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Fighting the insurgency at the Jersey Shore

Fort Monmouth struggles to jam IEDs, track mortar rounds and stay alive

By Michael Moran
Senior correspondent
MSNBC

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FORT MONMOUTH, N.J. -

In an aging office park not far from the Ferris wheels and boardwalks of the New Jersey shore, the Army's fight against Iraq's insurgents and Afghanistan's Taliban is in high gear.

Here, where among other things the aircraft altimeter was invented (1933), the first "walkie-talkie" was developed (1936), and where the Army trained courier pigeons until 1957, engineers and researchers are working on ways to counter two of the most deadly and effective weapons in the arsenal of America's enemies: mortar attacks and IEDs -- or "improvised explosive devices." Collectively, these two weapons have taken more than 500 American lives in Iraq and Afghanistan in the past three years.

"A very significant portion of Army casualties comes from mortars and IEDs," says Larry Smith, deputy chief of staff for operations and planning at the base. "We have people working on things that save American lives, and we've been working full out ever since Sept. 12, 2001."

At the start of next month, Fort Monmouth will begin shipping to eager units in Southwest Asia the fruits of its research -- an important software update to a portable radar array its engineers developed several years ago.

The array is known as "Lightweight Counter Mortar Radar" and it was designed to provide protection for special operations forces routinely forced to set up camp behind enemy lines, where attack can come from any direction.

Deployed by U.S. Army Rangers for the first time in early 2004, it allows American troops to quickly identify the exact spot that a mortar round originated and, if all goes well, destroy the weapon before it can get off another round or move to a new position. In June, after just six months of seeing the LCMR in action, the Army named it one of the inventions of the year, and commanders have credited Fort Monmouth and the LCMR's contractor, Syracuse Research Corp., with saving dozens of lives.

Larry Bovino, the senior engineer who oversaw development of the radar, says the updating coming this month is much in demand: a software rewrite that will allow the very same radar system not only to direct "counter battery fire" but also to give off a warning signal before even the first round hits.

"Over the past year or so, with the LCMR in action in Iraq and Afghanistan, people came to us and said that the early warning piece would really be nice," he said. "The update will go out in a CD. It should be as easy as putting a new game on your computer."

'Not very sexy stuff'

Work like that done at Fort Monmouth and the two dozen other major military laboratories in the

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United States often gets obscured by the more compelling news from the front lines. "Sometimes, it's just not very sexy stuff," says Smith, who has risen to the upper levels of management at Fort Monmouth since arriving in 1976 as an intern. "But we also have a lot of sensitive stuff that can't be discussed freely for security reasons."

Among the more recent "home runs" hit by the Fort's various labs: new "Joint Network Node" radios that allow even small units to bounce vital communications off of satellites rather than relying on unreliable "line-of-sight" radio signals; the phraselator – a handheld device that "speaks" up to 30,000 pre-programmed phrases in dozens of languages, and "Blue Force Tracking" systems that are credited with reducing "fratricide" or friendly fire deaths to virtually zero, an amazing and underreported aspect of the war given the high friendly fire casualty rates of previous conflicts.

Right now, the Holy Grail is something called Crew 2 — a product of the Information Warfare unit at the fort that commanders hope will help prevent the Iraq insurgents and other groups from using cell phones to detonate IEDS.

Like the counter-mortar radar, Crew 2 is built on the back of an existing system — a countermeasures device known as Warlock which proved ineffective in the end because it could not block the frequency of a radio detonator unless it intercepted it, which is very difficult. Crew 2 is said to work differently, but just how is being kept very quiet.

"We don't talk much about Crew 2, and we certainly don't describe its capabilities in any specific way or even describe the device it counters," says Tim Rider, an Army spokesman. "There's a chess game going on between us and the insurgents, and we're not giving away our moves."

Race against time

What is public record, however, is a \$550 million contract awarded two weeks ago to Syracuse Research Corp., the same company that produces the counter-mortar radar, in early July. The five-year contract includes money for development, training, production and maintenance -- a typical "full life-cycle" project that will be administered by Ft. Monmouth.

Meanwhile, other military labs run by the Navy and the Air Force are working on similar devices, each racing against time as the insurgency adapts from cell phones to garage door openers to television remote controls to set off its mines.

Even as its scientists and engineers drill down on these problems, another challenge that could prove as disruptive as any IED has arisen: Fort Monmouth has been listed for on this year's Pentagon base closings list.

But Fort Monmouth is fighting an uphill battle against its own age, a uniformed military that wants to consolidate facilities to put more money into weapons, and parochial factions in Congress bent on taking jobs to their states. The current base closing template announced by Secretary of Defense Donald Rumsfeld in May would move much of Fort Monmouth's work to Virginia's Ft. Belvoir and the Aberdeen Proving Ground, a weapons testing depot in rural Maryland.

Smith, a professorial-looking man nearing the end of his long Army career, is not at liberty to discuss his views of the proposed move. He concedes, however, that a move like that would pose some challenges. "If the recommendations are implemented, we'll be expected to complete our mission and relocate at the same time. "It will be challenging."

Besides extensive labs working on communications, radar, electronic countermeasures and information warfare, Fort Monmouth's offices contain hundreds of white-collar workers who manage large defense contracts. There is also a support center that operates 24 hours a day providing what amounts to customer service to soldiers all around the world who are having

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trouble with the Army's increasingly complex array of systems and software programs.

Indeed, except for the guard and signs at the front gate, the average person could probably drive through a facility like Fort Monmouth without ever realizing they were on a military base. Its 219 acres employs about 8,000 people – only 467 of them uniformed military. The vast majority of the fort consists of civilian federal government employees, some 5,085 people, who drive to work in skirts or shirts and ties, then drive back out again to homes in affluent Monmouth County, New Jersey.

"Often people come here and say, 'Where are all the soldiers'," Smith says. "We're definitely lopsided toward the civilian side. But we know what our troops need and we're here to provide it. That's our mission."

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Congress of the United States
House of Representatives
Washington, DC 20515

July 14, 2005

Mr. Philip E. Coyle III
Commissioner
Base Realignment and Closure Commission
2521 South Clark Street, Suit 600
Arlington, VA 22202

Dear Commissioner Coyle:

It was good seeing you at the Regional Hearing in Baltimore, Maryland, on July 8. I hope you found New Jersey's presentations about Fort Monmouth helpful and informative. I want to take this opportunity to follow-up on the questions you raised at the hearing, but also want to reiterate our argument that C4ISR capability would be diminished greatly, immediately, and for at least a decade by the proposed closure and move. This is independent of cost and payback calculations.

You are correct that the Department of Defense (DOD) failed to account fully for workforce transition costs, and we have attempted to capture the significant cost of recruiting and training a potential new workforce at Aberdeen Proving Ground (APG). However, in the data made available to us, the salary cost savings from closing Fort Monmouth and the salaries added for new people at Aberdeen are considered in the same manner, and not included in COBRA runs (with the exception of positions eliminated, and the pay differential that results).

Our analytical team, led by Vice Admiral (ret.) Paul Gaffney II, conducted a thorough analysis of the recruitment and training costs for reconstituting a workforce at Aberdeen. A summary of our calculations is attached. In every case, we have been conservative in our assumptions.

When we submitted our report to the BRAC Commission on July 8, we calculated the payback period to be 21 years using a "constant dollar" payback period. However, all BRAC recommendations use a "net present value" payback period. Using the "net present value" data, the payback period for moving Fort Monmouth would be 33 years. (A correction was submitted to Chairman Principi by VADM Gaffney on July 12.) As you will see, the payback period expands to 44 years when costs for reconstituting a new workforce are included.

Attached you will find a short summary of our calculations for recruitment and training costs, including our sources, assumptions, and methodology. Also attached is a more complete answer to your second question, which sought a listing of programs in use in Iraq that would be disrupted by a closure of Fort Monmouth. A complete, more digestible version will follow next week.

I hope this information is useful to you. Please do not hesitate to contact me if I can be of further assistance.

Sincerely,



Rush Holt
Member of Congress

Workforce Models

There are extensive studies available in the body of pertinent literature that analyze and describe recruitment, training, and lost productivity costs when an employee must be hired to backfill the "leaver," i.e., the employee who must be replaced. For example:

- "Private Sector Downsizing: Implications for DoD" by Michael L. Marshall and J. Eric Hazell (published in *The Acquisition Review Quarterly*, Spring 2000) listed several parameters that apply to replacing personnel, including advertising and marketing; recruitment, hiring, and training; overtime to personnel taking up the slack; productivity losses; and lost training for departed workers. The article concludes, "Regardless of the exact number of businesses, there is widespread agreement that *turnover costs are somewhere between high and Olympian.*"
- "The Business Cost and Impact of Employee Turnover" by William Bliss of Bliss & Associates (2000) concludes that the cost of employee turnover is at least 150% of the leaver's annual salary.
- A Price Water-House Saratoga Institute workforce replacement model cited in "It's Costly to Lose Good Employees" by J. Fitz-enz (1997) estimates that the total cost of turnover ranges from 100 to 200% of the leaver's pay and benefits.
- A workforce replacement study conducted by Kwasha Lipton (referenced in *The Acquisition Review Quarterly* Spring 2000) concludes that replacing exempt workers costs 150% of the leaver's salary, and for non-exempt workers, it costs 175% of the leaver's salary.

Assumptions

- DoD's analysis reflects a transfer of 3,879 civilians from Fort Monmouth and 767 from Fort Belvoir to APG for a total of 4,646 civilian personnel. Of this total, history and recent polling suggest that a maximum of 20% of employees are expected to transfer to their new location. The remaining 80% (3,717 employees) would have to be hired at APG. The bulk of these employees are scientists, engineers, and highly special technical experts.
- For purposes of this analysis, 15% of the 3,717 employees are considered administrative/clerical (and therefore have lower base salaries).
- Given the differences of the functional knowledge required to develop, acquire, test and field C4ISR systems and equipments, the professional skills domain is split into two subsets; Scientists/Engineers (SE) and Acquisition/Logistics (AL).
- COBRA used a civilian salary of \$59,959, an unrealistic figure for recruiting and training senior and journey-person SE and AL personnel. Using the Bliss study as the model, we have used the salary of a GS-14/Step 5 as representative of senior employees. For journey-person (JP) employees (GS-13 and below), we have used the salary of a GS-12/Step 5. In all cases, 28.9% is applied for cost of benefits.
- We have conservatively included lost productivity costs only during the period of time the new employees are being trained. Also, we have not included any productivity impacts likely to result from an immature workforce, such as program disruptions.

Conclusions

High End of the Cost Spectrum.

