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U.S. Army Nuclear and Chemical Agency

Fall / Winter 2003

U.S. Army Nuclear Disablement Team

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Provide nuclear and chemical technical expertise in support of all Army elements, and to other U.S. Government and NATO agencies as requested.

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USANCA's Top 7

Dr. Charles N. Davidson
DIRECTOR
U.S. Army Nuclear and Chemical Agency

From time to time, we're asked to elaborate on what our most important current actions are. These actions usually have a definable end point, but often endure for a year or more. I thought it might be useful to update you on just what these top actions are today. There are seven, and I'll present them in no particular priority order.

Man, Equip, Train, Deploy, and Sustain NDT. As many of you are aware, USANCA became a force provider for the first time ever during Operation Iraqi Freedom. An 11-person Nuclear Disablement Team (NDT) consisting of two assigned and nine attached Servicemembers was deployed into Iraq to search out, assess, render safe, and make unusable any nuclear or radioactive materials, weaponized or not. Deployed under the command of COL Mickey Freeland, USANCA's Nuclear Division Chief, the NDT did just that, reaching back for USANCA technical support when necessary. MAJ Jerry Vavrina and MAJ John Greaves, two NDT members, detail the first part of the deployment story in this issue.

An NDT had never existed before within the DoD. But large doses of expertise, initiative, and dedication resulted in team member selection and assembly, equipment selection and purchase, and some pretty unique training in just over 30 days. Although the initial manning, equipping, training, and deploying are over, it's the sustaining of this capability that keeps it on our list. Incorporating lessons learned, revising the concept of operations, maintaining the sensitive equipment, and preparing to re-deploy on order are ongoing non-trivial tasks. And preparing to migrate all or some of that capability into the Army's new Chemical, Biological, Radiological, Nuclear, High Explosive (CBRNE) Command under development is critical. Time will tell how successful we are in this transition, but indications at this writing are good.

Ensure ABCS and FCS Survivability. The Army Battle Command System (ABCS) and the Future Combat Systems (FCS) are arguably the most critical and overarching Army systems under development. ABCS integrates all Army C4I functional systems for the Current Force; FCS integrates networked air- and ground-based maneuver, maneuver support, and sustainment systems for the Future Force. Our job is to make sure that critical components of these systems will survive the nuclear and chemical environments they are likely to encounter. We do this by working threshold NBC survivability requirements statements and criteria into the requirements documentation, and then tracking the analysis and testing necessary to satisfy the requirements during development.

Our red-amber-green stoplight charts tracking survivability progress for ABCS components have become increasingly green over the years, testimony to the efforts of many individuals throughout the Army. Our goal is to do as well with the much more recent FCS development. We know from hard experience that these survivability efforts are never-ending; both the requirements and efforts to meet them can fall by the wayside if we're not vigilant.

Revise Joint Pub on Theater Nuclear Planning. We are well along in a significant effort to revise and consolidate Joint Pubs 3-12.2 and 3-12.3 on theater nuclear weapons employment into a single Joint Pub 3-12.1 that lays out the tactics, techniques, and procedures for planning theater nuclear operations. By the time you read this, the second draft will be in worldwide staffing. You will recall that the Army (USANCA) writes these publications, despite having no nuclear weapons of its own, because weapon use in a theater role would most impact the ground commander's scheme of maneuver and troop safety.

This new USANCA-written Joint Pub 3-12.1, which includes contributions by USSTRATCOM, will enable staffs of Combatant Commanders to perform target analysis

in a theater context, ensure friendly force safety, avoid collateral damage, and determine likely effects on future land operations. Final publication of the approved document is anticipated late this fiscal year.

Write Biological Surety Army Regulation. Shortly after anthrax mailings emerged as a threat, the Vice Chief of Staff Army directed preparation of an Army Regulation on biological surety that roughly paralleled regulations already existing for nuclear (AR 50-5) and chemical (AR 50-6). This new regulation, currently referred to as AR 50-X, is nearing completion by an Army G3-led drafting team with heavy USANCA involvement. Writing this reg has not been an easy job. Despite rough parallels with the other surety regs, defining the regulation's applicability (should it apply only to Army research agents at Army laboratories, or also to Army contract facilities using Army agent, or even to non-Army agent being researched at non-Army facilities under Army contract?) and establishing practical restrictions and controls on a research program already in place are not easy problems.

Regulate Reactor Consolidation. Army Test and Evaluation Command, which owns the Army's two nuclear testing reactor facilities, has decided to consolidate all capabilities of both reactors into a single facility, the one located at White Sands Missile Range in New Mexico. Rising costs of security personnel were a major driver in this decision, subsequently approved by the Army G3. The detailed and incredibly complex plan for this consolidation involves ceasing operations at the Aberdeen Proving Ground facility to allow the nuclear fuel to "cool down", transporting that fuel to an approved storage location using safe and secure transport, establishing irradiation capabilities at White Sands that are currently unique to Aberdeen, and managing the simultaneous drawdown and expansion of reactor staffs at the respective facilities. Throughout this process, the customer base at both facilities must continue to be served.

Under AR 50-7, USANCA regulates all aspects of nuclear reactor operations within the Army, performing functions similar to those of the Nuclear Regulatory Commission with respect to the civilian nuclear industry. This includes issuing operating permits and certifying reactor operators. More to the point, it also includes overseeing reactor fuel shipments and the subsequent decommissioning of the Aberdeen reactor. A complicating factor is that the reactor fuel is "owned" by the Department of Energy and all fuel shipments must be carried out by the DOE.

Expand FA52 Presence in New Commands/Offices. As new organizations (such as Northern Command, the OSD Office of Homeland Defense, the Army Component Command of USSTRATCOM, the new Army CBRNE Command) are stood up, one of our jobs is to ensure they are properly staffed with nuclear (Functional Area 52) officers. We usually initiate these actions by informal liaison, assistance to the new organization in justifying FA52 spaces, and then providing the right officers to fill the newly authorized slots (or even detailing officers to slots not yet formally authorized). By the end of FY04, we expect to have at least 129 authorized FA52 positions, an increase of 13 over today's 116.

But this is only part of the job. We are hard at work increasing the number of FA52 spaces and faces in the Reserve Component as well. For a variety of reasons, the number of authorized spaces for FA52 Reserve officers had fallen to only six, with a correspondingly very small number of Reservists who formally carried FA52 as one of their official designators. You will find details of our efforts to increase authorized spaces and discover nuclear-qualified Reserve officers to fill these spaces in an article in this issue by COL Bobby Armstrong. We are already making substantial headway, and anticipate the number of authorizations to increase from six to 26 by the end of this fiscal year.

Support Prague Capabilities Commitment in NATO. You may recall from LTC Maribel Rodriguez' article in our last issue of *NBC Report* that most NATO efforts today are focused in support of commitments made by NATO Heads of State at their November 2002 summit meeting in Prague. One of the four fundamental areas these commitments encompass is defending against CBRN attacks. And one of the most critical pieces of this fundamental area is the development of a multinational CBRN battalion that, as a force package, can be assembled and deployed by NATO as needed. This battalion includes sampling, analysis, and assessment capabilities; it is scheduled to be initially operational by the time you read this, and fully operational in mid-2004. Since USANCA is heavily involved in most non-medical NBC NATO standardization tasks, it's not surprising that efforts in support of this appear as one of our most important current actions.

Conclusion. Need more information or have something to contribute on the seven topics listed above? Feel free to weigh in with a phone call or e-mail. We welcome your ideas.

Why Nuclear Matters

Mr. Steve Henry
Deputy Assistant to the Secretary of Defense for Nuclear Matters (DATSD/NM)

With the end of the Cold War, many believe the possibility of a large-scale nuclear war is practically non-existent. There is a pervasive perception that nuclear weapons and nuclear issues are no longer fundamental to U.S. national security. Few seem concerned about nuclear war, but worry instead about weapons of mass destruction (WMD) terrorism and accidents. These concerns have resulted in pressure to reduce the nuclear arsenal and focus on the nuclear nonproliferation agenda. However, these attitudes and beliefs must be addressed and corrected to reflect the current situation. As long as nuclear weapons technologies exist in the hands of any nation or non-state entity, nuclear weapons will continue to be a national security concern for the United States. Acknowledging this reality shifts the focus of the debate from whether the U.S. should *have* nuclear weapons to one that addresses *which* weapons best suit current and future security needs.

A Weapon Unlike Any Other

An important first step to recognize and support the premise that "nuclear *matters*" is the recognition that nuclear weapons are in a class by themselves. Nuclear weapons pose the only threat to hundreds of thousands of people and, potentially, to the very existence of the United States. Despite the demise of the Soviet Union, Russia remains a peer competitor with respect to its ability to physically hold hostage the American homeland with a nuclear strike.

Nuclear weapons still remain the best and most effective alternative for deterring a potential nuclear or other WMD attack against the United States or responding to such an attack. The U.S. nuclear stockpile is also an important element in deterring or defending against an overwhelming conventional attack upon our Allies. As the long "nuclear peace" over the past fifty years has demonstrated, the potential employment by the U.S. of nuclear weapons renders the prospect of any type of conflict or attack against U.S. interests a more dangerous consideration and the outcomes more difficult to predict. The resulting uncertainty is calculated to reduce the willingness of a potential aggressor to risk escalation by initiating such a conflict. Stripping the U.S. of the ability to respond effectively invites attack without fear of retaliation.

An Evolving Threat

With the fall of the Soviet Union, determining the means of effective deterrence has become much more difficult. More countries have joined the "nuclear club" in the decade since the dissolution of the Soviet Union than had joined in the preceding half century; and there are others working assiduously to become members as well. With the U.S. policy to enhance its reliance on conventional forces, many potential adversaries will turn to chemical, biological, and nuclear weapons to offset their numerical and technological disadvantages. The pursuit of a nuclear weapons capability is a relatively inexpensive method of achieving global status and influence. India, Pakistan, and North Korea provide examples of how to parley a national nuclear capability into economic and political advantage which have not escaped the notice of others in the world community who are currently counted among the nuclear "have nots."

What It Will Take

There are many reasons, then, why nuclear (still) matters and why

the United States will and must continue to maintain an effective nuclear weapons stockpile. Not many Americans would advocate unilateral U.S. nuclear disarmament. Similarly, there are few who would respond positively if asked whether they would support the weakening of the U.S. capability to deter aggression, assure defeat and avoid war. And yet there is limited support for the kinds of resources, activities and policies that would prevent such a decline. By remaining stagnant in our nuclear capabilities, the United States puts itself at risk of losing technological advantage to other nations as well as losing the foundation of expertise and infrastructure necessary to make future advancements. The more difficult issue to address is, "What will it take?"

In all likelihood, it will take the design and production of new weapons not just to keep pace with an evolving global security environment, but also to preserve the U.S. stockpile at its current levels of safety, security and reliability. There are those who oppose the modernization or upgrade of the U.S. nuclear stockpile on the grounds that the concomitant revitalization of the nuclear infrastructure, new design and production efforts, and the possible need to resume underground testing to ensure confidence in the weapons undermine non-proliferation goals. Sadly, however, world events during the last decade have proven this argument specious. It seems abundantly, if unfortunately, clear that other nations (and potentially non-state entities) will acquire, build and test new weapons, or try to, regardless of U.S. actions. As an example, the U.S. has retired and is currently dismantling its chemical weapons stockpile, but this action has not stopped others from pursuing the development of these types of weapons.

Nuclear weapons do not have an indefinite shelf life. They are technologically complex and are composed of thousands of individual components. Each of these com-

ponents must individually operate as specified for the weapons as a whole to function as designed. As a weapon ages, the performance of an increasing number of components may deteriorate. Maintaining the safety, security and reliability of these aging weapons is an increasingly difficult task, particularly without the benefit of underground nuclear testing. Although the threat has and will continue to evolve, the nuclear weapons stockpile has not.

Thus, it will take, first and foremost, American ingenuity and intellect. It is the expertise and experience of American military and civilian personnel that has produced the extraordinary safety, security and reliability records maintained by the United States since these weapons were first developed. This experience and expertise must continue to be nurtured and passed on to future generations of scientists and engineers. The U.S. must perpetuate its ability to design and produce the safest, most reliable and most secure nuclear weapons in the world. The U.S. must also have the industrial and manufacturing infrastructure to achieve this goal, and the ability to be confident in the success of its accomplishments.

Nuclear Matters

The Cold War is over, the Evil Empire has been defeated and the United States has triumphed, in no small part as a result of our nuclear deterrent. An unintended consequence of these successes is that nuclear weapons are no longer perceived to be the cornerstone of U.S. defense policy, but are instead viewed as a source of lurking danger, and therefore something to be eliminated—at least conceptually. While this statement may not be inaccurate, the resulting conclusion is incorrect.

Further, while the U.S. continues to develop employment plans for the use of its nuclear arsenal in wartime, there is widespread belief at home and abroad that the U.S. will never actually use its weapons in combat. It is not and cannot be the purpose, intentional or otherwise, of the U.S. nuclear deterrent to deter only the United States from using these weapons. Certainly, we hope that we will never have to use our nuclear weapons, but the best chance to prevent their use is to have them in the first place, and to keep them ever safe, secure and reliable.

Nuclear *does* matter for the United States. For better or worse, it is simply not possible to "unthink the unthinkable." Until another alternative presents itself, nuclear weapons are the last best option to deter the use of nuclear and other weapons of mass destruction against the U.S. Strength is the only sure means of peace. Of course, nuclear weapons should never be a first response, but the United States must ensure that the American nuclear stockpile continues to represent the last word.

Mr. Henry became the Deputy Assistant to the Secretary of Defense for Nuclear Matters in July 2003. In this position, he is responsible for coordination, review, and approval of all activities related to the acquisition and modernization of the nuclear weapons stockpile. The Nuclear Matters office manages nuclear surety, integration, storage, transportation, surveillance, maintenance and support.

Prior to his appointment, Mr. Henry served in the Pentagon as the Deputy Division Chief for Nuclear Weapons, Strategic Operations Division, J-3, Joint Staff.

In 1996, Mr. Henry received an Excepted Service appointment by the Secretary of Energy, to create, develop, and manage a program to extend the life of the nuclear weapons stockpile – now known as the Stockpile Life Extension Program (SLEP) and for the creation of the 6X Acquisition Process. In 1999, he became the Associate Deputy Assistant Secretary for the Nuclear Weapons Stockpile where he was responsible for management, oversight, and direction for the Stockpile Life Extension, Enhanced Surveillance, and Advanced Design and Manufacturing Technologies Programs as well as the Special Materials Readiness Campaign.

Mr. Henry spent over 21 years as a U.S. Army officer in various Field Artillery and Nuclear Research and Operations assignments. These assignments included Operations Officer of a Pershing Task Force; Division Operations Officer and Team Chief for Nuclear Weapons Technical Inspections; Nuclear and Chemical Targeting Officer, Allied Air Forces Central Europe; Chief of the Nuclear Weapons Section, J-3, Joint Staff; and Program Manager, Department of Energy.

A graduate of the International Institute of Politics in Hamburg, Germany, Mr. Henry holds a B.B.A. from the University of Oklahoma, a M.S. in Systems Management and Information Systems from the University of Southern California, and a M.A. in National Decision Making from the U.S. Naval War College.

Nuclear Disablement Team Operations in Operation Iraqi Freedom: Part 1

MAJ Gerard Vavrina
United States Army Nuclear and Chemical Agency
MAJ John Greaves
Joint Forces Command

When a radiological source or nuclear material is found on the battlefield, whom does the Joint Task Force Commander task to assess its hazard, characterize it, and conduct disposition? Prior to Operation Iraqi Freedom (OIF), there was no "one stop shopping" military organization that could support this mission, in any Service. However, due to the anticipated requirement to disable and eliminate weapons of mass destruction (WMD) in Iraq, the U.S. Army Nuclear and Chemical Agency (USANCA) stood up a team to support this effort. No team to execute an operation of this type had been attempted since the Alsace Operation in World War II. This article will discuss the activation of the Nuclear Disablement Team (NDT), it's manning, equipping, training, and deployment to Iraq. A follow-on article will discuss specific operations during NDT deployment in support of Operation Iraqi Freedom, lessons learned and future NDT operations.

The NDT was originally conceived as capable of executing three of four phases of the Defense Threat Reduction Agency (DTRA) WMD elimination concept. DTRA was assigned the four-phase Weapons of Mass Destruction-Elimination (WMD-E) mission in March 2003, which consisted of the initial identification of weapons and related facilities (site assessment), collection of intelligence and forensic evidence at these sites (exploitation), disablement of weapons/facilities to prevent use against Coalition forces (disablement) and finally, disposal/removal from theater (elimination). This mission involved many teams task organized to execute a particular phase after discovery of chemical, biological, nuclear or missile weapons and facilities in Iraq.

DTRA approached USANCA to lead the nuclear disablement mission due to its Army/Joint nuclear technical and nuclear operations expertise, a resident Functional Area 52 (FA52) career manager to assist with manning, and an already in-place DTRA/ Army Staff (ARSTAF) coordination. In addition, the NDT would assist with the exploitation mission and also maintain a corporate role in the elimination mission. Extensive negotiations were conducted between the NDT, DTRA and the Department of Energy (DOE) regarding responsibility for the packaging of radioactive material as part of the elimination mission. After much discussion, the DOE was given this mission, and the NDT was limited to field-expedient packaging on-site to ensure personnel/public safety.

DTRA coordinated with the Joint Staff to task the Army with the nuclear disablement mission, which in turn, tasked USANCA as the lead agency. Once the tasking was provided to USANCA, COL Raymond Freeland, Chief of the USANCA Nuclear Division was selected as the NDT Commander. Originally a Field Artillery officer, COL Freeland had extensive experience in nuclear matters, particularly international inspections and treaty verification, which would be critical in the success of the NDT. His mission was to bring the team from concept to reality as a useful capability in the Iraq area of operation within 30 days!

Based upon this tasking, the following NDT mission statement was derived:

"On order, The NDT renders radiological and nuclear threat capabilities ineffective, precludes losing control of identified radiological and nuclear materials, equipment, and technologies, and is prepared to coordinate final disposition of radiological and nuclear infrastructures."

The original NDT concept of operations was developed such that the team would deploy and link up with the 75th Exploitation Task Force. The NDT would provide assistance to the DTRA Sensitive Site Exploitation (SSE) teams and Mobile Exploitation Teams (MET). The NDT would characterize the site and all materials, and perform disablement tasks in order to both prevent near-term capability to reuse the site and also to facilitate follow on elimination operations.

As more fidelity developed on mission requirements, the next challenge was finding the appropriate expertise within the Services to meet the mission demands. As the intelligence was sketchy on the status of the Iraqi nuclear program, all poten-

tial scenarios had to be considered from disablement of a full-scale enrichment or weapon production facility to disablement of nuclear fuel cycle or industrial/medical/research materials and sources to packaging of special nuclear material (SNM). The original joint manning document called for twelve personnel including a Navy Nuclear Engineer and a USAF Health Physics NCO, with the remainder being Army personnel. The USAF was not able to support the request, so the table below depicts the final composition of the NDT when it deployed to Camp Doha, Kuwait.

The preponderance of Army officers came out of the FA52 Nuclear Research and Operations Career Field. A Joint Staff tasking was sent to the Joint Staff J3, Joint Forces Command (JFCOM), and DTRA to release four officers and one NCO. These personnel were handpicked because of the extremely short time before deployment date, which necessitated building a cohesive team that could work well together immediately. An FA52 officer filled the Nuclear Operations Officer position with extensive experience in small-unit explosive ordnance disposal (EOD) operations, intelligence and joint staff work. FA52 officers and a Navy officer filled the Nuclear Engineer and Nuclear Physicist positions with expertise in enrichment, fuel life cycle management, criticality and reactor operations. The Army Health Physicist NDT position was filled by the existing USANCA Health Physicist, a Medical Service officer with experience in designing comprehensive radiation safety programs and laboratory analyses that would minimize exposure from the radiation the NDT would likely encounter. The Health Physics Technician position was filled by a 91SN4 Army Medical Department (AMEDD) NCO from the Uniformed Services University of the Health Sciences (USUHS) due to his skill sets in procedures and equipment involved in radiation dosimetry, radiation surveys, environmental sampling and field/laboratory sample analysis.

Additionally, DA G3 sent a request to Forces Command (FORSCOM) for four NCOs from the 21st Ordnance Company (ORD CO). The 21st is located at Kirtland Air Force Base, Albuquerque, New Mexico and trains to render safe improvised nuclear devices. In that capacity, the unit trains daily with DOE personnel during exercises and in the National Labs. Some of the skill sets and levels of competency/certifications the Soldiers in that unit possess as a result of their training are only resident in the 21st ORD CO (EOD), and it's sister unit, the 55th ORD CO (EOD). Those skills include specialized radiological monitoring, nuclear material handling, and packaging and shielding.

