



CBRN IAC

*Chemical, Biological, Radiological & Nuclear Defense
Information Analysis Center*

Newsletter



Volume 8 Number 3
2007



Chemical/Biological Incident Response Force (CBIRF)

USAMRICD and Aberdeen's Science and Mathematics Academy
Sign Partnership Agreement

Joint Air Force and Army Training Exercise Features Tandem
Use of Remote CBRN Reconnaissance Equipment

Your Program, Project, or Research can be highlighted in the *CBRNIAC Newsletter*!

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CBRNIAC Newsletters are mailed in hardcopy format to over 2,000 individuals and agencies and are archived in PDF on our publicly available website. CBRNIAC announces the most recently posted newsletter via email to over 3,000 members of the CBRN Defense and Homeland Security communities.

Due dates for articles *approved for public release* are:

- First Quarter (Number 1)** - October 15th
- Second Quarter (Number 2)** - January 15th
- Third Quarter (Number 3)** - April 15th
- Fourth Quarter (Number 4)** - July 15th

For article guidelines, visit
http://www.cbrniac.apgea.army.mil/products/newsletter_article.php

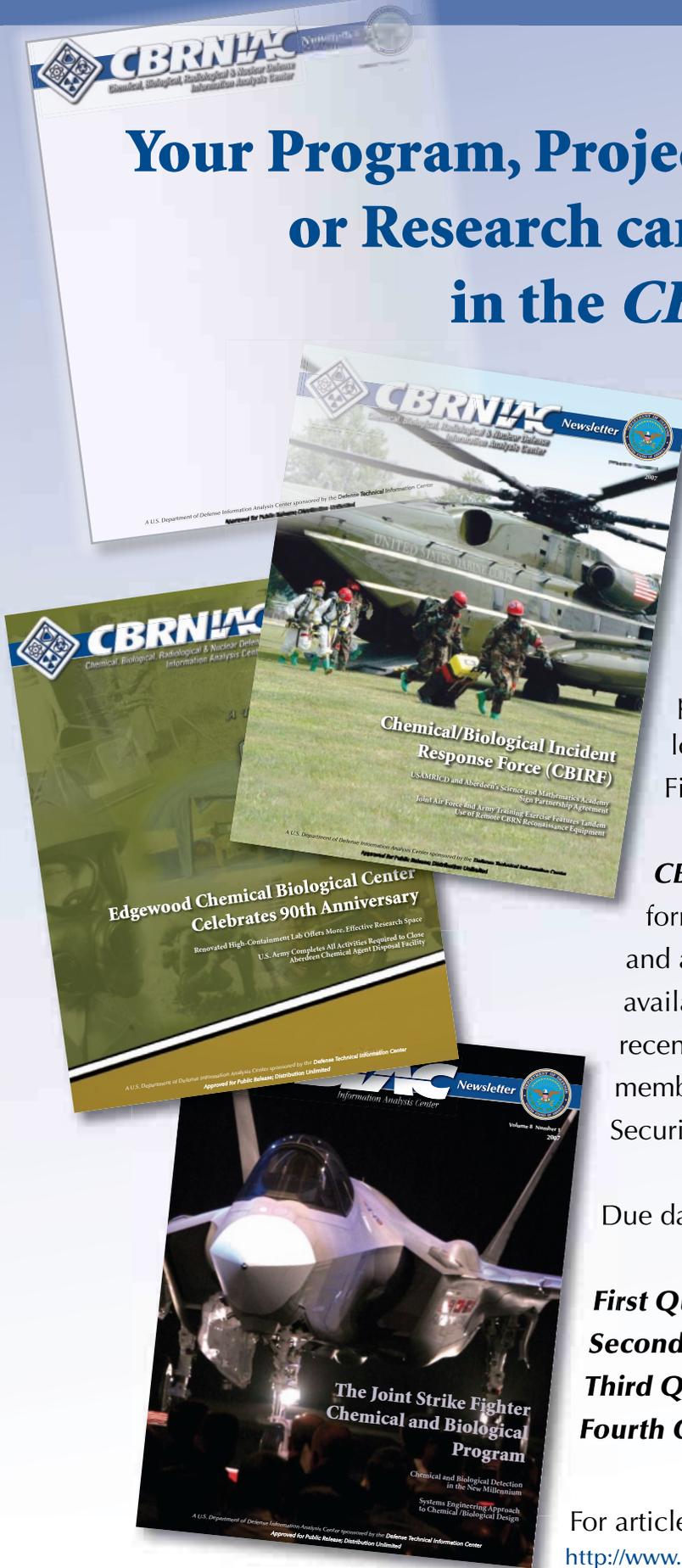
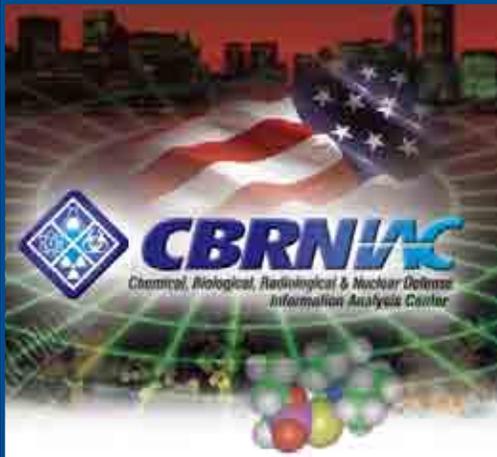


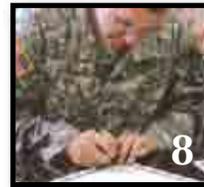
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On the Cover: CBIRF exercise for the Incident Response Force (IRF). The helicopter has landed on the golf course at CBIRF's home base, the Naval Surface Warfare Center (NSWC), Indian Head, MD. *Photo Courtesy of CBIRF Public Affairs Office.*

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- Third Quarter (Number 3) – April 15th
- Fourth Quarter (Number 4) – July 15th

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CDR USA RDECOM
Edgewood Chemical Biological Center
ATTN: AMSRD-ECB-AP-T (CBRNIAC COTR)
5183 Blackhawk Road
Aberdeen Proving Ground, MD 21010-5424

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<http://www.cbnriac.apgea.army.mil/>

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Chemical/Biological Incident Response Force (CBIRF)



Currently located in Indian Head, Maryland, the Chemical Biological Incident Response Force (CBIRF) is an organic element of II Marine Expeditionary Force (II MEF), U.S. Marine Forces Command (MARFORCOM). CBIRF is self-contained, self-sufficient, and capable of rapid response to a chemical, biological, radiological, nuclear, or high yield explosive (CBRNE) terrorist threat anywhere in the world. Activated in April, 1996 at Camp Lejeune, North Carolina, CBIRF was established by the Marine Corps in response to Presidential Decision Directive 39.

CBIRF MISSION

CBIRF's mission is to save lives. When directed, CBIRF will forward-deploy and /or respond to a credible threat of a CBRNE incident in order to assist local, state, or federal agencies and Unified Combat Commanders in the conduct of consequence management operations. CBIRF accomplishes this mission by providing capabilities for agent detection and identification; casualty search and rescue; personnel decontamination; and emergency medical care and stabilization of casualties.

READINESS

CBIRF is organized to respond on short notice to a CBRNE incident worldwide. In the event of a CBRNE incident, CBIRF's Assessment Team and Initial Response Force (IRF) deploy immediately to help contain the catastrophe. CBIRF is capable of responding by land, sea or air.

TASKS

CBIRF tasking can include:

- Conducting Agent Detection and Identification Operations
- Conducting Casualty Search and Extraction Operations
- Conducting Personnel Decontamination Operations
- Providing Emergency Medical Care and Stabilization
- Providing Force Protection in CBRNE Environment
- Task Organizing in Support of National Events
- Coordinating with Local, State & Federal Agencies
- Developing Concepts; Organization; Tactics, Techniques, and Procedures (TTP); and Equipment.

CAPABILITIES

CBIRF is trained to save lives under the extreme conditions of CBRNE threats. Its capabilities include, but are not limited to the following:

Reconnaissance

Upon arrival at the incident site, CBIRF first detects and identifies the threat. CBIRF is equipped with Level A (fully-sealed environment), B (biological suit with respirator) and C (full Mission-Oriented Protective Posture [MOPP]) personal protection; and state-of-the-art sampling, detection, and identification equipment for CBRNE threats. CBIRF is capable of detecting and identifying toxic industrial chemicals (TICS); chemical warfare agents (CWA); biological agents; and alpha, beta, gamma, neutron, and x-ray emissions.

Continued pg. 5

CBIRF cont.

Rescue and Extraction

CBIRF is certified in confined space rescue, trench rescue, vehicle and advanced rope rescue. They can perform collapsed structure stabilization and rescue. After assessment of the threat, CBIRF moves to locate and extract casualties. They have two teams, the Rapid Extraction Team, and the Search and Extract Teams. Casualties are divided into Non-ambulatory and Ambulatory (direct or lead out).



Medical

CBIRF is able to provide medical care in the “hot zone.” The medical team carries supplies to provide critical or moderate medical care to patients with a range of injuries.

Decontamination

CBIRF establishes decontamination tents designed to move casualties through a station-to-station assembly line decontamination process. A system is set up for both Non-ambulatory and Ambulatory casualties.