1. **Recruiting Cost Factors.** The Bliss study percentage of full salary (150%) was applied for senior SEs and adjusted down for JP SEs (75%), Senior AL (100%), and JP AL (75%) positions.
2. **Recruiting Calculations.**
 - a. $160 \text{ SE} \times \$ 129,096 \text{ SALARY} \times 150\% = \$30,983,000$
 - b. $1200 \text{ JP SE} \times \$ 91,866 \text{ SALARY} \times 75\% = \$82,680,000$
 - c. $211 \text{ AL} \times \$ 129,096 \text{ SALARY} \times 100\% = \$ 27,239,000$
 - d. $1588 \text{ JP AL} \times \$ 91,866 \text{ SALARY} \times 50\% = \$ 72,942,000$
 - e. Subtotal = \$214 M
3. **Training Costs Factors.** Training is conservatively estimated to be required for at least a three-year period. The assumption is that the newly hired SE employee will be in a training environment for three months of each year for three years, and for an AL employee, two months per year for three years. That is the time considered necessary to bring the newly hired individuals to a level where they are able to perform and contribute commensurately with the individuals they are replacing. Training costs are calculated as a percentage of full salary, on the assumption that training time is non-productive in the year of training.
4. **Training Calculations**
 - a. $160 \text{ SE} \times \$129,096 \times .25 \times 3 = \$15,492,000$
 - b. $1200 \text{ JP SE} \times \$91,866 \times .25 \times 3 = \$82,679,000$
 - c. $211 \text{ AL} \times \$129,096 \times .167 \times 3 = \$13,647,000$
 - d. $1588 \text{ JP AL} \times \$91,866 \times .167 \times 3 = \$73,087,000$
 - e. Subtotal = \$185 M
5. **Bottom Line.** Based on the set of assumptions above, the high end recruiting and training cost is \$399M (\$214M for recruiting, \$185M for training).

Low End of the Cost Spectrum

1. **Recruiting Cost Factors.** Drawing on other conclusions from other studies, the Bliss study percentage of full salary was adjusted significantly downward to establish a lower bounding for the range: senior SEs (75%); JP SEs (50%); senior AL (50%); JP AL (30%)
2. **Recruiting Calculations.**
 - a. $160 \text{ SE} \times \$ 129,096 \text{ SALARY} \times 75\% = \$15,492,000$
 - b. $1200 \text{ JP SE} \times \$ 91,866 \text{ SALARY} \times 50\% = \$55,120,000$
 - c. $211 \text{ AL} \times \$ 129,096 \text{ SALARY} \times 50\% = \$13,620,000$
 - d. $1588 \text{ JP AL} \times \$ 91,866 \text{ SALARY} \times 30\% = \$43,765,000$
 - e. Subtotal = \$128 M
3. **Training Costs Factors.** Again, training is conservatively estimated to be required for at least a three year period. The assumption is that the newly hired SE/AL employee will be in a training environment one month of each year for three years to bring the newly hired individuals to a level where they are able to perform and contribute commensurately with the individuals they are replacing. Training costs are calculated as a percentage of full salary, on the assumption training time is non-productive in the year of training.
4. **Training Calculations**
 - a. $160 \text{ SE} \times \$129,096 \text{ Salary} \times .083 \times 3 = \$5,143,000$
 - b. $1200 \text{ JP SE} \times \$91,866 \text{ Salary} \times .083 \times 3 = \$27,450,000$
 - c. $211 \text{ AL} \times \$129,096 \text{ Salary} \times .083 \times 3 = \$6,783,000$
 - d. $1588 \text{ JP AL} \times \$91,866 \text{ Salary} \times .083 \times 3 = \$36,325,000$
 - e. Subtotal = \$76 M
5. **Bottom Line.** Based on the set of assumptions above, the low end recruiting and training cost is \$204M (\$128M for recruiting, \$76M for training).

Return on Investment (ROI)

Taking the midpoint between the high estimate and low estimate, the amount of \$300M factored into the COBRA formula yields an ROI (payback) of 44 years.

Current Fort Monmouth and Team C4ISR Support to Operation Iraqi Freedom

Quick Response: Aircraft Survivability. This Team C4ISR effort provides aviators from Army and the other military services with life-saving systems. Team C4ISR develops, fields and sustains the radar warning receivers and missile warning systems found on Army, Navy, Marine Corps, Air Force, and Presidential Fleet helicopters. These systems rely on software that contains current threat information tailored to specific regions of the world. Just prior to the outbreak of hostilities in Iraq, Team C4ISR updated that software, in record time, with new threat information for Southwest Asia. The team also adapted the systems to operate better in the harsh desert environment.

Quick Response: Guardrail Common Sensor System. Guardrail is a theater-level airborne signals intelligence collector system. Due to geopolitical boundaries and restrictions, it was not able to function as designed in Operation Iraqi Freedom. Team C4ISR field software engineers, deployed with the system, assessed the problem and reported it to Team C4ISR at Fort Monmouth. Our engineers developed a solution and fielded it in less than a week allowing Guardrail to collect the actionable intelligence that was vital to our military success. Bottom line here is that our forces need Guardrail to locate threats so they can neutralize them. By fielding our software solution, we saved warfighter lives.

- **GUARDIAN EAGLE** is a Quick Reaction Capability (QRC) to insert into the Guardrail/Common Sensor (GR/CS) Fleet of aircraft the ability to Detect, ID and locate LPI communications. GR/CS was the only Army Tactical Airborne asset in OIF with this capability. The two battalions equipped with this capability provided unique essential information on High Value Targets in the months leading up to hostilities as well as during the actual conflict. Team C4ISR continues to work with the units to provide constant updates to this capability. This QRC was accomplished on the first two systems four months after receipt of funds. We were uniquely equipped to accomplish this because of extensive technical expertise with all the GR/CS systems gained over twenty years of designing, building and fielding these systems. Other factors that contributed to our success were our flight activity at Lakehurst NAEC and our unique location that affords us the quiet zone in the warning areas over the Atlantic for calibration, and our ability to acquire the TCDL link located on the roof of building 600 and bring the data into our labs for analysis.

Lightweight Counter Mortar Radar Support. The LCMR detects and locates enemy mortar firing positions rapidly and with deadly accuracy so that coalition forces can instantly destroy them. Team C4ISR managed the accelerated development of LCMR to meet urgent warfighter needs. Team C4ISR helps field the LCMR to units, provides training on its use to soldiers throughout the theater and will work to keep it running around the clock.

FireFinder Radar System. Firefinder tracks and locates the source of incoming mortars and rockets. The Radar rapidly became an extremely critical system in the OEF/OIF

theater, with a demand for the deployed systems to essentially be available 100% of the time to provide troop protection. Since the onset of hostilities several new capabilities have been added to the Firefinder system, through a series of new software packages. These enhanced capabilities come in direct response to the ongoing and developing threat in Iraq and Afghanistan. For example, the ability to detect mortar fire was improved by 25 percent. Of note is the new capability to provide an "early warning capability" as well as an intercept capability. Team C4ISR community has taken extraordinary measures to support the deployed systems, and to get returning systems ready for re-deployments. Daily contact with the units in theater is maintained, spare parts and maintainers have been positioned forward and intensive transportation and tracking has been implemented. Additional LARs have been sent forward, and a Telemaintenance Capability has been established to assist unit maintainers and operators in areas where transportation to the radar sites is difficult, dangerous and LAR support may be delayed. Performance of the Radars in the harsh conditions of OEF/OIF has been exceptional, thanks to the dedicated support provided by the Fort Monmouth community.

AN/PPS-5D Man-Portable Battlefield Surveillance Radar. PPS-5D is the US Army's Man-Portable Battlefield Surveillance Radar system used to target enemy personnel and vehicles. This Radar system played an essential role in the protection of U.S. forces at the beginning of Operation Iraqi Freedom when it was the only system available that could penetrate through a sandstorm and successfully target approaching Iraqi tanks, leading to their destruction. It was successfully used throughout Operation Iraqi Freedom (OIF) by the 82nd Airborne Division (Ft. Bragg), the 103rd MI Battalion (Ft. Stewart), the 101st Airborne Division (Ft. Campbell) and the 312th MI Battalion (Ft. Hood). The radar was an essential system used to target enemy personnel and vehicles. During the sand storm early on in the conflict, the Army was forced to remain stationary, making them vulnerable to enemy attack. The AN/PPS-5D radar proved to be the only system available that could penetrate the wind driven sand and dust to locate enemy targets. Through the sand and dust, the radar successfully targeted approaching Iraqi T-72 tanks at nearly 20km, leading to their destruction. The radar was also used for force protection and perimeter surveillance, once the coalition entered Baghdad.

TROJAN Special Purpose Integrated Remote Intelligence Terminal (SPIRIT). More than 20 TROJAN Special Purpose Integrated Remote Intelligence Terminal (SPIRIT) systems were deployed to U.S. Army and U.S. Marine Corps units and operational in support of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Both the AN/TSQ-190(V) TROJAN SPIRIT II and the AN/TSQ-226(V) TROJAN SPIRIT LITE variants have been utilized to provide crucial secure communications reachback capabilities, to include near-real-time data, Unmanned Aerial Video (UAV) video, and other video, into national networks and databases to support Military Intelligence (MI), force protection, and other requirements. Over 20 systems were deployed by the US Army and US Marine Corps during height of OIF and remained operational availability rates of over 95 percent. The TROJAN Program is managed by Team C4ISR, TROJAN Systems Integration and Fielding Office (SIFO), Fort Monmouth, NJ.

Counter-Radio Controlled Improvised Explosive Device (C-RCIED) System

(WARLOCK). Beginning in FY03, existing Shortstop Electronic Protection System (SEPS) technology was modified by Team C4ISR into several variants of an Electronic Countermeasures (ECM) system to protect convoys, warfighters, engineers, Unexploded Ordnance (UXO) squads, and VIPs from various RCIEDs. This program, a Quick Reaction effort in response to multiple Operational Needs Statements from MNC-I and CFLCC, was conducted jointly with Team C4ISR and the US Army Rapid Equipping Force (REF), and fielded nearly a thousand units within nine months in direct support of OEF/OIF. To date 1000+ systems, of varying capability and target set have been fielded and are protecting troops today.

Improvised Explosive Device Characterization Lab. The Lab began operation during 1QFY04 to identify the performance characteristics of remote controlled triggers used to activate improvised explosive devices. Analyses conducted by this lab identify deficiencies in existing or emerging coalition systems and are provided to Team C4ISR Countermeasures and IED detection programs for immediate action. I2WD also worked closely with the FBI's Terrorist Explosive Device Analysis Center (TEDAC) and has on site personnel at the TEDAC facility. These technicians conduct preliminary evaluations of incoming devices and prioritize the devices for analysis by the Characterization Lab.