COL Freeland coordinated all requests for personnel during the last weeks of March 2003. The Joint Staff and Army Staff sent taskers out, orders were cut, and amazingly, all ten Army personnel showed up at USANCA by 1 April. The Navy Nuclear Engineer arrived in the second week of April. A flurry of activity took place at USANCA as the team came together and began identifying equipment and training requirements. All equipment had to be procured, and any training had to be completed NLT the 29 April deployment date.

Identifying requirements for equipping the team was performed at two levels. The first level was the basic Soldier survivability gear that would be required for an undefined period in Iraq. The second level was the technical equipment that would be required for mission execution. For individual equipment a combination of Fort Belvoir CIF issue and credit card purchases fulfilled all NDT requirements. The challenge for some of the equipment was to locate a vendor that had stockage on hand. It was no surprise that desert patterned military gear such as interceptor vests with plates, tentage and air conditioning units were hard to locate by April 2003. Some equipment literally came in on the day of deployment, but ultimately all equipment that was required was on hand for deployment. Also critical to this effort were personnel from the US Army's Training and Doctrine

Position	Grade	Service	AOC/MOS
Team Chief	O6	USA	52B
Nuclear Operations Officer	O4	USA	52B
Nuclear Physicist	O5	USA	52B
Nuclear Engineer	O5	USA	52B
Nuclear Engineer	O4	USN	
Health Physicist	O4	USA	72A
Health Physics Technician	E6	USA	91SN4
EOD Specialist	E8	USA	55D
EOD Specialist	E7	USA	55D
EOD Specialist	E6	USA	55D
EOD Specialist	E6	USA	55D

Command (TRADOC), which is USANCA's higher headquarters. Any equipment that had to be procured through the military supply system, such as weapons, was procured by TRADOC logisticians. The logisticians worked diligently from requisition to receipt to ensure the NDT had all equipment by deployment date. This was tracked in weekly phone conferences between TRADOC and USANCA.

Locating the technical equipment was equally as challenging. The equipment procured was predominately off-the-shelf technology and was done by contracts and government Visa card purchases. Discussions with DTRA regarding equipment used by their SSE and Site Assessment Team (SAT) significantly reduced the amount of research required before procurement of useful equipment. Equipment was procured with the assumption that no calibration/maintenance support would be available at a particular mission site. This equipment was also selected based on past demonstrations of successful operation within harsh (sandy plus hot) environments. Therefore, MILSPEC equipment was selected whenever possible. This equipment included:

Disablement

- General mechanic / specialist / manual-entry tool kits
- Digital multimeters
- Rigging equipment
- Night Vision Goggles (NVGs) / portable lights
- Power generators / battery chargers
- Portable industrial x-ray systems
- Global Positioning System (GPS)
- Electronic scales
- Expedient packaging kit, 2-part foam

Communications

- Digital video recorders / cameras
- Secure International Maritime Satellite (INMARSAT), Security Technology
- Incorporated (STI) and Iridium phones (voice/data/video)
- Laptops with video/ethernet capability
- Inter-team communications (wire commo, ICOMs, cell phones)
- Personal Radio Communications (PRC)-5 man-pack radios

Force Health Protection

- Personnel dosimeters (whole-body/extremity thermoluminescent dosimeters (TLDs))
- Analog nonsecure(AN)UDR-13s w/alarm)
- Hand-held spectroscopy
- AN/voice digitations(VD)-2, AN/PDR-77, Ludlum radiation survey meters
- Alpha/beta air hazard samplers/monitors (with alarm)
- Joint Chemical Agent Detector (JCAD) individual / area chemical weapon agent monitors/alarms
- Hand-held toxic industrial chemical (TIC) vapor detectors
- Hand-held confined space monitors
- Mission oriented protective posture (MOPP) industrial individual protective equipment (IPE) (Tyvek suits, forced-air respirators, etc.)
- M256A1/M34A1/toxic industrial material (TIM) sampling kits
- Emergency spill kits
- Benchtop gamma spectroscopy system with multi-channel analyzer
- Bioassay kits

Concurrently, while this flurry of equipment was being ordered and received, training requirements were being identified, coordinated, and conducted. Technical training included technical presentations on production and enrichment processes, weapon production, radiation safety, and technical equipment operation. Extensive intelligence briefings, many with former Iraq International Atomic Energy Agency (IAEA) inspectors were received at each training site. The majority of this training was held at national laboratories located at Sandia, Lawrence Livermore, Los Alamos and Oak Ridge. In addition to intelligence briefs from each of the national labs, the CIA and NSA provided intelligence briefs. NDT members also completed cross training on equipment operation during any available time within the busy four-week period. Much of this training would be replicated again while doing mission rehearsals in Iraq.

Basic Soldier training was also critical to mission success. Many of the NDT personnel came from staff positions where Common Task Training (CTT), NBC skills, and weapon qualification was not done on a regular basis. All NDT members went through weapons training and qualification, as well as NBC training. Rudimentary skills such as driver training was also conducted, so all members of the NDT were properly licensed and knew how to operate army vehicles including the Army 5-Ton Truck. On an 11-man team, all members were expected to (and did!) drive if required.

By 29 April, the NDT had completed the personnel requirements to deploy to the CENTCOM AOR, received all of the tactical and technical training to perform its mission, and received all its required equipment. Two personnel escorted the equipment from CONUS to Camp Doha, Kuwait, with the rest of the

team following two days later. After a send-off party hosted by the Director of USANCA, Dr Davidson, which included remarks from Dr. Dale Klein, the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs, ATSD (NCB), the NDT boarded a bus to Baltimore Washington International Airport to fly a military chartered flight to Kuwaiti International Airport. In roughly a month's time, the team had stood up, identified and procured all required equipment, and conducted all training required to successfully execute its wartime mission. Now it was time to prove the concept of a Nuclear Disablement Team during upcoming operations in Iraq.

(In the next issue of the NBC Report, Part II of this article will cover NDT's missions, the organizations it fell under, lessons learned and future operations.)

Major Gerard Vavrina is currently assigned as the Nuclear Medical Science Officer in the Nuclear Division at USANCA. He has a B.S. in Physics from Loyola College and a M.S. and Ph.D. in Nuclear Physics from North Carolina State University. As a health physicist in the Medical Service Corps, he has held positions at the Armed Forces Radiobiology Research Institute and the Landstuhl Regional Medical Center. MAJ Vavrina is a graduate of the Combined Arms Services and Staff School.

Major John Greaves is a FA52 officer currently stationed as a Homeland Security/Consequence Management Exercise Planner in J7, Joint Warfighting Center, Joint Forces Command, Norfolk, VA. He has served in numerous Explosive Ordnance Disposal assignments including two company commands and one field grade command. MAJ Greaves is a graduate of the US Army Command and General Staff College.

Anatomy of the Hunt for Weapons of Mass Destruction

LT David Gai, USN
Defense Threat Reduction Agency

"We were about to take on the 'bad guys' and their WMD. You win the ground war but what do you do with their WMD?" asked Army Maj. Bob Ivy, head planner for Task Force Disablement/ Elimination (TF D/E) and the Iraq Survey Group (ISG).

This was the premise of a series of meetings and conferences that DTRA participated in during the summer of 2002 at the National Defense University. This also began DTRA's active support to U.S. Central Command (CENTCOM) in the hunt for and elimination of Iraq's WMD, a mission that transitioned and morphed before, during and after combat operations.

In the Fall of 2002 as DTRA personnel helped CENTCOM write the war plan to invade Iraq, Dr. Stephen M. Younger, the director of DTRA, asked, "What do we need to do and what can we do right now?" The answer was that DTRA and the services could assist CENTCOM in finding, disabling and eliminating WMD found during the campaign.

By November the Coalition Forces Land Component Command (CFLCC) recognized the need for a task force to do exploitation. The U.S. Army's 75th Field Artillery Brigade from Fort Sill, Okla., was picked to be the forward element of the Exploitation Task Force (XTF) and work with the planners to bring in the expertise to set up the site assessment teams (SAT). The original plan had the XTF doing both exploitation and disablement. By January, the 75th realized they couldn't train and field the disablement teams quickly enough to match the timetable they needed to meet.

DTRA provided four Site Assessment Teams and a command and control planning cell. The Defense Intelligence Agency (DIA) brought in three Chemical and Biological Intelligence Support Teams (CBIST) that became the core of the mobile exploitation teams (MET). The 513th Military Intelligence Brigade from Fort Gordon, Ga., added analytical support into what became known as the Intelligence Exploitation Base (IEB).

By the beginning of March, DTRA was preparing to field a disablement and elimination capability. At this point, Ivy points out, there was a separation of planning between phases three and four of the war plan. The first phase of the war plan was the U.S. Army's V Corps deployment, second was the air war and the third was the ground war. The fourth phase was post-hostility, meaning a transition from the ground war into civil-military operations, humanitarian relief and in this case disablement and elimination. "When the SAT teams and XTF came over," said Ivy, "CFLCC, as the land com-

Army MAJ Bob Ivy driving a HMMWV while in Iraq. Ivy is currently assigned to the U.S. Army Nuclear and Chemical Agency. Prior to that, Ivy worked in the DTRA Operations Center.

ponent commander, signed on to have them do the extra mission of exploitation. They never signed up for doing the disablement and elimination because they saw that as a phase four task."

As a result, CFLCC decided to bring in an entirely separate staff, the Combined Joint Task Force 4 (CJTF-4), a combined-services, multinational effort, to do the elimination. When Navy Capt. Ric Weyrick and his D/E team arrived in theater they originally hooked up with CJTF-4, but that all changed when the mission of CJTF-4 changed to one of restoring basic services (sewage, water and power).

As a result the disablement and elimination piece was ultimately joined with the exploitation piece. "It all came back together because we were still exploiting at the same time we were trying to get ready to do disablement," said Ivy. According to Ivy, the idea was to roll all of DTRA's exploitation elements in with the elimination and disablement elements into a larger task force.

At the time, Secretary of Defense Donald Rumsfeld and CENTCOM Commander Army Gen. Tommy Franks planned a rapid reduction of force that included the withdrawal of the U.S. Third Army headquarters and a hand-off of CFLCC to the Army's V Corps, headquartered in Heidelberg, Germany. Planners envisioned a multi-national corps, along the lines of NATO's Rapid Reaction Corps, would be in place within six months to run phase four.

The first shortfall of phase four, according to Ivy, was logistics. "We fully anticipated having a greater logistics flow coming into Iraq, but it was mitigated due to the requirement for higher security. The supply chain for water, food and supplies was a problem. Until the first week of July, Soldiers were limited to two liters of water a day and most were only getting one hot meal a day and two MREs."

For DTRA, the main problem in phase four was the transition from WMD disablement to elimination. "We had expected that by the time we got to elimination we would be in a permissive environment," said Ivy. "Simply put, we would only have to worry about security at fixed sites. And we would destroy those pieces that we needed to by handing them off to the contractors. But with the security situation as it stands, we transitioned out of a permissive into a semi-permissive environment. Fortunately hostilities were localized, and we were able to bring in the contractors; although with a greater security and force protection concern."

"When we originally started talking about the contractual pieces of our mission we fully anticipated a focus on chemical and biological weapons," said Ivy. "We did not anticipate a large missile or nuclear/radiological disablement effort. However, we found just the opposite to be the case." Due to clauses built into the contract, the contractor was able to adjust and still accomplish the work.

The Iraq Survey Group

The Iraq Survey Group (ISG) was established by Dr. Stephen Cambone, Undersecretary of Defense for Intelligence, in May 2003. The original plan was for the ISG to come into a country with a permissive environment and quickly glean intelligence. They were going to examine a wide range to issues: atrocities, war crimes, terrorist acts, POW/MIA concerns and WMD. By June, WMD was the only mission. Around the same time Sen. Bill Nelson (D-Fla.) visited Iraq and raised interest in verifying the fate of Navy Capt. Michael Scott Speicher, who was shot down and remains unaccounted for since the first days of the 1991 Gulf War. Soon after Senator Nelson's visit, missions relating to Speicher were added to the ISG.

Air Force Maj. Gen. Keith Dayton, operations director at DIA, was selected as the commander of the ISG. Ivy and fellow planners in Qatar then worked on and locked down a mission. "That was really the biggest piece we had to work on," said Ivy. "The plan then went back to Washington for approval and we didn't see it until the end of May. Dayton brought in significant analytical capability and came into Qatar as other folks were pulling out. He had a one-for-one swap for space."

The ISG consists of a Survey Operations Center (SOC) in Baghdad, a Survey Analytical Center (SAC) in Qatar and the Sector Control Point (SCP), also in Baghdad.

The three groups work together: SAC would take a look at intelligence information and recommend targets to SOC. SOC would validate the recommendations and then task mobile collection teams (MCT) to plan and conduct the missions to gather information. The information from the MCTs would then be sent back to the SAC for review and the whole process would start again.

"Since there was limited operational or tactical level planning beyond SAC, DTRA elements with Task Force D/E started working hand-in-hand with SOC to set up their operations capability," said Ivy. The Site Survey Teams (SSTs) operating under the 75th XTF were reorganized into MCTs to put their expertise and experience to better use. TF D/E morphed operations from the 75th XTF to the ISG by forming analytical teams: biological team, chemical team, nuclear disablement team and missile/UAV (unmanned aerial vehicles) team. Most MCTs had a core element of DTRA folks and were augmented by several units pri-

Army MAJ Bob Ivy, Air Force Lt Col Lani Smith of the On-Site Inspection directorate and Air Force Lt Col David Alcorn of the Cooperative Threat Reduction directorate, outside the dining hall at Camp Slayer, Baghdad.

This article has been reprinted from Defense Threat Reduction Agency's September 2003 "Connection" publication. USANCA wishes to thank DTRA for allowing reprint of this article and extends an invitation to other agencies involved in NBC matters to submit previously published articles to USANCA for publication in the NBC Report.

marily from the Utah National Guard's 142nd Military Intelligence Battalion, 455th Chemical Brigade from Fort Dix, N.J., and the 450th Chemical Battalion from Houston, Texas.

"We made a commitment to the ISG to help them get on their feet," said Ivy. Army Col. John P. Connell, from DTRA's On-Site Inspection directorate, led efforts to redesign the teams and Navy Capt. Ric Weyrick redesigned the staff functions.

The ISG has since restructured how targets are selected and missions are planned. Each of the decentralized analytical teams submit their proposal on where they want to go. These proposals are approved by a board and then the team sells the ideas straight up the chain of command. Missions are then handed down to one of the ISG's subordinate tactical level elements. The analysts then get with the appropriate MCT to plan and execute the mission.

"This process is significantly different than what we had originally set up," said Ivy. "We established a model called Team Pox which revolved around the DTRA expertise that was brought into theater to improve the exploitation effort. " For instance, biological experts were brought in to pursue the trail of Iraq's smallpox biological weapons program. Medical doctors and virologists went to the universities where a lot of related work originated and talked with Iraqis as peers. When they started comparing data they found they started to get a lot of information. "The idea of talking to the Iraqi scientists as peers was really what bought them a lot of progress. That is in contrast now to the analytical teams that go out and conduct interrogations — a big difference," said Ivy.

LT David Gai, USN, is a DTRA public affairs officer. From May 24 to July 28 he served as the public affairs officer for Task Force Disablement/Elimination in Baghdad.

"We were about to take on the 'bad guys' and their WMD. You win the ground war but what do you do with their WMD?"

NWEDS: Modeling the Nuclear Battlefield

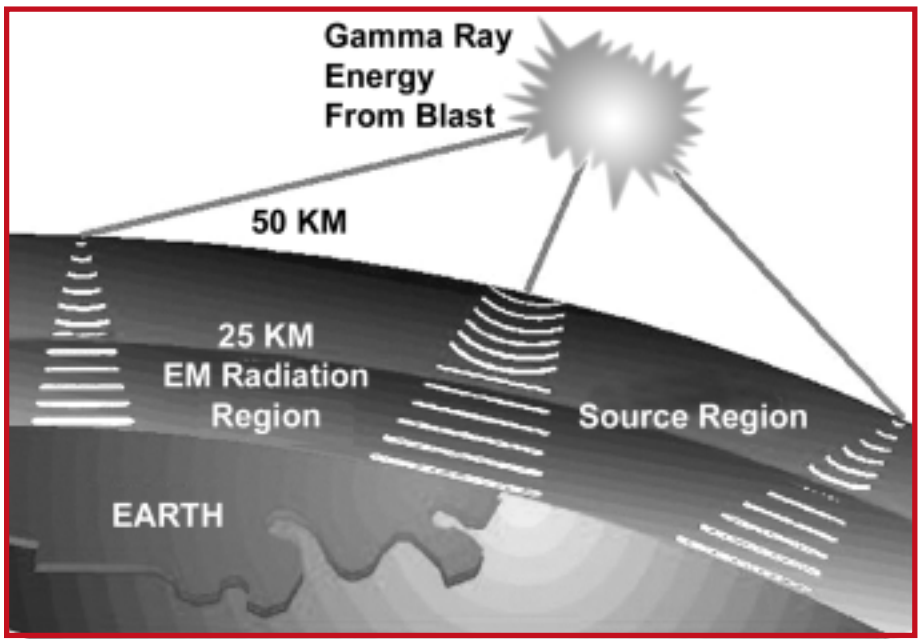
Mr. Martin W. Moakler, Jr.
United States Army Nuclear and Chemical Agency

Nuclear Weapons Effects Database System (NWEDS) is a set of computer programs, algorithms, and automated data files used to calculate nuclear weapons effects information for Army theater nuclear targeting and to establish nuclear survivability criteria for U.S. equipment. It is the premier tool used by the Army to target and analyze the effects of nuclear weapons in the theater nuclear battle. NWEDS predicts nuclear weapons effects on structures, equipment, materiel, and personnel. NWEDS was originally developed by the Defense Nuclear Agency (now, the Defense Threat Reduction Agency (DTRA)). The data that populates the NWEDS database comes mostly from DTRA Effects Manual, EM-1, and the Personnel Risk and Casualty Criteria (PRCC) document. The United States Army Nuclear and Chemical Agency (USANCA) is the sole operator and custodian of the code.

NWEDS is used to produce three primary products. First, it is used to produce Joint Publication 3-12.1, "Joint Tactics, Techniques, and Procedures for Theater Nuclear Planning" in support of the Joint Chiefs of Staff (JCS). Second, hardness survivability criteria for the acquisition of the Army's mission critical equipment are issued via NWEDS. Finally, and most importantly, NWEDS produces data tables containing nuclear weapons effects, coverage areas, and safety limits for Probability of Damage Calculator (PDCALC), United States Strategic Command's (USSTRATCOM's) primary nuclear targeting damage predictor. NWEDS capabilities are very important in supporting USSTRATCOM's "few nukes" scenarios analyses and the prediction of collateral effects. Unlike other OPLAN 8044 targeting automations, NWEDS provides USSTRATCOM with real nuclear weapon effects at the appropriate granularity for the theater battle.

As can be easily seen, NWEDS is a very important tool for nuclear targeting, doctrine development, and effects analysis. NWEDS is also used for real-world contingency support with the capability to produce data to support worldwide contingency planning.

NWEDS will predict nuclear battle personnel casualty and materiel damage effects; troop safety (ex-



Pdwin.exe

pressed as minimum safe distance), preclusion (expressed as least separation distance), and collateral damage distances; target coverage; and equipment nuclear survivability criteria. Illustrative examples of NWEDS output are presented for the above categories.

To remain unclassified, a fictitious nuclear weapon is used:

Cruise Missile (Y1) – 3kT yield; preset Heights of Burst (HOB) of 0, and 125 meters; Probable Error HOB (PEH) of 6 meters; and Circular Error Probable (CEP) of 100 meters.

PERSONNEL EFFECTS: First, some definitions are provided for clarity. Next is an illustrative example of NWEDS-produced casualty information. The NWEDS results shown depict a 50 percent probability of the effect occurring.

■ **Immediate Permanent Ineffectiveness (IPI).** Personnel become combat-ineffective within a few minutes and never recover, usually dying within a day.

■ **Immediate Transient Ineffectiveness (ITI).** Personnel become combat-ineffective within a few minutes, but may partially recover shortly thereafter for several hours. They usually die within a week.

■ **Latent Ineffectiveness (LI).** Personnel become performance degraded within several hours, and then perform with reduced efficiency for several weeks until death or recovery.

MATERIEL DAMAGE EFFECTS: First, some definitions are provided for clarity. Next is an illustrative example of NWEDS-produced materiel damage information. The NWEDS results shown depict a 50 percent probability of the effect occurring.

