



CBRNIAC

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

Newsletter



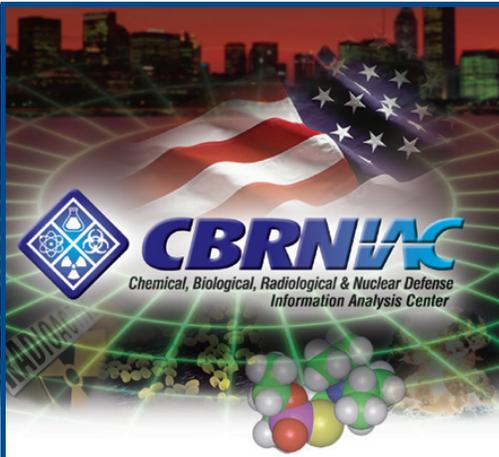
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2012



CBRNIAC Contract Ends in 2013 to Make Way for the New Homeland Defense and Security IAC

New PEO in Town

**Army Scientist Recalls Six Decades of
Inquiry, Breakthroughs**



The **Chemical, Biological, Radiological and Nuclear Defense Information Analysis Center (CBRNIAC)** is a Department of Defense (DoD)-sponsored Information Analysis Center (IAC) operated by Battelle Memorial Institute and supported by Horne International, Innovative Emergency Management, Inc., MTS Technologies, Inc., QuickSilver Analytics, Inc., and SciTech, Inc., and administered by the Defense Technical Information Center (DTIC) under the DoD IAC Program Office (Contract No. SP0700-00-D-3180).

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U.S. Government agencies and private industry under contract to the U.S. Government can contact the CBRNIAC for information products and services. CBRNIAC services also extend to all state and local governments and the first responder community, to include local emergency planners, firefighters, medics and law enforcement personnel.

For further information or assistance, visit or contact the CBRNIAC.

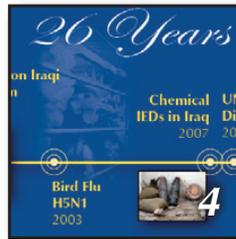
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The *CBRNIAC Newsletter*, a quarterly publication of the CBRNIAC, is a public release, unlimited distribution forum for chemical, biological, radiological and nuclear defense information. It is posted in Portable Document Format (PDF) on the CBRNIAC Homepage.

The CBRNIAC welcomes unsolicited articles on topics that fall within its mission scope. All articles submitted for publication consideration must be cleared for public release prior to submission. The CBRNIAC reserves the right to reject or edit submissions.

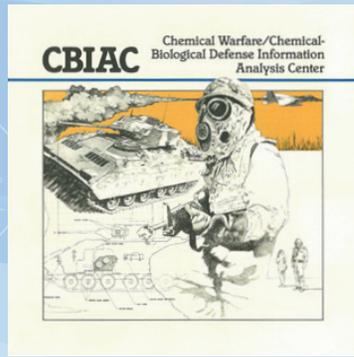
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CBRNIAC Contract Ends in 2013 to Make Way for the New Homeland Defense and Security IAC

The New Year, 2013, will bring changes to the daily operation of the Chemical, Biological, Radiological and Nuclear Defense Information Analysis Center (CBRNIAC), known in earlier days as the Chemical Biological Defense Information Analysis Center (CBIAC). After twenty-six years serving the CBRN Defense and Homeland Security Communities, the CBRNIAC contract will come to a close as the new Homeland Defense and Security Information Analysis Center (HDIAC) begins to take form.

History of the CBRNIAC



Sponsored by the Defense Technical Information Center (DTIC) and operated by Battelle Memorial Institute, the CBRNIAC has been funded to serve as an authoritative technical information resource to DoD and other federal government scientists and engineers, elected and appointed leaders, state and local government agencies, first responders, supporting contractors in industry and academia, and program managers in the areas of Chemical, Biological, Radiological and Nuclear (CBRN) Defense and Homeland Security (HLS). When first established in 1986, the CBIAC operated from Government facilities on the Edgewood Area of Aberdeen Proving Ground in Maryland. The location made the CBIAC easily accessible to the CB Defense community, since computer networks and the Internet were not then widely used. Over the years, the community CBRNIAC serves has grown from its Army core to include the Air Force, Navy, Marine Corps, Joint Staff, DoD Staff, and a wide range of other federal, state, and local government entities and their support contractors.



In the beginning, the CBIAC, along with DTIC and the other IACs, was aligned under DDR&E, emphasizing support to the DoD Research, Development, Test and Evaluation (RDT&E) community. In 1999, DTIC, and thus the CBIAC and the other DoD IACs, was re-aligned under the Defense Information Systems Agency (DISA), resulting in an increased emphasis on support to the Regional Combatant Commanders and the warfighters, and a higher level of visibility. In 2001, the terrorist events in the U.S. brought the CBIAC additional visibility as an authoritative resource for Domestic Preparedness and Homeland

Security. In 2004, DTIC, CBIAC, and the other DoD IACs were re-aligned under DDR&E, re-emphasizing our alignment with the DoD RDT&E community.

Early years brought the growing pains of limited facilities, an infant database, and minimal staffing, but the program was successfully executed by people who believed in the mission and importance of this IAC. The CBIAC/CBRNIAC mission, program, and staff grew steadily over the years.



Three contracts later, the CBIAC/CBRNIAC has relocated three times, changed names once, and expanded its scope with each new contract. The latest iteration of its database, the CBRN Scientific and Technical Analysis and Research Tool (CBRN START), now holds over 212,000 citations to documents and over 200,000 documents, most in digital format. Originally, the IAC's documents were held in over 125 file cabinets and 10 bookcases, but the digitization process, undertaken with DTIC's support, reduced the storage requirements to hard drives, tapes, and servers. The digitization process was largely completed several years ago. The oldest document in the CBRNIAC collection is an 1852 British Army report on protection against smallpox by vaccination. The first document catalogued into the archive is a 1987 report on chemical casualty treatment protocol development. The newest item added to the CBRNIAC collection was probably published yesterday. A dedicated staff has made the various transitions over the years as seamless and transparent to our increasingly diverse community of users as possible.



Left to Right: Francis (Fran) Crimmins, first Director; Ron Evans, third Director; and Jim McNeely, second and current Director.

Original CBIAC Scope (1986 – 1994):

- Chemical and Physical Properties of CW/CBD Materials
- Toxicology
- Warning and Identification
- Medical Effects and Treatment
- Treaty Verification
- International Technology, Proliferation and Control
- Individual and Collective Protection
- Chemical Identification
- Environmental Fate and Effects
- Decontamination
- NBC Survivability
- Combat Effectiveness
- Smoke and Obscurants
- Demilitarization
- Analysis of Manufacturing Processes for NBC Defense Systems
- Defense Conversion & Dual-use Technology Transfer

Scope areas added for the second CBIAC contract (1984 – 1999):

- Domestic Preparedness / Homeland Security
- Force Protection
- Counterterrorism
- Counterproliferation

Scope areas added during the third contract (1999 – 2013) and following the name change in 2007 to CBRNIAC:

- Toxic Industrial Chemicals/Materials (TICs/TIMs)
- Radiological and Nuclear Defense

Originally, the CBIAC was divided into two key programs: the Core Program and the Technical Area Task (TAT) Program. As the knowledge base and information handling requirements of the CBIAC expanded over time, it was determined that a third program would be beneficial to our user community. The Knowledge Management and Development (KM&D) Program was created to enable decision-making tools and real time access to scientific, technical and operational information.

