of years.

“What we’ve done [for NIE] is that we’ve gone back and taken a look at those concepts and looked for the high-requirement gaps that we have. We’re currently working on the tactical network. We identified those gaps and then looked for viable solutions that were in the government system under development or that industry had a solution for, and then we put them immediately into the soldiers’ hands out here in the field. What’s different is that we’ve been able to compress the amount of time that it takes to bring a capability into the soldiers’ hands, get their feedback, make adjustments and get that capability out to the Army.”

He added, “What we’ve been able to do is move to a digital environment, extend the network down to the soldier level, and expand the number of command control nodes from eight under the legacy systems to a deployable set of 58 under the capability set 13.”

NIE has delivered results and solutions quickly. After only about 18 months since NIE began, a capability set of about 15 separate components evaluated during the previous NIEs is now being fielded to the 3rd and 4th BCTs of the 10th Mountain Division.

As it stands now, eight more BCTs are scheduled to receive capability sets during FY 2013, and six more BCTs will receive the kit in FY 2014 while NIEs 14.1 and 14.2 concurrently incorporate the latest improvements into capability set 14 for continued fielding, ensuring backward compatibility.

The network is also being developed to ensure U.S. joint-service compatibility and compatibility with multinational military partners.

NIE-based development and fielding builds on the successful fielding concepts that provided soldiers with the necessary gear to fight in Iraq and Afghanistan, such as the Rapid Fielding Initiative (RFI). RFI identified available off-the-shelf solutions to meet soldiers’ needs or those that could be quickly developed and delivered.

Meanwhile, NIE has saved money. Approximately \$6 billion in savings has been documented as NIE has re-engineered equipment that the Army was previously preparing to buy.



The Satellite Transmission Terminal (Plus) dish provides data transfer for the TCN system.



Clockwise from top left, the 2nd BCT staff works inside the brigade's TOC, monitoring WIN-T nodes. Platoon leader 1LT Jasper Lo, A-1/1 Cavalry, climbs stairs at a mock village in an urban terrain site at White Sands Missile Range during NIE key leader engagement training. SGT Brandon Bell, a 1/35 Armor squad leader, lays out sectors of fire to a soldier during NIE 13.1.



SPC Robert Byes launches a Raven unmanned aerial vehicle during NIE 13.1.

The NIE-developed capability core, WIN-T, furthers the concept of Mission Command called for by the Chairman of the Joint Chiefs of Staff GEN Martin E. Dempsey and is being doctrinally reinforced by the U.S. Army Training and Doctrine Command (TRADOC).

“Looking at the elements of Mission Command—and the key element of understanding the environment—we try to give commanders and leaders a wide array of tools to wrestle with a very complex environment and understand it. They are able to use some of these tools to help collaborate and share how they see that environment unfolding and then, as they’re operating, to be able to describe that to their subordinates,” BG Dragon explained. “Where they may have gone to chalk drawings on the side of a vehicle in the past, commanders now have some tools that allow them to describe that environment and then direct it. What we have tried to do here is develop a tool set that scales to the commanders: If they want to see the operational picture in a certain way, they can tailor it. They can do it



The commander's position in a MATV is crammed with equipment that allows full WIN-T communications capability, giving the commander the same Mission Command information picture that would be available in a TOC. The primary component is the Joint Battle Command Platform.





Scouts from Company C, 1/6 Infantry employed military motorcycles and light all-terrain vehicles during the evaluation exercise.

in a fixed facility, as we could in the past, or a mobile platform, where they can be anywhere, linked into that network and still be able to display that same level of Mission Command presence out into their force.

“Under NIE,” he continued, “we focused first on the network and making sure that we understood the tool set, and that’s where we are now. While we’ve been doing that, we’ve been working Mission Command applications, those things that interface and use the network. It is the commanders’ interface with those Mission Command applications that allows us to see a little bit more about how we operate and how we want to operate in the future.”

NIE capabilities have gone further, driving Mission Command capability down to the squad- and team-leader levels with the Nett Warrior system.

“Squad and team leaders operate pretty much as they did in World War II,” BG Dragon said, “but we now are able to arm them with the ability to access information relatively rapidly from a remote location. They will be



SGT Antonio Perez (left) and SGT Andrew Koener check data on their Nett Warrior handheld end user devices.