CRUISE MISSLE
3 KT - Y1

Safety Yield - 3.3 $W^{1/3}$ - 1.489

PERSONNEL EFFECTS

PERSONNEL CASUALTIES
(DISTANCE IN METERS)

	EXPOSED			IN OPEN FOXHOLES			IN APCS			IN TANKS			
HOB	IMMED PERM	IMMED TRAN	LAT INEFF	IMMED PERM	IMMED TRAN	LAT INEFF	IMMED PERM	IMMED TRAN	LAT INEFF	IMMED PERM	IMMED TRAN	LAT INEFF	HOB
125	640	770	1050	460	570	820	570	690	950	450	560	810	125
*0	590	720	990	420	530	770	530	640	890	410	520	750	0*

EQUIPMENT:

■ **Severe Damage.** Incapable of performing one or more primary functions. Major damage that is severe enough to normally cause abandonment or scrapping of the equipment.

■ **Moderate Damage.** Incapable of performing one or more primary functions. At least one critical subsystem is nonfunctional and repair requires special tools, specialist skills, or parts not available within the unit owning the damaged equipment. Back to depot.

STRUCTURES:

■ **Severe Damage.** That degree of structural damage that precludes further use of a structure for the purpose for which it is intended without essentially complete reconstruction. Generally, collapse of the structure is implied.

Moderate Damage. That degree of structural damage to principal load-carrying members (trusses, columns, beams and walls) that precludes effective use of a structure for the purpose for which it was intended, until major repairs are made.

TROOP SAFETY, PRECLUDE, & COLLATERAL DAMAGE DISTANCES: First, some definitions are provided for clarity. Next is an illustrative example of NWEDS-produced safety, preclusion, and collateral damage information. For troop safety, the NWEDS results shown depict a very high assurance that the Soldier's acceptable risk criteria are not exceeded. For preclusion of damage, the NWEDS results shown depict a very high assurance that less than 10 percent incidence of structural light damage due to blast or thermal effects occurs. For collateral damage, the NWEDS results shown depict a very high assurance that less than 5 percent incidence of personnel injury require hospitalization or less than 5 percent incidence of moderate structural damage due to blast effects occurs.

■ **Minimum Safe Distance (MSD).** The distance from desired ground zero at which a specific degree of personnel risk and vulnerability will not be exceeded with a 99 percent assurance. The MSD is the sum of the radius of safety (RS) and the buffer distance.

CRUISE MISSLE
3 KT - Y1

Safety Yield - 3.3 $W^{1/3}$ - 1.489

MATERIEL DAMAGE EFFECTS

MODERATE DAMAGE (DISTANCE IN METERS)					SEVERE DAMAGE (DISTANCE IN METERS)						
	WHEELED VEHICLES							BRIDGES			
HOB	EXPO	SHLD	TANKS	TOWED ARTY	WOOD FRAME BLDG	MULTI STORY BRICK APTS	FACT-ORIES	FIXED	FLTG	SUPPLY DEPOTS	HOB
125	890	910	50	50	920	700	360	270	340	360	125
*0	800	900	100	100	760	620	300	210	270	300	0*

■ **Least Separation Distance (LSD).** The minimum distance that a desired ground zero must be separated from an object to ensure no more than a 10 percent incidence of damage or obstacles with 99 percent assurance. It is the sum of the radius of preclusion (RP) and the buffer distance.

■ **Collateral Damage Distance (CDD).** The minimum distance that a desired ground zero must be separated from civilian personnel and materiel to ensure with a 99 percent assurance that a 5 percent incidence of injuries or property damage will not be exceeded. It is the sum of the radius of collateral damage (RCD) and the buffer distance.

■ **Buffer Distance.** The horizontal distance, reflecting delivery system inaccuracy, which, when added to the radius of safety, radius of preclusion, or radius of collateral damage, will give 99 percent assurance that the specified degree of risk or damage will not be exceeded.

TARGET COVERAGE: NWEDS depicts the coverage indices that describe the fraction of damage of an area target with uniform distribution.

NUCLEAR SURVIVABILITY CRITERIA: Finally, NWEDS derives the regulatory nuclear survivability criteria required for the acquisition of mission critical equipment.

NWEDS PROBLEMS: NWEDS does have its problems. It was developed by DTRA in 1982 and modified numerous times and has been written in FORTRAN, BASIC, and ADA over the years. Despite this evolution, NWEDS is still an old model and cumbersome to use. Although NWEDS is a functioning code, it is in great need of an overhaul and modernization. The experts who understood the workings of the code have long since retired. NWEDS is currently written as a UNIX-based model that needs to be converted so that it can be run in a Windows-like environment on a laptop computer. NWEDS requires a user-friendly method for data input and output. The current method is very laborious with the look-up of numerous constants that could easily be made into a selection of choices in a "pull-down" menu. NWEDS has no error trapping mechanisms. These need to be written into the input processes with the appropriate error messages to the analyst. NWEDS documentation needs to be redone. NWEDS requires a graphic interface system (GIS), so that its information can be plotted on a map. NWEDS needs to become High Level Architecture (HLA) compliant, so that its output can be transferred to other Army and DoD nuclear-related simulations.

CRUISE MISSLE
3 KT - Y1

Safety Yield - 3.3 $W^{1/3}$ - 1.489

ADDITIONAL DATA

PRESET HOB 125 — PEH 6

Delivery Notes:
Freefall and Retarded Air Burst
Contrail and Laydown Option

SAFETY DISTANCE
(WITH BUFFER)

TROOP SAFETY (99%)(MSD) (DISTANCE IN METERS)					PRECLUDE (99%)(LSD) (DISTANCE IN METERS)							
	UNWARNED EXPOSED		WARNED PROTECTED				ACFT IN FLIGHT		FOREST BLOWDOWN		WILDLAND FIRES	
CEP	HDS	EMER	HDS *	EMER *	MOD DAM FIXED WING	LT DAM TO BLDG	ASLT HEL	OTHER HEL	DECID	CONIF	CLASS I	CLASS IV
100	2200	2100	1300	1300	900	2500	2200	7200	1700	1300	3500	2100

* NUCLEAR RADIATION EFFECTS ARE SIGNIFICANT.
SEE TABLE 5-6 FOR MODIFICATION OF RISK RADII FOR PREVIOUSLY EXPOSED TROOPS.

COLLATERAL DAMAGE DISTANCE (99%)(CDD) (DISTANCE IN METERS)											
	PERSONNEL INJURY 5% INCIDENCE			MODERATE DAMAGE 5% INCIDENCE					THERMAL IGNITION THRESHOLD LEVEL		
CEP	URBAN	RURAL	IN OPEN	SINGLE STORY FRAME BUILDING	SINGLE STORY MASONRY BUILDING	LIGHT STEEL INDUST BUILDING	FIXED BRIDGES	RAIL ROAD EQUIP	WOOD SHINGLES	DRAPES	NEWSPAPERS AND DEBRIS
100	1300	1600	2100	2200	1600	1100	1000	1200	2100	2500	2600

CRUISE MISSLE
3 KT - Y1

TARGET COVERAGE

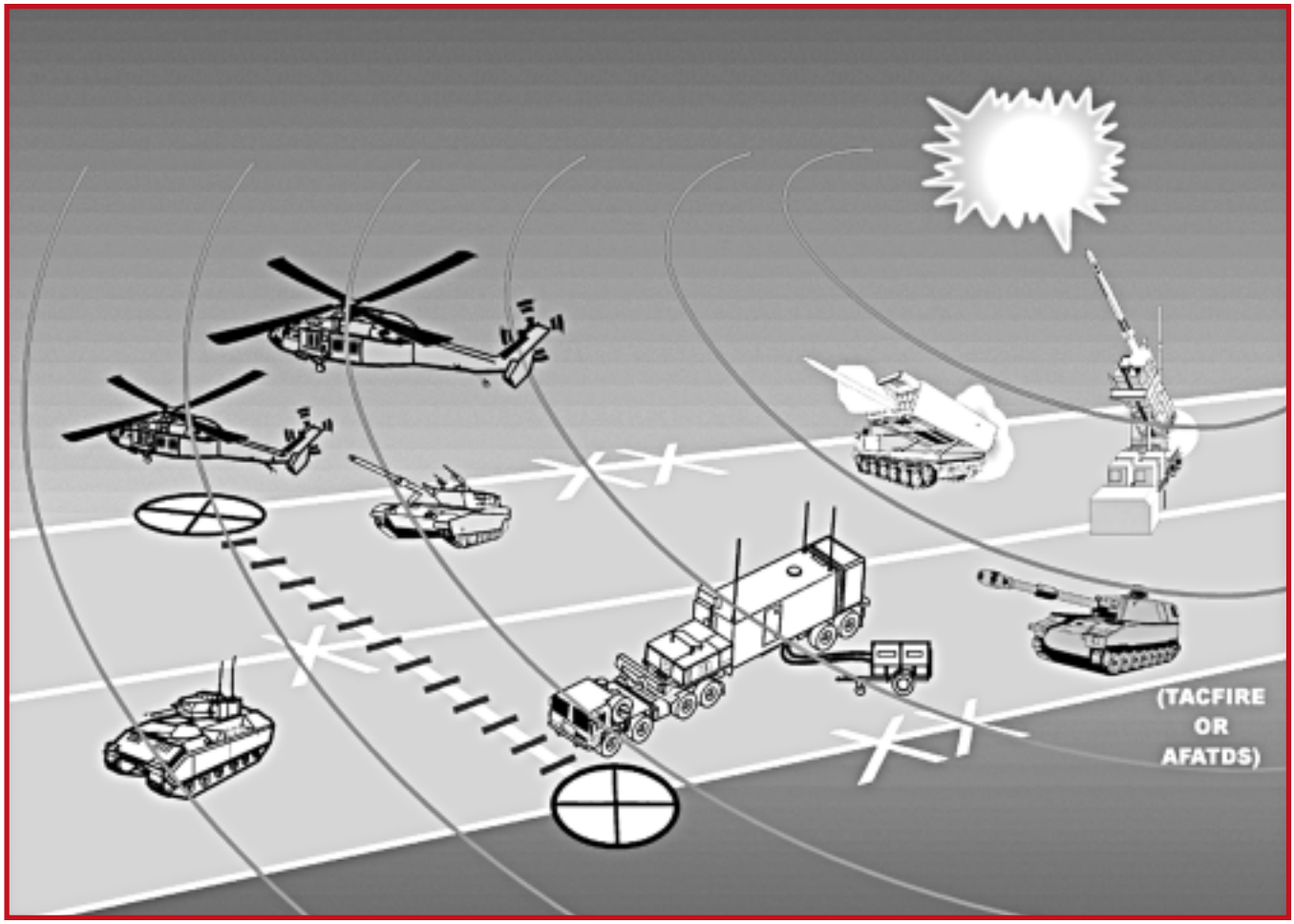
EXPOSED PERSONNEL

ENTER BY CEP

IMMEDIATE PERMANENT - AIRBURST

COVERAGE RADIUS OF TARGET								ACCURACY DATA				
350	500	750	900	1000	1200	1600	2000	RD	CD90	CEP	HOB	PEH
1.0	.9	.7	.5	.4	.3	.2	.1	635	182	100	125	6

Mr. Martin Moakler is a retired Army FA52 Colonel and is currently working as a physical scientist in the Nuclear Division at USANCA. His previous assignment was as Chief of the Nuclear Division at USANCA. He earned a M.S. in Nuclear Engineering and Computer Science from Rensselaer Polytechnic Institute, a M.S. in Engineering Management from the University of Missouri-Rolla, a M.S. in Education from Old Dominion University, and is a graduate of the US Army War College.



Optimally, NWEDS needs to be developed to provide four options of operation; first, an operational code with “canned options” for U.S. field use; second, an operational code with “canned options” for NATO use; third, an engineering code that allows the experienced analyst full flexibility to do what-if analysis; and fourth, an unclassified generic weapon version for use in what-if analysis supporting homeland defense initiatives and training. It is very important that NWEDS provides USANCA the flexibility to easily change standard criteria and robust enough to recalculate the results using changed reference criteria (i.e., as the definition of an effect changes).

On 27 July 2001, the Army Deputy Chief of Staff for Operations and Plans (DCSOPS) stated in writing that NWEDS modernization is his number one priority with respect to nuclear weapons effects information. This is detailed in the immediately following article.

SAIC Science Applications International Corporation
An Employee-Owned Company

NWEDS Modernization

Mr. Mark Vandersluis
Science Applications International Corporation
Mr. Martin Moakler, Jr.
United States Army Nuclear and Chemical Agency

Science Applications International Corporation (SAIC) is presently under contract to the Defense Threat Reduction Agency (DTRA) to transition the existing NWEDS system from the current Unix-based command line environment to a PC-based system with a unified graphical user interface (see the immediately preceding article for background). The goals of the project are (1) to enhance NWEDS to streamline the existing work processes of USANCA engineers for producing the JP 3-12.1 and nuclear survivability criteria (NSC), (2) to enhance the flexibility of the NWEDS tool to handle new problems, (3) to produce a tool for calculating nuclear weapons effects suitable for use outside USANCA and with much lower training requirements than the current NWEDS, (4) to improve the traceability of NWEDS results by thorough documentation of all algorithms and data used in the code, and (5) to extend the life of the NWEDS code into the 21st century by updating the code base into a widely used development language (Visual Basic .Net) suitable for use on Windows operating systems and providing complete documentation of the code to facilitate future maintenance. We are well on our way to meeting these goals; several prototypes have already been delivered, and an operational version of the transitioned NWEDS code will be available by the time you read this.

The NWEDS modernization program consists of four phases: discovery, transition, modernization, and maintenance. Initially, a discovery phase, already completed, gained a basic understanding of the existing code determined the level of effort required for transition and modernization. A functional decomposition of the existing code was completed in the discovery phase. The existing code was also installed on a Unix machine at the contractor work site. The difficulty of this step reinforced need for modernization of the code.

In the transition phase, now complete, the entire code base has been updated and the code runs under Windows NT, 2000, and XP. It is required to replicate exactly the results of the existing Unix version so we can move forward from a validated baseline. In the modernization phase, to be completed during calendar years '04 and '05, new features will be added, and calculation algorithms may be updated. Finally, some low level of maintenance is expected in the out-years.

Transition Phase

While the transitioned code is required to replicate the results of the Unix version, nothing else about the code remains the same. The code has been entirely re-written in *Visual Basic .Net*, a modern object-oriented language that allows for rapid prototyping and development of software. The use of *Visual Basic .Net* facilitates the creation of complex user interfaces, the reuse of code, access to databases, and the creation of both standalone and web-based software using the same underlying code.

Figure 1, page 19, shows the architecture of the transitioned NWEDS. The new code is organized into four layers: the User Interface Layer, the NWEDS Layer, the Phenomenology Layer, and the Data Management Layer. This reorganization of the code is not just a computer science exercise; it has a real impact on the future utility of the code. This is best illustrated by working from the inside out, starting with the Phenomenology Layer.

Each service within the Phenomenology Layer provides some information that is necessary for getting answers from the code. For example, the Weapons Characteristics Service provides information on real weapons in the inventory, including yield (both for safety and casualty purposes and fractional yields for blast, thermal, and radiation output), delivery systems and their accuracy, and radiation output. The Weapons Characteristics Service is a computer program in its own right. It is used to provide inputs for NWEDS but could also be used to provide information for any other nuclear weapons effects code, either locally or over a network. The same is true for the other four services in the Phenomenology Layer. One of the key elements of the new architecture is the ability to provide a consistent set of nuclear weapons effects phenomenology to a broad set of tools, not just the NWEDS code.

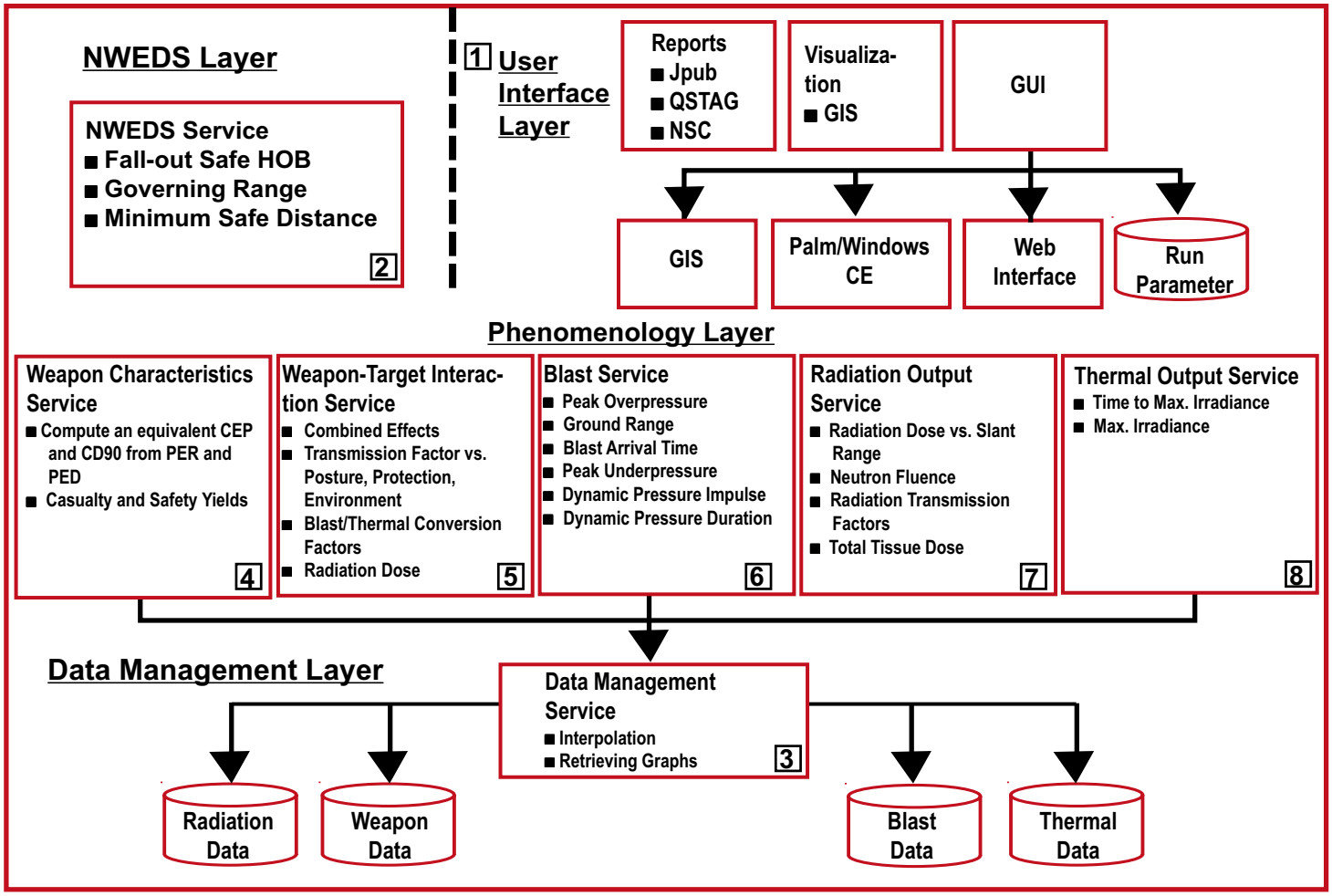


Figure 1. NWEDS Architecture.

Many of the calculations in NWEDS are performed using interpolations on nomographic data from DTRA EM-1. The data management layer is used to maintain this data and perform the required interpolations. Each service in the Phenomenology Layer has its own instance of the Data Management Service that maintains its own database. Using a separate service to perform these functions allows us to avoid repeating code in the Phenomenology Layer Services and ensure that any required changes are propagated to the entire NWEDS code.

The NWEDS Layer is the piece responsible for generating NWEDS results, by receiving input from the User Interface and calling on the other services as needed to perform calculations. This layer provides the high-level flow to the program for generating, for example, the JP 3-12.1 report.

The User Interface Layer is the portion of the code that the user actually sees and interacts with. From the user's point of view, this is the code; the user need not know anything about the rest of the architecture. The User Interface Layer provides a constrained mechanism for setting up and maintaining NWEDS runs (called "Tasks"). By constrained, we mean that there is very little free-form input; for a standard user, most inputs will come from drop-down menus.

Figure 2, page 20, shows the view seen by the user on starting the NWEDS code. Each user has a unique username that allows authorship of a given NWEDS task to be tracked. All NWEDS tasks that have been defined on the workstation are shown on the right, in a sortable view. Figure 3, page 20, shows the properties window for a task. One of the benefits of the transitioned NWEDS code is the ability to maintain a record of NWEDS tasks, including a description of the purpose and assumptions for each task. This is useful for quality control and documentation. The system also allows the user to copy a previous task so that new tasks can take advantage of previous work.