SIGINT Support. Team C4ISR has provided extensive expertise in the area of Signals Intelligence (SIGINT) supporting the National Security Agency (NSA) Army Cryptologic Operations Office (ACO) and the Intelligence and Security Command (INSCOM). Team C4ISR personnel have provided specialized technical, operational, logistical and maintenance support for both OEF and OIF. We have developed and provided technology solutions known as Quick Reaction Capabilities (QRC's) in response to requests for assistance from the field to acquire, identify, collect and exploit signals of interest. Team C4ISR personnel have deployed to the field to assist with training and operation of SIGINT equipment fielded as a result of these QRCs to answer critical SIGINT needs. Personnel possessing extensive knowledge and experience in SIGINT technology and the application of this technology directly supported the Combined Forces Land Component Command and served as SIGINT Operations Officers in the Joint SIGINT/Electronic Warfare Coordination Cell.

- **Prophet.** Prophet detects, collects, and exploits conventional and modern military emitters. A secondary mission will be Electronic Warfare against selected enemy emitters to interrupt, spoof, disrupt, and/or disable target command and control nodes. Prophet is mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV), with a quick-erect seven-meter antenna mast. Prophet also has a dismounted man-pack version, which supports airborne, early entry, and urban operations. Both configurations provide intelligence support to a division, Stryker/heavy/light brigade, regiment, UA or task force. This intelligence support provides indications, warning, location, tracking, and identification of threat emitters. Prophet will cross-cue other battlefield sensors (e.g. tactical unmanned aerial vehicles, PBS2 radars, etc.) as

well as provide additional data that may confirm indications and detections from the other manned and unmanned battlefield sensors. Testimonials to PROPHET include:

- “Long-haul communication capability and data downlink need to be added to the Prophet.”
 - “Lack of TACSAT bandwidth for SIGINT hindered the ability to communicate at TS/SCI level with ground collectors.” -10th MTN OEF IBOS AAR
 - “The Prophet Hammer was the preferred SIGINT collection system available to the 4th ID.” - 4ID IBOS Way Ahead Recommendations to LTG Alexander Army G2 - 11 May ‘04
 - 101st CG states: “Prophet is invaluable”
- **PROPHET HAMMER.** Team C4ISR developed this specialized Signals Intelligence (SIGINT) and provides support to the Intelligence and Security Command (INSCOM) during Operation Iraqi Freedom by fielding PROPHET HAMMER systems, training, and providing post-deployment support to MI units. Team C4ISR engineers and intelligence specialists are still in Iraq with the same MI units providing long-term sustainment support and sustainment training.

STARGRAZER. This provides a previously unavailable Special Purpose Electronic Attack (SPEA) capability specifically developed and deployed in under 9 months as a Quick Reaction Capability for OEF and OIF forces. The system is composed of an “Extreme” ruggedized PC fitted with specially developed PCI based system capabilities. Additional components include multiple antenna options, an external power amplifier, and a complete power subsystem allowing the system to operate with a BB-390 battery pack, HMMWV, commercial vehicle or 110/220V AC power. Initially, Team C4ISR delivered ten (10) units to CFLCC/MNC-I OIF/OEF. The STARGRAZER system has gone through two subsequent capability upgrades to include additional capability for OEF/OIF deployed forces as well as other Team C4ISR customers supporting the Global War on Terrorism (GWOT). In addition, five (5) of these systems were recently transitioned to the Naval Central Command (NAVCENT) in support of counter narcotics patrolling. Team C4ISR continues to support STARGRAZER users by providing all necessary training and system support.

SANDPIPER (SP). SP is a “Leave Behind” Quick Reaction Capability (QRC) prototype consisting of a HMMWV with an Electronic Warfare (EW) system shelter, support vehicle with generator, and multiple antenna configurations.

COUNTER ROCKET, ARTILLERY, MORTAR (C-RAM). C-RAM utilizes the Lightweight Counter Mortar Radar (LCMR) to provide initial cueing for C-RAM “Sense and Warn” and as the first line sensor providing incoming target track to C-RAM Command and Control (C2) net for active engagement and interception.

LYNX SYNTHETIC APERTURE RADAR. Team C4ISR engineers have been providing technical support and training in the operation and use of the Lynx Synthetic

Aperture Radar as deployed on an IGNAT UAV by Team C4ISR. Development of techniques in change detection for the detection of small targets has been ongoing and is being utilized in the field. Complementary efforts in Change Detection are ongoing with other agencies.

Joint Users Interoperability Communications Exercise (JUICE). Team C4ISR received reports from Kuwait regarding the inability to make secure wireless calls through the local wireless provider. Technically, the data portion of the call (i.e. the port needed to go secure), would not work. Based upon the experience and expertise of software engineers stationed at Fort Monmouth, experimentation began immediately with several wireless systems that might provide a solution. Team C4ISR software engineers began a dialogue with the wireless provider in theater to better understand the local conditions and the exact nature of the problem. Combining the engineering expertise along with the test bed capabilities at Fort Monmouth enabled the software engineers to recreate the problem and develop and deliver the required capability. The solution enables secure wireless calls in the theater of operations to be placed; thereby enabling command and control among deployed forces.

Combined Arms Planning and Execution Monitoring System (CAPES). CAPES was provided to the 4th Infantry Division for use in Operation Iraqi Freedom. This unique system automates the development of detailed battle planning and provides visual situational awareness of operations during execution of battle plans. CAPES was named one of the top ten technologies in the US Army Material Command Greatest Inventions Program for 2002.

Joint Satellite Communications Engineering Center (JSEC). The JSEC has provided hotline and on site support to the troops in Iran and Afghanistan by responding to numerous requests for technical support.

- Over the last year the JSEC Strategic Systems Lab has responded to 75 requests for assistance from the Teleport/ STEP sites at Landstuhl & Ramstein Germany, Bahrain, Wahiawa, Hawaii, and Ft Buckner, Japan. These sites provide most of the communications to and from our troops in that area of the world. An example of the kind of response by Team C4ISR was the development of procedures and assistance in restoral of critical satcom network control.
- The JSEC Tactical Systems Lab (TSL) has provided extensive support to warfighters in both Afghanistan and Iraq. The TSL provides 24/7 Help Desk support to SMART-T and SCAMP EHF satellite communications terminals users in the field. During FY04 the Help Desks responded to approximately 200 calls and emails from users in both Afghanistan and Iraq. This level of support continues in FY05 and is expected to continue for the foreseeable future. The nature of the support includes troubleshooting issues with the operation of the terminals, communications planning, logistics and upgrades to terminals software. The TSL also assists units scheduled to deploy with equipment preparations and terminal training.

- The JSEC TSL has conducted an upgrade of software and hardware to 82 SMART-Ts deployed to SWA. The TSL has also conducted the upgrade on 23 SMART-T returned from SWA and redeployed.
- The JSEC TSL also supported urgent materiel releases of the military satellite communications Global Broadcast System (GBS) receive suites for the 101st AB, 10th Mountain Division, Stryker Brigade Combat Team (SBCT) 3 and V Corp, who are all deploying to Iraq.
- A representative from the JSEC TSL also provided on site field support to the 3rd and 5th Special Forces Group and AF Special Operations Command in Afghanistan, Uzbekistan, Oman, Pakistan and Kuwait from Feb to Apr 2002. Support provided users with Internet Protocol communications over the military satcom system known as Low Data Rate Milstar, as well as communications planning to the Region Satellite Support Center.

Joint Network Node Capability Spiral 1 (JNTC-S). The Joint Network Node Capability (JNTC) Spiral 1) has been fielded to the 3ID currently deployed in Iraq and will be fielded to all other Army Divisions rotating into theater. The JNTC is the main communications backbone for the deployed Warfighters. The JNTC is composed of Unit Hubs, Joint Network Nodes (JNNs), Battalion Command Post Nodes (BnCPN) and associated SATCOM KU Band Trailers. Team C4ISR Engineers directly support these systems prior to and during deployment. Team C4ISR Engineers develop initial system configurations and are on call 24/7 to help the deployed units with troubleshooting or reconfiguration. Team C4ISR engineers deploy to OEF/OIF with JNTC equipped units to assist in initial setup and configuration.

Stryker Brigade Combat Team Systems. Brigade Subscriber Nodes (BSNs), Network Operations Center – Vehicles (NOC-Vs) and Battlefield Video Teleconference Systems (BVTCS) have been fielded to SBCT 1, 2 and 3 and are currently deployed in Iraq with SBCT-2. Team C4ISR Engineers directly support these systems prior to and during deployment. Team C4ISR engineers designed, developed, integrated, and fabricated these systems while providing 24/7 technical support to assist with troubleshooting.

- The BSN provides secure and non-secure backbone IP switching and network services with RF data rates of up to 8 Mbps and reachback capability over Secure Mobile Anti-jam Reliable Tactical Terminal (SMART-T) and legacy satellite systems. It incorporates a legacy gatekeeper to allow one seamless global numbering plan for all subscribers whether connected to BSN or Mobile Subscriber Equipment (MSE).
- The NOC-V provides the S6 with an operational facility and an integrated means to plan, manage, monitor and control tactical systems and networks within their management domain. The NOC-V contains a Force XXI Battle Command Brigade and Below (FBCB2) suite for battlefield Situational Awareness (SA) message traffic, a Tactical Internet (TI) Manager for the Internet and TOC management, a Global

Broadcasting System (GBS) for watching worldwide news and the Armed Forces Network in the field, and radio links via Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location Reporting System (EPLRS), and Near Term Digital Radio (NTDR).

- The BVTC provides support to the TOC's at all echelons down to Brigade. Despite being separated by many kilometers, the BVTC capability gives the commander and his staff the tools to plan face-to-face and coordinate activities far more effectively and quickly than before. BVTC was chosen as a critical component for the STRYKER BCTs, the JNTC-S 3rd Infantry Division (ID) effort, and the Baseband Node (BBN) program.

High Frequency Tracker & Communicator. The HF Tracker and Communicator is government-developed and over twenty-five copies have been distributed throughout the Army to include units in Afghanistan and Iraq. The HF Communicator is a Graphical User Interface (GUI) used to send text messages from the ground via either the AN/PRC-138 or AN/PRC-150 Harris HF radios directly to an aircraft via the Control Display Unit AN/ARC-220 Aviation HF radio platform. The HF Tracker and HF Communicator systems are credited with helping to save lives in the field. We have received positive feedback on its use and were notified about the following message: "The 68 MED Operations NCO reported a MEDIVAC aircraft was returning from a remote site when the Operations Center learned two critical casualties had been brought to the air strip after the aircraft left. (Aircraft was BLOS from both ends of flight.) Using HF-Tracker and the ARC-220 HF system he was able to direct the pilots to return and pick up the casualties. The HF Communicator sent messages and pilots took required action and the casualties were saved."