Explosive Ordnance Disposal (EOD)

CBIRF has the equipment and training to render an Improvised Explosive Device (IED) safe. Equipment includes the capability to operate remotely. CBIRF equipment includes protective clothing designed for EOD.

Command and Control (C2)

C2 systems are established for critical network communications. Data exchange, communication with reach-back resources, tactical communications and coordination with Civil Response Liaisons are all possible with communications equipment utilized by CBIRF.

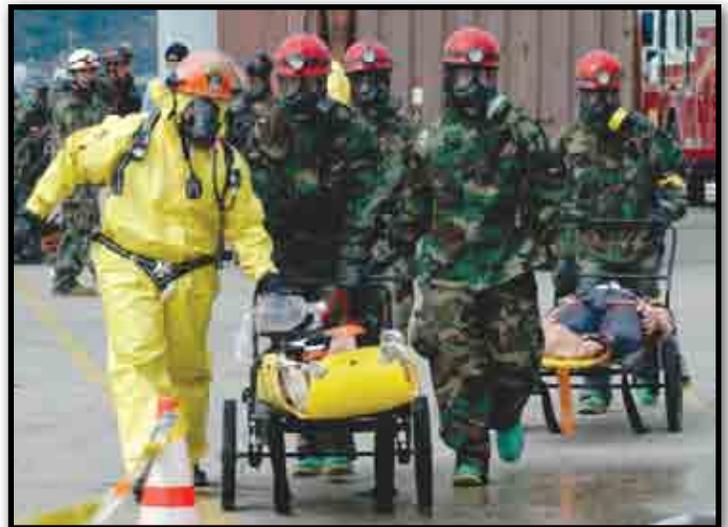
Logistics

CBIRF responds by land, sea or air. As a self-contained, self-sufficient task-organized unit, it has established procedures and equipment for transportation and survival.

SUMMARY

CBIRF’s mission is to save lives through rapid deployment, assessment of the CBRNE threat, extraction, decontamination, and treatment of casualties. As a result of the requirement for dependable, reliable personal protection and detection equipment, laboratory analysis capabilities, communications relays, and supplies for self-sustaining operations, CBIRF has often served as the testing and evaluation ground for CBRNE defense-related equipment, procedures, processes, techniques and doctrine. As a result, CBIRF has made significant contributions to the First Responder community.

- CBIRF’s interaction with other First Responder organizations has had a dramatic impact on the operational readiness of both Department of Defense (DOD) and Civilian First Responders.
- CBIRF has contributed numerous initiatives to many organizations worldwide. (e.g. cross-training and joint exercises, information sharing, and interaction with all standard’s writing organizations or leading the way to improve research, development and acquisition of new equipment).
- CBIRF has influenced changes to statutory regulations and guidelines to help keep pace with technology.
- CBIRF has performed hundreds of evaluations of commercial off-the-shelf (COTS) items that enhance personal protective equipment (PPE), detection and decontamination of NBC agents.
- CBIRF has volunteered for physiological testing in live agents and simulants. Shared scientific data has had a direct effect on equipment and TTP’s of other federal, state and municipal first responders and first receivers, and has enhanced overall Homeland Security.
- CBIRF, partnered with Marine Corps Systems Command (MARCORSYSCOM) and the Technical Support Working Group (TSWG), has provided the necessary improvements to material solutions in a timely manner. ◆



For further information, visit CBIRF online at <http://www.iimefpublic.usmc.mil/public/iimefpublic.nsf/sites/cbirf>



Contract Awards

Standoff Sensor

BBN Technologies Corp.
Cambridge, MA
\$1,339,000 July 20, 2007
By USAF/AFMC, Wright-Patterson AFB, OH

Personal Protection Against Infectious Agents

University of Nebraska
Omaha, NE
\$1,572,300 July 18, 2007
By USAF/AFMC, Wright-Patterson AFB, OH

Advanced Weapons and Explosives Detection System Carry-On Baggage/Possessions At Passenger Checkpoints- Project Cambria

Smiths Detection
Pinebrook, NJ
\$655,603 June 29, 2007
By Department of Homeland Security, Transportation Security Administration, Arlington, VA

Linear Radiation (LRM) and Handheld Radiation Monitors (HRM)

Sensor Technology Engineering, Inc.
Santa Barbara, CA
\$86,581,480 June 28, 2007
By Naval Sea Systems Command, Indian Head Division, Indian Head, MD

Perform Research on Novel Broad-Spectrum Therapeutics Against Gram-Negative Bacterial Threat Agents

Achaogen
San Francisco, CA
\$18,789,538 June 15, 2007
By The Defense Threat Reduction Agency, Fort Belvoir, VA

Support During Emergency Responses that Require Environmental Clean-Up Work

Guardian Environmental Services Company, Inc.
Bear, DE
WRS Infrastructure & Environment, Inc.
Bristol, PA
KEMRON Environmental Services, Inc.
Vienna, VA
\$190,000,000 June 13, 2007
By U.S. Environmental Protection Agency, Washington, D.C.

Spectrally Innovative Laser Component and Performance of a Vapor Plume Simulation

Lockheed Martin Corp.
Orlando, FL
\$5,424,000 (as part of a \$12,737,523) June 1, 2007
By Defense Advanced Research Projects Agency, Arlington, VA

20 Million Doses of IMVAMUNE®

Bavarian Nordic
Washington, D.C.
\$1,600,000,000 June 4, 2007
By U.S. Department of Health and Human Services, Washington, D.C.

Application of Nanomaterial Technology to Develop Biological Agent

Protective Fabric
Eastern Michigan University 202 Welsh Hall
Ypsilanti, MI
\$910,000 May 29, 2007
By U.S. Army Research, Development, and Engineering Command Acquisition Center – Natick, Natick, MA

Bioinformatics and Assay Development Program (BIAD) (Topic Area TTA 2-5: Assays For Novel, Emerging, or Engineered Threats)

Midwest Research Institute
Kansas City, MO
\$1,474,952 May 18, 2007
By Department of Interior–National Business Center, Ft. Huachuca, AZ

Continued Chemical Agent Neutralization Operations Leading to the Closure of the Newport Chemical Agent Disposal Facility

Parsons Infrastructure and Technology Group
Pasadena, CA
\$69,686,662 May 10, 2007
By U.S. Army Sustainment Command, Rock Island, IL

Construction of a Combined Arms Collective Training Facility

Emerson Construction Co., Inc.
Temple, TX
\$17,322,900 May 11, 2007
By U.S. Army Engineer District, Fort Worth, TX



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Chemical Corps Dedicates Lt. Terry Training Facility

By Christian DeLuca, **Guidon** staff

The U.S. Army Chemical School (USACMLS) showcased its newest state-of-the-art training facility to fellow members, friends and Family of the Army Chemical Corps with a ribbon cutting ceremony Tuesday, June 26, 2007.

The ceremony celebrated the completion of the Lt. Joseph Terry Chemical Biological Radiological Nuclear Responder Facility and honored its namesake with speeches, presentations and a VIP tour of the main building.

The Terry Facility occupies more than 40 acres on Fort Leonard Wood and will be used by USACMLS, different branches of the military and other organizations to train CBRN response to incidents.

Brig. Gen. Thomas Spoehr, USACMLS commandant, said the new multi-million dollar facility will increase the nation's readiness to defend itself from CBRN accidents and attacks.

"On June 28, 2005, we celebrated the ground breaking of this facility. Today, two years later, we're here to cut the ribbon," he said. "(This facility is an indication) of the seriousness the United States of America places on protecting its citizens from a CBRN attack."

The Terry Facility consists of the main building, which houses classrooms, office space, training bays and a sensor and detector lab, plus five other training areas.

The urban training area, consisting of four buildings connected by tunnels, will be used for multiple CBRN scenarios for group and individual training.

The intermodal containers training area will use a collection of International Maritime Organization intermodal shipping containers to train individuals and groups in site characterization, search, survey and sampling procedures on possible harmful substances entering the U.S. by cargo ships.

A concrete road intersection, called the vehicular training area, will be used to train CBRN responders to perform multiple operations used to control a variety of tanker truck spill scenarios.

The railcar training area contains 200 feet of rail and four different types of railcars. They will be used to conduct training on a number of CBRN attack and spill scenarios.

A cave complex will also be used for CBRN identification and response training.



*Soldiers gather for the dedication of the Terry facility.
(photo by Christian DeLuca, **Guidon**)*

During the ceremony Brig. Gen. Walter Chahanovich, deputy commanding general, U.S. Army Reserve, said the new facility and the world-class training it will provide should bestow a sense of pride in the people involved in making it a reality.

"This is a great day for Gen. Spoehr, the Army, the Army Reserve and the nation," he said.

The Terry Facility was named after Lt. Joseph Terry, a World War II veteran and Distinguished Service Cross recipient. Terry, who passed away in 1999, received the medal for heroic actions that saved the lives of six of his fellow Soldiers during a prolonged hostile artillery barrage. Terry was one of only nine Chemical Corps Soldiers who received the Distinguished Service Cross during WWII.