Two types of NWEDS task are defined: JPUB (the type of task used to generate the JP 3-12.1), and NSC. We will look here at the first type. A JPUB task consists of a set of tables for safety, coverage, effects, and collateral damage. Figure 4, page 21, shows the safety tables defined for one task. The

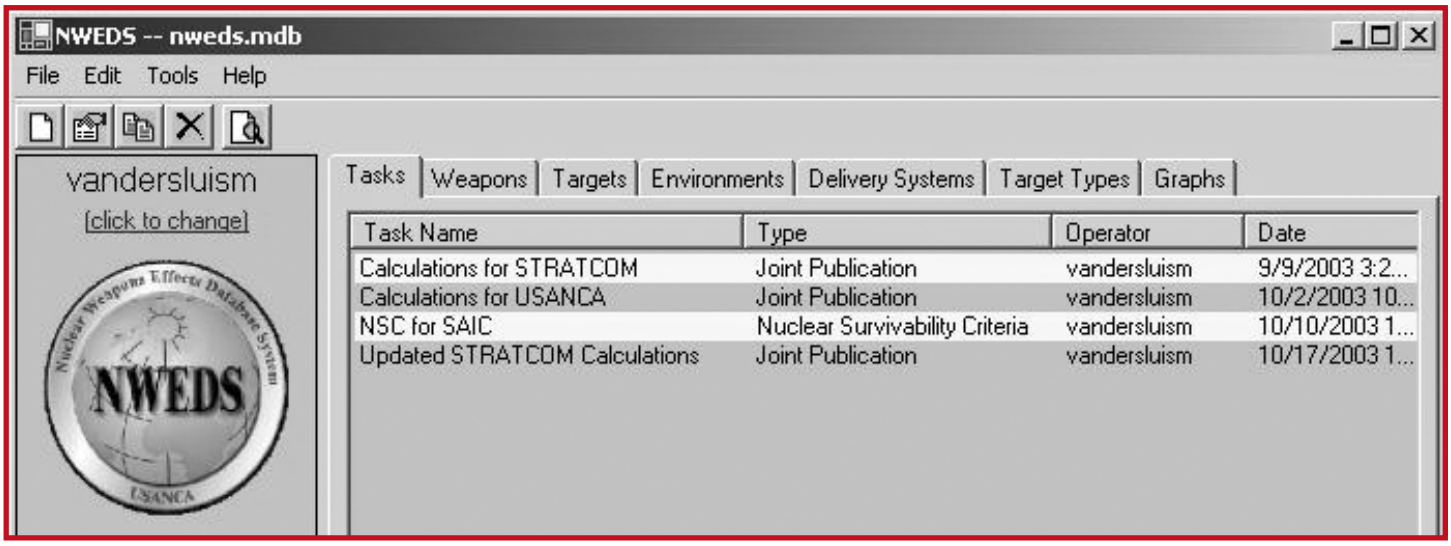


Figure 2. NWEDS Tracks All Tasks Performed on the Workstation.

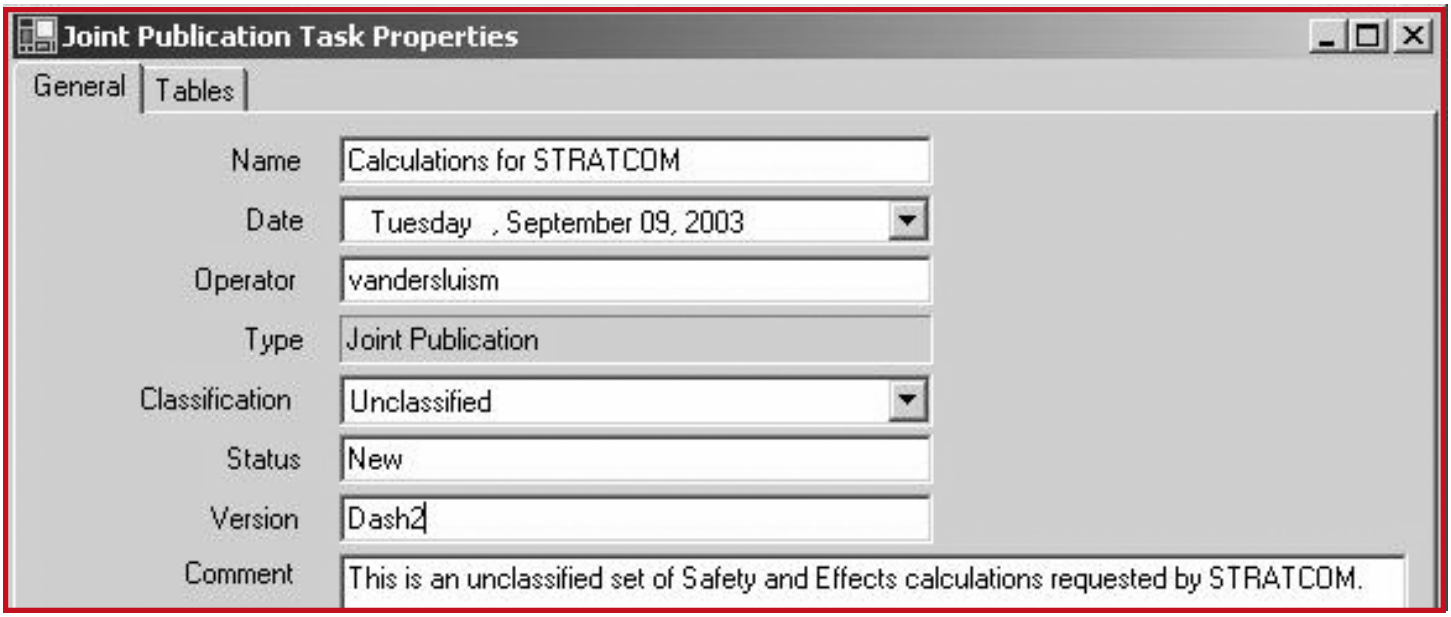


Figure 3. Descriptive Data is Stored for Each Task.

tables are built by selecting a target, a weapon-delivery system pair, an environment, a damage level, and a damage mechanism. The transitioned NWEDS code allows users to build these tables through a "wizard" mechanism; some of the data entry screens for this wizard are shown in Figure 5.

Advanced users are allowed to generate new weapons, targets, environments, and delivery systems for the code. Example input screens for this process are shown in Figure 6, page 22.

Once the tables are defined, the code can be run, and the results are reported in a series of tables. A sample of unclassified results is shown in Figure 7, page 22. The code can generate the entire JP 3-12.1 report.

The transitioned code greatly streamlines the process required for generation of required reports. Nevertheless, it is still a complex activity, and many users may want just a small subset of the results available from the code. To this end, we have implemented a number of "calculators" for generating quick answers with minimal input and setup time. Figure 8, page 23, shows two of these, one of which calculates the effects distance for a given weapon against a given target, and the other calculates the raw stress metrics for blast, given a yield and height of burst.

The NWEDS code is a critical tool for USANCA and is used to provide key information to warfighters. We have taken care at every stage to ensure that the transition effort has not changed any of the results of the

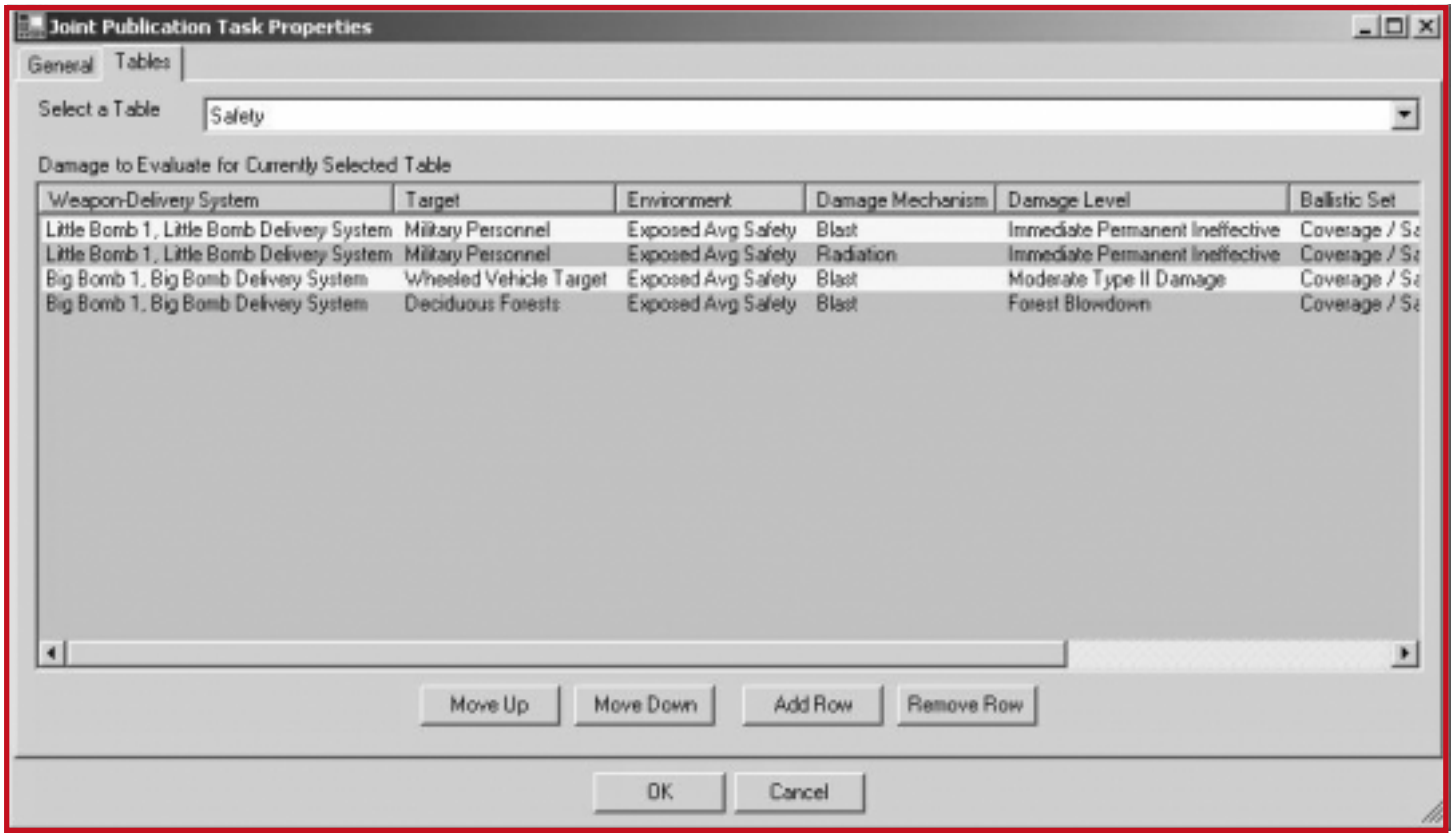


Figure 4. Tables to be Generated for the Task.

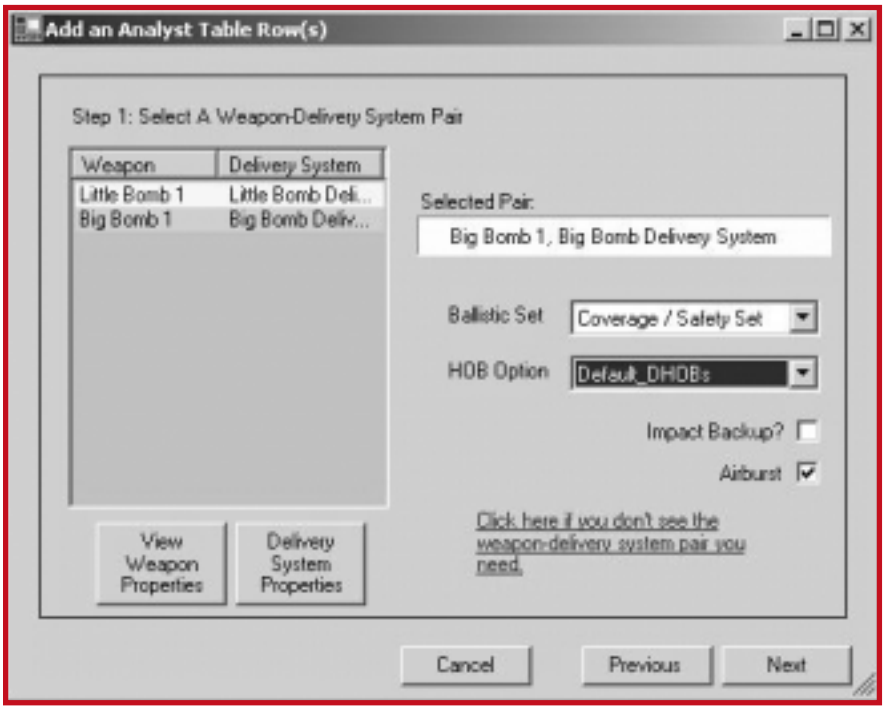


Figure 5. Steps for Defining a New Table.

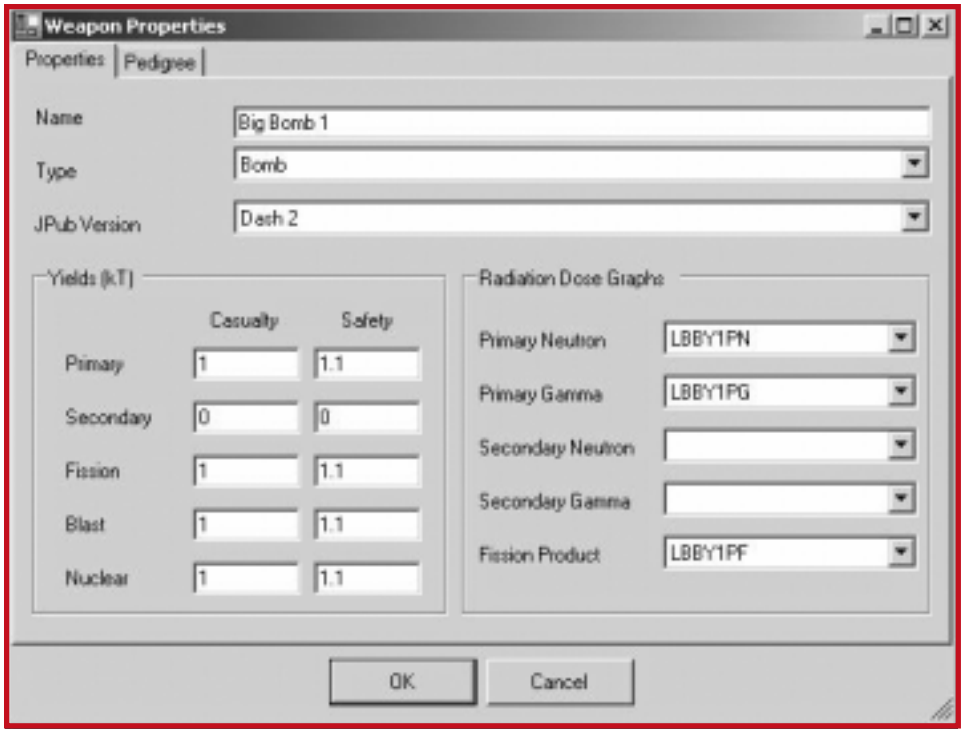


Figure 6. Defining a New Weapon.

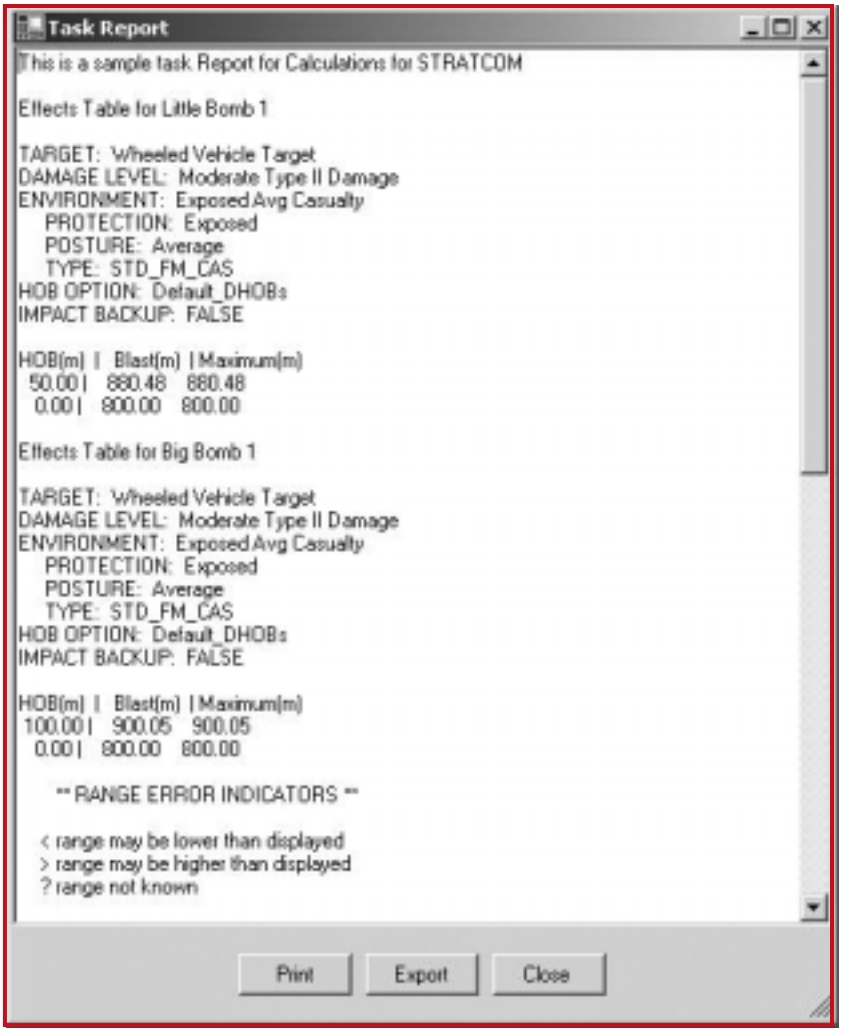


Figure 7. NWEDS Output.

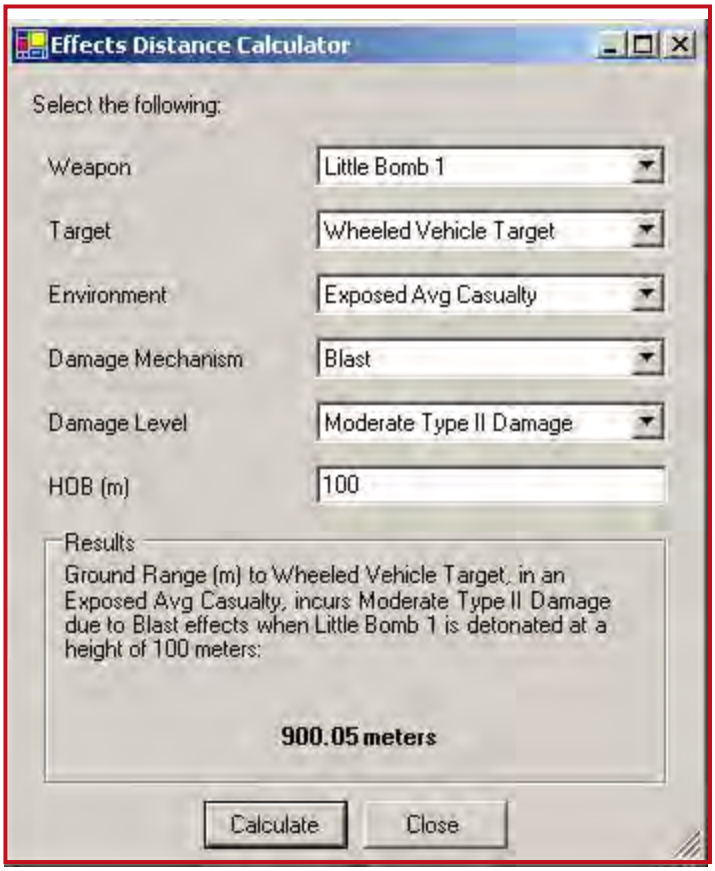


Figure 8. Example of NWEDS Calculators.

code. Each service is tested to make sure that it replicates the output of the Unix version; each function contains a set of internal tests against coding errors; and the reports generated by the final product will be compared to reports generated by the original for a suite of test inputs.

Modernization

The discussion above provides a sample of the features of the transitioned NWEDS; the full set is similar. In calendar years '04 and '05 we will be modernizing the code. Key enhancements over the next two years include the addition of mapping (GIS) capabilities, the creation of a web-based version (using the DTRA integrated WMD toolkit (WMDT) architecture), and creation of an interface for handheld devices. Additional enhancements under consideration include adaptation of the code for war-gaming purposes, the inclusion of the impact of terrain, and 3D visualization.

Conclusions

The NWEDS modernization program is safeguarding a critical nuclear weapons effects calculation capability by creating a more maintainable and auditable version of the NWEDS code. Along the way, we have been able to improve the ease of use and reliability of the code and expect to expand its community of users. Unclassified versions of NWEDS will probably be sent out to FA 52 Soldiers.