Each change in name or expansion of scope brought a new look to the CBIAC/ CBRNIAC, its Web site, newsletter, and outreach materials. The quarterly *CBRNIAC Newsletter*, a recognized and valued outlet for CBRN defense information, has a pool of regular contributors who provide content geared to the needs of the community.

The CBIAC/ CBRNIAC Technical Area Task (TAT) Program has also played a major role in CBRN Defense and Homeland Security. This contract vehicle's scope and range of customers has expanded over the years as well. Under the first CBIAC contract (1986-1994), there were 100 TATs awarded in support of CB Defense. Under the second CBIAC contract (1984 – 1999), there were 237 TATs that met the project needs of the CB Defense communities. Under the current CBIAC/ CBRNIAC contract (1999 – present) there have been more that 729 TATs awarded in support of CBRN Defense and Homeland Security efforts. In 2013, the CBRNIAC TAT contract vehicle will be replaced by a multiple award contract (MAC) vehicle addressing the HDIAC scope areas.

Looking back over the years, the CBRNIAC has touched history as the expertise of its staff and Subject Matter Experts (SMEs) provided support during events such as Desert Storm/Shield, the Anthrax attacks, Fukushima Daiichi nuclear disaster, the numerous agency formations, reorganizations, realignments, and other Government transformation.

In 2007, the expanding need for authoritative information on defense against radiological and nuclear threats inspired the name change from the CBIAC to the CBRNIAC. Over the twenty-six years of operation, the CBRNIAC has responded to over 20,000 inquiries and conducted hundreds of TATs that touched all levels of the CBRN Defense and Homeland Security communities.

In 2008, the CBRNIAC took the initial steps to establish a Scientific Research Council (SRC). In response to recommendations from the SRC, a series of information exchanges, referred to as Technical Forums, was sponsored or co-sponsored by the CBRNIAC. The first CBRNIAC Technical Forum discussed the "Future of Toxicology in CB Defense." A total of eight forums on topics relevant to the CBRN Defense community, such as CBRN Defense Requirements, Bioforensics, Biodecontamination, Food Safety from Rad Threats, and more were held between 2008 and 2011. Proceedings were published as CBRNIAC information products when appropriate.



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1986



CBIAE
Established
1986

Halabja Poison Gas Attack
1988



The Gulf War: 1990-1991
Desert Shield: 1990
Desert Storm: 1991

Sarin Attack, Matsumoto, Japan
1994

United Nations Special Commission (UNSCOM)
1991

START Treaty in force
1994

Sarin Attack on Tokyo Subway
1995

CBIAE goes online



CWC Entered into Force and OPCW formally established
1997

United Nations Monitoring, Verification, and Inspection Commission (UNMOVIC)
1999



CBIAE has a new look and expanded services



Another outreach effort by the CBRNIAC was an onsite lunchtime video series initiated in 2010 to showcase videos and DVDs from the CBRNIAC collection. Four video presentations were offered during 2010 and 2011.

It is impossible to share all the accomplishments, experiences and adventures that have taken place across 26 years. Behind-the-scenes, a dedicated team of people have met deadlines and goals while coping with environmental challenges, limited budgets, and short turn-around times. Several staff members have had the privilege of working together for the entire 26 years of the CBIAC/ CBRNIAC operation. Timely replies and project deliverables often occurred while staff members celebrated marriages, births, and graduations, or grieved the loss of staff and family members. Recently dubbed "the legacy staff" of the CBRNIAC, the current staff members are processing the grief that goes with endings. It is our hope that the dedication of the CBIAC/ CBRNIAC managers and staff has made a difference to your program, project or research over the years. ♦

Notes:

CBIAC's first offices were in leased space near the Edgewood Area (EA) of Aberdeen Proving Ground (APG) for Fall 1986 when the team moved to E3330 on EA. Following a move to a nearby warehouse while the E3330 space was renovated, CBIAC returned to an enlarged space in E3330 in the summer of 1987.

A second phase of renovation began in 1992 and resulted in larger and more comfortable accommodations. Beginning in 1998, the CBIAC was assigned additional space in the basement of E3330 to better support our Government clients. Incremental changes continued up to the CBRNIAC's relocation to its final location in Aberdeen, MD in December of 2010.

Initiate a TAT:

<https://www.cbrniac.apgea.army.mil/TAT/Initiate/Pages/default.aspx>

Visit our Web site:

<https://www.cbrniac.apgea.army.mil/Pages/default.aspx>

Ask a question:

<https://www.cbrniac.apgea.army.mil/Products/Inquiry/Pages/default.aspx>

Read a newsletter:

<https://www.cbrniac.apgea.army.mil/Products/Newsletter/Archive/Pages/default.aspx>

Order a product:

<https://www.cbrniac.apgea.army.mil/Products/Catalog/Pages/default.aspx>

For more information DTIC's IAC program and the HDIAC, see <http://www.dtic.mil/dtic/iac>.

Letter from the Director



In 1986, the concept of an Information Analysis Center (IAC) dedicated to Chemical and Biological (CB) Defense was introduced. I served as the Deputy Director under the first contract to operate the Chemical and Biological Defense Information Analysis Center (CBIAC). Now, three contracts, one organizational name change and 26 years later, my assignments include serving as the Director of what is now the Chemical, Biological, Radiological and Nuclear Defense Information Analysis Center (CBRNIAC). It has been a dynamic 26 years supporting the CBRN Defense and Homeland Security communities. Due to changes in the contract requirements, the CBRNIAC will phase out in early 2013, to be replaced by the new Homeland Defense Information Analysis Center (HDIAC) which will absorb the CBRNIAC's scope and address new scope areas including critical infrastructure protection, biometrics, medical, cultural studies, and advanced sources of energy. Battelle will no longer be engaged in the "Basic Core Operations (BCO)."

I have watched the operation of the CBIAC/ CBRNIAC grow from a dedicated starting team of three employees in limited office facilities to a diverse group of more than 21 members during our most demanding years. Some staff members have been with the CBIAC/ CBRNIAC since its inception. While our working environment and budget have been constrained at times, the CBIAC/ CBRNIAC team has never wavered in its commitment to providing timely scientific and technical information to the communities it serves.

Over the years, we have changed our name from CBIAC to CBRNIAC (in 2007), expanded our scope and services, responded to national crises and hopefully made your job a bit easier. Through our Core Program and extensive Technical Area Task (TAT) program, the CBIAC/ CBRNIAC has provided design, engineering, research, and knowledge management solutions for CBRN Defense and Homeland Security organizations, their contractors, state and local governments, and first responders.

My hope and vision for the New Year and new contract is that the CBRNIAC's dedication and commitment to its mission will be carried forward by the HDIAC, maintaining the record of the last 26 years. I wish the legacy staff of the CBRNIAC and the staff of the new Homeland Defense IAC much success in the future.