Above, troopers from A-1/1 Cavalry conduct a dismounted training exercise at White Sands Missile Range. Right, a Paladin gun crew from Battery A, 4th Battalion, 27th Field Artillery—SGT Hector Verastegui, gun chief; SGT Shane Irvin, gunner; and SPC Ryan Sager, number one man—conduct a drill during NIE 13.1.



able to get things on the ground that they simply could see before. An important one is position location. With these systems, small-unit leaders will need to be able to focus less on where everyone is and focus more on what they need to do to change the environment in the direction that commanders want to change it, whether it's delivering indirect fires, negotiating with a key leader on the street corner or delivering relief supplies. The squad is a fundamental formation, and the ability to access a quantity of information, such as joint fires capabilities, at the ground level is unprecedented. We simply haven't had it before in the conventional forces."

The most valuable asset of the NIEs has been the degree of soldier evaluation that has been incorporated into the mix. Soldiers provide formal feedback on how well a system under evaluation performed, specifically related to how well it enabled them to do their mission. They note things that they would like to see changed or tweaked to make it perform better before the Army makes a decision on whether to push it out to the field in a capability set.

SSG Ryan McMillan and SSG Lanis Roberts from 1/6 Infantry are veterans of all four NIEs to date.

"I was surprised that the Army hadn't done this sooner



Left, Legos are used to depict positions during an NIE rock drill. Below, the TCN antenna can be lowered for travel, and the system can still function on the move.

mediator between our higher headquarters and civilian engineers and the soldiers who work for us, making sure that the soldiers are able to articulate their findings,” SSG McMillan added. “We can see immediate impact: The development time is shortened, and the equipment is designed for what the Army needs it to do.”

CSM Andre Johnson of the 2nd BCT’s 1st Squadron, 1st Cavalry, said, “The Army listens to us, and what we do during an NIE really matters. It’s important for each of us because some other soldier doing your job is forward, and getting him the gear he needs is important. The NIE, however, should be transparent in what we do. We have to make sure that we’re training for our combat mission along with the testing because we do more than test—we train, and this brigade probably spends more training time in the field than any other brigade in the Army.”

COL Thomas Dorame, the 2nd BCT commander, said, “We are a BCT, not a test brigade, and at the core my job—like that of any other brigade commander—is to train and prepare my soldiers to do their jobs. The NIE is important enough to the U.S. Army that it pulls a brigade to do this mission, but my mission is to train and prepare a BCT. That said, however, the better my soldiers are trained, the better they can provide feedback.

“The brigade will have a lasting impact on the Army,” COL Dorame continued. “I think the Army got it right when they put this equipment into the hands of soldiers. I am amazed at the investment that the Army has made to do that.”

The Brigade Modernization Command (BMC) is an element of TRADOC’s Army Capabilities Integration Center. BMC looks at capabilities requirements and matches them against NIE evaluating capabilities. It is one of four elements that support NIE.

Another is the formal testing conducted by the U.S. Army Test and Evaluation Command, which looks at programs of record. The third is the Army Acquisition Corps program manager activities connected with NIE, and the fourth is the 2nd BCT and its soldiers.

“BMC’s role is to assist in the integration, to provide a scenario to match soldiers and systems to the scenario,” BG Dragon said. “We then use our partners when it comes to a formal test or when we have specific programs to make sure the soldiers in the brigade combat team have a cohesive package to evaluate once they get to the field. It’s all based on that relationship. Each of us has a role. It has evolved over time, and it continues to evolve.”

“NIE brings the equipment developer, formal tester and capability developer into the mix, standing next to a soldier and an engineer,” BG Dragon explained. “To have the power of those folks all standing on the ground at the same time is the major step forward.”



—getting soldier and squad and team leader feedback,” SSG McMillan said. “For example, the radios we were given initially were fundamentally good radios, but the engineers didn’t know how we fight, and with our input they were able to fix them.”

“We have a responsibility to give them the right input,” SSG Roberts added. “Once we say that equipment is good, it had better be good.”

“The NIE aspect of the NCO’s job out here is to be a