Mr. Mark Vandersluis is a Team Leader for software development at Science Applications International Corporation, where he has worked since 1986. He is responsible for developing software to support nuclear weapons effects analysis, critical infrastructure protection, and emergency management. He is currently providing technical oversight for SAIC's NWEDS transition effort and is involved in software development for the DTRA MIDAS (Mission Degradation Analysis) program. Mr. Vandersluis received a BS in Physics and Mathematics from the University of Maryland in 1985.

Mr. Martin Moakler is a retired Army FA52 Colonel and is currently working as a physical scientist in the Nuclear Division at USANCA. His previous assignment was as Chief of the Nuclear Division at USANCA. He earned a M.S. in Nuclear Engineering and Computer Science from Rensselaer Polytechnic Institute, a M.S. in Engineering Management from the University of Missouri-Rolla, a M.S. in Education from Old Dominion University, and is a graduate of the US Army War College.

Electromagnetic Pulse Simulation in the USSR

Mr. Robert Pfeffer
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During the Cold War years, Blue and Red nations developed numerous technologies that addressed military platform/system lethality and survivability. Some were high-voltage technologies designed to conduct threat-level electromagnetic pulse (EMP) stress tests on entire systems. While many publications identified test simulators and support electronics developed for Blue Departments of Defense and Ministries of Defense, few publications were available on Red test techniques. This article is the first of two that discuss Red nations' EMP simulation testing.

This article looks at several EMP system-level stress test simulators located at a Soviet EMP test facility near Saint Petersburg, Russia. The simulators simulated either (1) the EMP field or (2) the calculated coupled signal on the system. Like Blue nation simulators, these EMP field simulators approximated portions of the high-altitude EMP (HEMP) or the low-altitude EMP (sometimes referred to as source-region EMP (SREMP)) environments. Coupled-signal simulators, on the other hand, involved some form of current injection to drive currents on a system's input/output ports.

HEMP is the EMP resulting from the interaction of a nuclear device with the upper atmosphere typically greater then 50 kilometers. It is a radiated EM signal that travels through the atmosphere, primarily toward the earth. This means the electric and magnetic fields are perpendicular to each other and to the direction of travel and are related to each other by a constant. More detailed discussions of these fields and how they interact with earth ground are given in earlier NBC Report articles. SREMP is a more complicated set of electric and magnetic fields. It is the net EMP field in the vicinity of an earth ground when the nuclear detonation occurs on or near the earth. Close to the detonation, the pulse is not a pure radiated wave; hence, the signal has different electric and magnetic field waveshapes and amplitudes. In addition, SREMP is found in a region of time varying air conductivity. In both cases, HEMP and SREMP are characterized by electric fields in units of kilovolts/meter and by magnetic fields in units of amp-turns/meter. Once these fields interact with a system, the coupled signals are typically expressed in currents (amperes) and voltages (volts).

Figure 1. Author (left) and several EMC 95 Attendees on Tour of Test facility

At the conclusion of the June 1995 EMC 95 Conference held in Saint Petersburg, Russia, the author and other conference attendees toured what was once a very large EMP test facility (See Figure 1). This was an opportunity for an interesting look at a critical segment of the system-level lethality and survivability programs of the former USSR. From this tour, a comparison of these Soviet-developed EMP simulators can be made to known Blue EMP simulators. One of the Soviet simulators, however, was unique.

Techniques Used to Simulate the HEMP Environment

With the cessation of atmospheric testing, HEMP testing has been done using either of two non-nuclear means to simulate a HEMP environment at a test object: radiated free field simulators or bounded wave simulators. Both techniques used to simulate the HEMP criteria have advantages and disadvantages that must be considered in any HEMP test program. Previous NBC Report articles describe some of the more important EMP simulator characteristics. For example, the U.S. Army typically chose radiated free field simulators (e.g., AESOP) because they not only simulate the HEMP free field environment (the HEMP criteria specified in MIL-STD 2169B) they also provide the correct net field when the free field interacts with the

ground and the test object. The U.S. Air Force tended to use bounded wave simulators (e.g., TRESTLE), since they could provide a uniform field over an entire test object without radiating fields onto nearby runways and aircraft. In addition, the simulated free field and the net field are the same far from the earth's surface, such as what would be experienced by aircraft in flight.

The HEMP test facility near Saint Petersburg had both types of environment simulators. All appeared to be in various levels of a mothballed state and had power supplies and pulse-shaping techniques that were prevalent in Blue test facilities in the late 1960s and early 1970s. One of the radiated free field simulators is shown in Figure 2 with the horizontal antenna structure lowered. Figures 3 (a), (b) and 4 show bounded wave simulators. In each case, the simulators approximated the early time (<200 nanoseconds) environment, with peak amplitudes in units of kilovolts/meter (kV/m), and a double exponential waveshape. Judging from the proximity of the simulators, both shared the same power source and pulse-shaping hardware.

Techniques Used to Simulate the HEMP/System Coupled Response

A different simulation technique used to identify the response of a system to HEMP is to subject the system to the coupled signal(s) picked up on the system exterior and then monitor the resulting signals inside the system. This technique is done by first calculating (either analytically or by scale model testing) the signal on the system's exterior and then driving that signal onto the system. These currents and voltages can be created on a system's exterior much more cheaply than system-level testing at a HEMP radiated free field or bounded wave simulator, as long as the system topology is simple (i.e., not electromagnetically complex). No current injection simulator was shown to the visiting attendees.

Figure 2. A Horizontally Polarized Free Field Radiating Simulator.

Figure 3a. A Vertically Polarized Bounded Wave Simulator (Outdoor), power source end shared with radiating simulator.

Figure 3b. A Vertically Polarized Bounded Wave Simulator (Outdoor), antenna terminal end.

Figure 4. A Vertically Polarized Bounded Wave Simulator (Indoor).

Simulator X

Thus far, the discussion describes Red EMP test facilities that are essentially the same as Blue test facilities used to simulate (1) free and net HEMP fields, or (2) induced signals coupled onto the surface of a test object. A third type of simulator did not fall exactly into either of the two categories and it looked noticeably different than the others. This unique simulator design shall be referred to as Simulator X.

Simulator X was located in the same massive building as the Figure 4 simulator. Inside the open multi-story building was a crane that moved on a track across the entire building ceiling. Directly below the track and at one end of the building was a hole in the concrete floor, perhaps 15 feet in diameter. The hole was a right circular cylinder 10-15 foot deep with its symmetry axis perpendicular to the ground surface. Inside the cylindrical hole were many metal plates symmetrically distributed around it. No power supply, pulse shaping or test electronics were present.

Based upon the geometry and the physical location inside the building, it appeared the hole was a simulated silo, and the plates provided a non-nuclear means to EMP-test shallow-buried equipment, such as missiles, brought into the building and dropped into the hole via the crane. Figure 5 is one of the few photos that was allowed of the simulator. No power sources were present, nor were any test electronics, so it is left to the reader to recreate the polarization of the fields generated by these plates and to estimate what EM fields they were attempting to simulate.

Summary

■ Non-nuclear HEMP simulation techniques are dictated by (1) original HEMP field characteristics, (2) test object topology, and (3) relative location of a test object to earth ground.

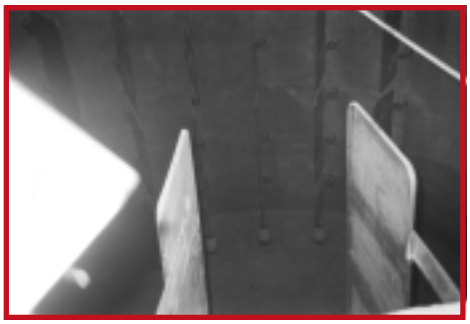

Figure 5. The Ground-level Portion of Simulator X.

■ Non-nuclear SREMP simulation is even more complicated because of the in-close characteristics of the electric and magnetic fields and their presence in a time varying air conductivity. There was no evidence of SREMP simulation, other than a vertical bounded wave simulator that could have been used to simulate just the vertical electric field in no time varying air conductivity.

■ The Cold War Red EMP test facility near Saint Petersburg used essentially first-generation non-nuclear technologies found in early Blue test facilities to conduct HEMP lethality and/or survivability tests.

■ Simulator X, with additional modifications, could have been used to couple complicated EMP fields on shallow-buried, ground-based systems such as missiles in silos.

For Additional Reading On EMP and HEMP, the Author Recommends the Following

- NBC Report Spring/Summer 2003, Overview of Electromagnetic Pulse Simulation and Modeling, p. 66.
- NBC Report Spring/Summer 2002, High-Altitude EMP (HEMP) Environments and Effects, p. 24.
- NBC Report Spring/Summer 2002, A Brief History of the Army EMP Program, p. 30.
- NBC Report Spring/Summer 2002, HEMP Coupling Onto Army Systems; A Primer, p. 33.
- NBC Report Spring/Summer 2001, Coupling Electromagnetic Energy Onto Electronic Systems, p. 35.
- NBC Report Fall/Winter 2000, Modeling EMP Targets From Source to End Points, p. 16.
- NBC Report Spring/Summer 2000, Army HEMP Validation Testing, p. 21.
- NBC Report Fall/ Winter 1999, Reducing Army EM Protection Costs, p. 25.
- NBC Report Spring/Summer 1999, HEMP Survivability: Exposing the Myths, p. 2.
- EUROEM 94 International Symposium on Electromagnetic Environments and Consequences, Book of Abstracts, 30 May – 4 June 1994, Bordeaux, FR.
- EMC 95 Conference Abstracts, 26-30 June 1995, St. Petersburg, RU.

Mr. Robert A. Pfeffer is a Physical Scientist at the U.S. Army Nuclear and Chemical Agency in Springfield, VA, working on nuclear weapons effects. He has B.S in Physics from Trinity University and a M.S in Physics from The Johns Hopkins University. Previous government experience includes Chief of the Harry Diamond Laboratories (HDL) Electromagnetics Laboratory and Chief of the HDL Woodbridge Research Facility, both in Woodbridge, Virginia.

FA52s — Keystone Soldiers in the New United States Strategic Command

LTC Scott T. Horton, FA52
United States Strategic Command

Avid NBC Report readers will recall the Fall/Winter 2001 article, "Army FA52 Officers at US Strategic Command," which focused on positions and responsibilities of Army nuclear planners at the command. Since that publication, US Strategic Command (USSTRATCOM) has been reshaped as an entirely new command, instrumental in fighting the war on terrorism and focused on developing the global capabilities that the military of the 21st century will demand. In this new command, FA52s will play a keystone role in efficiently anticipating and countering the diverse and increasingly complex threats our nation will face in the foreseeable future.

In the past, a new arrival or visitor to USSTRATCOM would have received a mission brief on the command's vast responsibilities with respect to strategic nuclear deterrence. Today, in addition to those enduring responsibilities, USSTRATCOM adds Space and Computer Network Operations roles received from the former US Space Command, and four new missions previously unassigned to a Unified Commander. President Bush assigned USSTRATCOM new missions through Change-2 to the 2002 Unified Command Plan (UCP) on 10 January 2003. These four missions are global strike planning and execution; integration of Department of Defense (DoD) information operations (IO); global missile defense operations; and oversight of command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) in support of strategic and global operations. "Strategic" no longer equals "nuclear" as USSTRATCOM has reclaimed the classic definition of a "strategic command" and developed a new globally focused mission statement:

Establish and provide full-spectrum ***global strike***, coordinated space and ***information operations*** capabilities to meet both deterrent and decisive national security objectives. Provide operational space support, ***integrated missile defense, global C4ISR*** and specialized planning expertise to the joint warfighter.

A New Organization

To meet these new mission requirements, USSTRATCOM has reorganized away from a traditional J-code structure and into five major functional directorates: Global Operations (GO): Strike Warfare (ST); Joint Force Headquarters Information Operations (JFHQ-IO); Policy, Resources, and Requirements (PR); and Combat Support (CL) (See Figure 1).

Global Operations (OP) Directorate coordinates the planning, employment and operations of DoD strategic assets and combines all current operations, global command and control operations, and intelligence operations. The directorate includes all Command Center operations, the Joint Intelligence Center, Current Operations, and the National Airborne Operations Center.

Strike Warfare (ST) Directorate provides integrated global strike planning, and command and control support to deliver rapid, extended range, precision kinetic (nuclear and conventional) and non-kinetic (elements of space and information operations) effects in support of theater and national objectives.

The Joint Force Headquarters – Information Operations (JFHQ-IO) Directorate incorporates, integrates, and synchronizes DoD information operations (IO) disciplines that enable the commander to use defensive and offensive IO in support of all Combatant Commanders.

Policy, Resources, Requirements

(PR) Directorate develops overarching policy to support execution of all the command's missions. It is also responsible for the articulation and development of all command requirement processes to ensure that STRATCOM has the tools to accomplish its mission.

The Combat Support (CL) Directorate provides acquisition; contracting; combat logistics and readiness; command, control, communications and computer systems for strategic forces; intelligence; and global command and control to support command missions.

Figure 1. USSTRATCOM

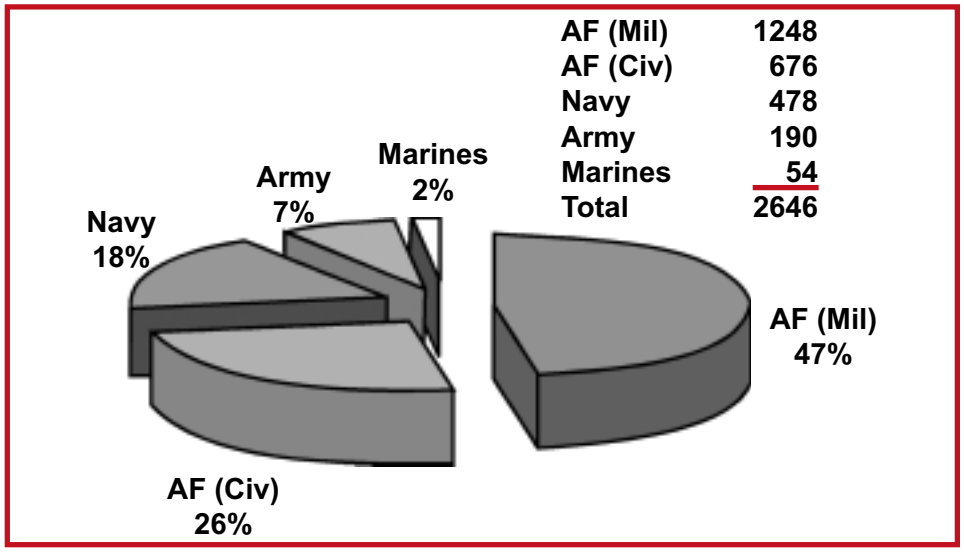

Figure 2. USSTRATCOM Manpower by Service.

A New Opportunity for Army Soldiers

In USSTRATCOM's global missions, Army Soldiers will receive exposure to a broad range of strategic issues, contact with all combatant commands, increased interface with US allies, interaction with DoD and non-DoD agencies, and important Joint duty credit. Members of the Army, Navy, Air Force and Marines are distributed throughout the headquarters and its geographically separated units providing an opportunity to serve USSTRATCOM in a variety of locations. The headquarters lies 10 miles south of Omaha, NE. Its geographically separated units are in Cheyenne Mountain, located in Colorado Springs, CO; The Joint Information Operations Center at Lackland, AFB, TX; and Joint Task Force – Computer Network Operations, located in Arlington, VA. A myriad of Army duty assignments and a 380 percent increase in USSTRATCOM Army end strength to 190 Soldiers in FY03 provides both variety and opportunity to serve this critical command.

A New Role for Army FA52s

As in the past, Army FA52s remain key enablers in support of USSTRATCOM and the national objectives outlined in the Nuclear Posture Review — assurance to friends and allies; dissuading a military competitor; deterring threats and coercion against US interests; and if deterrence fails – decisively defeating any adversary through its strategic planning and force execution. FA52 officers' efforts span across the command, supporting innovative weapons concepts development, nuclear planning, developing counterproliferation predictive tools, and analysis of the consequences of execution for the variety of the command's global missions. The following paragraphs describe some of the specific FA52 positions at USTRATCOM to amplify the new roles.

The Strike Warfare Directorate has two positions for FA52s. The first of which serves as the Chief of Desired Ground Zero Construction. This is an O5 authorization and key duties include supervising a team of planners and analysts who construct the desired ground zeros, or nuclear weapons aim points used in the nation's strategic war plan, in accordance with national guidance.

These duties require the use of sophisticated computer models to predict the effects of nuclear weapons on the targets of interest. The second position is a new O5 authorization available for fill in FY04. The FA52 officer assigned to this position will serve as a counter-proliferation analyst and plans officer. Planning and analysis in both these positions will be challenging and rewarding as the command integrates kinetic and non-kinetic effects into the nation's war plans.

The Policy, Resources, Requirements (PR) Directorate has six positions for FA52s. The primary FA52 position in PR is the Chief of the Force Assessments Division (PR12). This is an O6 authorization and is the senior FA52 position at USSSTRATCOM. PR12 provides analytical and technical support for strategic and theater war plans assessment and development.

The PR12 function is to provide scientific and technical analyses for USSTRATCOM staff, Geographic Combatant Commanders and the Office of the Secretary of Defense (OSD). This robust effort includes evaluating the effectiveness of strategic war plans; conducting special studies to assess the effects of future force structure, target selection, and employment guidance on strategic war planning; and evaluating and modeling the threat posed by enemy air and space defense networks to strategic forces. FA52s fill key positions to support PR12 that include weapons effects model development, consequence of execution analysis, and support for the Strategic Support Team (SST).

The SST is a handpicked team of experts from USSTRATCOM that deploys to support theater operations as requested by other combatant commands. Members of this team are the primary advisors to combatant commanders for strategic weapon targeting and resulting collateral effects. FA52 officers within PR 12 and deployed as part of a SST use standard tools such as PDCalc and the Hazard Prediction and Assessment Capability (HPAC) to assist in fulfilling their requirements.

Other 52s in PR12 work with advanced strategic technology concepts. Recently a FA52 was assigned to the command's space and missile defense assessment branch and will help provide strategic weapons effects relating to global missile defense and space operations.

One additional FA52 position in PR12 is a strategy and policy support assignment responsible for development and review of national level guidance in support of USSTRATCOM missions.

The Global Operations Directorate has FA52 positions assigned to fulfill the command and control responsibilities during execution of forces. These officers perform duties as Logistic Officers and Mission Commanders aboard the U.S. Strategic Command's Airborne Command Post (ABNCP). Logistical responsibilities are throughout all phases of nuclear operations and include: directing generation of strategic forces and providing updated information on safe areas used for the redeployment of forces as a result of nuclear fallout. Mission Commanders are the primary advisor to any one of over 20 flag officers who fly as Airborne Emergency Actions Officers (AEAOs) and are ready to assume command from CDRUSSTRATCOM and advise the President concerning his options involving the employment of nuclear forces. FA52 officers are also command certified code handlers for the Airborne Launch Control System and qualified to prepare JCS and USSTRATCOM emergency action messages for command and control of the nations nuclear triad. FA52 officers receive in-depth training that requires learning detailed tasks, developing plans to train those tasks, and participating in a series of annual exercises used to demonstrate and refine proficiency.

Summary

FA52 officers remain keystone members of USSTRATCOM and provide crucial support to the command missions. Innovative Soldiers are arriving every day bringing skills that complement the new missions, and their presence and value added has not gone unnoticed by the senior leaders from all Services within the command.

In addition to professional benefits, the Omaha area offers families a high quality of life, a relatively low cost of living, minimal traffic, top-notch schools, and a vibrant city with world-class attractions and events.

USSTRATCOM provides a wonderful opportunity to develop as a global warfighter, obtain advanced personal and professional education degrees, joint credit and a quality tour for Soldiers and their families.

LTC Scott T. Horton is a FA52 officer assigned as the Chief, Designated Ground Zero (DGZ) Construction Section, Strike Warfare Directorate, USSTRATCOM. He was commissioned in the Field Artillery upon graduation with a B.S. in Physical Chemistry from Cameron University and has a M.S. in National Security and Strategic Studies from the Naval War College. Prior to Career Field Designation into ISCF/52, he served in various field artillery assignments in Germany with the 1st Armored Division, with U.S. Forces (Korea), and with the XVIIIth Airborne Corps at Fort Bragg. His previous FA52 assignments include a tour at the Defense Threat Reduction Agency and as the Special Weapons Planner in J5, U.S. Forces (Korea).