James McNeely
Director, CBRNIAC

26 Years of Service



Contract Awards

Develop Alternative Dry Formulation Delivery Method for Recombinant Protective Antigen (rPA)-Based Anthrax Vaccine

Pfenex, Inc.
San Diego, CA
\$2,180,000
October 20, 2012
By National Institute of Allergy and Infectious Diseases, Bethesda, MD

Securing the Cities

City of Los Angeles
Los Angeles, CA
\$1,500,000
October 16, 2012
By Department of Homeland Security, Domestic Nuclear Detection Office, Washington, DC

Dried Plasma Device for CBRNE Mass Casualty Scenario

Velico Medical, Inc.
Beverly, MA
\$38,600,000
October 12, 2012
By Biomedical Advanced Research and Development Authority, Washington, DC

Nebraska University-Affiliated Research Center

University of Nebraska
Lincoln, NE
\$84,000,000
October 10, 2012
By U.S. Strategic Command, Offutt AFB, NE

Advance the Development of PreviThrax™ (Recombinant Protective Antigen Anthrax Vaccine, Purified)

Emergent BioSolutions
Rockville, MD
\$ N/A
October 4, 2012
By Biomedical Advanced Research and Development Authority, Washington, DC

US FDA Trial for the use of ReCell® Spray-On-Skin® in the Treatment of Burn Injuries

Avita Medical Ltd.
Northridge, CA and Cambridge, UK
\$880,000
September 28, 2012
By U.S. Department of Defense, Washington, DC

Countermeasure to Nerve Agents

Kentucky Bioprocessing
Owensboro, KY
\$2,700,000
September 27, 2012
By Defense Advanced Research Projects Agency, Arlington, VA

Improve Safety of Nuclear Reactors

Georgia Institute of Technology
Atlanta, GA
\$6,000,000
October 1, 2012
By U.S. Department of Energy, Washington, DC

Chemical Weapons Demilitarization Facility Construction

Bechtel Parsons Bluegrass
Blue Grass Army Depot, KY

\$599,000,000
September 27, 2012
By U.S. Department of Defense, Washington, DC

Intranasal CNS Delivery of Drugs Against Organophosphorous Threat Agents

Henry M. Jackson Foundation for the Advancement of Military Medicine
Bethesda, MD
\$375,214
September 26, 2012
By National Institutes of Health, Bethesda, MD

Development of Amodiaquine and its Analogs as Reactivators of Organophosphate-INH

Columbia University Health Sciences
New York, NY
\$400,000
September 26, 2012
By National Institutes of Health, Bethesda, MD

Countermeasures for Chlorine-Induced Airway Fibrosis

University of Louisville
Louisville, KY
\$341,934
September 25, 2012
By National Institutes of Health, Bethesda, MD

Accelerating Inflammation Resolution to Counteract Chemical Injury

Yale University
New Haven, CT
\$404,335
September 19, 2012
By National Institutes of Health, Bethesda, MD

Development of Therapeutics for Chlorine-Induced Airway and Lung Injury

Duke University
Durham, NC
\$914,322
September 14, 2012
By National Institutes of Health, Bethesda, MD

Develop Fast and Effective Methods to Test Chemicals' Toxicity to People and the Environment

University of Texas at Austin
Austin, TX
North Carolina State University
Raleigh, NC
Oregon State University
Corvallis, OR
University of California Davis
Davis, CA
Battelle Memorial Institute, Pacific Northwest Division
Richland, WA
University of North Carolina at Chapel Hill
Chapel Hill, NC
University of Michigan
East Lansing, MI
University of South Carolina
Columbia, SC
\$11,000,000 (Grants)
September 13, 2012
By Environmental Protection Agency, Washington, DC

DRAFT New PEO In Town



Program Executive Office
Assembled Chemical Weapons Alternatives



Left: ACWA's Program Executive Officer, Conrad Whyne, shown here observing progress at the Blue Grass plant, is a familiar figure on the construction sites of both projects. Right: Construction of ACWA's Pueblo Chemical Agent-Destruction Pilot Plant in Colorado nears completion.

A longtime Aberdeen Proving Ground tenant, the Assembled Chemical Weapons Alternatives program, known as ACWA, underwent something of a “makeover” on October 1. Not an *extreme* make-over worthy of a reality TV show, but a significant change nonetheless. With the start of the new fiscal year, ACWA was formally designated a Program Executive Office, joining the ranks of a dozen such organizations charged with the management of major acquisition programs.

At the same time ACWA changed its name from U.S. Army Element, ACWA to Program Executive Office, ACWA, it was reassigned from U.S. Army Materiel Command (AMC) to the U.S. Army Acquisition Support Center (USAASC) for logistical and administrative support.

“Although the ACWA program reports directly to the Department of Defense as mandated by Congress, it has always been administratively aligned within the Army to ensure the organization is properly resourced,” explained Conrad Whyne, ACWA’s Program Executive Officer. “Since 2007, as part of AMC, the program entered its most dynamic time. We owe AMC commanders and staff our thanks for the many years of support they provided and we look forward to forging a similarly productive relationship with USAASC, an organization well

known for the quality of its personnel development systems and management support capabilities.

The ACWA program, established by Congress in 1996 to examine alternatives to incineration as a means of destroying

the U.S. chemical weapons stockpile, is responsible for the safe destruction of the two remaining chemical stockpiles – 2,611 tons of mustard agent munitions in storage at the U.S. Army’s Pueblo Chemical Depot in Colorado, and 523 tons of mustard and nerve agent projectiles and rockets stored at the Blue Grass Army Depot in Kentucky. Both stockpiles will be destroyed by neutralization rather than incineration. Construction of the Pueblo destruction facility is slated to be completed this year, while the Blue Grass plant just passed the 50 percent construction mark.



In the Pueblo Chemical Agent-Destruction Pilot Plant’s Enhanced Reconfiguration Building, a plant electrician checks continuity in one of the utility control cabinets. The electrical cabinet shown will provide power to utilities within the Enhanced Reconfiguration Building where the chemical munitions will be disassembled.

“This transition to PEO status,” continued Whyne, “will raise the program’s visibility within the Defense establishment, making it easier for us to obtain the kind of support and resources we need as we move closer to completing the construction of our Colorado and Kentucky facilities and ramp up through systemization to the actual start of destruction operations.”

ACWA’s mission – the destruction of the last 10 percent of the U.S. chemical weapons stockpile – marks the final chapter in the elimination of an entire class of weapons that by its mere existence successfully deterred the use of chemical weapons against U.S. forces for more than 90 years. ♦



Army Scientist Recalls Six Decades of Inquiry, Breakthroughs

By Mr. Dan Lafontaine, RDECOM

After more than 60 years as a researcher, educator and mentor, Harry Salem remains committed to advancing the field of science in the U.S. Army.

Salem's talents and expertise led to an already distinguished career spanning three decades in pharmacology and toxicology—including the development of the cold and cough remedies NyQuil and Contac as well as the extended-wear soft contact lens Permalens—all before joining the Army as a civilian scientist in 1984.

In his current role as the chief scientist of life sciences, Salem oversees and guides research efforts at the U.S. Army Research, Development and Engineering Command's Edgewood Chemical Biological Center (ECBC). He has recently created a Center of Excellence for Stem Cell Research, recruiting 12 post-doctoral students to help embark on his vision.

Promising Research in Stem Cells

Stem-cell research holds the greatest opportunity for advancements in medicine, according to Salem.

"Stem cells are the future of medicine," he said. "I can see the potential of this, not only in regenerative medicine, but also in testing for safety and efficacy and medical mitigation, including all aspects of pharmacology, toxicology and medicine."

Historically, cellular-based testing has been conducted on immortalized tumor cell lines, Salem said. These are cells that have had tumor genes introduced into them to make them immortal and able to survive in cell culture outside the body.

Salem's researchers have recently acquired a novel *in vitro* technology in which they are able to convert samples of human skin and blood cells into new kinds of stem cells known as induced pluripotent stem (IPS) cells. IPS cells are artificially derived, typically from an adult somatic cell, by forcing the expression of specific genes that cause them to differentiate into a particular cell type, Salem said.