Portable Emergency Broadband System (PEBS). The PEBS network is designed to facilitate digital access (i.e., IP voice, video, and data) for Warfighters, First Responders, and other emergency response personnel in disaster, combat, or underground areas. Through use of easily deployable wireless repeaters or Breadcrumbs (BC), rapid setup of a reliable multi-hopping network will be achieved. Breadcrumbs are small wireless meshing bridges and access points that allow stand-alone networks to quickly organize in places where there is no standing infrastructure. BC uses ad-hoc networking technology to create a self-healing network that will offer wireless connectivity to any client within range. S&TCD equipped 33 units, including 13 Supercrums, 8 Breadcrums and 12 Wearablecrums, under the Rapid Equipping Force (REF) Initiative to deploy with the 3rd Bde, 3rd ID to meet its operational needs in Iraq. These units were shipped to OIF units in December 2004.

Night Vision and Infrared. Team C4ISR has provided a variety of specialized Image Intensification and Thermal Infrared systems that augment the capabilities of existing, fielded equipment. New hand held and robot mounted thermal sensors have been used by Soldiers conducting combat operations in Afghanistan. Wide field of view, night vision goggles have also been fielded to ground and airborne for fighting during urban

operations. Team C4ISR has already deployed over 30 different prototype and limited quantity systems that are meeting the unique mission requirements in Iraq and Afghanistan.

Advanced Field Artillery Tactical Data System (AFATDS). The Advanced Field Artillery Tactical Data System (AFATDS) provides Army, Navy, and Marine Corps automated fire support command, control and communications. AFATDS pairs targets to weapons to provide optimum use of fire support assets. AFATDS automates the planning, coordinating and controlling of all fire support assets (field artillery, mortars, close air support, naval gunfire, attack helicopters and offensive electronic warfare). AFATDS will perform the fire support Command, Control, and Coordination requirements at all echelons of field artillery and maneuver, from Echelons above Corps to Battery or Platoon in support of all levels of conflict.

- AFATDS is the digitized sensor to shooter link providing automated technical and tactical fire direction solutions, fire asset management tools and decision support functionality. AFATDS functions from firing platoon through Echelon above Corps. AFATDS is the fire support node of ABCS. It enhances dominant maneuver, survivability and continuity of operations for Joint Force Commander.
- AFATDS system is deployed in support of Operation Iraq Freedom/Operation Enduring Freedom (OIF/OEF). There are over 120 AFATDS systems deployed with the SBCT 2, 173rd Bde, 3rd Army, XVIII C/A, and 42 ID, as well as Contractor Logistic Support in support of deployed systems. There are FIT personnel in country to assist in operational readiness of the AFATDS system. These personnel are contractor employees, managed through a time and material contract at PM Intel and Effects. Any degradation of contractor logistic support and/or fielding support will affect the readiness of the AFATDS system, resulting in inadequate fire support.

ABCS upgrades: Providing ABCS Synchronization and Compatibility. ABCS (Army Battle Command System) is a System of Systems that provides the critical command and control functions for the war fighter to use in support of his mission for all of the US Army. The Army could not communicate digitally between digitized and non-digitized forces without this support. Some divisions had been modernized with ABCS systems through normal modernization, and there were others who had no digitization at all. The Army was putting together a force of both equipped and non equipped units. We were able to bring all the deploying units onto a common operational software configuration and provide system of system and joint and coalition interoperability. We have fielded over 2,500 BFT (Blue Force Tracking) systems, various quantities of the other 11 ABCS systems, 13C2V's, 3LDOC's, and A2C2S which is the CDR's TOC in the Sky, and 13 Bradley BCV to provide on the move communications capability. "This is the success story of the war." In addition, we provided a DISA Collaboration Suite to for secure voice, whiteboard, chat, FTP, and VTC capabilities and have since moved on

to developing a windows based Tactical Business Enterprise System for web based unit reporting. This activity continues today as we provide synchronization to all OIF deployments and have merged it with the Army Transformation Plan to include Modularity, JNTC, and BFT.

Team C4ISR Special Projects Office.

- **SPO In Theater Support.** SPO manages and assigns technical representatives for every BFA to every deploying Division and separate BDE. Our tech reps are still in the AOR with their units. We manage the tech reps from a PEO FWD location in Doha that reports back to us here at Ft Monmouth. To date we have provided technical support to over 57 combat Brigades, 9 Divisions and 3 Corps in support of OIF/OEF. We currently have 254 personnel in theater supporting the Warfighter.
- **Joint Initiatives/GWOT.** Team C4ISR has coordinated, engineered, and provided direct engineering liaison to Joint Organizations including: Joint Forces Command, the Air Force Command & Control, Intelligence Surveillance Reconnaissance Center at Langley AFB, Army Training and Doctrine Command (TRADOC) at Ft Monroe & Ft Eustis, Supreme Allied Commander - NATO Europe, Fleet Forces Command (previously CINCLANTFLEET). These relationships and participation in experimentation and prototyping has facilitated technical advancement and improved interoperability that transfers directly to the war on terrorism. Recent activities include: Improved interoperability of collaborative systems that allow units to share information across theater, integration of Net Centric web-capabilities into coalition and interagency networks (Coalition Warrior Interoperability Demonstration '05), improved Joint Targeting using Service Orient Architecture approach (Joint Rapid Architecture Environment), and JFCOM's Joint Fires Initiative. This involvement between Joint organizations and the CECOM community speeds development of needed capability and insures timely procurement and delivery to the warfighter and first-responder alike. Only through this close involvement between the warfighter on the ground and the requirements development teams and the Army C4ISR Acquisition team can the cost savings, customer support, and rapid acquisition be realized.

Blue Force Tracking (BFT) Network Operations Cell. Over 1,800 BFT Platforms were installed and fielded to support OIE/OEF. Ft Monmouth SPO building 2707 is the network operations Cell for the OCONUS based BFT network. This Cell monitors the health and welfare of the network as well as managing the individual BFT platforms which includes software upgrades, troubleshooting of communications. There is no other facility like this in the world that provides this capability...one that would require duplication, certification, and a formal burn in period for transition.

Satellite Range Extension for deployed Units/Joint Network Nodes. Team C4ISR managed the design of several range extension projects, such as a satellite networking capability that allows the 3rd Brigade 2nd ID Stryker Brigade to operate with continuous

digital connectivity using commercial technology. One such effort provided CJTF-76-needed digital and voice service to isolated elements located throughout Afghanistan, while another project was for the 1st ID while that unit was deployed in Iraq. All of these range extension projects were initiated and met within 120 days of request. This specialized knowledge is helping the SPO with the Managed Range Extension Capability Assessment for Units of Action—a special study team that worked with TRADOC and DA to recommend an appropriate communications architecture to reorganize the Army into separate and self-sufficient Units of Action to support modularity. Critical to this task has been the engineering management support provided to our program manager for tactical radio communications systems in the development, testing and initial fielding effort of Joint Network Nodes to the 3rd ID, the first Army unit to be reorganized using the Unit of Action concept.

Life Cycle Sustainment. Team C4ISR provides support throughout the life cycle of equipment.

- **National Inventory Control Point and the National Maintenance Point .** Fort Monmouth is responsible for acquiring, stocking, inventory management and repair of nearly half of the Army's National Stock Numbered parts and systems. The total spares acquisition and hardware repair program for the current Fiscal Year 05 is \$2.3B. *In total, in direct support of OEF/OIF since the start of the operations, they have handled nearly 600,000 requisitions from field units, both Army and other Services, and provided over \$1.6B worth of parts across the entire spectrum of C4ISR systems.* They conduct Anticipatory Logistics, which means they work with units identified for deployments to help determine their status of systems and parts on-hand and what they will need while deployed, in order to better and more quickly satisfy their needs once deployed. Team C4ISR routinely does Readiness Analysis of C4ISR system's operational status with all field units across the Army. The sustainment support provided by the Team C4ISR is literally worldwide and from “factory to foxhole”. *The scope of equipment touches essentially every weapon system platform in the Army.*
- **Reset Program.** It receives from returning units, systems that have been subjected to the severe conditions of deployment and combat environment, performs depot level maintenance and returns fully combat ready systems to those units ready for redeployments. This is typically done within 120 days. *Thus far for FY03 - 05, they have Reset over 70 different types of weapon systems, with over 5,100 incidents of system maintenance, involving about 180 Battalion level units across the Army.* This effort involves daily contact by the DA Civilian workforce with those field units, both electronically, and via on-site inspection and maintenance teams. The C4ISR systems Reset range from radios to satellite terminals, airborne sensors/countermeasure sets to Command and Control Vehicles, Radars to Generator Sets.
- **Electronic Sustainment Support Centers.** The Team C4ISR has deployed these centers with DA Civilian Managers to provide forward, in-theater maintenance in direct support of deployed forces. *There are currently 9 different sites in the theater, and they have handled nearly 71,000 repair work orders.* Equipment

supported includes not only Army and other Service Standard systems, but a wide variety of commercial automation, communication and electromechanical equipment brought to the OEF/OIF theater by deploying forces. In addition, they have forward stocked certain critical system's spare parts in theater, both Army and DLA, in order to be more responsive to unit demands for parts.

- **Logistics Assistance Support.** There have been over 400 Logistics Assistance Representative (LAR) deployment events involving over 200 DA Civilian LARs, with an average of 55 in the OEF/OIF theater at any time, providing direct hardware technical assistance on-site with units. Some LARs have deployed up to 5 times to the OEF/OIF theater. In addition, there have been 161 Field Software Engineer (FSE) deployments, with an average of 45 in the OEF/OIF theater at any time, providing direct software support on-site with units.
- **Aircraft Countermeasure Filters.** The AN/ALQ-144 Countermeasures Set protects Blackhawk, Apache and Kiowa Helicopters from hostile Infrared (IR) homing missiles by jamming the threat IR Missile System. Deployment of the helicopters to the severe desert environment resulted in dust and sand getting into the mechanical/optical sections of the transmitter and causing greatly premature failures of the system, grounding the helicopters until the system could be repaired. Team C4ISR rapidly developed, tested, and fielded over 2600 Air Filter Kits, greatly improving nearly 75 times the reliability of the AN/ALQ-144, and reducing the maintenance burden and downtime for the aircraft.