Rapid Prototyping – Developing Solutions for the U.S. Army's Technical Escort Unit

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Ms. Kathleen Gatens
Mr. Donald Verrill
Idaho National Engineering and Environmental Laboratory

The engineers and technicians at the Idaho National Engi neering and Environmental Laboratory (INEEL) in Idaho Falls, Idaho, never had a name for their engineering integration project for the U.S. Army Technical Escort Unit (TEU). This was not for reasons of security or secrecy, though team members did not discuss the purpose or destination of the sophisticated equipment they were assembling. Instead, they never named the project because they didn't have time. There was no need to create an elaborate name for a task that from beginning to end took 45 days.

Conceptual Design

TEU contacted the INEEL in January 2003 for support in conceptualizing solutions that would allow optimal response to the discovery of potential WMD materials. This Army unit had to determine how to get their teams in place quickly, and with the right nequipment so they could not only secure an area, but also begin assessment of potential weapons of mass destruction (WMD) material. Due to the escalating situation in Iraq, the TEU had to come up with these solutions fast.

Sequestered in a vault for more than two weeks of 17-hour days, the military personnel addressed the tactical aspects of manning and deployment and the INEEL engineers focused on the equipment and system delivery.

Part of the overall plan – and the INEEL portion – called for integrating advanced assessment technologies, along with appropriate support equipment and tools, into five military cargo containers that could be shipped overseas and deployed into the field.

The schedule would be tight, the TEU advised the laboratory engineers. The first two modules would be needed in as few as 45 days, with the remaining three systems following in two weeks. Could the Department of Energy national laboratory design, procure, assemble and ship complex systems to the exacting requirements in less time than it normally takes to buy a computer?

The two INEEL engineers returned to Idaho before they answered. They surveyed personnel rolls for the right team members, examined processes, and sought management support to streamline procedures, enabling them to amass the thousands of system parts and pieces quickly, while still meeting federal acquisition regulations. They made preliminary telephone calls to manufacturers and vendors to determine the availability of parts and pieces needed for their concept to work. They cleared facility space and their calendars and called the Edgewood, Maryland facility with their answer. Yes, they could get the job done.

Then they waited while military planning continued and world events focused on 437,000 square kilometers in the Middle East, a landmass just slightly more than twice the size of the state of Idaho.

A few weeks later, they received the call to proceed, but with one change. In order to properly train personnel for this hazardous mission, TEU needed the systems quickly. They wanted the first two systems in 30 days and the remaining three, two weeks later. The complete task, from end-to-end, could take no more than 45 days.

Procurement

Both TEU personnel and INEEL staff procured equipment for the containerized systems. This was done to expedite purchasing and save costs, however, it increased the logistical complexity of acquiring, tracking and assembling the systems. The INEEL alone purchased 1,430 items ranging from a 30-cent rivet to field portable gas chromatograph/mass spectrometers exceeding $100,000. To add another strand to the complex web the Army and its support contractor were weaving, some of the equipment, regardless of which entity purchased it, was shipped to Maryland and some was shipped to Idaho.

INEEL engineers and technicians needed to design, assemble and integrate the separate pieces into one

comprehensive system that the TEU could use to complete its mission; no-notice deployment to provide chemical and biological advice, verification, sampling, detection, mitigation, assessment, decontamination, packaging, escort and remediation of chemical and biological devices or hazards worldwide. For its part, TEU needed to begin training its personnel immediately on that same equipment to assure mission success.

To accommodate this need, INEEL engineers planned on four identical systems, comprised of standardized and interchangeable modules into which the integrated systems would be safely stowed, labeled and locked. A fifth system was designed to carry spares and other supplemental equipment. The plan of action did not allow for down time due to failed equipment, so immediately available spares were needed. The shipping container itself was listed in the "spares" category, so it had to be configured to be able to replace an entire module if necessary. As a result, with the exception of the five cargo containers that all went to Idaho, for each type of equipment ordered, at least one went to the INEEL for integration, while the remainders went to TEU for training.

The INEEL team included several professionals whose sole function was procurement. Even so, this was no easy task. A few pieces of equipment went astray when delivered to the INEEL's 890-square-mile site, forcing the buyers to spend hours tracking and restoring wayward items. Even now, months after project completion, the team members voice appreciation for the exceptional support they received from vendors around the country, and realize they could not have accomplished this portion of the task without their support.

One vendor rerouted X-ray generators to the INEEL that were originally being shipped from Germany to an overseas customer. A local muffler firm completed new exhaust lines on a container delivered to him that Saturday morning. On and on it went, with vendors accommodating every daunting request for immediate service. In the end, even as the bits and pieces were arriving in as timely a fashion as humanly possible, engineers were deep into the design.

Rapid Prototyping

TEU and the INEEL have a long history of cooperation on successful programs, beginning over a decade ago with the portable isotopic neutron spectroscopy, or PINS system. Developed by INEEL physicists, PINS is a field portable nondestructive evaluation tool to safely and reliably identify the contents of munitions and chemical storage containers. Originally developed for use by the U.S. Army to identify chemical warfare agents within stockpiled or non-stockpile munitions, PINS has also shown remarkable value in environmental applications where it is used to identify or confirm potentially hazardous container contents. PINS, a 1992 Research and Development 100 award winner, can detect chemical weapons agents, explosives, and hazardous materials in typical assay times of 100 to 1000 seconds. PINS was first used by the TEU in 1993 during Operation Safe Removal, Spring Valley, Washington, D.C., for which the unit received the 3rd Army Superior Unit Award for recovery of 147 munitions as part of the Service Response Force.

Since that time, the INEEL has developed several munitions assessment platforms for the TEU, including several mobile systems and a facility-based system located at Pine Bluff, Arkansas. One mobile system is deployed from Edgewood, Maryland, another system is deployed from Pine Bluff, Arkansas, and the third is now stationed at INEEL for deployment within the Western U.S.

Each of the munitions assessment systems contains advanced instrumentation, including INEEL-developed systems such as PINS and a digital radiography/computed tomography package, as well as other commercial, off-the-shelf equipment. In the last decade, many of the TEU successful missions were conducted using INEEL technologies and systems.

It is based on this history that the TEU directed INEEL to reconfigure these and other instruments and equipment into a robust package that could be shipped overseas and be expected to perform under harsh environmental and situational conditions.

INEEL engineers define rapid prototyping as turning problems into solutions in a very short time – solutions that are simple to operate and require low maintenance. They cannot accomplish this on their own. Each and every step of design and fabrication is closely coordinated with their customer and the field operators. Project personnel traveled cross-country regularly and spoke with customers and operators countless times during the few weeks to ensure design met utility requirements.

The cycles of procurement, design, integration and fabrication were occurring concurrently. The engineers handed sketches to the technicians who were told, "Build this here." Only half in jest, the process was referred to as "stand-up engineering." Many ideas went directly from the white boards to the welders for start of fabrication.

INEEL's focus was necessarily on the first two systems, which if integrated efficiently, would speed the work on the remaining three. As the equipment arrived, the team had to make significant design changes.

The engineers were designing the interiors of the cargo containers to meet two different functions. First, they needed them to serve as storage and shipping containers. Every item had to be packaged to fit and be held securely in place for shipping. The design had to accommodate shipping by cargo container ship, military aircraft, or even sling loading from a helicopter. Second, the containers had to double as operations platforms with air conditioning, power, cable penetrations, an appropriate amount of counter space and whiteboards.

Figure 1. Stacked Packing Modular Systems Within the Cargo Container.

These helped to ensure that the advanced instrumentation arrived to the field in working condition. The cargo container has a dual function as a shipping container and an operations platform once in the field.

The generators, which came installed on the 20-foot containers, would have rattled the teeth out of any service-member who tried to work in their proximity. Unfortunately, they arrived supplying high-voltage three-phase power rather than the low-voltage single-phase power needed for the project. As mechanical engineers redesigned the mounting of the large generators, electrical engineers redesigned the power distribution. Teamwork was essential and carried the engineers through the long hours and hard work.

Figure 2. Cargo Containers In the Process of Being Readied for Shipment in Support of the TEU.

Day and night, working in concert with the TEU, the units came together. While the engineers and technicians were assembling, other team members were compiling consumables not easily acquired in the Middle East, such as inventories, and operations, maintenance and training manuals. For the first time, the INEEL staff used digital images, taken during every step of the process, to enhance the training materials. This approach worked so well that the INEEL staff plans to incorporate digital photography into training updates for other munitions assessment systems.

Twenty-eight days after approval was given to begin, the first two shipments left Idaho for the 2500-mile journey to Maryland, one stop before its final destination in the Middle East. Even this last task required teamwork. Team drivers were used to get the systems to their interim destination in less than 48 hours.

Reach-Back

But even as the final containers made their way across the country, the work was not done. An important aspect of INEEL's support to the TEU is a continual reach-back, from Maryland or from the battlefield. Some of the calls were easy to resolve, such as requests for an additional diskette drive and laptop for the assessment systems. Some were a little more complicated. Such was the case with the liquid nitrogen supply used to cool the PINS system's HPGe detector. Normally, as with other PINS systems used by the TEU, liquid nitrogen is supplied in a small Dewar flask, which is filled as needed from a larger supply.

Figure 3. Team 2 and Team 3 Containers Complete and Waiting for Delivery.

That larger supply was in Kuwait, and by the time the flasks traveled to their destination, sometimes half the liquid nitrogen had evaporated, lessening the time PINS could be used. During the original planning sessions, the two organizations had considered a liquid nitrogen plant that could supply the coolant as needed. INEEL engineers immediately shipped such a plant to the field, but it needed steady power and water to operate. The service per-

sonnel discovered that both were in short supply.

So the engineers went back to the drawing board and designed, fabricated and shipped a stand-alone mobile liquid nitrogen plant. This first-of-its-kind system was air-cooled and powered by a diesel generator. The design, procurement, and fabrication of this system were all completed in six short weeks. As in every INEEL design, safety engineers evaluated the equipment and systems to ensure uncompromised safety conditions.

TEU personnel and INEEL staff talk regularly, and reports come in from the field on the successful operation of the systems. The INEEL continues to support this project and its other stateside TEU programs. This particular project, named or unnamed, particularly demonstrates how rapid prototyping can help the U.S. Army field complex systems in an incredibly short time.

Mr. Stacey G. Barker is a Principal Technical Specialist at the INEEL. He graduated in 1987 from Idaho State University with an AAS degree in Electronic Systems Technology supplemented with a certificate in Laser Electro Optic. He has 16 years of experience working on research and development programs for the Department of Defense, including programs for the Air Force, Army and other government agencies.

Ms. Kathleen Gatens is the Communications Liaison for the National Security Division of the INEEL.

Mr. Donald Verrill is an Advisory Engineer at the Idaho National Engineering and Environmental Laboratory (INEEL), a U.S. Department of Energy laboratory operated by Bechtel BWXT Idaho, LLC. He currently is the Project Manager for Mobile Systems for Chemical Demilitarization. He has over 25 years of experience in technical operations, research and development and systems integration. This experience includes 14 years in the United States Air Force. He has headed technical and operational teams in the development and operations of numerous mobile platforms and portable systems for the Department of Defense.

Figure 4. The INEEL Team – (Back row, standing in container, from left to right) John Zabriskie, Stacie Horman, Jodi Hansen, Jennifer Cameron (Front row, from left to right) Stacey Barker, Lorin Hanson, Rick Evans, Bob Denkers, Gary Thinnes, Brent Smith, Don Verrill, Mike Corbridge, Bruce Case, Paul Mottishaw, Kevin Young and Greg Anderson.

Federal Emergency Management Agency and the New Frontier

Mr. Joe Correa
Department of Homeland Security

The purpose of this article is to provide an overview of the Federal Emergency Management Agency (FEMA) and how it supports the Department of Homeland Security (DHS) effort. As the DHS evolves and matures in the next six months FEMA may assume additional responsibility as the principal organization for consequence management, emergency preparedness and response.

A transfer of several agencies, including FEMA, to the DHS took place on 1 March 2003. The DHS is still integrating parts of these former agencies. The DHS initiated an organizational structure that included the Emergency Preparedness and Response (EP&R) Directorate, which is also known as FEMA. Mr. Michael Brown, the Under Secretary for EP&R/FEMA leads the four main divisions:

- Preparedness, Mr. R. Dave Paulison, Director, is also the US Fire Administrator.
- Mitigation, Mr. Anthony Lowe, Director, was the previous administrator of the Federal Insurance and Mitigation Directorate.
- Response, Mr. Eric Tolbert, Director, previously served as the Deputy Director, Office of National Preparedness.
- Recovery, directed by Mr. Larry Zensinger.

In accordance with the Disaster Relief and Emergency Assistance Act, FEMA is primarily a coordinating agency. The Agency relies on strong partnerships to carry out its mission. FEMA works with a variety of agencies, States, Territories, tribal nations, local governments, first responders, voluntary organizations, businesses, industries, and individuals. While the Agency's mission is squarely focused on protecting and preparing the nation as a whole, primary responsibility for disaster response rests with state and local authorities. This means FEMA does not respond to all disasters that occur in the United States. Instead, when state and local capacity to respond is threatened or overwhelmed, a Governor may ask the President for Federal assistance.

A Presidential disaster declaration directs FEMA to provide and coordinate a variety of assistance and support. FEMA's primary mechanism for doing this is the National Response Plan. It provides a process and structure for the systematic, coordinated, and effective delivery of Federal assistance to address any major disaster, regardless of type or cause. Through the National Response Plan, FEMA marshals the resources and expertise of its many partners, including Federal agencies and numerous voluntary organizations, and coordinates the overall effort with the States and communities affected by the disaster.

The principal policy organization within FEMA that develops the necessary approach to nuclear, radiological and chemical hazards is the Nuclear and Chemical Hazards Branch within the Preparedness Division. Mr. W. Craig Conklin, formerly with the Environmental Protection Agency, leads this branch. The branch is further subdivided into the Radiological Emergency Preparedness section, led by Ms. Vanessa Quinn and the Chemical Stockpile Preparedness section, led by Mr. Daniel Civis, the former Quality Assurance Special Ammunition Specialist.

For the immediate future, the Nuclear and Chemical Hazards Branch will continue to provide direct assistance to communities that have hazards related to these elements. With the national concern on all aspects of weapons of mass destruction, more changes and additional responsibilities may be expected.

Within FEMA there are other elements involved with additional aspects of WMD to include special support teams that handle and manage WMD consequences. This area is evolving and will be the subject of a future article, once transitions are completed.

The Headquarters for FEMA is located at 500 C ST. SW, Washington DC, 20472. For the immediate future, the Regions continue to be located as follows:

Region I, Boston, MA, Region II, New York, NY, Region III, Philadelphia, PA, Region IV, Atlanta, GA, Region V, Chicago, IL, Region VI, Denton, TX, Region VII, Tulsa, OK,

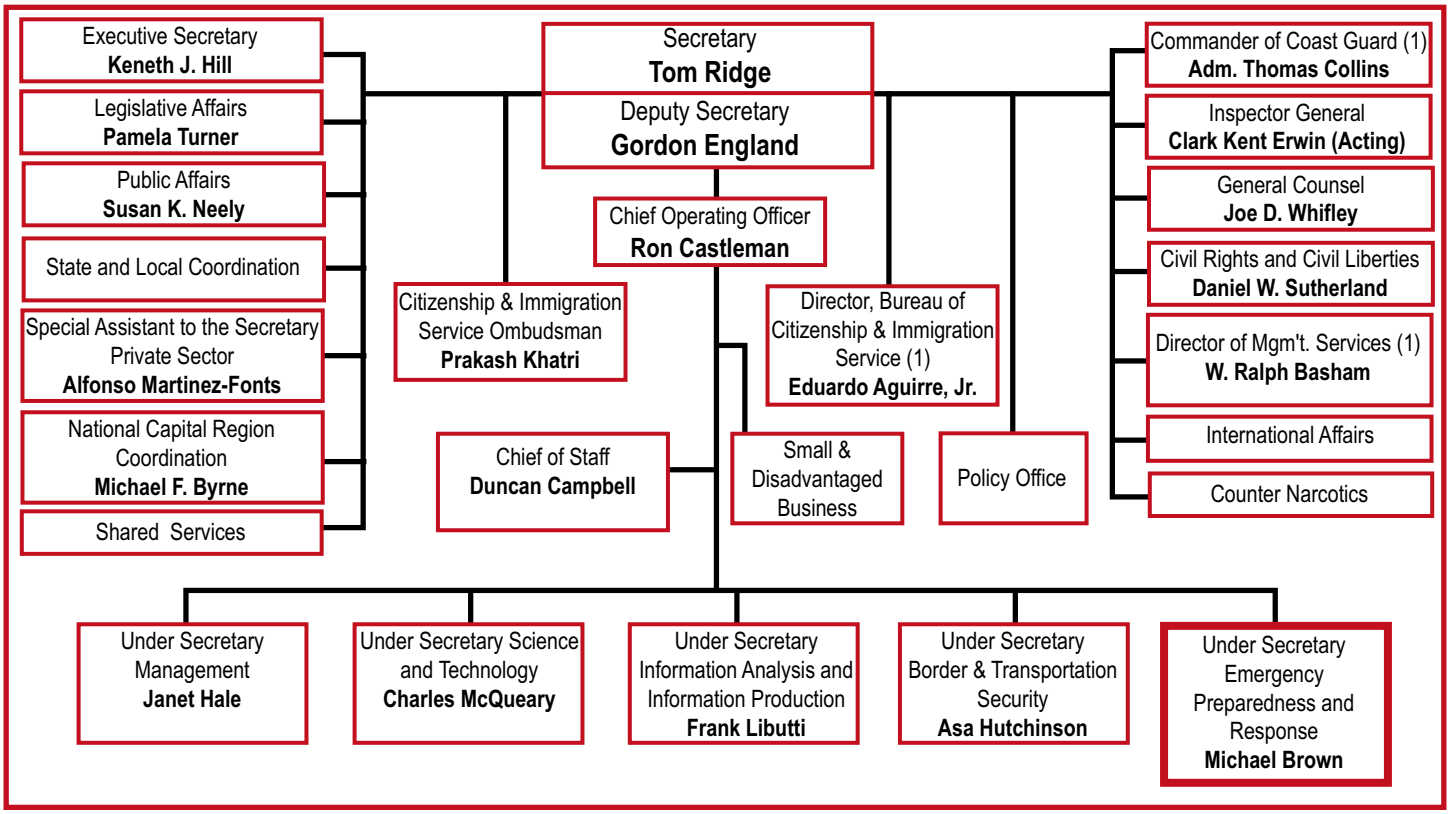


Figure 1. Department of Homeland Security.

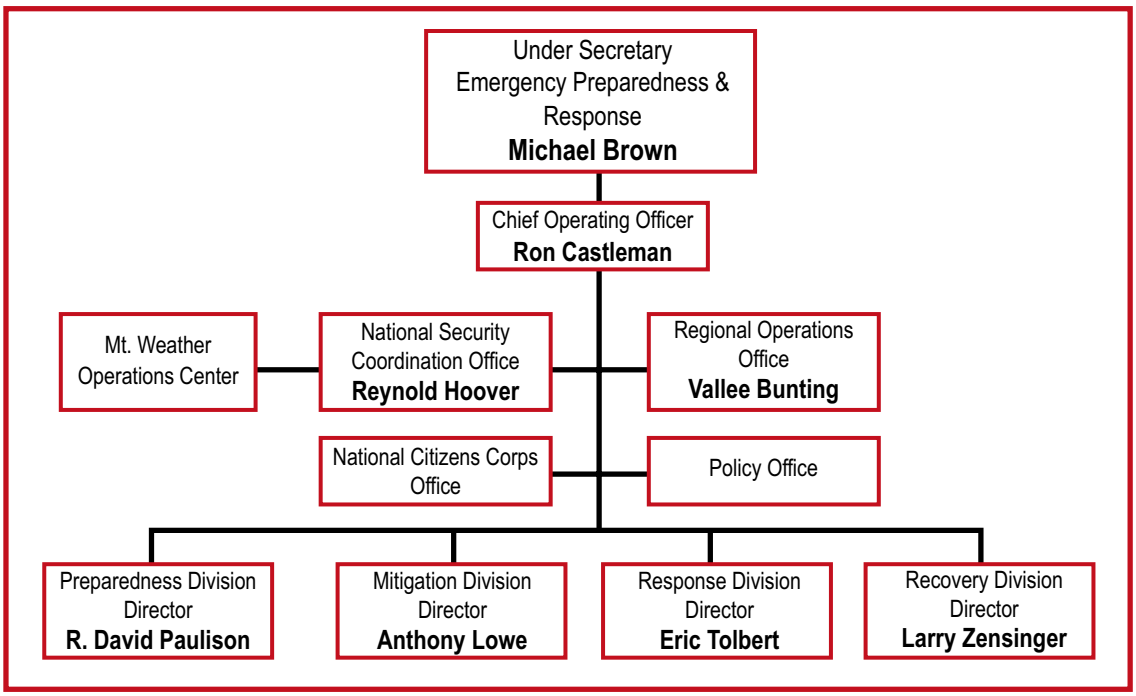


Figure 2. Emergency Preparedness and Response

Region VIII, Denver, CO, Region IX, Redding, CA and Region X, Bothell, WA

Mr. Joe Correa currently works as an Emergency Preparedness and Policy Specialist in the Department of Homeland Security, Federal Emergency Management Agency. He is a retired Army officer with experience in nuclear and chemical weapons, to include experience as a Nuclear Weapons Detachment Commander. Mr. Correa has a B.S. from the University of Puerto Rico and a M.S. from Strayer University. He is a graduate of the United States Army Command and General Staff College.