Salem emphasizes that his group does not use human embryonic stem cells, which are isolated from embryos and embroiled in ethical controversy.



Harry Salem serves as chief scientist of life sciences for the U.S. Army Research, Development and Engineering Command's Edgewood Chemical Biological Center.

One of Salem's scientists spent a year at Johns Hopkins University learning the latest techniques in IPS cell technology in order to initiate the stem cell work at ECBC laboratories.

"In the last year we have transitioned the technique to our laboratories so we're actually doing it here at ECBC. We're making the cells here and getting ready to use them for testing," Salem said. "We can now make tissues of different organs from stem cells."

The National Research Council Post-Doctoral Program, the Defense Threat Reduction Agency and ECBC are sponsoring Salem's work on the lungs, liver and heart. He is looking to expand the laboratory's research with additional organs and to involve more scientists so the team has an expert on each organ of interest.

According to Salem, the Army is partnering in this field with Johns Hopkins University, Harvard University, University of Michigan, Wake Forest University, and Massachusetts Institute of Technology.

Regenerative medicine is one of the promising areas the Army and its partners are pursuing. Salem believes the research could benefit the military as well as civilians.

"Soldiers who come back with a lost limb may be able to have them re-grown. That's the ultimate advance that we're looking for," he said. "That's one of the hopes we have."



Continued pg. 9

“Wake Forest has made stem cell bladders and implanted them in children. They have been functioning for several years. Perhaps a lot of diseased organs can be replaced. Most of the things we do now will not only help the military, but it will serve a dual purpose—it will help civilians as well.”

Family Illness Prompts Interest in Science

At the age of 8, Salem was confronted with his maternal grandmother’s unexpected illness. He described the profound impact her diagnosis would have on his academic endeavors and professional career.

“My maternal grandmother lived with us. All of a sudden, she was diagnosed with tuberculosis without any visible signs or symptoms. She was abruptly taken from our house, and that was it,” he recalls. “She was put in a sanatorium, which was quite a distance from where we lived.”

“At my age, I was not allowed in the sanitarium. I could only look through the window, and somebody had to lift me up so I could see my grandmother. One day as I was looking through that window, I vowed that someday I would do scientific research, not knowing what it really was, to prevent or cure lung diseases. That’s when I decided I would like to do it. It seems like my life was steered in that direction.”

A native of Windsor, Ontario, Canada, Salem earned a bachelor of arts in general sciences at the University of Western Ontario in 1950. After visiting his older brother during a football weekend at the University of Michigan, Salem enrolled there, where he earned a bachelor of science in pharmacy in 1953.

Salem recalled an experiment during his third year at Michigan that spurred his passion for pharmacology.

“I still remember the experiment that made me fall in love with pharmacology. They put a cat in a bell jar, and then put a mouse into its space. The cat immediately attacked the mouse. At the time they were working on mind-boggling drugs, and they injected the cat [with a drug]. Then they put a mouse in its space, and the cat ignored it completely. That’s what hooked me,” Salem said.

Salem then returned to Canada for his graduate studies in pharmacology at the University of Toronto, where he earned a master’s degree in 1955 and a doctorate in 1958.

Salem’s master’s degree thesis work included the initial evaluation of the breathalyzer blood-alcohol level test. The equipment used by police to check drivers’ sobriety was quite advanced, although their method for capturing exhaled breath was rather rudimentary, he said.

At that time, when the police investigated an accident or caught someone suspected of driving under the influence, the driver or suspect would blow into a rubber balloon.

“They took these latex balloons to the police station, and when tested, there was no alcohol there. The policeman would swear, ‘I could smell the alcohol. The guy was drunk. I know it.’ But there was no alcohol, so they couldn’t do anything,” Salem said. “We looked at other plastics,

Most of the things we do now will not only help the military, but it will serve a dual purpose—it will help civilians as well.



and what we found was the alcohol was passing through the rubber of the balloon and dissipating into the air. We developed a polyethylene plastic bag for them to blow into. The half life for alcohol was about five hours in the polyethylene plastic bags versus 15 minutes in the rubber balloons.

“Later on when Saran Wrap was developed, we fabricated a Saran plastic bag that you blew right through. It collected the alveolar air, the last portion of air exhaled, and that was correlated with the amount of alcohol in the blood. The half life for alcohol in the saran bag was about 24 hours.”

A Lifetime Devoted to Advancing Science

After earning his doctorate in 1958, Salem held positions in industry and academia, where he developed a strong reputation

as a researcher and educator. His successes include incubators for premature babies, a labor induction drug, drugs for the common cold and cough, and continuous wear soft contact lenses.

While working for Smith Kline and French, Salem directed the respiratory research laboratories for the Menley and James Division, where he participated on the team that developed Contac.

Later, he joined Richardson-Merrell National Drug Company in Philadelphia, where he led the respiratory research laboratory for a subsidiary, Vicks. In this position, he was on the successful team that developed NyQuil.

“In those days we joked, ‘We have a NyQuil. Why don’t we have a DayQuil?’ Thirty years later, there is a product called DayQuil,” Salem said.

Salem also taught pharmacology and toxicology at the University of Toronto, University of Pennsylvania, Temple University, Drexel University, University of Maryland and Rutgers University, where he is still a visiting professor. He has published 13 books, including three volumes of the International Encyclopedia of Pharmacology and Therapeutics, as well as more than 100 papers in scientific journals.

In addition to his research for the Army over the past 28 years, Salem has served as a consultant for federal government organizations, including the U.S. attorney general, Federal Bureau of Investigation (FBI), Environmental Protection Agency (EPA), Department of Homeland Security and Congress.

Army Scientist *cont.*

In 1993, he advised then-U.S. Attorney General Janet Reno as she considered options to intervene at the Branch Davidian compound in Waco, Texas.

"The FBI took me down to visit with [Reno]. When she came into the room, I didn't know whether I was going to brief her or just answer questions," Salem said. "She came in and started firing questions, and I responded. She was direct. I was very impressed with her and the way she worked. I told her all about the riot-control agents that we had worked with."

"I gave her good, sound scientific advice. She asked me to appear with her on '60 Minutes,' but the Department of Defense thought better of that. I did not appear, although she said very nice things about me on television."

For the 1996 Summer Olympic Games in Atlanta, Salem served as the chairman of the pharmacy committee for the Office of Emergency Preparedness of the National Disaster Medical System.

In 2001, Salem was awarded the Society of Toxicology Congressional Science Fellowship and spent a year on Capitol Hill as a Congressional adviser. He worked in the office of U.S. Rep. Jim Greenwood, who was chairman of the House Energy and Commerce Committee and responsible for oversight and inspection of the National Institutes of Health and EPA.

Salem recalled the events of 9/11.

"On Sept. 11, 2001, Greenwood had called for a bioterrorism hearing. I was on the way to the hearing room when the first plane hit. I was sent back to my office, and I saw the second plane hit on television," he said.

Salem said he still wears the American flag pin, which was given to him by his Congressional colleagues shortly after 9/11, on his suit jacket.

Leading Future Generations of Scientists

As Salem discussed his work over 60 years, he reflected on the legacy left for future generations. He spoke fondly of his post-doctoral scientists and colleagues.

"I hope I've inspired the young people to continue doing research. Don't be afraid of learning something new," he said. "When I went to school, nerve cells didn't regenerate. That's what I was taught. Now we're doing it in our labs right here. That's exciting."