Information Assurance: Team C4ISR Information Assurance staff continually supports Information and Communications Security systems and operations. Their continuous attention has revealed some security vulnerabilities and they have applied corrective actions directly to field operations in Iraq and Afghanistan that resulted in preventing security compromises and loss of mission and life. Evaluation of IA Security Tools/Security Hardware used by Tactical Army - Problems encountered over a one year period average at approximately 75 problems/solutions resolved, as appropriate with vendor or NSA. Examples are In-Line Encryptors TAFLANE, KG-250, GOTS Firewall Cloud shield, Secure GSM Phones, Tactical PKI, Secure PDA, Secure Wireless LAN, Secure Universal Purge Tool. Details are sensitive.

Software Release Summary. In support of over 200 operationally deployed C4ISR systems, we provide new software versions (i.e. capabilities) critical to the Warfighter as these releases provide necessary enhancements, improvements and corrections required for these systems. Over the last twelve months the Team C4ISR Software engineering deployed 49 software releases, eleven (11) of which were emergency releases, in support of Operation Iraqi Freedom/Operation Enduring Freedom. More than 1,200 Warfighter requirements were fulfilled with the releases of these versions. These software upgrades included critical enhancements and fixes in areas such as: force protection; navigational accuracy of aircraft; intelligence analysis capabilities to be used to combat terrorism; early strike warning capabilities for friendly troops under indirect fire and; faster and more secure satellite communications.

2501 Kelso Court
Fallston, Maryland 21047
19 July 2005

Chairman Anthony J. Principi
Base Realignment and Closure Commission
2521 South Clark Street
Arlington, Virginia 22202

Dear Chairman Principi and Members of the Commission:

This letter contains comments about the recent New Jersey presentation at Goucher College regarding Ft. Monmouth and Aberdeen Proving Ground.

I listened with great interest to the testimony given to you by the delegation from New Jersey on Friday, July 8, 2005, at Goucher College. I wish especially to correct the sworn testimony that you heard concerning Ft. Monmouth and the countermeasure systems that are being fielded in Iraq and Afghanistan to neutralize the insurgent's Improvised Explosive Devices. You were told, quite pointedly, that this program would be harmed at the wrong time if the mission and functions and staffing of Ft. Monmouth were to be transferred to the Aberdeen Proving Ground. Not true.

During 1956 – 1996, most of my service as a soldier and as a civilian employee of the Army was at Aberdeen Proving Ground, in positions that required intimate knowledge of how the various electronics systems, fielded and in development, were designed, how well they performed or were intended to perform, and their technical specifications, durability on the battlefield, acceptability by soldiers, and overall operation in combat. I studied and worked with radios, sensors, command and control systems, air and ground reconnaissance platforms, and signal warfare equipment. On numerous occasions I was asked to lead investigations for the Department of Army and for HQ U.S. Army Materiel Command. For more than 20 years I had desk space in a secure facility where I was given access to many C4ISR programs. I visited the various parts of Ft. Monmouth on many occasions, and took part in the highest level program reviews both at Ft. Monmouth and in the Pentagon. I chaired reviews of Ft. Monmouth's compliance with recommendations of the Army Science Board, I participated as a member of source selection advisory boards, at Ft. Monmouth and elsewhere, and I served as technical evaluator of many electronics development programs over the years. In addition I worked closely with the Army's electronics test facilities in the U.S., at and around Forts Huachuca and Hood, and with the operational test evaluation groups in the Training and Doctrine Command. For several months, I served as Acting Technical Director of the Operational Test and Evaluation Agency. I participated, along with the British Army, in the evaluation of electronic warfare systems that prepared the U.S. Army for its 1986 reorganization. I headed and participated on teams that evaluated combat system performance in the Middle East in 1973 and again in more recent years. I am familiar with the Ft. Monmouth programs and the command's approach to new system development. I've had occasion to meet with many of Ft. Monmouth's contractors across the U.S. I was a member of the Senior Executive Service for 14 years. I am retired, and I am an unpaid volunteer member of the Aberdeen Army Alliance. I have no expectation of financial reward as a result of any actions that I might influence regarding

the DoD. I have no relative employed by the federal government, in Harford County or in any other place, in any role other than as a soldier currently deploying to Iraq. I am interested only in improving the U.S. Army by supporting the DoD position concerning Ft. Monmouth and Aberdeen Proving Ground.

Three main points:

- The Army Research Laboratory's Survivability/Lethality Analysis Directorate (SLAD) at Aberdeen took the initiative to endorse and fund project suggestions by their field test and design group at the White Sands Missile Range. SLAD designed and developed, in collaboration with New Mexico State University, the countermeasure system that is being fielded, and this design will continue to be fielded. It is one of four concepts that are now managed by the Program Executive Office IEW&S at Ft. Monmouth in a program called Warlock. The alternative designs appear to have been created by contractors, not by the Ft. Monmouth staff. Contractors provide the SLAD field support, not the Ft. Monmouth staff. Every part of the logistics support and program management is, by nature, highly portable. I have been unable to discern a single aspect of this program that would be harmed if the functions and staffing were transferred elsewhere, at any time. The SLAD team was one of ten Army groups honored for their inventions for the year 2004, because their creation works. The Army's active-duty divisions and the Training and Doctrine Command chose the ten winning programs for their impact on Army capabilities. Nominations for the program were submitted from across the Army laboratory community. None of the New Jersey testimony to you regarding this very important program was factual. It was irresponsible, in this and in other instances. I know that you understand the truth in this matter.
- The institutional culture at Ft. Monmouth is not conducive to creative technical thought. There are some wonderful exceptions, most notably at the Night Vision Laboratory and in a few small pockets of Ft. Monmouth. Using whatever wisdom, the Department of Defense recommendation to create a new center of excellence at Aberdeen Proving Ground is right on the mark, because the Aberdeen culture promotes independent technical thought and the pursuit of battlefield know-how among its military and civilian workforce. As a result, electronic system test design, testing, and development test evaluation *has* been conducted at both Aberdeen and at the Army Test Center's electronic proving ground, Ft. Huachuca. Most of the test work is carried out at Ft. Huachuca and White Sands, because the east coast electronic environment, including commercial radio traffic, air traffic and associated radar create barriers, as you know. The same applies to Ft. Monmouth. For whatever reason, the Ft. Monmouth approach to developing new military capabilities has failed, singularly, to produce a tactical command and control system that soldiers use for much more than e-mail. It has failed to produce a useful system to facilitate the processing of tactical intelligence information (today, the All Source Analysis System is, essentially, tent furniture). Many of the tactical sensors that have been produced under the oversight of the Ft. Monmouth staff are huge, barely mobile "targets." Useful electrical engineering and applied physics know-how is very hard to find at Ft. Monmouth. The real accomplishments of the Ft. Monmouth staff toward fielding useful systems are very few, and that is a main reason that staff spends so much money—the pursuit of failure after failure! In particular, software development (including software performance evaluation) is very weak, and the software must

always be repaired and reprogrammed *during combat*, because the Ft. Monmouth software is not subjected to sufficiently rigorous laboratory tests. Field cellular phones (Mobile Subscriber Equipment) cannot keep up with mobile combat operations. The list is endless. The Ft. Monmouth staff and leaders are not well prepared to supervise their research and development and production contracts. A change in environment cannot harm the missions of the Army's C4ISR developer. It will provide a start on the road to recovery.

- The whole series of presentations by the New Jersey group was replete with misrepresentations concerning Ft. Monmouth and Aberdeen. As one example, one of the New Jersey briefers gave an especially artful set of comments about contamination at Aberdeen Proving Ground. As you are aware, our predecessors did not know enough about chemistry or geology, and they did leave some problems for our generation. We are dealing with them. We have solutions. We are very concerned about the environment in which we and our families live and work. I am reminded of this constantly, in another volunteer role as a Director of the Friends of Harford (County). APG is our welcome neighbor. We actively seek to improve our environment. Apparently that briefier has not taken the opportunity to perform a Google search on <"Monmouth County" toxic>. Monmouth County has problems that appear to surpass those in most of our country. In 1994 there were 390 toxic sites in Monmouth County! Long Branch is a source of unusually high cancer rates due to the long-ago use of coal plus chemicals for gas lamps. If I happen to visit that area again, I shall drink bottled water, and hope that it is okay. Like Aberdeen's neighbor, Harford County, Monmouth is working their way through the problem. That briefier tried very hard to make Aberdeen sound like a bad place in which to live, and suggested that the Ft. Monmouth staff would not wish to move to our area. Those who do move will upgrade their living environment.

Thank you very much for your service.

Very respectfully,

Arend H. Reid
Director
Aberdeen Army Alliance

Fr. Monmouth Clearing House Report

12 July 05

PIMS #0442

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SUBJECT: Request comment about closure, Ft Monmouth
RE: PIMS Tasker # 0422

1. The justification for the recommendation to "Relocate the US Army Military Academy Preparatory School to West Point, NY" states that this move "increases training to enhance coordination, doctrine development, training effectiveness and improve operational and functional efficiencies". Please discuss these improvements.

Answer for Q#1.

By consolidating all Academy related training in one location, it encourages direct interaction and coordination of both instructors and staff. This coordination fosters consistency, standardization and training proficiency while eliminating excess capacity in institutional training installations. It also provides the same or better level of service at a reduced cost, and reduces instructor force requirements.

2. Part of the recommendation is to "Relocate the Joint Network Management System Program Office to Fort Meade, MD." What are the functions that these personnel perform, and what is the efficiency that will be gained from this movement?

Answer for Q#2.

The Joint Network Management Systems (JNMS) Program Office currently at Ft. Monmouth, NJ, is responsible for the Development and Acquisition (D&A) of the Information Systems hardware and software required to centrally manage various data networks deployed by the services in support of joint operations. The purpose of the H&SA JCSG Recommendation to co-locate the JNMS PO at Ft. Meade with other joint C4ISR D&A activities, e.g., the Defense Information Systems Agency (DISA) from Arlington, VA, the Joint Tactical Radio System (JTRS JPO) from Crystal City, VA and the DJC2 (Deployable Joint Command & Control System) from Panama City, FL is to bring together the D&A programs that provide core, common C4ISR capabilities to the services into a Joint C4ISR D&A Center that will integrate the currently separate pieces into a single interoperable system. As the JNMS provides the Joint network management capability, it is a key to the successful achievement of this objective.

3. Please elaborate on the functions and mission of people impacted by the recommendation to "Relocate Information Systems, Sensors, Electronic Warfare, and Electronics Research and Development & Acquisition (RDA) to Aberdeen Proving Ground, MD."

Answer for Q#3.