Assessing the Radiological Dispersal Device Threat

MAJ Dirk Plante, FA52
Defense Threat Reduction Agency

Of the WMD/CBRNE threats we face, the Radiological Dispersal Device (RDD) is probably least understood by the NBC/FA52 community. After all, we have hundreds of tests to fall back on for data on nuclear weapons, years of data on chemical and biological agents, and centuries of data on high explosives. What do we know about the RDD? This article offers a general overview of RDDs, their effects and the threat they pose, and summarizes the Defense Threat Reduction Agency's (DTRA) recently completed test series that simulated an RDD event.

DTRA defines an RDD as "an explosive device that is intended to spread radioactive material from the detonation of conventional explosives."[1] (This article will also consider the non-explosive release of radioactive material). Despite being able to fit the established definitions of a weapon of mass destruction (WMD),[2] an RDD can more realistically be defined as a weapon of mass disruption. This is because the psychological impact of an RDD event can be much greater than the physical impact.

Effects of a Radiological Dispersal Device

There are many factors involved in determining an RDD's effectiveness for producing casualties. Some things to consider are the material (e.g. plutonium, uranium, cesium, strontium), form (metal, ceramic, liquid), and aerosolization technique (explosion, implosion, liquid sprayer). These factors and others contribute to the amount and particle size distribution of the released material.

There are two effects to be concerned with for an explosively released RDD. First is the blast from the conventional explosives used in the device. The blast effect can be so great that little, if any, thought will be given by first responders to the concerns of radiation. Their immediate action is to treat casualties of the blast at the scene, thus contributing to additional exposure time to any radioactive material dispersed by the explosion. It may be hours, days, or weeks later before it is discovered that radioactive material was dispersed.

The second effect is that of the ionizing radiation released in the environment. In an explosively released RDD, the blast will disperse an amount of the radioactive material in the immediate area (e.g. a city block, shopping mall food court, etc.) and also loft the remainder into the air to be transported and dispersed over a greater area. Contamination can be further spread by inadvertent movement of the radioactive material by vehicles (e.g. ambulances transporting casualties, fire trucks) and people (e.g. contaminated clothing) leaving the area. The material lofted will be transported away from the blast site by the wind and subject to the effects of the weather, with larger particles falling to the ground sooner, and smaller particles transported farther downwind.

While the blast effect is not a concern for non-explosively released RDDs, the dispersal of the radioactive material can be as extensive, if not more, than if the material is released explosively, depending on the method of the non-explosive release. Spreading of contamination inadvertently and by the weather are also concerns with a non-explosive release.

"Common" Radioisotopes found in a Radiological Dispersal Device

Obviously, the terrorist needs to obtain radioactive material. The concern is where will the terrorist get the material. The terrorist could attack a nuclear power plant to get spent fuel rods out of the fuel storage pool, or obtain americium-241 found in millions of discarded smoke detectors. These two examples represent possibly the two opposite extremes in where radioactive material can be found. A more probable scenario would be somewhere in the middle, e.g. stealing a radioactive source from a research laboratory at a university.

Note: Lost, abandoned, or stolen sources are referred to as "orphaned sources."

Sources that pose the greatest risk for use in RDDs are those that have high radioactivity levels. The

shorter the half-life and the greater the mass of material, the higher the radioactivity level. Plutonium-239 and uranium-235, the fissile isotopes used for a nuclear bomb, would not make the best RDD material because of their long half-lives (uranium-235: 704 million years; plutonium-239: 24,000 years). This is not to say that plutonium and uranium do not pose a risk to the public; both are alpha emitters and an inhalation hazard.

Table 1. Characteristics of Select Radioisotopes.

Radioisotope	half-life	decay mode	gamma	Application
Americium-241	433 years	alpha	yes	radiography
Cesium-137	30 years	beta	yes	blood irradiation
Cobalt-60	5 years	beta	yes	radiation therapy
Iridium-192	74 days	beta	yes	radiography
Strontium-90	29 years	beta	no	RTG

Radioisotopes that pose a greater risk include americium-241, cesium-137, cobalt-60, and strontium-90. These are common radioisotopes found in medical sources, industrial sources, radioisotope thermoelectric generators (RTG), and other devices that could be orphaned. Table 1 lists the characteristics of some of the radioisotopes that could be used in an RDD

Results of Recent Tests Performed by DTRA

Recently, DTRA conducted a test series at the Nevada Test Site (NTS) to further understand the consequences of an explosively disseminated RDD.[3] The goal was to look at RDDs a terrorist might use to optimize death, destruction, economic impact, and psychological impact. The test series provided four deliverables: source term data for dispersion models, comparison of two well established transport and dispersion (T&D) models to an outdoor test event, video footage for training purposes, and a preliminary analysis of source term interaction with common building materials.

The tests involved four underground shots and one outdoor test using full-scale devices. The underground tests, two shots each using benign/non-radioactive forms of strontium titanate ceramic and cesium chloride salt, provided needed data to obtain particle size distribution for source term development, and to conduct an examination of how the radioactive surrogates interacted with common building materials. Building materials used on the tests included concrete, marble, sandstone, and painted sandstone. Photo 1 shows the test chamber used at NTS for the four underground shots.

Test Chamber at Tunnel U12p at NTS, used for the four underground shots. The RDD was suspended in the center of the chamber. Samplers located at various elevations on the four sampler poles actively sampled the post-explosion plume. Blocks of building materials were placed at mid-height on the walls of the test chamber. (Photo courtesy of Test and Technical Support Division, DTRA).

An analysis of the results showed that RDD design and type of surrogate material used had a pronounced effect on the particle size distribution, specifically the fraction of material in the respirable range, and depth of penetration in the building materials. An order of magnitude reduction was obtained in the fraction of material in the respirable range with an encapsulated design versus a non-encapsulated design. Also, initial analysis of data from scanning electron microscopy interrogation, and other techniques, of the building material samples showed that the depth of penetration is a function of many factors, including building material type, distance from the blast, and the form of the surrogate material.

The outdoor test used an RDD containing cesium chloride. The primary objective for the outdoor shot was to gather data for comparison with T&D model predictions. The Hazard Prediction and Assessment Capability (HPAC) software produced by DTRA and the Explosively Released Atmospheric Dispersion (ERAD) model produced by Sandia National Laboratories provided predictions of the outdoor test. Each model was used to make point data predictions running actual weather observations taken at the time of the test and also using numerical weather prediction data obtained before the test. Photo 2 shows the layout of the testbed for the outdoor test.

An analysis of the predictions found that both models overpredicted the observed cesium dosage levels using both forecasted

Overall view of the testbed at Nevada Test Site used for the outdoor test. The testbed was wetted down with water prior to the shot to reduce the amount of dust and dirt lofted. The device was placed on the steel table at the center. Ground-level samplers, placed five to six feet above the ground, were arrayed around the test site. Samplers were also placed at several elevations on 60 foot towers to sample the lofted plume. Blocks of building materials are also shown, arrayed around the center of the testbed. (Photo courtesy of Test and Technology Support Division, DTRA).

weather data and actual weather observations. A set of follow-up predictions for HPAC, using an improved source term developed from the underground shots, resulted in an improved prediction for both sets of weather data.

Conclusion

Certainly, the threat posed by radiological dispersal devices is a concern, but not all radioactive materials are practical for use in building an RDD. Regardless of the device's design, an RDD is more of a means of causing mass disruption than being a true weapon of mass destruction. The real and perceived levels of radiation contaminating an area would have economic and other consequences, apart from the number of actual casualties. It is important to take a step back from the issue of a terrorist's use of an RDD, look at test data and data from actual events, and obtain a better understanding of how bad, or not, the problem is.

Major Dirk Plante is serving in his first FA52 position as the Test Program Manager for the Consequence Assessment Branch at the Defense Threat Reduction Agency. Prior to this assignment, he was the project officer for the Discrete Fury test program. He earned a B.S. in Physics from Texas Christian University and a M.S. in Nuclear Engineering from the Air Force Institute of Technology.

[1] Defense Threat Reduction Agency (DTRA), "Weapons of Mass Destruction Terms Reference Handbook," DTRA-AR-40H. September 1, 2001.

[2] Reference 1 defines a WMD as "Any destructive device that is intended or has the capability, to cause death or serious bodily injury to a large number of people through the release, dissemination or impact of: (a) toxic or poisonous chemicals or their precursors; (b) disease-causing organisms; or (c) radiation or radioactivity; or (d) conventional explosives sufficient for widespread lethality." 18 USC § 2332a (C) (2) defines a WMD as "any explosive, incendiary, or poison gas; bomb; grenade; rocket having a propellant charge of more than four ounces; missiles having an explosive or incendiary charge of more than one-quarter ounce; mine; or similar devices …"

[3] Further information on the DTRA tests can be found in "Final Report on the DISCRETE FURY Test Program," Project Officer's Report (POR) 7652, Defense Threat Reduction Agency, Fort Belvoir, VA 22060. August 2003 (Distribution F).

Surety Update

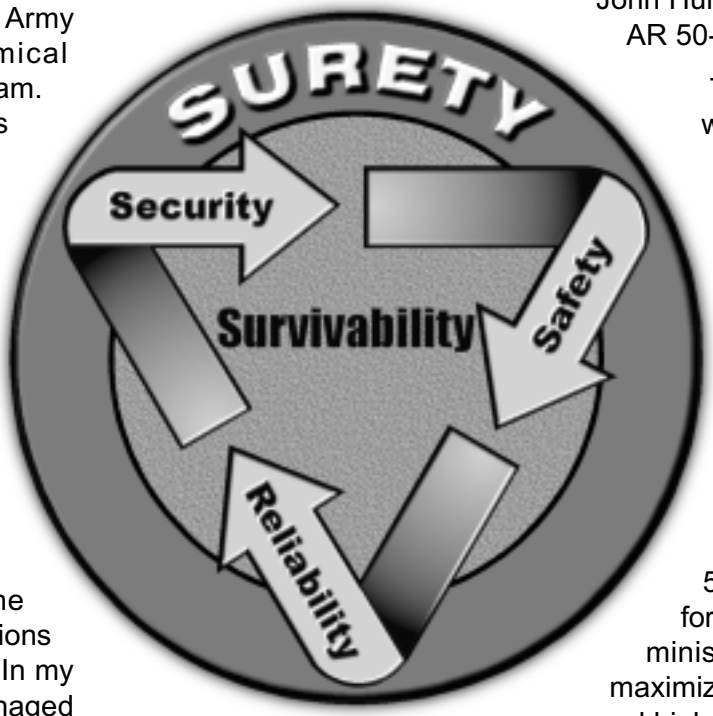
MAJ(P) Tom Moore, FA52
United States Army Nuclear and Chemical Agency

USANCA Surety Team

LTC Larry Jones and I comprise the new United States Army Nuclear and Chemical Agency (USANCA) surety team. I welcome the opportunity this professional journal provides to share developments, concerns, and questions within the surety field. Before I start, however, allow me share a few of our experiences.

I have been in Field Artillery assignments, to include time as a special weapons officer of a nuclear-capable firing battery, for ten years. I transitioned into the Nuclear Research and Operations (FA 52) career field in 1997. In my first FA 52 assignment, I managed a nuclear personnel reliability program (PRP) and served as the emergency action training officer for a Combatant Command. My last assignment was at the Defense Threat Reduction Agency (DTRA) as Executive Officer to the Director of Combat Support and the Deputy Director of DTRA. I was fortunate enough to gain visibility into many chemical, biological, and nuclear programs while assigned to these positions.

LTC Jones brings a wealth of chemical experience to the team. His educational background is in biology and he has over twenty years of experience in the Army's Chemical Corps. Most recently he served as Chief of an Assessment Team in Iraq that searched for weapons of mass destruction. He also worked on the Chemical Weapons Convention with the Department of Commerce.



With the formalities out of the way, I would like to discuss pertinent information regarding chemical, biological, and nuclear surety.

Army Surety Regulations

USANCA's surety team has been working closely with Deputy Chief of Staff, G3 (DAMO-SSD) action officers on two Army regulations (ARs). Bolstered by inputs from the surety community, we made significant revisions to AR 50-6, Chemical Surety, and developed AR 50-X, Biological Surety, the Army's first biological surety regulation. LTC June Sellers is the focal point for AR 50-6 and Mr. John Humpton is the focal point for AR 50-X within DAMO-SSD.

There were advantages to working on these regulations simultaneously. Many of the 'tried and true' chemical surety practices and procedures were appropriate for biological facilities. Conversely, some biological facilities present unique surety concerns that resulted in an examination of the intent of procedures depicted in AR 50-6. Ultimately, every effort was made to minimize administrative requirements and maximize surety in both chemical and biological facilities.

AR 50-6, Chemical Surety

The current version of AR 50-6 carries a date of 26 June 2001. Over the last three years there have been many changes in the chemical surety arena. New agencies have formed, demilitarization activities have increased, and Department of the Army Inspector General reports, staff assistance visits, and reports from the field have raised policy concerns that needed to be addressed.

DAMO-SSD has incorporated proposed changes from the field in the revision to AR 50-6. Additionally, DAMO-SSD and USANCA have conducted a line-by-line review of the regulation to ensure that all changes are incorporated and syn-

chronized with other portions of the Army surety program. The revised version will provide clear and consistent guidance on chemical surety. The first draft of the AR should be in the field for staffing as you read this article. The target date for publication of AR 50-6 is the first quarter of FY 05.

AR 50-X, Biological Surety

In a December 2001 implementing message, the Vice Chief of Staff of the Army directed the establishment of an Army biological surety program. He also stated that the viability of the Army's biological defense program would be maintained. This was the charter for the development of AR 50-X, Biological Surety.

DAMO-SSD recently completed revisions to the final draft of AR 50-X and has released the draft to the field for comment. This regulation will provide guidance to ensure Army biological research agents are secure while maintaining the viability of biological defense programs. Formal publication through the United States Army Publishing Agency is projected for the third quarter of FY 04. Headquarters, Department of the Army is working on an implementation plan to ensure that biological surety sites are prepared when this regulation goes into effect. In addition to work on the Army regulation, DAMO-SSD coordinated the Army review and concurrence with the final draft Department of Defense (DoD) Directive on Safeguarding Biological Select Agents, which was recently submitted for publication. Additionally, DAMO-SSD participates in the DoD working group on the draft DoD Instruction on Minimum Biological Select Agent Security Standards, which is expected to be staffed for formal coordination in the second quarter of FY04.

DoD Inspector General Nuclear Surety Audit

In October of 2003, I sent a message to Army MACOM Surety offices informing them that the DoD IG will conduct an audit of all Army nuclear surety programs. The audit team has traveled to Air Force and Navy nuclear sites and has formed an idea of how our sister-Services administer their PRPs. The team members are not experts in surety, but are professional auditors who will make recommendations on streamlining administrative requirements of the PRP. They have not identified the Army sites they will visit; however, DAMO-SSD has requested a minimum 30-days notice prior to the audit of an Army nuclear surety site. A visit from this team presents an opportunity to express your surety concerns and make recommendations to further improve the Army's surety program. The team has not established a schedule and will consider visiting locations that request an audit.

We bid a fond farewell to LTC Keith Zurlo, who has left the USANCA surety team and retired from the Army after some 21 years of service. LTC Jones and I look forward to meeting you at the Army's various surety locations. In the interim, we solicit any surety discussions, concerns, and questions that you may have.

MAJ(P) Tom Moore is a FA52 officer currently assigned as the nuclear surety officer in USANCA's Operations Division. His previous FA52 assignments were with the Defense Threat Reduction Agency and United States Pacific Command. He was commissioned in the field artillery and served in assignments at Fort Lewis, WA, South Korea and Fort Carson, CO. He has a B.S. in Psychology from Saint Anselm College, Manchester, New Hampshire, a M.A. in Organizational Management from the University of Phoenix and a M.M.A.S. from the Army Command and General Staff College.

USANCA's surety team has been working closely with Deputy Chief of Staff, G3 (DAMO-SSD) action officers on two Army regulations (ARs).

Personnel Update for USANCA's Chemical Division

Mrs. Janice Grassel
United States Army Nuclear and Chemical Agency

USANCA's Chemical Division has undergone an unusually large personnel change in recent months. In carrying out their work, Division members Mr. Frank Jordan, LTC Maribel Rodriguez and Mr. Ed Soliven have had to shoulder a large part of accomplishing the Division's mission. For their efforts the Chief, Chemical Division thanks them with great appreciation. Although some faces have changed, the mission of the Chemical Division remains the same…NATO NBC Defense and NBC contamination survivability. Now let's meet the new employees in the Division.

COL Jesse E. Daniels — Chief Chemical Division

COL Jesse E. Daniels is a graduate of Fort Valley State University, GA. He has a Masters of Science degree from Troy State in Human Resources.

His military education includes: Chemical Officers Advanced Course (COAC); Command and General Staff College (CGSC); and Joint Forces Staff College.

Highlights of his military career include: Installation Chemical Officer, Ft. Gordon, GA; 38th Chemical Detachment Commander, Yong San, Korea; multiple assignments at Ft. Bragg NC: 2nd BDE Chemical Officer, Commander 21st Chemical Company, 82nd Airborne Division, 18th Airborne Corps Artillery Chemical Officer, 82 Airborne Division Chemical Officer, 18th Airborne Corps Chemical Officer; NORAD Southeast Sector Chemical Officer, Tyndall AFB; 2nd Infantry Division Chemical Officer, (Camp Red Cloud) Korea; XO U.S. Army Training BDE, Ft. McClellan, AL; III Corps Chemical Officer, Ft. Hood, TX; CJTF-180-CJ3 Chemical Director, Bagram, Afghanistan.

In August 2003, he assumed duties as Chief, Chemical Division. He serves as Co-Director of the Army Nuclear and Chemical Survivability Committee Secretariat (NCSCS) and is U.S. Head of Delegation to the NATO NBC Working Group.

Ms. Mary Rease — Secretary, Chemical and Operations Divisions

Mary says that the best years of her career were the past 11 she spent in Germany. USANCA'ns have assured her that her best years are yet to come. She brings a broad range of experience on country clearances, passports, and handling secret and classified documents.

Prior to joining our organization, she worked for the Department of Defense within several areas of Heidelberg, Germany. These include 266th Theater Finance Command, Headquarters United States Army Europe (HQ USAREUR), 7th Army – Deputy Chief of Staff Logistics (DCSLOG). Her assignments also took her to United States European Command, Stuttgart, Germany.

Mary Rease joined USANCA in August 2003. She is the Secretary for two divisions, Chemical and Operations.

LTC Moultrie T. Glover, Jr. – NBC Rationalization, Standardization, and Interoperability Officer

LTC Moultrie T. Glover, Jr. is a graduate of South Carolina State University. He has a Masters De-

gree in Human Resource Management Development from National-Louis University. His military education includes: Chemical Officers Advanced Course (COAC), Combined Arms Services and Staff School (CAS3) and CGSC.

Military assignments include: 3rd Brigade Asst. Chemical Officer and 1st Battalion 508th Airborne Infantry, Battalion Chemical Officer, 82nd Airborne Division, Ft. Bragg; Chief, Chemical Team, Readiness Group Jackson and Commander, Echo Company, 4th Battalion, 13th Infantry, Ft. Jackson; 2nd Aviation Brigade Chemical Officer, Camp Stanley, Korea; Chief, Technical Escort Division, Redstone Arsenal; 108th Air Defense Artillery Brigade Chemical Officer, Ft. Polk; Mission Commander and Current Operations Officer, Defense Threat Reduction Agency, Ft. Belvoir; Chief, Distance Learning Branch and Chief, Training Development Staff Management Division, Ft. Monroe.

LTC Glover assumed duties as NBC RSI Officer, Chemical Division, USANCA in August 2003. He serves as the DoD International RSI Officer for all NATO activities involving non-medical NBC Defense Issues.

MAJ Kenneth W. Harris — Chemical Operations Research Systems Analyst

MAJ Kenneth W. Harris is a graduate of Columbus State University, Columbus, Georgia. He has a Masters in Industrial Engineering from New Mexico State University. His military education includes: Aviation Basic Course, Infantry Advanced Course, CAS3, and CGSC.