A plaque was dedicated in his honor during the ceremony and a duplication of the plaque was presented to his family, who were present for the ceremony. ♦

*This article appeared in the Fort Leonard Wood **Guidon**, June 28, 2007, Volume 9, Number 26, and is reprinted with permission from the **Guidon**.*



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USAMRICD and Aberdeen's Science and Mathematics Academy Sign Partnership Agreement

By Cindy Kronman, U.S. Army MRICD Public Affairs

Scientists at the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD), at Aberdeen Proving Ground, Md., are welcoming some of Harford County's brightest high school science students from the Aberdeen Science and Math Academy, as they mentor these students through senior year capstone science projects.

The USAMRICD has a history of supporting and encouraging the scientific development of our nation's youth through various internship and employment programs, providing research experience and training to college and high school students, as well as to college graduates and postgraduates. Now the institute has formally partnered with the Harford County public school system to provide even more opportunities to develop the scientific knowledge and skills of promising young high school students. Specifically, in an agreement signed this past June, the USAMRICD agreed to "promote the Aberdeen Science and Mathematics Academy (ASMA) curriculum by sharing knowledge of the bio-medical sciences and the professional career paths with students and teachers throughout the 2007-2009 school years." Under the agreement, scientists at the institute will mentor ASMA students not only in their senior capstone science projects, but also through summer employment programs.

This school year five ASMA students will be doing their capstone projects at the USAMRICD; three of those students got an early start by working at the institute over the summer under the George Washington University Science and Engineering Apprenticeship Program.



Ms. Donna Clem, the ASMA coordinator, looks at images generated by the field emission scanning electron microscope, while her former student, microscopist Tracey Hamilton, explains the research that academy students will be involved in for their capstone projects.

The establishment of a formal partnership between USAMRICD, the Harford County Board of Education and the Aberdeen Science and Mathematics Academy was directed by Col. Brian J. Lukey, during his tenure as commander of the institute. Dr. David Moore, USAMRICD's director for strategic research program development, arranged the partnership agreement. Lukey signed the agreement, along with Ms. Donna Clem, coordinator



Before relinquishing command in July, MRICD's Col. Brian Lukey met with Ms. Michelle Shaivitz, coordinator, Harford County Public School Partnerships for Student Achievement, left, and Ms. Donna Clem, the ASMA coordinator, right, to sign a partnership agreement in which institute scientists will mentor academy students.

of the Science and Mathematics Academy, Aberdeen High School, and Ms. Michelle Shaivitz, coordinator, Harford County Public School Partnerships for Student Achievement.

"We're honored to be able to collaborate with you in your endeavors," Lukey told Clem at the signing, adding that the partnership complemented the institute's Build a Bench Program, which was established to attract and develop young scientists at all levels to be the future researchers of USAMRICD.

Since the signing, Col. Timothy K. Adams has assumed command of the USAMRICD.

"I applaud all who made the agreement possible," says Adams, who considers the partnership "an exceptional step in fostering healthy community relations."

"The partnership affords these students an opportunity that is not out there for everybody," continues Adams, "by allowing them to take advantage of the equipment, expertise, and high level of technology that reside in a world-class DoD laboratory that's right in their backyard." Adams also sees benefits for DoD and ultimately the nation in nurturing individuals with the potential to one day make contributions to science and medicine.

"Perhaps by working for DoD or for organizations that collaborate with DoD, some of these students may touch the institute again in future endeavors," said Adams.

Continued pg. 9

MRICD cont.

Clem was also very excited about the agreement.

She described the academy, which is merely three years old, as “a work in progress,” something that might deter potential mentors looking for a proven track record from volunteering. The 2007-2008 school year will be the academy’s first with a senior class, and therefore the first in which students will be developing and executing their capstone projects under the guidance of career professionals.

“We are good teachers, but not research scientists,” said Clem, explaining the importance of having mentors to provide students with real-world, hands-on experience at the bench, as well as to introduce them to the various careers available in the fields of science and mathematics.

While visiting the institute for the signing, Clem and Shaivitz briefly toured some of the laboratories that will be hosting academy students as they complete their capstone projects. Their tour guide was Dr. John McDonough, one of MRICD’s most senior scientists and a recent Army Research and Development Achievement award recipient. McDonough, who will also be a capstone project mentor, is already very familiar with the academy’s program; his wife, Linda, has taught biology there for the last two years.

Clem and Shaivitz toured McDonough’s electroencephalography laboratory, the genomics laboratory, an analytical chemistry laboratory, and the room that houses the institute’s state-of-the-art field emission

scanning electron microscope. There, microscopist Tracey Hamilton, herself a former student of Clem’s, explained the scope’s capabilities and the research that their lab’s student would be doing. Hamilton credited Clem’s own mentoring as key to her decision to pursue a career in science.

For Clem and Shaivitz, MRICD and its capabilities were not entirely new; both had spent time at the institute before. Shaivitz, as a high school student, worked at MRICD one summer under the George Washington University Science and Engineering Apprentice Program. Five years ago, Clem, through a program sponsored by the Northeast Maryland Technology Council, spent a week at the institute interviewing the principal investigators about their research and what skills they thought students should develop for these professions.

“It was incredible to see the work done at MRICD,” Clem said of her experience then. She was particularly impressed, she said, at the variety of science being conducted and especially by the range of equipment that was available to the scientists. ♦

photos by Stephanie Froberg, USAMRICD

Visit U.S. Army MRICD online at <http://chemdef.apgea.army.mil>



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**Bringing the CBRN Defense and Homeland Security
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In the News

Sensing with Nano Engineered Plastics

Tom Shelley

Eureka Reference Article

July 20, 2007

"A family of sensors has been developed that uses polymer films with moulded apertures that allow particular molecules to fit into them... with potential applications ranging from explosive and drug detection through medicine, to the detection of chemical and biological warfare agents."

<http://www.eurekamagazine.co.uk/article/10403/Sensing-with-nano-engineered-plastics.aspx>

Invitrogen Develops Prototype Hand-Held Biothreat Detectors Under \$3.9M Contract from Defense Threat Reduction Agency

Invitrogen Press Release

July 10, 2007

"...Invitrogen Federal Systems, under a \$3.9 million contract from the Defense Threat Reduction Agency (DTRA), successfully completed the development of a prototype hand-held device for the detection of multiple biothreat agents in a single sample."

<http://phx.corporate-ir.net/phoenix.zhtml?c=61498&p=irol-newsArticle &ID=1024551&highlight=>

Sentinels at Sea

Mark Schrope

Popular Science

June 2007

"...Florida start-up SeaAway has developed a security system that would move cargo screening 14 miles offshore to the safety of the open seas. The plan calls for pairs of 100-foot-wide platforms anchored outside the world's major ports...the system monitors for chemical, biological and nuclear traces as ships travel between the platforms."

<http://www.popsci.com/popsci/technology/cadb9bc19e863110vgnvcm1000004eecbccdrd.html>

Richmond Company Gets Biohazard Truck Contract: Vehicle Will be Equipped to Detect Biological Threats from Five Kilometres Away

Brian Morton

The Vancouver Sun

June 1, 2007

"A Richmond-based company has been awarded a \$4-million contract to develop technology capable of alerting Canadians to a biological attack by terrorists."

<http://www.canada.com/vancouversun/news/business/story.html?id=1d3fea24-9db6-4d63-a10f-44aa50307544>

Research Looks to Detect Chemical Warfare Agents

Medical News Today

May 30, 2007

"Cutting-edge research at South Dakota State University could give doctors a longer window of time in which to find out whether someone has been exposed to chemical warfare agents...doing the lab studies to find out whether a person's hair can store the chemical markers of such agents."

<http://www.medicalnewstoday.com/medicalnews.php?newsid=72557>

Water Sensor Detects Toxins and Bacteria 24/7

Mike Janes

Water and Wastewater

May 24, 2007

"In late 2004, Sandia National Laboratories announced a multiyear research agreement with Tenix Investments Pty. Ltd., a partnership that offered the vision of a safer future for the nation's water supplies. Now, Sandia researchers have a working device in place...and is now a reality."

http://www.waterandwastewater.com/www_services/news_center/publish/article_001279.shtml

System Traces Airliner Bioterror Pathogens

United Press International

May 22, 2007

"Researchers in the United States have developed a system they say can identify terrorists who release bioterrorism agents aboard an airliner."

http://www.upi.com/Security_Terrorism/Briefing/2007/05/22/system_traces_airliner_bioterror_pathogens/2653/

Continued pg. 11

Vol. 4 No. 3 of the Chem-Bio Defense Quarterly Magazine is Now Available!

Vol. 4 No. 3 Chem-Bio Defense Quarterly Magazine

In recent years, we have seen nations and terrorists use chemical, biological and radiological weapons. The medical community has always been called upon to protect and treat the victims of these attacks. The Chemical Biological Medical Systems Project Management Office leads this effort on behalf of the Joint Program Executive Office for Chemical and Biological Defense, providing our Warfighters the necessary medical protection, diagnostic and treatment countermeasures against chemical, biological and radiological and nuclear threats. This Chem-Bio Defense Quarterly magazine provides an overview of Chemical Biological Medical Systems

To view the electronic version, visit: http://www.jpeocbd.osd.mil/page_manager.asp?pg=4&sub=0

Would you like to receive the link to upcoming issues or have a hard copy version for your office or organization? If so, complete the interactive form at http://www.jpeocbd.osd.mil/page_manager.asp?pg=0&sub=9.