To support activities in Information Systems, Sensors, Electronic Warfare, and Electronics Research and Development & Acquisition (RDA), the following organizations will move to Aberdeen Proving Ground:

- Communications-Electronics Command (CECOM) Headquarters, Development and Acquisition Logistics Support, Software Engineering Center, from Ft. Monmouth and Ft. Belvoir

- Communications-Electronics Research Development and Engineering Center (CERDEC), from Ft. Monmouth, Night Vision Lab and its Development and Acquisition activities from Ft. Belvoir
- Program Executive Office for Intelligence, Electronic Warfare and Sensors (PEO IEW&S) from Ft. Monmouth and Ft. Belvoir.
- Program Executive Office for Command, Control, Communications - Tactical (PEO C3T) from Ft. Monmouth and Ft. Belvoir.
- Detachment of Army Research Institute (ARI), Ft. Knox.
- PM C3T from Redstone Arsenal.

4. Are there any drawbacks to consolidating the PEO EIS functions at Ft. Belvoir?

Answer for Q#4.

Consolidation of PEO Enterprise Information Systems (EIS) functions at Belvoir is a sound decision. PEO EIS develops business information systems. The proximity to the enterprise decision makers, system users, and the information- technology-rich National Capital Region is a decided plus for the Belvoir location. Rather than business systems, the consolidation at Aberdeen is focused on warfighting systems - from the processing of information at the sensor level on up to the information systems supporting the Joint Force Commander in theater. There is no net advantage to developing warfighting systems and business information systems at the same location.

5. An additional part of the recommendation is to: "Relocate the Budget/Funding, Contracting, Cataloging, Requisition Processing, Customer Services, Item Management, Stock Control, Weapon System Secondary Item Support, Requirements Determination, Integrated Materiel Management Technical Support Inventory Control Point functions for Consumable Items to Defense Supply Center Columbus, OH, and reestablish them as Defense Logistics Agency Inventory Control Point functions; relocate the procurement management and related support functions for Depot Level reparable to Aberdeen Proving Ground, MD, and designate them as Inventory Control Point functions, detachment of Defense Supply Center Columbus, OH, and relocate the remaining integrated materiel management, user, and related support functions to Aberdeen Proving Ground, MD. How are these functions currently performed and organized? Can you please articulate the efficiencies which will be gained through this movement?

Answer for Q#5.

The functions mentioned in the question for both consumable items and depot level reparable are currently performed at Ft Monmouth by the Communications-Electronics Command (CECOM) Inventory Control Point. CECOM is one of the Army's three major inventory control points. These, along with their subordinate elements, are located at five different Army installations. Within DOD, there are 16 separate inventory control point locations (all Services), managing both consumable items and depot level reparable with DLA managing the vast majority of consumable items. This recommendation consolidates the management of the remaining DoD consumables to DLA as well as consolidates the procurement

management and its related support functions of all depot level reparable from the Services to DLA.

The moves described above result in numerous efficiencies and benefits. First, they assist the Army by helping the Army facilitate a full fence-line closure of Ft Monmouth. The movement of the remaining consumable item management functions and the transfer of depot level reparable procurement management from Ft Monmouth to Defense Supply Center Columbus, OH, contribute to the consolidation of these functions under one DoD manager - DLA. As a result, it eliminates duplication of effort and creates economies of scale by leveraging the buying power of the separate Services into just one Agency. Finally, according to the Army, the move of Army inventory control point functions to Aberdeen Proving Ground collocates them with the Army's C4ISR Life Cycle Management Command, which results in one location responsible for nearly all Army C4ISR research, development, acquisition and logistics functions.

6. Please discuss the recommendation to "Realign Fort Belvoir, VA by relocating and consolidating Sensors, Electronics, and Electronic Warfare Research, Development and Acquisition activities to Aberdeen Proving Ground, MD, and by relocating and consolidating Information Systems Research and Development and Acquisition (except for the Program Executive Office, Enterprise Information Systems) to Aberdeen Proving Ground, MD" and the benefits from the justification that state: "The recommendation establishes a Land C4ISR Lifecycle Management Command (LCMC) to focus technical activity and accelerate transition."

Answer for Q#6.

The Benefit of Forming a Land C4ISR Lifecycle Management Command (LCMC).

The Land C4ISR center will provide a capability for Network Centric Warfare, which is the defining transformational concept for future warfighting. The essential interoperability between air, land and maritime C4ISR networks does not mean that all forces should be equipped with the same systems. Interoperability can be achieved between systems, which have significantly different performance characteristics. Systems, which support the land component have a vastly different scale for communications, information sources to process, and levels of information requirements: thousands of nodes for vehicles, soldiers and sensors, compared to the number of ships or aircraft in maritime or air C4ISR. The environmental influence of terrain, and vegetation on communication, and the need for short distance, low probability of intercept and high jam resistance, is not shared with most ship to ship or aircraft to aircraft needs.

Realignments of C4ISR Activities. For realigning C4ISR activities, it is essential to have a consolidated development and acquisition center focused on Land C4ISR needs. It is even more essential to facilitate the land network science, technology and experimentation essential to develop capabilities for the future by bringing together the research assets of CERDEC from both Ft Monmouth and Ft. Belvoir along with the information systems research assets already at Aberdeen and the personnel from Ft. Knox who perform human systems research in networks.

7. Are there any concerns regarding the payback portion which states: "The total estimated one-time cost to the Department of Defense to implement this recommendation is \$822.3M. The net of all costs and savings to the Department of Defense during the implementation period is a cost of \$395.6M. Annual recurring savings to the Department after implementation are \$143.7M with a payback expected in 6 years."

Answer for Q#7.

The Army used certified data from Fort Monmouth that were collected at the data call in the last 24 months. Savings were described from the COBRA model. Any concerns pertaining to Fort Monmouth savings would derive from recent changes in personnel or facilities from the certified data established beyond what's archived in the data call. These changes to the best of our knowledge would cause small changes in payback period and would not cause the Army to reconsider the recommendation.

8. Is there any additional information that you would like to communicate that might impact on these recommendations?

Answer for Q#8.

Implementation of this recommendation will require careful planning, time phasing, incentives and recruitment to mitigate the potential loss of technical capability. Army will take active role in recruiting efforts to mitigate personnel loss.

9. In unclassified terms, please name and describe all laboratory, test and certification facilities. Please note specifically: estimated time to newly construct each of those facilities to include time to achieve any required certifications; any certifications required; estimated cost to newly construct; length of time that old and new facilities would need to be co-operational before old facility could be "turned off".

Answer for Q#9.

At Fort Monmouth, CECOM has several major laboratory, test and certification facilities. CERDEC has laboratories and facilities at Fort Monmouth and Fort Belvoir. All 64 CERDEC laboratory, test and certification facilities at Fort Monmouth are listed on the attached Excel spreadsheet entitled, "Facility Excel Spreadsheet Question 9 – CERDEC Fort Monmouth, At Fort Belvoir, CERDEC has 46 laboratory, test and certification facilities listed on the attached Excel spreadsheet entitled, "Facility Excel Spreadsheet Question 9 – CERDEC Fort Belvoir." CECOM major facilities are listed below.

Pulse Power Building

The Pulse Power Building/Star Wars Laboratory/Special Projects Office/Bldg 2702 was constructed under a now declassified "Black Program" and may cost \$50M+ and require 2.5 years to reconstruct. It is a classified high bay, shielded facility designed to support and advance high voltage applications and pulsed power technologies, and to advance microwave, laser system and plasma technologies.

65 engineers and other essential personnel are employed at this facility today, a comparable overlapping staff would be required at Aberdeen during a two (to possibly three) year co-operations period. Therefore, assuming no loss of personnel, it would take a minimum of 4.5 to 5 years to re-establish this laboratory and its operations at a new location

Software Engineering Laboratory and Test Facilities

The Software Engineering Center (SEC) has approximately 65,000 square feet of laboratory and test facilities. Each facility is a secure area, with open storage of classified material.

- Integrated Command, Control and Communications (C3) Lab. The SEC Integrated C3 Laboratory, completed in 2002, houses a testing center equipped with systems and software representative of those used by Warfighters. This facility is approximately 19,000 square feet.
- Integrated Avionics Lab. The Avionics Laboratory provides the resources for SEC software engineers to simulate actual avionics problems reported from the field, develop fixes, and test proposed solutions. This facility is approximately 3,500 square feet.
- Integrated Electronic Warfare Lab. The Integrated Electronic Warfare Lab provides the resources for SEC software engineers to perform Post Production Software Support for the Common Ground Station (CGS), Joint Tactical Terminal (JTT) and Commanders Tactical Terminals which are deployed to Military Intelligence Battalions, Brigades, Corps and Echelons-Above-Corps, as well as to Joint Service users. This facility is approximately 5,000 square feet.
- Integrated Intelligence and Electronic Warfare Lab. The SEC Integrated Intelligence and Electronic Warfare Lab provides the resources for SEC software engineers to simulate actual electronic warfare and signal intelligence problems reported from the field, develop fixes, and test proposed solutions. This facility is approximately 4,000 square feet.
- Integrated Satellite Communications Lab. The SEC Integrated Satellite Communications Lab provides software engineering support for the Defense Satellite Communications System, which is comprised of strategic earth terminals, planning, monitoring, and control systems. These systems are deployed at worldwide operation centers and earth terminal locations. This facility is approximately 5,000 square feet.
- Integrated Sensors Lab. The SEC Integrated Sensors Lab provides the resources for SEC software engineers to perform Post Production Software Support (PPSS) for the Guardrail Common Sensor Systems. This facility is approximately 5,000 square feet.
- Integrated Communication & Interoperability Lab. – The SEC Integrated Communication and Interoperability Lab is the central location for Replication, Distribution, Installation and Training (RDIT) for software products. This facility is approximately 11,000 square feet.

In addition to these existing facilities, the SEC has identified requirements for new laboratories to support emerging mission requirements. These facilities have been presented to the appropriate personnel at the Aberdeen Proving Ground and will be included in the planned new construction. These future facilities requirements are identified below.

- Logistics Modernization Program (LMP) / Joint Computer-Aided Logistics Systems (JCALS) Integration Lab. This facility requirement is estimated at approximately 6,500 square feet.
- Battle Command Software (S/W) Integration Lab. This facility requirement is estimated at approximately 2,500 square feet.
- Joint Tactical Radio System (JTRS) S/W Integration Lab. This facility requirement is estimated at approximately 1,500 square feet.
- Electronic Key Management System (EKMS) Testing Lab. EKMS is a high priority Joint program that provides the structure for electronic cryptographic key generation as well as the accountability of all COMSEC devices and materials. This facility requirement is estimated at approximately 1,000 square feet.
- Joint Network Node (JNN) Test Lab. JNN is a state-of-the-art, mission-critical communications systems (high speed, high capacity) to provide secure, highly reliable voice, data and video information exchange supporting both NIPRNET and SIPRNET throughout the tactical theater with support for network management and information assurance. This facility requirement is estimated at approximately 1,000 square feet.