"I want to leave a legacy. My boss once said to me, 'Everybody knows who I am. It's up to me to make sure they know who you are.' " ♦



A four-minute video of Harry Salem, including a bit of historic footage of APGEA is available on YouTube at: <http://www.youtube.com/watch?v=grpfyTa2Qil>

ECBC Gives Children and Soldiers a Step in the Right Direction

With the help of additive manufacturing, disabled children as well as soldiers will soon be walking in customized orthotics that cost less than a third of the price and manufacturing time of standard braces. Through a research partnership with the University of Delaware, the U.S. Army Edgewood Chemical Biological Center's (ECBC) Advanced Design and Manufacturing Division is using 3D imaging to create braces, or orthoses, for the lower limbs.

ECBC is a U.S. Army Research, Development and Engineering Command (RDECOM) laboratory located at the Edgewood Area of Aberdeen Proving Ground, Maryland.

This project, known as Rapid Manufacture of Personalized Rehabilitation Devices, or RaMPeRD, will cut the cost of braces from \$15,000 per pair to \$2,000, according to Kevin Wallace, Branch Chief for Technology and Systems Integration at ECBC's Engineering Directorate.

"We can produce these orthotic devices in a matter of hours as opposed to weeks," Wallace said.

Currently, making orthoses takes six to eight weeks through a manual process with less precision. With additive manufacturing, or 3D imaging, an exact three-dimensional shape of a leg or ankle can be captured and used to mold a brace for a customized fit.

"The whole basis of this project is that we can create customized orthoses by taking a detailed scan of the leg," said Rick Moore, Rapid Technologies Branch Chief. "Using this kind of 3D data capturing technology creates comfortable, custom-fit rehabilitative devices, is cost-effective and can be produced quickly."

With the advancements in technology, additive manufacturing technologies and 3D imaging are being applied in everything from medical supply needs, to gaming, manufacturing, and archaeology.

ECBC and the University of Delaware are currently researching and developing these products for the Nemours Center for Children's Health, which has hospitals and clinics in four states. Eventually, these braces will be manufactured for soldiers wounded in combat.

To learn more about additive manufacturing at ECBC, watch this video: <http://www.youtube.com/user/RDECOM>

For more information about ECBC, visit <http://www.ecbc.army.mil/>.

New Military Apparel Repels Chemical and Biological Agents

by Anne M Stark, LLNL

Lawrence Livermore National Laboratory scientists and collaborators are developing a new military uniform material that repels chemical and biological agents using a novel carbon nanotube fabric.

The material will be designed to undergo a rapid transition from a breathable state to a protective state. The highly breathable membranes would have pores made of a few-nanometer-wide vertically aligned carbon nanotubes (CNT) that are surface modified with a chemical warfare agent-responsive functional layer. Response to the threat would be triggered by direct chemical warfare agent attack to the membrane surface, at which time the fabric would switch to a protective state by closing the CNT pore entrance or by shedding the contaminated surface layer.

“The uniform will be like a smart second skin that responds to the environment,” said Francesco Fornasiero, LLNL’s principal investigator for the Defense Threat Reduction Agency (DTRA)-funded project. “Without the need of an external control system, the fabric will be able to switch reversibly from a highly breathable state to a protective one in response to the presence of the environmental threat. In the protective state, the uniform will block the chemical threat while maintaining a good breathability level.”

High breathability is a critical requirement for protective clothing to prevent heat-stress and exhaustion when military personnel are engaged in missions in contaminated environments. Current protective military uniforms are based on heavyweight full-barrier protection or permeable adsorptive protective overgarments that cannot meet the critical demand of simultaneous high comfort and protection, and provide a passive rather than active response to an environmental threat.

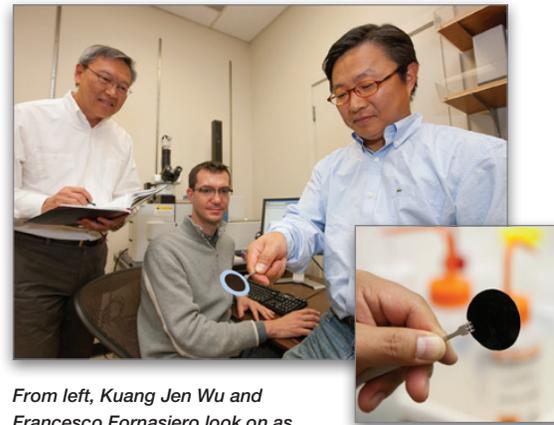
The highly breathable membranes have pores made of a few nanometer-wide vertically aligned carbon nanotubes that are surface modified with a chemical warfare agent-responsive functional layer.

To provide high breathability, the new composite material will take advantage of the unique transport properties of carbon nanotube pores, which have two orders of magnitude faster gas transport rates when compared with any other pore of similar size.

“We have demonstrated that our small-size prototype carbon nanotube membranes can provide outstanding breathability in spite of the very small pore sizes and porosity,” said Sangil Kim, another LLNL scientist in the Biosciences and Biotechnology Division. “With our collaborators, we will develop large area functionalized CNT membranes.”

Biological agents, such as bacteria or viruses, are close to 10 nanometers in size. Because the membrane pores on the uniform are only a few nanometers wide, these membranes will easily block biological agents.

However, chemical agents are much smaller in size and require the membrane pores to be able to react to block the threat. To create a multifunctional membrane, the team will surface modify the original prototype carbon nanotube membranes with chemical threat responsive functional groups. The functional groups on the membrane will sense and block the threat like gatekeepers on entrance. A second response scheme also will be developed: Similar to how a living skin peels off when challenged with dangerous external factors, the fabric will exfoliate upon reaction with the chemical agent. In this way, the fabric will be able to block chemical agents such as sulfur mustard (blister agent), GD and VX nerve agents, toxins such as staphylococcal enterotoxin and biological spores such as anthrax.



From left, Kuang Jen Wu and Francesco Fornasiero look on as Sangil Kim holds a piece of the nanotube fabric that repels chemical and biological agents. Photos by Jacqueline McBride/LLNL

The project is funded for \$13 million over five years with LLNL as the lead institution. The Livermore team is made up of Fornasiero, Kim and Kuang Jen Wu. Other collaborators and institutions involved in the project include Timothy Swager at Massachusetts Institute of Technology, Jerry Shan at Rutgers University, Ken Carter, James Watkins, and Jeffrey Morse at the University of Massachusetts-Amherst, Heidi Schreuder-Gibson at Natick Soldier Research Development and Engineering Center, and Robert Praino at Chasm Technologies Inc.

“Development of chemical threat responsive carbon nanotube membranes is a great example of novel material’s potential to provide innovative solutions for the Department of Defense CB needs,” said Tracee Harris, the DTRA science and technology manager for the Dynamic Multifunctional Material for a Second Skin Program. “This futuristic uniform would allow our military forces to operate safely for extended time periods and successfully complete their missions in environments contaminated with chemical and biological warfare agents.”

The Laboratory has a history in developing carbon nanotubes for a wide range of applications including desalination. “We have an advanced carbon nanotube platform to build and expand to make advancements in the protective fabric material for this new project,” Wu said.

The new uniforms could be deployed in the field in less than 10 years. ◆

This article originally appears online at: <https://www.llnl.gov/news/newsreleases/2012/Oct/NR-12-10-06.html>



Calendar of Events

Do you have a CBRN Defense or Homeland Security course or event to add to our Calendar? Submit the pertinent information via email to cbrniac@battelle.org. The CBRNIAC reserves the right to reject submissions. For a more extensive list of events, view our online calendar at <https://www.cbrniac.apgea.army.mil/Products/Events/Pages/default.aspx>.