Livermore Lab to Expand Biodefense

insideBayArea

May 21, 2007

"Come this summer, Lawrence Livermore National Laboratory scientists plan to start using a new biological research laboratory for biodefense and public health that will help better protect the United States. Called a Biosafety Level 3 (BSL-3) laboratory..."

http://www.insidebayarea.com/timesstar/ci_5947515

Clothing that is the Latest in Germ Warfare

Tom Leonard

Telegraph

May 20, 2007

"It may turn out to be the ultimate wardrobe dilemma - whether to wear the smog eating shirt or the cold-killing jumper."

<http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/05/11/wclothes11.xml>

DRDO Develops Anti-Nuclear Mask

K G Vasuki

newKerala.com News Channel

May 19, 2007

"In a significant development, the Defence Research and Development Organisation (DRDO) has indigenously developed state-of-the-art equipments to face any eventualities arising out of modern warfare like that of nuclear or chemical weapons."

<http://www.newkerala.com/news5.php?action=fullnews&id=31165>

SIGA Passes First Hurdle with Lassa Fever Antiviral ST-193

SIGA Technologies Press Release

May 15, 2007

"SIGA Technologies, Inc. announced today the successful results of a proof of concept guinea pig trial of its lead Lassa fever virus drug, ST-193."

<http://www.siga.com/press/051507.html>

House Authorizes Contagions Lab

Dallas Morning News

May 11, 2007

"The U.S. House has given the go-ahead for construction of a more than 500,000-square-foot biocontainment lab that a dozen states, including Texas, are pursuing. Authorization of the lab was part of a \$39.8 billion funding bill..."

<http://www.dallasnews.com/shareD.C.ontent/APStories/stories/D8P29RVO0.html>

Device Makes Quick Work of Suspected Toxins

Rick Stouffer

TRIBUNE-REVIEW

May 11, 2007

"Last month at the Fire Department Instructors Conference in Indianapolis, Mine Safety Appliances Inc. introduced...its latest version of a self-contained breathing apparatus to meet the latest criteria for firefighters... (and) the new Mine Safety Biosensor 2200R biological agent detector."

http://www.pittsburghlive.com/x/pittsburghtrib/business/s_507097.html



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DoD Chemical,
Biological, Radiological
and Nuclear (CBRN)
Defense scientific and
technical information**



Calendar of Events

Do you have a Chemical and/or Biological Defense or Homeland Security course or event to add to our Calendar? Submit the pertinent information via email to cbrniac@battelle.org or online at http://www.cbrniac.apgea.army.mil/info/posting_request.php. The CBRNIAC reserves the right to reject submissions. For a more extensive list of events, view our online calendar at http://www.cbrniac.apgea.army.mil/info/calendar_06.php.

October 23-25 **TRAINING: DoD Scientific and Technical Information (STINFO) Manager Training Program**
Fort Belvoir, VA
<http://www.dtic.mil/dtic/stinfo/>

October 28 - November 2 **2007 USCG Innovation Expo**
New Orleans, LA
<http://www.ndia.org/Template.cfm?Section=8230&Template=/ContentManagement/ContentDisplay.cfm&ContentID=17380>

October 29-30 **2007 Combatant Commanders Workshop: Rapid Technical Support for the Warfighter**
Enter Code: 20069924
Suffolk, VA
<https://www.enstg.com/Invitation/default.cfm?ems31e=0.290610098483>

October 29-31 **MILCOM 2007**
Orlando, FL
<http://www.milcom.org/2007/>

October 29-31 **Road & Rail Security Symposium & Expo**
Charleston, SC
http://www.defensetradeshows.com/RRSECURITY07_General_Info.html

October 29-31 **45th Annual Targets, UAVs & Range Operations Symposium & Exhibition**
San Diego, CA
<http://www.ndia.org/Template.cfm?Section=8410&Template=/ContentManagement/ContentDisplay.cfm&ContentID=16361>

October 30-31 **The 3rd NBC International Conference & Exhibition**
Sonthofen, Germany
<http://www.cbrnevents.co.uk/>

October 29 - November 1 **COURSE: Hospital Security Preparedness (HSP)**
Washington, D.C.
http://www.web.sitelms.org/view_event.php?event_id=39

November 1-2 **Detection Technologies 2007**
San Diego, CA
<http://www.knowledgepress.com/events/6151420.htm>

November 3-7 **American Public Health Association 135th Annual Meeting & Expo**
Washington, D.C.
<http://www.apha.org/meetings/>

November 5-9 **COURSE: Field Management of Chemical and Biological Casualties**
Aberdeen Proving Ground, MD
https://ccc.apgea.army.mil/courses/in_house/brochureFCBC.htm

November 6-8 **TechNet Asia-Pacific International 2007**
Honolulu, HI
http://www.afcea.org/calendar/eventdet.jsp?event_id=12133&w=Y

November 6-8 **Technologies for Critical Incident Preparedness 2007 Conference & Exposition**
San Francisco, CA
<http://www.ctc.org/webagenda07.htm>



CBRNIAC
Chemical, Biological, Radiological & Nuclear Defense
Information Analysis Center

Serving the CBRN Defense and Homeland Security communities

Continued pg. 13

Calendar cont.

- November 6-9 **Aircraft Survivability 2007**
Monterey, CA
<http://www.ndia.org/Template.cfm?Section=8940&Template=/ContentManagement/ContentDisplay.cfm&ContentID=17137>
- November 6-10 **FireRescue Conference and Expo 2007**
Las Vegas, NV
<http://www.firerescueexpo.com/App/homepage.cfm?moduleid=42&appname=100388>
- November 7-9 **2007 Mid-Atlantic All Hazards Forum**
Baltimore, MD
<http://www.allhazardsforum.com/>
- November 11-14 **EMEX 2007**
Reno, NV
<http://www.emex.org/>
- November 12-14 **SpecOps East 2007**
Fayetteville, NC
http://www.defensetradeshows.com/SPECOPSEAST07_General_Info.html
- November 12-14 **Port Security**
Los Angeles, CA
<http://www.iqpc.com/cgi-bin/templates/genevent.html?topic=329&event=14017>
- November 13-14 **2007 Preparing for Pandemic Influenza Conference**
Arlington, VA
<http://governmenthorizons.org/Pandemic-Influenza-Nov07.htm>
- November 13-15 **2007 Scientific Conference on Chemical and Biological Defense Research**
Timonium, MD
<http://www.cbdefense.com/>
- November 15-16 **CLEAN GULF 2007**
Tampa, FL
<http://www.cleangulf.org/>
- November 18-21 **Texas EMS Conference 2007**
Houston, TX
http://www.texasemsconference.com/texas_ems_conference_2007.htm
- November 27-28 **U.S. Maritime Security Expo**
New York, NY
<http://www.maritimesecurityexpo.com/>
- November 28-29 **Water Facility Security Conference**
Arlington, VA
<http://www.homelanddefensejournal.com/hdl/water-security-nov07.htm>
- November 28-30 **2007 MSS National Symposium**
Las Vegas, NV
https://www.sensiac.gatech.edu/external/mss/meetings/list_meetings.jsf
- December 2-5 **2007 Emergency Preparedness and Prevention & Hazmat Spills Conference**
Pittsburgh, PA
<http://www.2007conference.org/>
- December 4-6 **TRAINING: DoD Scientific and Technical Information (STINFO) Manager Training Program**
Fort Belvoir, VA
<http://www.dtic.mil/dtic/stinfo/>
- December 4-7 **Microelectronics, MEMS, and Nanotechnology**
Canberra, ACT, Australia
<http://spie.org/micro-nano-mems.xml>





New CBRNIAC Information Resources

Bernstein, Jeremy **Plutonium: a history of the world's most dangerous element.** Washington, D.C.: Joseph Henry Press, 2007.

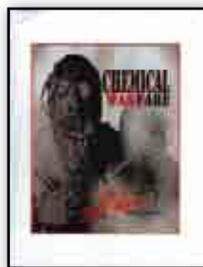
"...it got me started thinking about the subject of plutonium, about which I realized I knew rather little. I was hoping to find a book that would teach me. However, after searching the literature, I came to the conclusion that there isn't one. There are specialized monographs usually written for professionals, but no one has written about the history and science of plutonium, and its role in nuclear weapons, in an accessible form. This is what I have set out to do." (*Prologue*)

CB-057486
ISBN 0-309-10296-0
Joseph Henry Press
An Imprint of the National Academies Press
500 Fifth Street, NW
Washington, D.C. 20001
Phone: (202) 334-1902



Ketchum, James S. **Chemical Warfare Secrets Almost Forgotten.** Santa Rosa, CA: ChemBooks Inc., 2006.

"Thus, this foreword is intended to prepare the reader for a story that has never before been told, the telling of the history, the origins and the development of the physical structure and the variety of people who worked at both the Edgewood Arsenal and its precursor, the Army Chemical Center. This it indeed does, with a flood of photographs and names and candid viewings of the people who worked there during the 11 or so years that Jim Ketchum was a major research person in the medical section. There is a mass of small detail, ranging from unexpected visits and unusual interviews to the conversations taking place during some of the drug experiments with volunteer subjects. This is an intimate portrayal of the structure of the research group, and the slow but inevitable changes in attitudes and research goals that occurred over time." (*Foreword*)



CB-057487
ISBN 978-1-4243-0080-8
ChemBooks Inc.
2304 Fairbanks Drive
Santa Rosa, CA 95403
www.forgottensecrets.net

Roco, Mihail C. and William Sims Bainbridge, eds. **Nanotechnology: Societal Implications—Individual Perspectives.** Arlington, VA: National Science Foundation, 2006.