Highlights of his military career include: AH-1 Cobra Platoon Leader, Aviation Brigade, 5th Infantry Division, Ft. Polk, Louisiana; Flight Operations Officer 3rd Cavalry 4th Regiment, Schweinfurt Germany; G-3 Air, 3rd Infantry Division, Wurzburg Germany; A Company 4-227th Aviation Commander, 4th Aviation Brigade, 1st Cavalry Division, Ft. Hood, Texas; Executive Officer, Aviation Brigade, TSB, Ft. Stewart, Georgia.

MAJ Harris transitioned from aviation to FA-49 after completing ORSA MAC (Operation Research Analyst Military Applications Course), at Fort Lee, Virginia. He is slotted in the FA-49 ORSA position within the Chemical Division.

MAJ Harris assumed duties at USANCA in April 2003. He serves as Head of US Delegation and US Focal Point for NATO Allied Tactical Publication 45, NBC/TIM Warning, Reporting, and Hazard Estimation. He serves as author and US National Custodian of NATO STANAG 2104, Friendly Nuclear Strike Warning and STANAG 2229, Warning Friendly Forces of Hazardous Materials Releases.

Mrs. Janice Grassel - Physical Scientist

Janice is a graduate of St. Mary's University in San Antonio, TX. She has over 30 years experience working in various types of laboratories.

Her 29 years of Federal government service includes: Audie Murphy VA Hospital; Wilford Hall USAF Medical Center, Lackland AFB; Brooks AFB – School of Aerospace Medicine;

Clinical Investigations on Ft Sam Houston; Weapons Systems Components Plating Shop & Industrial Wastewater Treatment Plant on Kelly AFB; Institute of Surgical Research, Brooke Army Medical Center, San Antonio, TX.

Specialized training includes: Principles of Acquisition Management, DoD Federal Haz-Com Course, Pollution Prevention Workshop, Acquisition Professional Development Program (APDP), Level I, Mass Spectral Interpretation (GC-MS). Most current is Remote and Stand-off Detection, Joint DoD/DOE Nuclear Surety Executive Course (JNSEC), Chemical Weapons Convention Treaty Orientation course, and Anti-Terrorism (WMD).

Mrs. Grassel assumed her duties at USANCA in March 2003 as a Physical Scientist, Chemical Division. Her primary duties and responsibilities are to manage and update the chemical weapons effects database, review equipment ORDs for compliance with NBC contamination survivability, and provide chemical surety assistance.

Thanks in large part to the "old hands" in the Division, Mr. Frank Jordan and Mr. Ed Soliven, USANCA's Chemical Division has "weathered the storm" of an unusually large personnel transition and remains focused on accomplishing its mission.

FY04 Reserve FA52 Opportunities

COL Bobby C. Armstrong, Jr., FA52
Chief, Nuclear Division
United States Army Nuclear and Chemical Agency

Since my first Reserve Com ponent (RC) Functional Area 52 (FA52) assignment in 1986, I have witnessed the decrease of RC FA52 authorizations from over 30 to only 6. Many of the reductions were as a result of the elimination of nuclear weapons in the Army in the early 90's and subsequent reorganization of the Active Army FA52 Program. The RC FA52 officer inventory was down to six authorizations with only four spaces filled by January 2003. With so few FA52 Reserve Officers, the career management of FA52 at Army Reserve Personnel Command (AR-PERSCOM) had all but disappeared. A few Human Resource Command-St. Louis (HRCOM-STL) (formerly AR-PERSCOM) Branch Assignment officers were aware of FA52 authorizations in the Reserve, but there was no one assigned the duty to manage the officers. As a result, one of my duties, while mobilized here at USANCA, is to breathe new life into the RC FA52 Program.

Based upon the lessons learned from September 11th and Operation Iraqi Freedom (OIF), there is a renewed interest in the RC FA52 program. In 2003 alone, the demand for RC FA52 opportunities has tripled. By 4th quarter of 2004, there will be 20 new opportunities for those Reserve officers interested in FA52. That will bring the total number of Reserve FA52 authorizations to 26.

So where are these current and new opportunities for Reserve FA52 officers?

First, there are six existing FA52 authorizations; four at the U.S. Army Nuclear and Chemical Agency (USANCA) and one each at the U.S. Defense Intelligence Agency (DIA) and Headquarters, United States Pacific Command (HQ USPACOM).

The four USANCA positions are Nuclear Effects officers assigned to the Nuclear Division. All four of these USANCA positions are Individual Mobilization Augmentee (IMA) positions for Lieutenant Colonels. USANCA is implementing a program in FY04 to involve IMAs year round on projects within their area of expertise. This program will utilize the IMA more efficiently by providing the officer with increased responsibilities while accruing additional retirement points. USANCA, in turn, will benefit by having additional subject matter experts and depth in USANCA's functional areas year round.

The mission of USANCA is to provide the Army with a core of critical nuclear and chemical expertise with regards to nuclear and counterproliferation (CP) related matters. USANCA provides advice and assistance to other Department of Defense (DoD), Federal Government, and international organizations. USANCA reports directly to HQ TRADOC and is staffed with experts world-renowned in their fields. USANCA is home to the Army Reactor Office (ARO), FA52 Proponency, Nuclear Employment Augmentation Teams, Nuclear Disablement Team, and DoD's NATO and American, British, Canadian and Australian (ABCA) International NBC Action Agent

The four RC Nuclear Effects officers at USANCA perform functions within the following areas: 1) nuclear and NBC contamination survivability programs for all Army mission-critical systems; 2) nuclear and chemical effects databases and models; 3) NATO and ABCA nations standards for NBC equipment, procedures, and operations; 4) employment of, and vulnerability assessment to, nuclear weapons; 5) NBC surety programs; 6) chemical and nuclear incident responses to the Joint Staff, the Army Staff and Army organizations; 7) oversight management for, and technical expertise to the Department of the Army G-3 on all Army reactor issues; and 8) management of the Army's nuclear research and operations officers, FA52.

The DIA RC FA52 position is an IMA O4 Nuclear Research officer authorization with primary responsibilities in the area of weapons of mass destruction (WMD) effects and counterproliferation (CP). The DIA Reserve officer duties include: 1) responsibility for nuclear weapons and radiological weapons proliferation issues; 2) research, analysis, and production of military intelligence assessments of foreign nuclear capabilities in support of U.S. policy on CP of nuclear weapons; and 3) Response to long-term

and ad hoc intelligence tasking from the President, OSD, JCS, Combatant Commands, Services and various national agencies. This position is located in the Washington D.C. area and is being considered for upgrade to a Drilling IMA (DIMA) O-5 position. DIA is also considering increasing the number of Reserve Officer FA52 authorizations.

The existing HQ USPACOM position is a Nuclear Plans Officer authorization responsible for nuclear weapons employment planning. This officer's duties include: 1) advice on nuclear planning and weapons issues to the Commander, USPACOM and his staff; 2) liaison with United States Strategic Command (USSTRATCOM), Joint Staff, and OSD on nuclear weapons and planning issues; 3) assistance in coordinating nuclear weapons accident and terrorist response actions; and 4) WMD destruction staff operations officer, plans and policy.

The USPACOM Reserve FA52 reports to J57, WMD Branch, at Camp Smith, Hawaii and requires Top Secret clearance prior to assignment. The position is an Army Reserve Element-type (ARE) authorization. USPACOM will accept CONUS Reservists and prefers that CONUS Reserve Officers combine the drills and annual training into a single annual tour. Overall, this position provides a great opportunity to work on a joint planning staff with a great deal of visibility as a specialized planner.

There are 20 additional new RC FA52 authorizations: one at DIA, eleven at the Defense Threat Reduction Agency (DTRA), four at the Army Reserve Unit-Consequence Management (ARU-CM) and four at the Chemical, Biological, Radiological, Nuclear, and High Yield Explosives (CBRNE) Command.

The new DIA authorization will be a Weapon Effects Engineer. Like the Nuclear Research officer authorization, the Weapon Effects Engineer is a Joint Staff assignment at the DoD level. The duties will include: 1) planning and directing projects to develop and improve methods for modeling conventional, chemical, biological, and nuclear weapons effects and damage assessment; 2) updating and maintaining the Physical Vulnerability Handbook for Nuclear Weapons (authoritative joint nuclear employment manual) and vulnerability (VNTK) system for all targets in the national target installation database; 3) performing special vulnerability analyses and weapon application studies for the Joint Staff and combatant commands; 4) interacting widely with scientific and technical counterparts throughout the DoD and other weapon efforts research activities; 5) analyzing CP threats and issues; and 6) presenting technical topics and weapons effects studies to senior joint commanders, their staffs and the Joint Staff. This is an O-4/O-5 DIMA position and is located within the Washington, DC area.

DTRA has recently reinstated their RC FA52 authorizations based on lessons learned during deployment in support of OIF. There are eleven new authorizations at DTRA: five CBRNE Planner, three Plans and Operations, and three Nuclear Research authorizations. DTRA duties for RC FA52 Officers would include national-level missions and research activities in support of reducing and eliminating chemical, biological, radiological, or nuclear threats to our nation's security. These are DIMA authorizations.

The CBRNE officers report to the Combat Support Directorate that is responsible to the Combatant Commanders for direct operational support in planning and operations to include: 1) development of nuclear planning systems, WMD defense analyses, deterrence framework analyses, training programs, physical security exercises, theater missile defense integration studies and exercise planning; 2) providing operational and analytical support to DoD and other organizations for critical nuclear and other WMD defense matters; and 3) management and sustainment of the nuclear stockpile, associated equipment and facilities, and intellectual infrastructure.

The Plans and Operations officers report to the Combat Support Emergency Response Directorate that is responsible for emergency response involving WMD and radiological events. DTRA operates the DoD Joint Nuclear Accident Coordination Center. The officer interfaces and exercises with other military and Joint Service organizations (Active,

Current and New Reserve FA52 Opportunities

ARU-CM	– 4 O-5 (IDT)
CBRNE Cmd	– 1 O-5 (IDT)
PACOM	– 1 O-5 (ARE)
CBRNE Cmd	– 3 O-4 (IDT)
DTRA	– 6 O-5 (DIMA)
USANCA	– 4 O-5 (IMA)
DTRA	– 5 O-4 (DIMA)
DIA	– 1 O-4 (IMA)
DIA	– 1 O-5 (DIMA)

Figure 1. Current and New Reserve FA52 Authorizations.

Reserve and National Guard) in providing DoD emergency response.

The Nuclear Research officers report to the Technology Applications Directorate that is responsible for supporting operational forces with systems designed to counter WMD proliferation. This is accomplished by using state-of-the-art technologies that improve force application/protection modeling capabilities, by providing enhanced weapons and sensors for defeat of WMD-related facilities, and by optimizing existing capabilities for use by Special Operations Forces.

The DTRA authorizations are located at DTRA Headquarters at Fort Belvoir, VA; DTRA Field Operations office at Kirtland AFB, Albuquerque, NM; National Guard Bureau in Arlington, VA; and at Headquarters, United States European Command (USEUCOM), Headquarters, United States Northern Command (USNORTHCOM), USPACOM, United States Central Command (USCENTCOM), USSTRATCOM, United States Transportation Command (USTRANSCOM), and/or United States Joint Forces Command (USJFCOM).

There are four new RC FA52 authorizations at ARU-CM. This is a relatively new unit with the mission to provide chemical, biological, radiological, nuclear (CBRN) consequence management technical subject matter expertise to Army and Joint agencies. Consequence management includes those response measures required to protect the health and safety of DoD personnel and families and to maintain or to restore the capability to continue DoD's strategic mission. The ARU-CM augments Research, Development and Evaluation (formerly SBCCOM), DoD, or interagency response efforts and deployment requirements, and performs other designated missions to organizations, such as the future CBRNE Command. The Reserve Officer duties include: 1) conducting CBRN consequence management operations; 2) supporting and conducting anti-terrorism/force protection (AT/FP) operations; 3) providing CBRN technical subject matter expertise through deployable Soldier cells supporting the Domestic Emergency Support Team, or Foreign Emergency Support Team staff, allowing for expanded 24-hour technical support operations; and 4) coordinating national level consequence management exercise operational planning and training events.

ARU-CM main unit locations are at Edgewood, MD and Washington, D.C. Forward deployed locations are at Joint Task Force Civil Support (JTF-CS), Ft. Monroe, VA; First Army TF-East, Atlanta, GA; and Fifth Army TF-West, San Antonio, TX. These are new Inactive Duty for Training-type (IDT) positions for O-5's and location of the authorizations is flexible.

The CBRNE Command is a new unit comprised of Active, Reserve and National Guard personnel. Initial operational capability of this unit is 4th quarter of FY04. The CBRNE Command's mission is to integrate, coordinate, deploy, and provide trained and ready forces to exercise command and control of full spectrum chemical, biological, radiological, nuclear and high-explosive (CBRNE) operations to Joint and Army Force Commanders. The CBRNE Command provides Army support to civil authorities for homeland defense; maintains technical links with appropriate Joint, Federal, and State CBRNE assets, as well as research, development and technical communities to assure Army CBRNE response readiness; and provides or assists in the training and readiness oversight of CBRNE assets (Active, Guard, and Reserve).

CBRNE technical operations will include actions to detect, identify, assess, render-safe, dismantle, transfer, dispose of unexploded ordnance (UXO), improvised explosive devices (IEDs) and/or CBRNE incident devices/materials; and/or decontaminate organic personnel and property exposed to CBRNE materials during response. Employment of CBRNE technical operations forces will include routine responses, support to lead Federal agencies, support to Combatant Commanders, support to national special security events and international sporting competitions, service response force missions, technical escort of chemical and nuclear surety material, support to U.S. Secret Service and State Department, and service augmentation and reinforcement of installation CBRN-Installation Support Teams following a CBRN incident.

There are four RC FA52 positions within this command. Two are Deputy Chiefs for two of the four CBRNE Coordination Elements within the CBRNE Command. The CBRNE Coordination Element deploys to support Combatant Commander planning and execution of CBRNE technical operations to include AT/FP. The element is capable of providing CBRNE planning, modeling, and hazard prediction for CBRNE events in the theater of operations.

The other two RC FA52 positions are for a Nuclear Physicist and a Nuclear Engineer within the Nuclear Disablement Team (NDT). The NDT is assigned missions requiring the disablement and elimination of nuclear and/or dual use radiological and nuclear materials infrastructures. The NDT deploys with a CBRNE task force to conduct and/or supervise disablement and elimination operations. The NDT trains for response missions as a team and in collective training exercises with

joint, state, and federal organizations to ensure a high state of readiness for supporting any nuclear related homeland security or military contingency mission.

All four of these CBRNE positions are IDT-type positions for O-4's and O-5's. The CBRNE Command is currently planned to be located at Edgewood, MD as a FORSCOM unit.

Figure 2 summarizes the recent growth in RC FA52 authorizations.

These are not the only planned new Reserve FA52 opportunities.

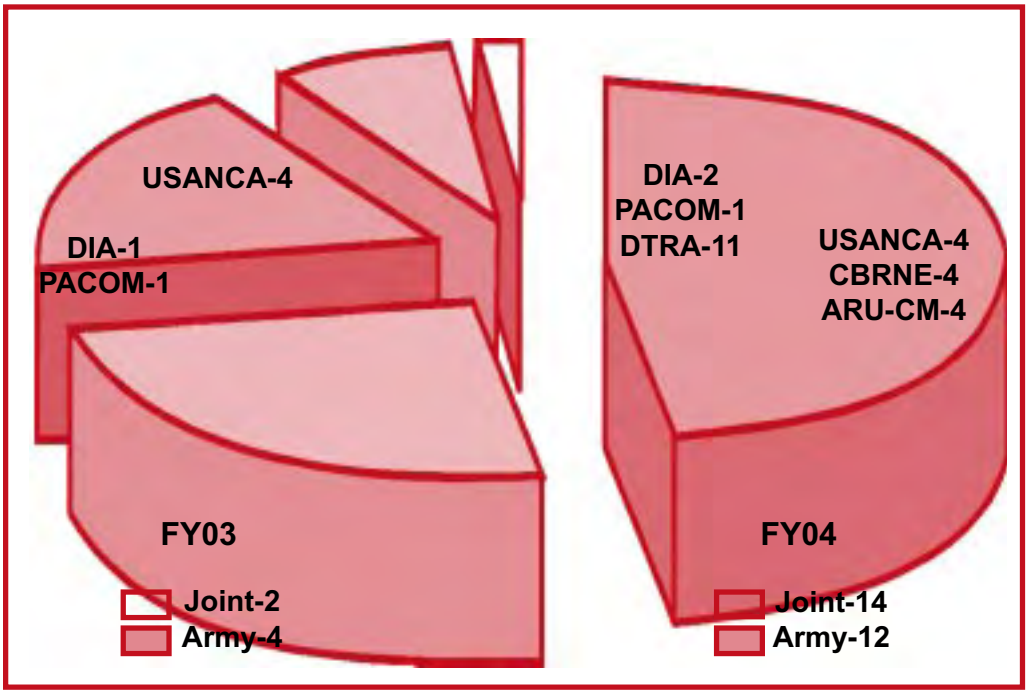


Figure 2. Recent Growth in FA52 Authorizations.

Other authorizations are being explored to support the Active and Reserve Army, Joint Agencies and the National Guard Bureau. The future of the Reserve FA52 program is alive and well; it is an exciting time to be an RC FA52 officer.

If interested in becoming a part of the new RC FA52 Program, contact COL Bobby Armstrong or Mr. Rob Beimler at the following address:

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COL Bobby Armstrong is a FA 52 and Chemical Corps Reserve officer currently mobilized at USANCA. He is the "Dean" of USANCA Individual Mobilization Augmentees, having been assigned since 1986 and is currently the only FA 52 O-6 Reserve officer. He graduated from Mississippi State University as a Distinguished Military Graduate with a B.S. and M.S. in Nuclear Engineering and was commissioned directly into the Reserve. He is a professional licensed nuclear engineer (P.E.) most recently with Dominion Resources as a Senior Nuclear Fuel Engineer. He has over 23 years experience in the civilian nuclear power industry and has designed fuel at over twelve different power plants.

In January 2003, COL Armstrong was called to active duty as Chief, Chemical Division and is currently serving as Chief, Nuclear Division at USANCA. Since mobilization, his duties include technical oversight of the Army Reactor Program, co-chairman of the Nuclear and Chemical Survivability Committee Secretariat, US Head of Delegation for NSA (NATO) NBC Defense Operations Working Group, manager of the NBC Contamination Survivability Program, oversight of the Army Reactor Consolidation Program, and oversight of the Reserve Officer FA 52 Program. He continues to serve as the Deputy Army Reactor Program Manager, Army Reactor Council Member, and Military Academy Liaison Officer in his Reserve officer capacity.

Did You Know ...

... USANCA can help your surety program?

Mr. Robert Pfeffer
United States Army Nuclear and Chemical Agency

■ One MACOM, AMC, has established a "Tiger Team" composed of subject matter experts from the command to conduct quasi-Chemical Surety Inspections (CSIs) to identify deficiencies prior to their scheduled CSI.

■ The United States Army Nuclear and Chemical Agency (USANCA) can assist in preparing units and activities for Department of the Army Inspector General nuclear and chemical surety inspections.

■ USANCA initiates contact with MACOMs on an annual basis by phone and e-mail to extend an invitation for assistance visits. USANCA's budget and other pending operations are the only limitation to their visits.

■ USANCA does not provide policy, but provides responses for policy interpretation after consulting HQDA G3 and receiving approval to provide feedback to the requester.

■ All information gained during a Surety Assistance Visit (SAV) is kept confidential. Even if units do not desire a SAV, they can call USANCA to confidentially discuss surety issues or concerns.

■ USANCA includes major observations and questions from the field in its NBC Report, which does not include names, specific units or locations.

■ USANCA does not publish results of its SAVs. The information is compiled as part of a trip report that is kept internal to USANCA.

■ Has your MACOM or unit been contacted yet? If not, do not wait until a CSI or Nuclear Surety Inspection DEFICIENCIES: FAILING rating is given.

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NUCLEAR EMPLOYMENT AUGMENTATION TEAM (NEAT)

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Tell It To The Community

You may submit calendar items, small notes, items of interest, etc. to the USANCA Bulletin Board.
Email items to
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or call
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The next issue of the NBC Report is scheduled for publication the first week of June 2004. Bulletin Board submissions for the issue should cover dated items from July-December 2004 and must be submitted NLT 30 April 2004 for publication.
Note: The editor retains the right to edit and choose which submissions are printed.

SMR

Army Specific Military Requirements for Radiation and Nuclear Weapons Effects

Provides DA-G3 approved rank ordered list of requirements for information on

- **Nuclear Weapons Effects**
- **Related Electromagnetic Effects**
- **Related Directed Energy Effects**

The FY05/06 SMR was disseminated December 2003..
For a copy of the FY05/06 SMR contact USANCA's Nuclear Division at (703) 806-7860 or DSN 656-7860

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