Jan 8–10	International Disaster Conference & Expo (IDCE) 2013 New Orleans, LA http://www.internationaldisasterconference.com/	Feb 23–24	Pittsburgh Fire Rescue & EMS Expo Monroeville, PA http://kellysimontradeshows.com/monroeville/index.html
Jan 12–16	SLAS2013 - 2nd Annual Conference and Exhibition Orlando, FL http://slas2013.org/	Feb 25–27	2013 ASM Biodefense Emerging Diseases Research Meeting Washington, DC http://www.asmbiodefense.org/
Jan 24–25	8th Annual International Conference on Predictive Human Toxicity and ADME/TOX Studies Brussels, Belgium http://www.mondialresearchgroup.com/index.php?whereTo=humt13	Mar 3–7	8th HIC-RPC Bioseparation Conference Savannah, GA http://www.hic-rpc.org/
Jan 28–30	24th Annual SO/LIC Symposium & Exhibition Washington, DC http://www.ndia.org/meetings/Pages/default.aspx	Mar 4–8	International Conference on Environmental Pollution, Restoration and Management Hanoi, Vietnam https://vniceporm.com/
Jan 28–31	4th Annual Next Generation Bio-Based Chemicals San Diego, CA http://www.informationforecastnet.com/index.php/conference/675/registration/?utm_source=BottomReg&utm_medium=Oct23&utm_campaign=BioBasedChem	Mar 5–6	Lab-on-a-Chip European Congress Barcelona, Spain http://selectbiosciences.com/conferences/index.aspx?conf=LOACEC2013
Jan 30	Combating Terrorism Technical Support Office Advance Planning Briefing for Industry Washington, DC http://www.ndia.org/meetings/3090/Pages/default.aspx	Mar 5–8	2013 Pacific Operational Science and Technology Conference Honolulu, HI http://www.ndia.org/meetings/Pages/default.aspx
Jan 30–Feb 1	6th Annual Biometrics for National Security and Law Enforcement Summit 2013 Pentagon City, VA http://www.biometricsevent.com/	Mar 10–14	SOT Annual Meeting and Tox Expo San Antonio, TX http://www.toxicology.org/AI/MEET/AM2013/
Feb 4–7	Seventh International Conference on Remediation of Contaminated Sediments Dallas, TX http://conferences.battelle.org/sediments/	Mar 12	Chemical, Biological and Explosives Defense (Government clearance required) Lexington, MA POC: HPWS@LL.mit.edu
Feb 14–18	The Beauty and Benefits of Science Boston, MA http://www.aaas.org/meetings/	Mar 12–14	MIT Lincoln Laboratory Homeland Protection Workshop Series (U.S. citizens only) Lexington, MA POC: HPWS@LL.mit.edu
Feb 14–18	2013 AAAS Annual Meeting Boston, MA http://www.aaas.org/meetings/	Mar 12–15	Public Health Preparedness Summit 2013 Atlanta, GA http://www.phprep.org/
		Mar 17–21	Pittcon 2013 Philadelphia, PA http://pittcon.org/

Global CBRN Detector Market Survey: 2013 Version

NEW!

GLOBAL CBRN DETECTOR MARKET SURVEY

Fill out the 2013 Global CBRN Detector Market Survey and get wide circulation of your information across the global CBRN community.

Your participation ensures worldwide exposure of your commercial system to future customers.



LINKS

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2011 PDF VERSION

Download the Published 2011 Market Survey click here

2007 PDF VERSION

Download the Published 2007 Market Survey click here



US Government Market Surveys – CBRN Detection

The Edgewood Chemical Biological Center (ECBC) is proud of the success and popularity over the last decade of our Market Surveys for Chemical, Biological, Radiological Detectors! Hard bound copies of the 2011 edition were distributed throughout the global defense community & the web site recorded more downloads than all previous versions combined.

ECBC would like to invite YOU & YOUR COMPANY to participate in the (ALL NEW) 2013 Global Chemical, Biological, Radiological Detector Market Survey by clicking on this link:

www.CBRNHorizonScan.com

This survey will be the biggest & most detailed yet!!! The new version is a collaboration with our international partners in Europe and the Pacific Rim to reach more companies than ever.

DON'T MISS A CHANCE TO MARKET YOUR PRODUCT.

The online survey has been revamped based on feedback received for the 2011 version. We are interested in your DETECTION SYSTEMS FOR CHEMICAL, BIOLOGICAL, and RADIOLOGICAL DETECTION. If you are interested in your system joining the many systems already being used by responders in this widely used survey, we invite you to click the link above and provide the required information.

We appreciate your participation and look forward to receiving your completed online surveys.

Peter Emanuel, Ph.D.
US Army Edgewood Chemical Biological Center
peter.a.emanuel.civ@mail.mil



In the News

Ebola Antibody Treatment, Produced in Plants, Protects Monkeys from Lethal Disease

U.S. Army Medical Research Institute of Infectious Diseases News Release

October 15, 2012

"A new Ebola virus study resulting from a widespread scientific collaboration has shown promising preliminary results, preventing disease in infected nonhuman primates using monoclonal antibodies."
http://www.usamriid.army.mil/press_releases/Olinger_PNAS_Ebola_OCT2012.pdf

Investigative Report Criticizes Counterterrorism Reporting, Waste at State & Local Intelligence Fusion Centers

U.S. Senate Permanent Subcommittee on Investigations Press Release

October 3, 2012

"A two-year bipartisan investigation by the U.S. Senate Permanent Subcommittee on Investigations has found that Department of Homeland Security efforts to engage state and local intelligence "fusion centers" has not yielded significant useful information to support federal counterterrorism intelligence efforts."
<http://www.hsgac.senate.gov/subcommittees/investigations/media/investigative-report-criticizes-counterterrorism-reporting-waste-at-state-and-local-intelligence-fusion-centers>

L-3 MAPPS to Develop Human Factors Simulator for INL Research Program

L-3 MAPPS Press Release

October 3, 2012

"L-3 MAPPS announced today that it has won an order to supply a human factors simulator to the Idaho National Laboratory (INL) located in Idaho Falls, Idaho."
http://www.mapps.l-3com.com/Press_releases/20121002_INLHumanFactors.html

JPM-TMT Announces Down Selection Decision for Ebola Drug Candidates

JPM-TMT Project Management Office Press Release

October 2, 2012

"Joint Project Manager Transformational Medical Technologies (JPM-TMT), completed a comprehensive evaluation of its Ebola medical countermeasure (MCM) candidate development efforts and decided that the Hemorrhagic Fever Virus (HFV) program will continue with only one of two Ebola MCM development efforts."
<http://www.jpmtmt.mil/pdf/press/Press-2012-JPM-TMTAnnouncesDownSelectionDecisionforEbolaDrugCandidates.pdf>

Detecting Biological Weapon Use

NATO News Release

October 1, 2012

"...to develop for NATO an epidemiological surveillance system for tracking the state of health of Allied troops in operations...the critical importance of real-time tracking of health and of the threats to soldiers in their mission."
http://www.nato.int/cps/en/natolive/news_90256.htm?utm_medium=email&utm_campaign=NATO%20Update%20201240&utm_content=NATO%20Update%20201240+CID_bfb6cb5045064a00a18adff50822aed6&utm_source=Email%20marketing%20software&utm_term=Detecting%20biological%20weapon%20use

US, China Commission Radiation Detection Center, Enhance Efforts to Counter Nuclear Smuggling