SEC laboratory, test and certification facilities encompass the equipment and infrastructure needed to provide the software sustainment and development support required to keep C4ISR joint service equipment and technologies and associated missions operational. The total space requirement for those facilities is approximately 65,000 square feet. The total estimated replacement cost is between \$16M and \$17M. New construction time will be entirely dependent upon a milestone schedule which would include architectural design, contract award, and construction phases. Given the scope of this effort, the Army would estimate that it would take 12-18 months to construct new facilities at Aberdeen Proving Ground to meet these requirements.

SEC would require laboratory facility (as described above) and equipment redundancy during the transitional period. During that time, the Army would need a dual operating capability to provide uninterrupted support services. The Army expects that redundant operations would be required for an estimated period of 3-6 months.

10. In unclassified format, what support to legacy systems or technology will need to be reconstituted in Aberdeen?

Answer for Q#10.

Hardware, software and technology support to every C4ISR system in the Army inventory will need to be reconstituted in Aberdeen – over 51,000 nationally stock numbered items, including 6,000 major end items. As these systems are in constant use in Iraq, Afghanistan and around the world, reconstitution of the C4ISR mission at Aberdeen must be accomplished with no lapse in support to C4ISR legacy systems and technology and at a level sufficient to support current operating levels.

11. In unclassified format, please note and discuss any unique features of the Ft. Monmouth installation itself, to include any support to outside organizations or agencies. Is the impact to these organizations discussed in the recommendation? If not, please describe any impacts like relocation or potential continued operation in place.

Answer for Q#11.

Fort Monmouth has three unique, non-DoD tenants and two business partnership with nearby communities:

- The Federal Emergency Management Agency (FEMA) Region II Continuity of Operations Point (COOP) Alternative Operations Facility serves as a Disaster Field Office, Federal Radiological Emergency Response Center for New Jersey, Regional Operations Center and a COOP Site for the Emergency Relocation Group.
- The Federal Bureau of Investigation Information Technology Center, a secured facility. Subject to the resolution of funding, property acquisition and security issues, the FBI could potentially continue its operation in place.
- The Veteran's Administration Health Facility that handles in excess of 10,000 patients annually. The Fort Monmouth location provides veterans with "one-store" appointments and improves access to an under-served veteran population, reducing long distance travel for elderly and disabled veterans. Subject to the resolution of funding, property acquisition and security issues, this clinic could potentially continue its operation in place.
- Stevens Institute of Technology Hoboken, NJ, with campus just 50 miles from Fort Monmouth, serves as a C4ISR Urban Test Bed for wireless networks. This partnership can remain in place without Fort Monmouth.
- The Applied Communications and Information Networking (ACIN) program, which began in FY01, is a partnership between Drexel University, Sarnoff Corporation and CERDEC with top-level goal is to capitalize on wireless technology emerging from the commercial and consumer communications and networking industries by leveraging advances and influencing development efforts. In addition to the R&D efforts, the ACIN program has created a Center for Entrepreneurship (ACIN Center) located in Camden, New Jersey. The primary goal of the ACIN Center is to enable

communications and networking businesses that utilize information technology (IT) developed in ACIN R&D projects to be incubated and accelerated onto a rapid commercialization track. As a result of the ACIN efforts, several companies have joined the center fostering relationships with the Air Force, FAA, DISA, TSA, Coast Guard and NAVSEA. These programs can remain in place without Fort Monmouth.

12. In unclassified format, describe the relationship between Ft. Monmouth, Ft. Dix, Lakehurst NAS and Willow Grove. Include descriptions of acreage, facilities, current Ft. Monmouth usage of that location, and average yearly hours or days of Ft. Monmouth use of that facility. How do recommendations regarding Willow Grove impact Ft. Monmouth activities?

Answer for Q#12.

Please note this question should address "Warren Grove" Bombing Range, New Jersey, not "Willow Grove", Pennsylvania. The BRAC recommendation to close Willow Grove, Pennsylvania has no impact on Fort Monmouth activities.

Ft. Dix, Lakehurst Naval AES, McGuire Air Force Base and Warren Grove Bombing Range afford the engineers and scientists access to approximately 42,000 acres of land and over 200 miles of controlled restricted air space. Facilities include the Instrumentation Center, Sensor Fusion Center, Integration/Expo Center, Network Operation Center, Live/Virtual/Constructive Facility, Maintenance Facility, Weapons Vaults, Military Operations in Urban Terrain Facility and a Maneuver Area which features open terrain, wooded areas and rolling hills. Lakehurst Naval AES houses the CERDEC Flight Activity and provides 24/7 airfield operational capability and Visual and Instrumented Flight Rules (VFR/IFR) between 1,000 and 25,000 feet. In addition to flight operations, facilities include laser ranges and access to remote testing areas for air and ground communication projects. McGuire Air Force Base provides Air Traffic Control and facilities for large aircraft and has been utilized over the past two years with the Air Force's Command and Control Constellation Testbed utilizing the Paul Revere aircraft. Warren Grove Bombing Range is utilized to extend the maneuver areas of Fort Dix an additional 40 km.

13. There has been significant mention of the loss of intellectual capital. Given the current Ft. Monmouth workforce, on average, how many years of experience do senior system personnel have with that system? How long does it take, and what kind of training or education is required for someone to be considered a "system expert"? Is there any way to quantify the impact of the loss of this experience upon a system and the soldier?

Answer for Q#13. TBD

14. Are any of the organizations in leased facilities on Ft. Monmouth? If so, name the organization and leased building.

Answer for Q#14.

There are no organizations in leased facilities on Fort Monmouth.

15. How many engineering labs (Army) are there? How do they work with sister Service labs?

Answer for Q#15.

How many engineering labs (Army) are there?" There are six engineering Labs in the Army excluding Army Corps of Engineers (ACE), Engineer Research and Development Center (ERDC). The ERDC was excluded from BRAC due to a decision by Congress to exclude Civil Works from BRAC considerations, and ERDC has the DoD mission for Civil Works activity. The six Engineering Labs are;

- Armament RDEC , Picatinny, NJ
- Communications-Electronics RDEC, Fort Monmouth, NJ and Fort Belvoir, VA
- Edgewood Chemical Biological Center, Aberdeen Proving Ground (APG), MD
- Aviation and Missile RDEC, Redstone Arsenal, AL
- Soldier Systems Center, Natick, MA
- Tank Automotive RDEC, Warren, MI

All Centers remain except the Communications-Electronics RDEC, to be relocated to APG, MD. The Army Research Laboratory (ARL) and the Army Medical Research & Materiel Command (MRMC) also conduct engineering activities in addition to their primary activities in basic and applied research.

All six of the Engineering Centers, as well as ARL, fall under the management of the Army Research, Development and Engineering Command (RDECOM), Headquarters, APG, MD, which provides, along with ODASA(R&T), integration of investment strategies and oversight of R&D program execution across the Army Engineering Labs.

How do they work with sister Service labs? The Army engineering labs (and this includes the ACE ERDC), as well as ARL and MRMC, integrate their work with sister Service Labs through a combination of activities, including primarily the DoD Science & Technology (S&T) Reliance program, but augmented by other coordinating activities such as the annual Joint Army/Navy/NASA/AF (JANNAF) topical research symposia, and through joint working groups established by the Services in specific technical areas, e.g., energetic materials.

DoD S&T Reliance is a program run by the Services, the three DoD research agencies (DARPA, DTRA, and MDA), and OSD. Its stated mission is to "...strengthen cooperation [among the S&T Services and Agencies] by reducing redundant capabilities and eliminating unwarranted duplication [in S&T investments and activities]. It provides the framework for planning, documenting, and assessing the content of the DoD S&T program." This communication and integration is done at multiple levels of interactions, beginning with an annual, multi-day Comprehensive

Review and Assessment of the S&T programs by the Chief Scientists (referred to collectively as the "Defense Science & Technology Advisory Group", or DSTAG) from all the Components under the direction of the Director for Defense Research & Engineering (DDR&E). In addition, the DSTAG meets on a biweekly basis to review S&T investment plans vis-à-vis ongoing and newly occurring requirements.

At the Laboratory level, there are 12 Defense Technology Area Panels (DTAPs) covering all the S&T investment areas within the DoD. These panels are comprised of senior scientists and engineers from all the Components, most of whom work in the DoD Laboratories and Centers. These panels bear the responsibility for meeting on a regular basis (typically quarterly) to discuss high-priority research programs within the Components and proposing new joint research efforts to be funded by one or more of the Components. These research programs are referred to as Defense Technology Objectives (DTOs), and a brief description of each DTO is captured in an annual publication called the "DTO Document". These DTOs, as a collection, typically represent about 40% of the S&T funds invested by the Components, but cover essentially all major research areas of investment. Each year as DTOs complete, new ones are proposed, approved, and executed. There are about 400 active DTOs per year.

The panel meetings and DTO Document provide an excellent mechanism for communicating S&T investments and plans across the Services and Agencies. In addition, the Components review the DTOs, and supporting R&D programs, on a biennial basis through weeklong Technical Area Review and Assessment (TARA) meetings under the direction of DDR&E. These TARA are structured around the 12 DTAP technical areas and managed by the Chairs for the 12 DTAP panels. The Chairs for these Panels rotate among the Services and are filled at the SES level by R&D managers from the Components. In the alternate year the higher-level (DSTAG-level) Comprehensive Review and Assessment process occurs to better enable senior leadership to assess, plan, and adjust S&T investment strategies.

16. What is unique about the Ft. Monmouth installation itself?

Answer for Q#16. TBD

17. Can the test bed area here be recreated at Aberdeen?

Answer for Q#17.

The test beds at Ft. Monmouth can be replicated at the Aberdeen Proving Ground (APG). The Communications Electronics Research Development and Engineering Center (CERDEC) at Ft. Monmouth operates a Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) "On-the-Move" test bed. This test bed is located at Ft. Dix, NJ and includes various tracked and wheeled vehicles equipped with prototype hardware battle command and communication systems. Emerging technology, which could be employed in the Future Combat System (FCS), is demonstrated at this test bed that includes various roads and trails through wooded and open areas. The area

includes radio-equipped towers that allow communications to the vehicles to be maintained. Testing has also included airborne assets (manned and unmanned) with communications relay capability and surveillance capability. Ft. Dix consists of 31,065 acres of land, of which 13,765 acres are range and impact area and 14,000 are classified as contiguous maneuver area. (Compared to Aberdeen Proving Ground's 72,000 acres.) Aberdeen Proving Ground (APG) has similar terrain features with the notable addition of having a shoreline and over water areas for proving out new technologies.