"This volume contains the 48 essays contributed to the most significant single effort to chart the societal implications of nanoscience and nanotechnology. The authors include natural scientists, social and behavioral scientists, engineers, philosophers, and legal experts. They work in industry, universities, government, and private practice. All have thought deeply about the profound implications of the newest realm of science and technology." (*Introduction*)



CB-037671
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230
Phone: (703) 292-5111

Roco, Mihail C. and William Sims Bainbridge, eds. **Nanotechnology: Societal Implications—Maximizing Benefits for Humanity.** Arlington, VA: National Science Foundation, 2003.

"This document is the report of a workshop held under the auspices of the National Science Foundation and the NSET Subcommittee on December 3-5, 2003, at the National Science Foundation in Arlington, VA. The primary purpose of the workshop was to examine trends and opportunities in the nanoscience and nanotechnology toward maximizing benefit to humanity, and also potential risks in nanotechnology development." (*About this document*)



CB-037652
National Nanotechnology Coordination Office
4201 Wilson Blvd.
Stafford II, Room 405
Arlington, VA 22230
Phone: (703) 292-8626

Roco, Mihail C. and William Sims Bainbridge, eds. **Societal Implications of Nanoscience and Nanotechnology.** Arlington, VA: National Science Foundation, 2001.

"...the National Science and Technology Council (NSTC), Committee on Technology (CT), Subcommittee on Nanoscale Science, Engineering, and Technology (NSET)—the Federal interagency group coordinating the NNI [National Nanotechnology Initiative— sponsored a workshop on "Societal Implications of Nanoscience and Nanotechnology." Held September 28-29, 2000 at the National Science Foundation, this workshop brought together nanotechnology researchers, social scientists, and policy makers representing academia, government, and the private sector. Their charge was to: (1) survey current studies on the societal implications of nanotechnology (educational, technological, economic, medical, environmental, ethical, legal, etc.); (2) identify investigative and assessment methods for future studies of societal implications; (3) propose a vision for accomplishing nanotechnology's promise while minimizing undesirable consequences.

This report sponsored by NSF [The National Science Foundation] incorporates fully the views, opinions and presentations contributed by workshop participants and other leading experts." (*Executive Summary*)

CB-037649
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Truly Sick or Simply Scared?

Small Nano-based Biosensor May Get Help First to Those Who Need it Most

By Geoff Harvey, Pacific Northwest National Laboratory

Scientists at Pacific Northwest National Laboratory (PNNL) have discovered a way to increase the sensitivity of test strips that will enable creation of a portable biosensor that can address a major concern associated with incidents involving chemical or nerve agents - the need to quickly distinguish between individuals who have been exposed and the "worried well."

The sensor components resemble a pregnancy test strip and a small glucose testing meter. Its development will be discussed by principal investigator Yuehe Lin at the national meeting of the American Chemical Society.

Every disease has biomarkers, a change in the proteins that announces something is wrong. Lin and his team are creating a nanoparticle "label" that can increase the ability of a sensor to detect and interpret the message of biomarkers.

"Current test strip based-immunoassay technology has very good selectivity, but it can only give a positive or negative response," Lin said.

The researchers are working with an "electrochemical immunoassay approach." This involves using the antibody of a specific disease — a protein produced in response to an invading bacterium or other foreign substance — to attract the biomarker. Lin found that labeling a second antibody with a nanoparticle amplifies the biomarker's signal. Greater amplification means more precise readings.

Lin achieves this by removing the iron from a nanoparticle-sized ball of the protein ferritin, creating an empty "cage" called apoferritin, which he then loads with another metal, such as cadmium. The cadmium-filled cage is attached to one end of the reporting antibody, and the immuno-reaction product becomes electroactive.

"The electrochemical signal is amplified several hundreds to thousand times because of the metal ions," Lin said. "This level of sensitivity will allow detectors to be very precise in identifying the concentration of biomarkers in biological samples."

The five-year biosensor effort is funded by a \$3.5 million grant from the National Institutes of Health Countermeasures Against Chemical Threats (CounterACT) Research Network through the National Institute of Neurological Disorders and Stroke. A key resource for the

biosensor research is the Environmental Molecular Sciences Laboratory, a Department of Energy national scientific user facility located at PNNL.

Yuehe Lin made his presentation at the 234th American Chemical Society National Meeting in Boston, Massachusetts, on Sunday, August 19, 2007.

PNNL is a Department of Energy (DOE) Office of Science national laboratory that solves complex problems in energy, national security and the environment, and advances scientific frontiers in the chemical, biological, materials, environmental and computational sciences. 

Press release can be viewed at: <http://www.pnl.gov/news/release.asp?id=265>



Researchers at PNNL are developing a portable biomonitor to rapidly evaluate tiny samples of blood or saliva for exposure to nerve agents.

Joint Air Force and Army Training Exercise Features Tandem Use of Remote CBRN Reconnaissance Equipment

by Christopher Joyal, Senior Analyst (Camber Corporation), Defense Threat Reduction Agency, Chemical and Biological Technologies Directorate

On May 15, 2007, airmen from Alaska's Elmendorf Air Force Base and soldiers from neighboring Fort Richardson participated in a joint training exercise featuring the use of two developmental robotic platforms designed to detect chemical, biological, and radiological threats. This platform, developed as part of the Chemical, Biological, Radiological, and Nuclear Unmanned Ground Vehicle (CUGR) Advanced Concept Technology Demonstration (ACTD), was developed by the Edgewood Chemical Biological Center (ECBC) and funded by the Joint Science and Technology Office (JSTO) within the Defense Threat Reduction Agency's Chemical and Biological Technologies Directorate (DTRA-CB). The program addresses the need to provide a safer way for U.S. service members to inspect areas containing suspected Chemical, Biological, Radiological and Nuclear (CBRN) threats. The training exercise was held as part of the 2007 Northern Edge exercise.

The name of the robotic platform— CUGR—is an acronym within an acronym— CBRN Unmanned Ground Vehicle. It makes use of existing technology and commercial off-the-shelf (COTS) equipment, applying it to passive CBRN defense. The basic payload contains multiple cameras as well as equipment that detects chemical warfare agents, toxic industrial chemicals, radiation and lower level explosives (such as methane levels in confined areas). The robot can travel through water up to 18 inches deep, climbs stairs, opens doors, and can take samples using a set of grippers attached to the end of a hinged arm. The camera mounted at the top of the CUGR's robotic arm swivels, and hinges can elevate the arm to human height. The robot is controlled remotely by a console with four possible split-screen views that can simultaneously show the operator the position of the robot, camera angles, and readings from the various detection systems.

According to the training scenario developer, Master Sgt. James Ferguson, 3rd Wing, Civil Engineer Emergency Management Flight,

the initiating event involved a hazardous materials spill resulting from a train derailment on the tracks bordering Elmendorf AFB and Fort Richardson. In the scenario, Air Force personnel involved in environmental remediation discover a potential CBRN threat, a heavy steel cylinder with suspicious markings that spilled open to reveal vials, packing materials, and a shipping manifest. Air Force personnel withdraw from the area and request support from Fort Richardson's 95th Chemical Company.

Participants from the 3rd Wing, Elmendorf AFB, included the Civil Engineer Emergency Management Flight, Joint Base Elmendorf and Richardson (JBEAR) Fire and Emergency Services and the Bioenvironmental Engineering (BIO-E) Flight.

The exercise hazard was a mock Chemical Agent Identification (CAI) set, which contains chemical agents in less-than-lethal quantities. CAI sets, according to Ferguson, were used in live agent training by the Army in the 1950s and 1960s. Instructors stationed their trainees downwind and blasted open the agent vials as the trainees donned protective gear. The exercise scenario was realistic, as CAI sets have been unearthed recently on installations in Germany. In the scenario, the CAI set had been packaged in heavy steel tubes and bolted shut until a tractor unearthed it and compromised the cover.

During the training exercise, the 95th arrived shortly after notification. From there, the scenario progressed as a joint training exercise. A 2500-meter area was established to ensure CUGR operators were in a "clean" environment. The 95th then wheeled the first CUGR to an area adjacent to the incident command center and began setting up. They were ready to begin in less than 15 minutes.

Spc. Kenty Cruz, 95th Chemical Company, controlled the CUGR, steering the robot toward the hazard at the pace of a brisk walk.

Continued pg. 17



The CAI set used in the joint training exercise was unearthed by a tractor doing remediation work.



Airmen from Elmendorf AFB and Soldiers from Ft. Richardson ready the CUGR for operations.



CUGR operators support each other in a joint training mission.

Joint Exercise cont.



The CUGR removes the shipping manifest from the CAI set



The CUGR camera reveals the contents of the CAI set.



The CUGR camera and full-screen view reveal the contents of the CAI set to the operator.

The hazard was out of sight and behind a stand of trees approximately 100 meters downrange. Behind him, Sgt. Michael Towner and Staff Sgt. Mauricio Montalvo watched as a tractor came into view on the console screen. Air Force operators began setting up the second CUGR.