NNSA Press Release

September 27, 2012

"...(NNSA) this week held a ceremony to announce the successful completion of the Qinhuangdao Radiation Detection Training Center (RDTTC) and the commencement of the center's first class for China Customs officers."
<http://nnsa.energy.gov/mediaroom/pressreleases/sldgacc92712>

NRC Issues License to GE-Hitachi for Laser Uranium Enrichment Plant in North Carolina

NRC News Release

September 25, 2012

"The Nuclear Regulatory Commission today issued a license to General Electric-Hitachi Global Laser Enrichment LLC (GLE) to construct and operate a uranium enrichment plant using laser technology in Wilmington, N.C."
<http://www.nrc.gov/reading-rm/doc-collections/news/2012/12-106.pdf>

Authorities Say New SARS-like Virus Detected in Middle East

Fox News

September 24, 2012

"British health authorities have alerted the U.N. of a new respiratory virus that resembles SARS in a severely ill patient who recently traveled to Saudi Arabia -- where another man died of a similar illness earlier this year...In 2003, SARS killed hundreds of people, mostly in Asia..."
<http://www.foxnews.com/health/2012/09/24/authorities-say-new-sars-like-virus-detected-in-middle-east/>

Continued pg. 16

Vol. 9 No. 1 of the Chem-Bio Defense Magazine is Now Available!

The National Security Strategy notes that a whole-of-government approach is pivotal to strengthening national capacity and supports providing our service members with the resources they need to succeed.

To view the electronic version, visit: <http://www.jpocbd.osd.mil/packs/Magazine.aspx>



Safeguarding Nuclear Materials

By Matthew Van Sickle, Taissa Sobolev, and Elaine Specht

With the possibility of nuclear terrorism, evolving proliferation threats, and the potential for the diffusion of sensitive technology, the international safeguards and security system is challenged. The National Nuclear Security Administration's (NNSA) Office of Nonproliferation and International Security (NIS), however, has a number of efforts under way to help the international community safeguard and secure nuclear material to prevent its diversion, theft, and sabotage. This article highlights just two.

Promoting Adherence to the IAEA Additional Protocol

Under the NIS International Nuclear Safeguards and Engagement Program (INSEP), the United States promotes universal adherence to the Model Additional Protocol (AP) through technical partnerships with States that are preparing for AP ratification or States that wish to improve their current procedures for implementing the AP. Since 1997 the AP has served to strengthen nuclear safeguards systems by increasing the International Atomic Energy Agency's (IAEA) ability to detect undeclared nuclear activities. An AP is supplemental to any existing comprehensive safeguards agreement and provides for more information to IAEA, greater IAEA inspection access, streamlined administrative processes, and flexibility to tailor the AP to the specific situation.

When a State has both a Comprehensive Safeguards Agreements (CSA) and an AP in force, it better enables the IAEA to provide credible assurances to the international community of both the absence of undeclared nuclear activities and that declared materials remain in peaceful nuclear activities. Consequently, the United States believes that a CSA along with an AP in force should be considered the international standard for IAEA safeguards. In order to encourage remaining States to bring an AP into force as soon as possible, the United States joins the IAEA and others in offering assistance in the effective implementation of these safeguards instruments.

To date through INSEP, NIS has provided sustained support to Serbia, Morocco, Kuwait, the United Arab Emirates, Vietnam, Thailand, Malaysia, Indonesia, Philippines, and Iraq. INSEP tailors its cooperative efforts to each specific partner country. Technical engagement may include training to determine possible AP-related activities, enhancing understanding of AP requirements, conducting outreach planning, and

providing guidance for identifying and reporting manufacturing and exports listed in the AP. INSEP also collaborates with partner countries in AP-related infrastructure and organizational development, such as the establishment or improvement of legal frameworks, regulatory documents, software systems to collect and submit declarations, and procedures to conduct industry outreach and establish communication networks among stakeholders.



INSEP holds an AP technical workshop for Iraq in 2011.

INSEP's international technical assistance is conducted along with the IAEA and is complementary to the IAEA's mission. For instance, INSEP, in close coordination with the IAEA, initiated engagement in AP implementation with Iraq's National Monitoring Directorate (INMD) in 2011. INSEP held three technical workshops with Iraq, focusing on the review and evaluation of draft AP declarations and complementary access mock simulations. In the most recent workshop, INSEP and the IAEA provided training to INMD on the use of handheld safeguards instruments that can be used to characterize nuclear material.

Rescuing a National Security Asset

In another safeguards-related activity, the NIS Next Generation Safeguards Initiative is partnering with Oak Ridge National Laboratory and others to preserve some amount of a nuclear material otherwise destined for permanent removal. The U.S. Department of Energy (DOE) began removing and downblending all separated uranium-233 (U-233) across the complex in summer 2012 to eliminate the expense of securing the U-233 stockpile. While downblending a material that could be used to build a nuclear weapon sounds like a good idea, removing all U-233 would eliminate a material that is also a valuable national security asset. That is why NIS will be preserving approximately 1 kg of ultra-high-purity U-233.

In the field of nuclear safeguards, U-233 helps provide assurance that countries are not developing nuclear weapons under the guise of peaceful nuclear energy. In nuclear forensics, it helps detect and

AP Declaration Helper

INSEP's AP Declaration Helper software tool utilizes a simple, web-based or desktop interface to assist safeguards managers in determining which information to report to the IAEA. The Declaration Helper includes a built-in cross referencing feature that allows users to learn more about specific AP requirements and definitions. INSEP provides training on this tool and the IAEA's Protocol Reporter as part of its outreach efforts.

This free software tool is available for use or download at www.nnsa.energy.gov/aphelper.

Continued pg. 16

Safeguarding *cont.*

deter the use of nuclear explosives. Many U.S. Government agencies have a need for high-purity U-233 for the detection of clandestine uranium activities, the analysis of forensics uranium samples, and for the calibration of mass spectrometers and gamma spectrometers for the accurate determination of uranium isotopic composition of unknown samples.

The quantity of U-233 that NIS is preserving will be sufficient to produce a supply of certified reference material (CRM) that would satisfy U.S. and international CRM needs for more than 50 years and establish a strategic reserve of material for future CRM production.

While NIS initiated the U-233 preservation project, several other offices are providing financial or in-kind contributions to this project. NIS is now working closely with the NNSA Office of Nonproliferation Verification Research and Development, the DOE Nuclear Materials Information Program, and the Domestic Nuclear Detection Office of the Department of Homeland Security to preserve this rare and valuable material. ♦



Glove boxes being prepared for a leak test prior to being used to process and qualify the U-233 items.

Matthew Van Sickle serves as the INSEP Team Leader in the NIS Office of Nuclear Safeguards and Security. Van Sickle joined NIS in 2006 as a Nonproliferation Graduate Fellow and has served as a program manager for nuclear safeguards and nonproliferation projects in the Middle East, North Africa, and Southeast Asia.

Taissa Sobolev serves as a program analyst for the NIS Office of Nuclear Safeguards and Security. Sobolev has been with NIS since 2010, where she started as a Nonproliferation Graduate Fellow.

Elaine Specht of Battelle has been providing outreach assistance to NIS since 2009.

News *cont.*

Protection From Biological Agents is Army Scientist's Mission

Dan Lafontaine

www.Army.mil

September 24, 2012

"Biological agents remain a persistent threat to America and its Soldiers. U.S. Army scientists are researching new technologies to counter bioweapons in order to keep the nation safe."

http://www.army.mil/article/87677/Protection_from_biological_agents_is_Army_scientist_s_mission/

Chemist's Fluoride Research May Hold the Key to Easier Cleanup of Toxic Substances

Florida State University News Release

September 24, 2012

"A Florida State University chemist's work could lead to big improvements in our ability to detect and eliminate specific toxic substances in our environment."