CERDEC also operates a C4 lab within the Myers Center that is similar to the Central technical Support Facility (CTSF) yet much smaller. This facility can be replicated most anywhere in which an environmentally controlled building is available and communications is available. APG has the land to accommodate this test bed.

Frequencies of many of the communications systems have been operated at APG in the past and there is a 20 year long history of testing Ft. Monmouth systems at APG. Given BRAC funds to replicate the capabilities at Ft. Monmouth; there appears to be no limitation on fully recreating the Ft. Monmouth test beds at APG.

18. How do you (Ft. Monmouth) deal with technology transfers?

Answer for Q#18.

At Fort Monmouth the Army deals with many aspects of technology transfer and the approach varies with the situation. All of this will continue at Aberdeen Proving Ground.

Technology Transferred into the Government

The Army uses one of five mechanisms to transfer technology into Fort Monmouth from the private sector or academia:

- Federal Acquisition Regulation (FAR)-based contracts coupled with the use of standard and specially drafted data rights clauses;
- Other Transaction Agreements (OTAs) (contractual arrangements outside the FAR and the Defense FAR Supplement) generally awarded to non-traditional defense contractors coupled with the utilization of specially drafted non-DFARS data rights clauses;
- Cooperative Research and Development Agreements (CRADAs), wherein the Government obtains information from its CRADA partners without providing monetary reimbursement; - approximately fourteen CRADAs per year are recorded.
- Army Venture Capital Initiative to attempt to locate, support, and transfer new technologies, typically from companies which have little or no previous experience with the DOD; and
- Mandatory licensing provisions in traditional FAR-based contracts, whereby the Government may not get access to the information but where we provide the information directly to the contractor(s) of our choice.
- The Small Business Innovative Research (SBIR) Program was established to provide small businesses and research institutions with opportunities to

participate in government-sponsored research and development. To date, in FY05, CECOM has realized a 450% return on its investment into the SBIR program. Since the inception of the SBIR Phase II Quality Awards, Team C4ISR has won nine annual awards.

By way of quantification, by far the greatest number of arrangements for technology transfer into the Government is FAR-based contracts. Fort Monmouth awards approximately 180 R&D contracts per year (approximately 200, counting those awarded using simplified acquisition procedures), all of which provide for delivery of technical information to the Government. Beyond that, many of CECOM non-R&D contracts, of which approximately another 180 are awarded per year (approximately 930, counting those awarded using simplified acquisition procedures), call for data deliveries. The technical data and computer software purchased enhances our C4ISR technology base and that of those contractors doing business with us who subsequently receive the information pursuant to conducting that business.

Technology Transferred out of the Government

The Army uses one of three mechanisms to transfer technology out of Government:

- CRADA is the most frequently used vehicle to accomplish such a transfer. The work performed under these agreements ranges from testing and suggesting changes to commercial equipment, assisting in the design and development of items for use on contracts where the contractor is supplying a product to sister services, or, as in the case of the Future Combat Systems program, where the end item will be used by the Army. This vehicle allows the Army to insert technology developed by our laboratories into systems managed by Government PEOs and PMs without the need for that PM to take the contractual risk of directing such use. The CRADA vehicle is also used to allow for our laboratories and CRADA partners to cooperatively test and jointly refine components and systems which are candidates for military use in a C4ISR test bed located at Fort Dix/McGuire AFB/Lakehurst Naval AES, NJ. Such early collaborative effort reduces development time and cost and promotes operational compatibility among a plurality of systems leading to a seamless interaction of all C4ISR elements, ultimately providing the battle commander with a decisive advantage.
- Homeland Defense. CECOM has established CRADA relationships with the State of New Jersey and the Port Authority of New York and New Jersey. The Army Corps of Engineers is also a party to some of these efforts which are directed at providing port, bridge and water security to the New York City environs; enhancing their communications capability; and providing computer security to New Jersey's defense apparatus. CECOM has been able to provide assistance now in areas where the Department of Homeland Security has yet to establish significant expertise or methodology.
- Patent Program. Several patented inventions have been licensed over the years, most recently last year to the largest magnet manufacturer in the

United States. Beyond patent licensing, however, many Fort Monmouth patents have been cited extensively by the United States Patent and Trademark Office for the purpose of teaching those inventions to other applicants for patent, thereby broadening the knowledge base of the inventive community by disseminating technology developed here, while at the same time, reducing the government's future exposure to costly patent litigation.

19. Why were the facilities at Natick and Adelphi not brought into an Army C4ISR recommendation?

Answer for Q#19.

Both Natick and Adelphi were considered as part of the Army's consolidations onto Aberdeen Proving Ground (APG). These installations have related missions that would have complemented the extensive RDTE facilities and missions already in place at APG. Both were fully studied and registered as potential BRAC scenarios. Natick and Adelphi were deleted in the final DoD BRAC reviews due to high one-time costs to implement and a slow payback period associated with each closure.

20. Was Homeland Security/Homeland Defense taken into consideration as part of the Ft. Monmouth closure recommendation? If so, how? If not, why not?

Answer for Q#20.

Yes. Military Departments and Joint Cross-Service Groups were required to consider all selection criteria in their analysis, giving priority to military value (the first four criteria). Military value criteria #2 and #3 require consideration of homeland defense missions and surge respectively.

Additionally, the Commanders of U.S. Northern Command and U.S. Pacific Command reviewed all recommendations and commented that the recommendations do not create an unacceptable risk to the accomplishment of our homeland defense or defense support of civil authorities missions.

21. What were the first and second choice locations ahead of Aberdeen? Why were they rejected? How was Aberdeen deemed the best facility?

Answer for Q#21.

DOD's first choice is indeed the final BRAC recommendation location at Aberdeen Proving Ground, MD. Other alternatives were examined that led to this conclusion. These alternatives included:

Alternative # 1. Consolidate research at Adelphi and consolidate Development and Acquisition at Fort Belvoir.

- Research: Consolidate Army Research in Information Systems Technology and Sensors, Electronics and EW at Adelphi MD. Realign these research functions from Ft. Monmouth, Ft Belvoir, APG, and WSMR to Adelphi. Realign Human Network research function from ARI at Fort Knox to Adelphi.

- Development and Acquisition: Consolidate Army Development and Acquisition (D&A) in Information Systems Technology and Sensors, Electronics and EW at Ft. Belvoir, VA. Realign these D&A functions from Ft. Monmouth, Redstone Arsenal and Crystal City (PM-ALTESS) to Ft. Belvoir.

Alternative # 2. Consolidate research at Adelphi, and consolidate Development and Acquisition at Aberdeen Proving Ground and Fort Belvoir.

- Research: Close Fort Monmouth, realign ARL Fort Knox, ARL Aberdeen, White Sands and Night Vision Lab, Fort Belvoir, by relocating and consolidating Information Systems, Sensors, Electronic Warfare, & Electronics, and Human Systems Research to ARL Adelphi
- Development and Acquisition: Realigns Fort Monmouth, Redstone Arsenal, by relocating and consolidating Information Systems and Sensors, Electronic Warfare, and Electronics Development and Acquisition to Aberdeen Proving Ground, MD. Retains at Ft. Belvoir current Development and Acquisition in Information Systems, Sensors, Electronic Warfare, and Electronics, and realigns PM ALTESS facility in Arlington to Ft. Belvoir.

These alternatives to construct a C4ISR center for the Army were thoroughly reviewed and approved by senior Army and OSD leadership.

Alternative #1 was rejected for several reasons: the small acreage at Adelphi restricted the amount of space available for necessary construction and would have required extensive and expensive high rise construction of office space, laboratory space, and even parking garages; the lack of available unoccupied office space at Ft. Belvoir required new construction of office space; and the recommendation to establish a consolidated C4ISR center for the Army would actually take one element now at Ft. Monmouth and break it into two (i.e., research (CERDEC) at Adelphi and D&A (CECOM, PEOs IEW&S and C3T) at Ft. Belvoir).

Alternative #2 was rejected largely for the same reasons: the acreage limitations at Adelphi and breaking up Ft. Monmouth into separate pieces. This alternative also had a net present value cost of \$94 M.

APG was deemed the best receiver of the Ft. Monmouth mission for two primary reasons: cost and synergy with other RDTE missions and activities at APG.

The BRAC recommendation to move the Ordnance Center and School from APG offers substantial office/admin space to house Ft. Monmouth personnel while minimizing new construction costs. This related BRAC recommendation, coupled with the base operations savings from closing Ft. Monmouth, allows a payback in only 6 years and has an annual recurring savings of \$144M.

APG is a full spectrum Research, Development & Acquisition, Test and Evaluation Army installation. With the BRAC recommendation to close Ft. Monmouth, the research and engineering functions for communications, electronics, night vision,

and chemical/biological defense will be co-located with the Army Research Laboratory's Weapons and Material Research and, Human Research Engineering Directorates as well as the HQ, Army Research, Development and Engineering Command. For D&A functions, 3 PEOs (including the Joint PEO for Chemical/Biological Defense) and subordinate program managers will be located at APG. The T&E capabilities that exist at APG today are complementary and can be readily expanded to provide direct support to additional C4ISR programs while in the early development stages of acquisition.

APG was favored by both the Army and the Technical Joint Cross Service Group (TJCSG) as the preferred site for the land C4ISR center. The Army's military value criteria assigned greater value for available land/buildable acres and multiple mission capabilities of its installations. By these criteria, APG scored significantly higher than Ft. Monmouth. (Annex 3, Section II on page B-44 for a full listing of the Army's military value scores.) The Army has a critical requirement to build a networked future force and the related technology areas coming together at APG will enable faster technology transition to meet the warfighter.

The TJCSG strategy was to create full spectrum R, D&A, T&E centers where feasible. The co-location of testing and evaluation facilities with the program managers and the researchers is a key part of the TJCSG recommendations. The TJCSG also recommended the creation of agile, diverse research capabilities and this is reflected in other BRAC recommendations as well. APG offers a solution to this strategy; Ft. Monmouth does not.

For completeness, a COBRA analysis was accomplished early in the deliberative process to examine the feasibility of consolidating the C4ISR center at Ft. Monmouth. This scenario was deleted from further consideration because its payback period exceeded 100 years, and that there was not sufficient land available at Ft. Monmouth to support extensive outdoor testing.

22. In looking at the Technical recommendations, there are many joint C4ISR facilities, but no land C4ISR center. Why is there no such recommendation and how does the recommendation to close Ft. Monmouth fit in with that rationale?

Answer for Q#22.

The recommendation closes Fort Monmouth and establishes the Army Land C4ISR Center at Aberdeen Proving Ground.