The Army-controlled robot approached the tractor that had unearthed the suspicious container. Cruz moved the robot toward the pile of dirt, pivoted, swiveled its camera eye one way then the other, and found the easiest route through gravel to the mouth of the container. He inched it toward the opening of the container and stopped it with its tread just short of a glass vial containing a clear liquid.

The ease of the robot's movement, however, is deceptive. Cruz has trained extensively on the CUGR.

"We get hands on the equipment every Monday," said Towner, "and we crosstrained two more times per month with the Air Force last quarter."

The view from the camera did not reveal the hazard immediately. Towner said the operators did not immediately recognize it as a CAI set.

"Through the camera, it appeared to be jars that had been opened or broken open. One of the jars had spilled out two vials along with some shipping material. We did notice the document inside the tube and decided we would read it to possibly find out exactly what we were dealing with."

When the second, Air Force-controlled CUGR arrived and pointed its camera, the first CUGR had a better view of the container. Cruz first attempted to maneuver the camera into the tube where it could read what appeared to be an invoice, but shadows and the narrow tube (about two feet in diameter) made this impossible. At this point, a decision was made to attempt to remove the paper.

When asked how difficult it was to remove the shipping manifold, Towner was modest. "It was relatively easy to remove the paper from inside the tube. By the time we were at that point, the other CUGR was in place to give us another angle of view which made things a lot easier. It gave us a better sense of depth and made sure we were not going to disturb anything we didn't have to," he said, adding, "this is the first time we have used a second CUGR as an 'assistant.'"

Under the control of an expert operator, the CUGR is capable of precise, fine movements. The arm that supports the main camera is triple-hinged. On the hinge closest to the tracks, a set of pincers extended forward to attempt to grab the paper. This setup allowed a soldier 100 meters away to remotely grasp a face-up piece of paper from inside a drain-pipe-sized tube—using a set of pincers the size of salad tongs. Once removed, the shipping manifold was set on the ground, and the camera zoomed in to reveal the contents of the CAI set. Once the threat was identified, the training ended.

This precision comes from hours of training on the CUGR system, during which soldiers learn to maneuver the robot up stairs, open closed doors, and pick up small objects. According to Sgt. Joselito Layug, 95th Chemical Company, soldiers have picked up a paper clip from the top of a shelf and have picked up a quarter and dropped it into a cup. He also said that Air Force operators have picked up an ID card lying flat.

The end goal of this practice, of course, is to ensure that in the event of a suspected CBRN threat in an area to be traversed by soldiers, operators are able to maneuver the robot in tight quarters, take readings and possibly, samples. This will enable Soldiers to conduct dismounted reconnaissance for CBRN threats, while limiting possible exposure to agents or other dangers.

The CUGR is not yet fielded, but it shows promise as a technology. ◆

*Reprinted with permission of the **Chem-Bio Defense Quarterly** magazine. This article appeared in the Jul-Sep 2007 issue, Volume 4, Number 3, pp. 24-25. See announcement on pg. 10 of this issue.*

For additional information on the CUGR, visit <http://www.ecbc.army.mil/cugractd.htm>

For additional information on DTRA-CB <http://www.dtra.mil/rd/cbt/index.cfm>

Edgewood Chemical Biological Center (ECBC)

Presents "This Month in History"



By Jeffery Smart, U.S. Army Research, Development, and Engineering Command (RDECOM) Historian

This year marks Edgewood's 90th Anniversary. Since 1917, ECBC has served as the Nation's lead science and technology center for the development of chemical and biological defense products and services. From April 2007 to October 2007 ECBC is commemorating its 90-year history with lectures, informational products and special events. As a special anniversary feature, ECBC has created "This month in History" on its Website. April, May and June highlights are presented here.

World War I Shell Filling Plant Number 1

In **April** 1915

Germany initiated large scale chemical warfare in an effort to break the Allied lines at Ypres, Belgium and win World War I. The attempt failed, and soon both sides escalated the use of chemical weapons. Despite the use of chemical weapons for

almost two years by other countries, the U.S. Army had no training, equipment, or weapons to fight a chemical war when the United States entered the war in April 1917.



World War I Shell Filling Plant Number 1

In October 1917, President Woodrow Wilson approved Gunpowder Neck as the site for the Army's first chemical weapons arsenal. This led to a massive government construction project that quickly displaced the original residents of the peninsula and tenant farmers.

Captain Edwin Chance, a Philadelphia civil engineer, designed the first chemical shell plant built at Edgewood Arsenal, using current American bottling practices as his guide for the plant design. Civilian construction crews broke ground in November 1917 in what then was a wheat field and built the facility during one of the coldest winters on record. The power plant of Shell Filling Plant No. 1 was the first permanent building completed and sections of the plant still stand today on Webster Road between Hoadley and Fleming Roads.

Shell Filling Plant No. 1 became operational in April 1918, only five months after it was started, and it consisted of four wings in an "X" pattern with a central power house in the middle. The "X" design of the plant was to avoid destruction of the entire plant should an accident occur in one wing. One wing was designed to fill 155mm shells, one to fill 4.7 inch shells, and two to fill 75mm shells. Shells were brought into the shell receiving room on narrow-gauge cars and were placed nose down on a slow-moving motor-driven conveyor. Then, the shells passed through the cooling room for 30 minutes and chilled to -5 degrees. Shells were then placed upright on trucks in the filling room. The shells were filled similar to commercial bottles and then they were closed. Within a short time, 75mm chemical filled shells were filled and readied for shipping in the warehouses (called shell dumps) across the street from the plant.

The plant had a capacity of 9,000 4.7 inch and 155mm shells per day and 15,000 75mm shells per day. Most of the 75mm shells were filled with a mixture of chloropicrin and tin tetrachloride during WWI. The Army later completed a second shell-filling plant, but was unable to complete a third before the end of the WWI. The four shell filling wings of the Plant No. 1 were torn down prior to WWII.

Explosion in Building E5158

At approximately 1530 on **May** 25, 1945, a massive explosion blew apart the center section of Building E5158, then known as Building 509. Twelve female workers died as a result of the explosion and 57 other men and women were injured. This was the worst accident in Edgewood Area's history.

The building was constructed in 1918 and originally used as a shell dump (warehouse) for chemical weapons. By World War II, its mission had changed and it was used for assembling igniters for fire bombs, part of the Army's incendiary bomb program.



The men and women working in the building were one minute doing their job and the next minute dead or injured. Martha Nowell, a munitions handler in the building, described what she could remember of the terrible event:

"There was a lot of smoke; I could not see the entrance, everything was all black. I knew the door and went to grab the side and then I fell out. I do not remember falling but I must have fallen out. I was laying outside by the lumber pile. I do not know how long and then I got up and I noticed I was out in the open. I ran over a little way and as I went over my head was afire and Mr. Loeblein came along and put it out and I did not know it was burning."

Henry J. Loeblein, foreman spray painter, also helped Sarah Creswell, a munitions operator, who was knocked to the ground by the blast and had a table land on her. She helped two injured women out of the building. She then went to help another but her hair started to burn, so she had to retreat.

Shortly after the explosion and once the fires were out and the casualties removed, a board of officers was assigned to determine the cause. They interviewed witnesses, took pictures of

Continued pg. 19

History cont.



the damaged building, and collected a thick investigative file. One of the initial concerns was that one or more of the German prisoners held in the prisoner of war camp at Edgewood had sabotaged the building, but that was eventually rejected as a possible cause. The final report concluded: "That the immediate cause of the accident cannot conclusively be established." The officers speculated that a safety wire had been removed from a fuze either by accident or through carelessness, resulting in the explosion.

There were many heroes that fateful day in May. Some of those heroes were rewarded with Exceptional Civilian Service and Heroism awards on February 5, 1946. Sarah Creswell was one of those who proudly received the award from Brigadier General Ray L. Avery, the Post Commander.

1950: The Start of the Korean War

North Korea invaded South Korea on **June 25, 1950**, which launched the Korean War (initially named the United Nations Police Force Operations in the Far East). Seoul fell on June 28 and two days later, President Harry Truman committed ground forces in support of the South Koreans.



The war had an immediate impact locally. The Army Chemical Center, as the Edgewood Area was called in 1950, was divided into two main areas: Production Plants and the Technical Command (the laboratories). The Production Plants saw an increase in demand for products. The items initially ordered included flamethrowers, incendiary bombs, tear gas grenades, smoke pots, and M9 protective masks, the standard infantry mask at the time. The Technical Command was asked to provide a list of developmental items that could be expedited for National Defense. After some thought, the list included items such as pulse-jet smoke generators, liquid fuel contaminants, nerve agent and biological agent bombs, production of GB nerve agent, nerve agent detectors, collective protection systems for tanks, and radar and infrared screening agents. The cover letter stated: "It is considered that acceleration of the entire program is essential if there is any prospect that our opponents will resort to the use of chemical, radiological or biological warfare."



In response to the growing crisis, Brigadier General Egbert F. Bullene, Post Commander, upgraded the operational status and increased security at the post. Duty Officers were assigned to the Headquarters [Building E1675 at the time] 24

hours a day. All personnel entering or leaving the post were required to present proper identification. All but one gate to the Production Plants [the area around Building E5101] were closed, but there was a promise that more gates would be opened when additional security personnel were available. The wearing of civilian clothes by the military while on post was banned, with only a few exceptions allowed. Military leaves were limited to 24 hours.

The Army General Staff also made emergency plans in case the conflict became a nuclear war. The Army Chemical Center was designated the alternate headquarters for the Chemical Corps should the existing Headquarters in Washington, D.C. (including all personnel and records) be destroyed without warning and without prior declaration of war, hostilities, or national emergency."

June 1950 was also the 30th Anniversary of the Chemical Corps [based upon the date that the Chemical Warfare Service, the predecessor organization of the Chemical Corps, was made permanent following its temporary status during World War I]. On June 29, Major General Anthony C. McAuliffe, Chief of the Chemical Corps, issued a memorandum for all troops and civilian personnel:

Since its creation in World War I, the Chemical Corps has always fulfilled its mission of developing, manufacturing, procuring and supplying weapons and equipment of chemical warfare to all the armed services, and of preparing special chemical units for combat duty. The Corps has good reason to be proud of its brilliant record of achievement in World War II.

With the assignment of new missions in the fields of biological warfare and radiological defense, the role of the Chemical Corps becomes increasingly important to the security of the United States. Those increased responsibilities make necessary the continuation of the same high standard of loyalty and devotion to duty which has always marked the personnel of this Corps.

In addition to the nuclear threat, on June 30 the possibility of the United States being attacked by deadly chemical weapons hit the newsstands. The Washington Post ran an article about a speech Colonel John R. Wood, Chief Medical Officer at the Army Chemical Center, made in San Francisco to the American Medical Association concerning the effects of nerve agents. The opening paragraph stated: "The Nation's doctors were officially warned yesterday that enemies of this country may someday attack American populations with paralyzing to deadly 'nerve gases.'" According to the article, "His talk on the nerve gases marked the first time an Army official in service has openly discussed their existence."

The Defense Department was also concerned about the rapidly growing fiscal cost for improving National Defense. The conclusion, however, stated in the Semi-Annual Report of the Secretary of Defense for the period ending June 30, was:

The campaign in Korea and the preparations to meet the increased threat to our security will raise this cost materially. It is a cost we must bear as long as our peace and security are imperiled. ♦

Visit ECBC online at: <http://www.ecbc.army.mil/index.htm>

Chlorine Improvised Explosive Devices and Preventive Medicine Actions

Just the Facts...



36-015-0407

Purpose: This fact sheet is a preventive medicine reference tool and checklist for pre-deployment and response actions.

Background: Chlorine (Chemical Abstract Services (CAS) No. 7782-50-5) is an acutely toxic industrial compound (TIC) that can cause severe coughing, pulmonary, eye and skin irritation, and even death at higher concentrations. Because of its toxic properties and wide availability, insurgents in Iraq have increasingly used chlorine in improvised explosive device (IED) attacks. Although attacks thus far have resulted in limited releases, more sophisticated efforts involving chlorine as well as other TICs could result in more devastating effects.



Uses: Chlorine is used extensively in common commercial industries to include water treatment processes (e.g., swimming pools, drinking water) and paper and cloth manufacturing. It is often stored at commercial facilities in 1- and 2-ton cylinders or large tanks and is frequently transported via truck and rail. Chlorine cylinders are often but not always yellow; color coding should NOT be used to identify contents.



Physical and Chemical Characteristics: In most conditions, chlorine is a yellow-green gas with a suffocating bleach-like odor. If present, liquid solutions will likely volatilize quickly. Chlorine gas is heavier than air and will generally move downhill and downwind. It may concentrate in poorly ventilated, enclosed, or low-lying areas. *The gas should generally dissipate to levels below health concern within an hour if released outside; though extremely large volumes, colder climates, and confined areas can require longer periods of time.* Chlorine is also a strong oxidizer that can react explosively with compounds such as acetylene, fuel gas, ammonia, and hydrogen.

Exposure Signs and Symptoms: Liquid can produce skin burns/frostbite and eye irritation/conjunctivitis/corneal burns. Effects from exposures to chlorine gas depend on the dose and health condition of the exposed individuals (for example, asthmatics may be more sensitive to exposure than others). The latency is immediate to hours depending on dose. The severity of acute effects associated with approximately 1 hour of exposure is generalized below in conjunction with the military exposure guidelines (MEGs) provided in USACHPPM Technical Guide (TG) 230:

No adverse effects 1-8 hrs at < 0.5 ppm	Minimal effects 1-hr at 0.5 - 2 ppm	Significant effects 1-hr at 2 - 20 ppm	Severe effects (1-hr at > 20 ppm)	Very severe effects (1-hr exposure at ≥ 34 ppm)
Bleach-like odor is possible but no irritation anticipated in most personnel	strong odor, slight irritation of nose/throat/eyes	burning of eyes or throat, some cough and choking sensation	sense of suffocation, chest pain, shortness of breath (dyspnea), nausea, vomiting, hoarseness	pulmonary edema, sudden death bronchospasm (closure of larynx)
1-hr and 8-hr MEGs are 0.5 ppm	1-hr minimal MEG 0.5 ppm (1.5 mg/m ³)	1-hr significant MEG 2 ppm (5.8 mg/m ³)	1-hr severe MEG 20 ppm (58 mg/m ³)	Lethality has been reported after 1 hour 34-51 ppm

After non-fatal exposures, recovery is generally rapid; however, symptoms such as a cough may last for up to 2 weeks. Long-term medical monitoring is not necessary for most persons who recover from minimal to marginal effect. Persons who are treated/recover from severe illness could possibly develop chronic pulmonary problems.

Protection Against Exposures: If there is a release, MASK AND MOVE as far upwind as possible, ideally to a minimum distance of 240 meters (m) (the Emergency Response Guideline protection distance), then REASSESS.

The M40-protective mask should only be considered an escape device. Normal combat uniform will provide skin protection against chlorine vapors. The Joint Service Lightweight Integrated Suit Technology and the collective protection M48A1 Gas Particulate Filter protect against chlorine-limited chlorine exposure. For occupational/long-term exposures to chlorine, personnel may need to obtain Level A fully encapsulated suits and National Institute of Occupational Safety and Health-approved respirators (e.g., self-contained breathing apparatus).

Decontamination and Treatment: Victims exposed only to chlorine gas who have no skin or eye irritation *do not need decontamination*. If skin or eyes are affected, flush with water or saline. There is no specific medical test for chlorine injury. After being removed from exposure, limit exertion of all exposure victims. Provide supportive care (oxygen) and monitor (e.g., pulse oximetry) symptomatic individuals, and treat more severe effects accordingly, particularly *securing airway*. *Asymptomatic patients should be directly observed for 1 hour and under lesser observation for 6 hours before being medically cleared because symptoms may be delayed and bronchospasm may appear later.*

Chlorine IEDs cont.

Pre-deployment Preventive Medicine Planning Actions:

- Be aware of potential chlorine exposure scenarios and/or sites within the scope of your mission (e.g., water treatment plants, industrial facilities, railroad cars); contact The Armed Forces Medical Intelligence Center. (<http://www.afmic.detrick.army.mil/>), USACHPPM (<http://chppm-www.apgea.army.mil/>), and your intelligence staff.
- Train personnel to be aware of chlorine and other TIC gases of opportunity and how to avoid potential hazards.
- Train personnel to appropriately respond to chlorine/TIC attacks (see Response Actions below).
- Ensure personnel maintain the M40-protective mask and are proficient in donning all protective equipment.
- Be familiar with detection capabilities available in theater, and know how to use the equipment.
- Plan egress routes, and know weather conditions while on patrols.
- Know how to document exposure data (see Documentation Requirements below).

Response Actions and Considerations:

If an attack occurs and chlorine is identified (via odor and/or visual cues):

• MASK AND MOVE

- Don M40 mask and evacuate the area immediately.

NOTE: The M40-protective mask provides limited protection against chlorine and should only be considered an escape device.



- Move as far away as possible upwind from the release—at least 240 m; if this is not possible, consider other options (e.g., move to higher ground or up to a second story or rooftop as chlorine will concentrate along the ground).
- Move away from and report any unexploded canisters or cylinders in the area as these may detonate in a collateral fire.
- Reassess conditions: determine need for mask or additional evacuation.
- If the eyes or skin are irritated, flush with water.
- Ensure appropriate medical treatment for those more severely affected.
- Replace the canister (C2A1) on mask worn during a chlorine gas event.
- Notify higher headquarters per unit standard operating procedure.

Documentation Requirements:

DOD policy requires that exposure to hazardous substances like chlorine, be documented to support medical surveillance and follow-up treatment efforts:

- Document the following exposure incident information:
 - Unit name.
 - Unit rosters of all personnel involved (affected or possibly exposed).

- Summary of treatment provided to any individuals (list names of treated).
 - Personal protective equipment or countermeasures used; effectiveness of and compliance with countermeasures; any other exposure incident response activities.
 - Results of any chemical sampling/monitoring including type of monitor and sample location.
 - Description of any health risk communication materials provided.
- In coordination with the Joint Task Force and Combatant Command Surgeons, forward all the above documentation to the USACHPPM Environmental Surveillance Integration Program (ESIP) using either classified or unclassified channels:



Secure e-mail: oehsdata@usachppm.army.smil.mil

Unsecured e-mail: oehs@apg.amedd.army.mil

Secure FAX: DSN: 312.584.4244

COMM: 410.436.4244

Unsecured phone: DSN: 312.584.4230

COMM: 410.436.4230

Classified Mail:

USACHPPM; ATTN: MCHB-CS-OCP (OEHS Data Archive)
5158 Blackhawk Road, Building E1930
Aberdeen Proving Ground, MD 21010-5403

Unclassified Mail:

USACHPPM; ATTN: MCHB-TS-RDD
5158 Blackhawk Road, Building E1675
Aberdeen Proving Ground, MD 21010-5403

References:

- USACHPPM Technical Guide 273, Diagnosis and Treatment of Diseases of Tactical Importance to US Central Command, October, 2003.
- USACHPPM Technical Guide 230, Chemical Exposure Guidelines for Deployed Military Personnel, October, 2003.
- Emergency Response Guidebook, 2006; Department of Transportation.
- Bartlett JG & Greenberg MI. Physician's Desk Ref (PDR) Guide to Terrorism Response. Thomson PDR, Montvale NJ. 2005.
- Weinstein RS & Alibek K. Biological and Chemical Terrorism: A Guide for Health Care Providers and First Responders. Thieme Medical Publishers, NY. 2003.
- ATSDR Medical Management Guidelines for Chlorine and Tox FAQs; Rtrvd 3/5/2007, 2007: <http://www.atsdr.cdc.gov>.
- CDC Facts about Chlorine, Rtrvd 3/5/2007: <http://www.bt.cdc.gov/agent/chlorine/basics/facts.asp>.
- OSHA, Occupational Safety and Health Guideline for Chlorine, Rtrvd 3/5/2007: <http://www.osha.gov/SLTC/healthguidelines/chlorine/recognition.html>.
- Department of Defense Instruction 6490.03, Deployment Health, August 11, 2006.

U.S. Army Center for Health Promotion and Preventive Medicine,
Health Information Ops
5158 Blackhawk Road,
Aberdeen Proving Ground, Maryland 21010-5403
<http://chppm-www.apgea.army.mil>
DSN 584-5217; CM (410) 436-5217; FAX-8492

Chlorine Fact Sheet:

http://usachppm.apgea.army.mil/documents/FACT/36-015-0407_Chlorine_IEDs.pdf

Additional Fact Sheets: <http://usachppm.apgea.army.mil/HIOFS/>

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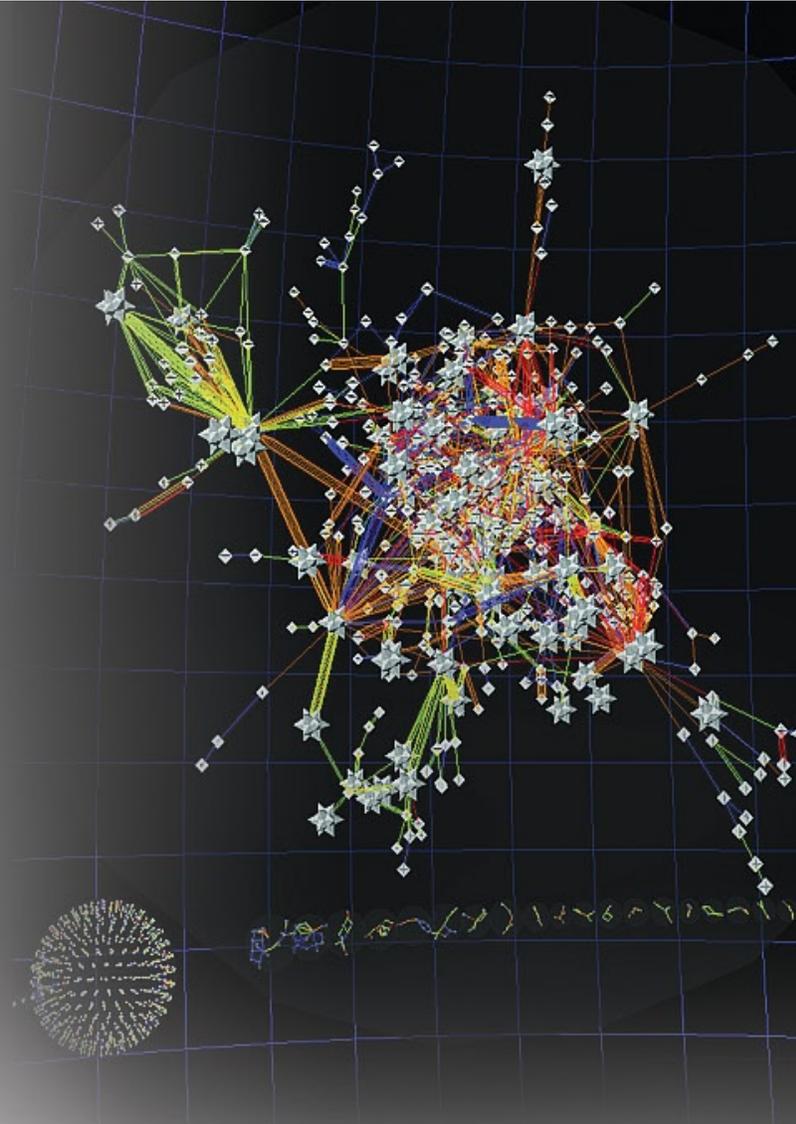
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CR-03-07 \$25.00 July 2003

This 2 CD-ROM set was developed in cooperation with the Edgewood Chemical Biological Center. The set offers a searchable collection of documents that highlights different aspects of Weapons of Mass Destruction events and topics (Homeland Defense Business Unit, Biological Weapons, Chemical Weapons, Emergency Management and Planning, Preventive Measures, Decontamination, and Treatment, Homeland Defense and Terrorism, References) with a Homeland Defense focus. The set features RDECOM Improved Response Program (IRP) products. CB-032587



Physiological and Psychological Effects of the Nuclear, Biological, and Chemical Environment and Sustained Operations on Systems in Combat (P²NBC²) Database

U.S. DoD Agencies and their Contractors Only; Unclassified

DB-97-01 \$60.00 January 1997

The P²NBC² Database was developed to archive data that was collected between 1985 and 1993 from 20 field tests sponsored by the P²NBC² program. Detailed information from 463 tasks performed in MOPP4 is formatted on CD-ROM. A PC with Windows is required for operation of this database. A user manual explaining system requirements, installation procedures, database design, and a summary of the individual field trials is also provided on the CDROM. References for the actual test and evaluation documentation are included. The database was converted to Access in August 2002. CB-032590



BACWORTH Encyclopedia Version 6.2a

U.S. Government Agencies Only; Export Controlled; Unclassified; For Official Use Only

HB-04-03 \$75.00 January 2004

The Biological and Chemical Warfare Online Repository and Technical Holdings (BACWORTH) Encyclopedia Version 6.2a contains detailed data on 86 CB agents, toxins, and riot control agents. Entries include both at-a-glance summaries and detailed description levels. There are also 16 overview functional chapters addressing critical CB defense topics in a non-agent specific format. The Encyclopedia cites more than 1,500 references. Each Agent entry covers 13 key topics. This edition supersedes HB-00-01 and HB-03-02, which are no longer available. CB-032591



Respirator Encumbrance Model

U.S. Government Agencies and their Contractors Only; Unclassified

SOAR-01-03 \$125.00 September 2000

The Respirator Encumbrance Model (REM) is a PC database application that provides information on human performance degradation for proposed mask designs. Such modeling minimizes the guesswork, cost, and effort commonly expended to determine effects of new mask designs on wearer operational performance. The REM is a collection of tables, screens, buttons, fact sheets, and lists that interact to provide a fractional human performance rating value for individuals performing military tasks while wearing respirators, along with a bibliographic database. The REM derived task performance ratings represent the expected level of performance relative to performance without a mask. Each performance rating is based on mask design parameters entered and mission or task set selected. CB-188974



Tactical NBC Information Tool

U.S. Government Agencies Only; Unclassified

SOAR-99-10 \$25.00 June 1998

This CD-ROM provides a complete set of NBC planning tools for use in tactical headquarters settings. Topics covered include agent characteristics, staff responsibility, the assessment tool, defense units, equipment, operations orders, threat, Army Universal Task List (AUTL) tasks conditions, and standards. The interactive nature of this tool greatly simplifies the NBC defense planning and training process. Included are a range of tools and manuals on NBC decontamination, protection, contamination avoidance, potential military CB agents and compounds, field behavior of agents, and medical management of chemical casualties. This CD-ROM would also be valuable to the domestic preparedness, force protection, and counter terrorism communities. CB-167465



CINC NBC Information Tool

U.S. Government Agencies Only; Unclassified

SOAR-98-08 \$25.00 December 1997

This CD-ROM provides a complete set of NBC planning tools for use in high-level headquarters settings. Topics covered include agent characteristics, staff responsibility, the assessment tool, defense units, equipment, OPLAN, threat, and Universal Joint Task List (UJTL). The interactive nature of this tool greatly simplifies the NBC defense planning process at headquarters level. This CD-ROM would also be valuable to the domestic preparedness, force protection, and counter terrorism communities. CB-106334



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