<http://www.news.fsu.edu/Top-Stories/Chemist-s-fluoride-research-may-hold-the-key-to-easier-cleanup-of-toxic-substances>

New FDA Task Force Will Support Innovation in Antibacterial Drug Development

FDA Press Announcement

September 24, 2012

"The U.S. Food and Drug Administration today announced the formation of an internal task force that will support the development of new antibacterial drugs, a critical public health care goal and a priority for the agency."

<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm320643.htm>

Automatic Building Mapping Could Help Emergency Responders

Larry Hardesty

MIT News Release

September 24, 2012

"MIT researchers have built a wearable sensor system that automatically creates a digital map of the environment through which the wearer is moving."

<http://web.mit.edu/newsoffice/2012/automatic-building-mapping-0924.html>

NNSA Partners with Canada, Russia to Build Counterterrorism Training Center for Russian Federation Ministry of Defense

NNSA News Release

September 21, 2012

"...(NNSA) today announced the commissioning of the Abramovo Counterterrorism Training Center (ACTC). Located in the city of Abramovo, the ACTC will be used by the Russian Ministry of Defense (RF MOD) to train personnel for Russia's nuclear sites in security tactics and measures."

<http://nnsa.energy.gov/print/mediaroom/pressreleases/actc092112>

Funding for Medical Research and Science Programs Faces Draconian Cuts Unless Congress and the President Act to Prevent Sequestration

FASEB News Release

September 18, 2012

"A new report from the Office of Management and Budget (OMB) is a stark reminder of the perilous situation facing the medical research and

Continued pg. 20

MRICD Microscopist Retires

by Cindy Kronman, MRICD

After 54 years of service, Dr. John P. Petrali, a research anatomist and principal investigator, recently retired from the US Army Medical Research Institute of Chemical Defense.

"It's an honor for me today to acknowledge your remarkable career," said Col. Bruce Schoneboom, MRICD's commander, at Petrali's retirement luncheon on August 2. "Thank you for your service to the nation and to ICD, and for the legacy that you've built here and leave to us to continue to work on."



Dr. John Petrali early in his career at the MRICD. (photo MRICD)

Petrali began serving his country in the military and was stationed at Edgewood Arsenal in 1959 as a medical corpsman private. Prior to being drafted, he had earned a bachelor's in biology from Davis and Elkins College, Elkins, West Virginia, and a master's in preclinical sciences from Boston University, School of Medicine, Boston, Mass. At Edgewood, he was assigned to a predecessor lab of MRICD, where later, in 1962, he began his federal civilian career as a biologist in the Pathology Branch. There under the mentorship of Dr. Ludwig Sternberger, Petrali trained in electron microscopy, immunology and ultrastructural techniques. In 1969, he received his doctorate in anatomy and pathology from the Medical Graduate Program of the University of Maryland School of Medicine.

Petrali is credited with establishing an electron microscopy (EM) facility at the MRICD, recognizing the numerous ways that this technology could contribute to the research program. Additionally, Petrali has been instrumental in mentoring the next generation of MRICD microscopists, who have maintained the facility's state-of-the-art capability, to include the installation of a field emission scanning electron microscope, with X-ray microanalysis capability.

"Being part of the EM team has had a life-long impact," said Tracey Hamilton, who worked with Petrali since the early 1980s.

"John was all about education when I joined the team, and he encouraged me to earn my EM certification," continued Hamilton. "Everything I enjoy about EM today is a result of his mentorship, and I'll always remember how we saw things no one else will ever have the privilege of seeing, and we saw them together."

During his long career at MRICD, Petrali did more than provide support for other investigators. He designed and conducted primary research to detect the mechanisms of chemical threat agents and to

identify those that might predict or be used to diagnose injury. His work led to a number of breakthrough discoveries. He was one of the first to determine that the effects of nerve agents on the blood-brain barrier were dependent on convulsive activity and the first to define the sequential ultrastructural immunopathogenesis of blister formations in skin and cornea resulting from exposure to the chemical warfare agent sulfur mustard. These investigations are now considered benchmark studies for the fielding of anticonvulsants as a first line immediate treatment of nerve agent casualties and for the development of non-invasive immunodiagnostic strategies to confirm mustard gas exposure.



"John's name is synonymous with ultrastructural pathology at MRICD," said coworker Dr. William Smith, who initially worked for Petrali when he first arrived at the institute in 1968.

Addressing Petrali at the luncheon, Capt. Carl Smith, chief of the Cellular and Molecular Biology Branch, and Petrali's current supervisor, remarked, "From the perspective of a new scientist, your accomplishments are completely awe inspiring. Your contributions are immeasurable."

Petrali is the author of, or co-author on, more than 140 peer-reviewed scholarly articles, book chapters, and technical reports, as well as presentations at innumerable scientific and professional meetings. Several of his presentations have received best poster or best paper awards. He also holds two patents: "Free Floating Cryostat Sections for Immunoelectron Microscopy" and "Optical Device for Self Monitoring of Pupillary Response."

In addition to numerous performance awards, Petrali has received a Federal Executive Board Outstanding Career Service Award (1987) and the Senior Research Scientist of the Year Award, from the Defense Threat Reduction Agency, Joint Science and Technology Office, Chemical/Biological Defense Program (2006). Petrali is a fellow of the Microscopy Society of America and served as chairman of the National Certification Board for electron microscopy technologists (2006-2009). In 2010 he was awarded an honorary doctorate of science from his undergraduate alma mater, Davis and Elkins College.

Upon his retirement, Petrali received the Meritorious Civilian Service award, recognition as a distinguished member for the US Army Medical Department Regiment, an Army Medical Department 30-year medallion and an Army medallion, as well as several letters from senior leadership, including President Obama, thanking him for his service and wishing him well in his retirement. ♦

Hard to Fit? ECBC has the Easy Solution

When it comes to masking and special equipment for the Warfighter, one size does not always fit all. Some servicemen and women need custom tailored clothing and equipment, and not having that equipment can cost opportunities and even jobs. Cindy Learn, an engineer with Edgewood Chemical Biological Center Protection Engineering Division's Joint Service Respirator Sustainment and Test Technology Branch, recalls comforting a distraught servicewoman over the phone when her deployment was in jeopardy because of an ill-fitting mask.

"The standard protective mask did not fit the small frame of her face," Learn said. "A Warfighter cannot be deployed without a mask that fits properly and securely to the face."

Thanks to the Hard to Fit program, rejuvenated by Learn and others in her branch, that same servicewoman was able to obtain a protective mask specially adjusted to fit her face just in time for deployment.

"I remember her being so grateful we were able to help her get the right mask," Learn said. "Many do not realize there are infinite different shapes and sizes of faces, and having a protective mask that fits well is essential to any deployable mission. Not being able to get your hands on the right fitting mask could be a career ender for some."

No Warfighter Left Behind

With a team motto of "No Warfighter left behind," members of the Hard to Fit Program make it their mission to ensure all deployable personnel have the correct-sized mask. Hard to Fit is a G-8 funded program housed within ECBC's Protection Engineering Division. The program fits members of the Army, Navy and Marine Corps, as well as civilians who have mask requirements for their jobs.

Learn said current mask styles are designed to fit up to 95 percent of users, while the most current masks are designed for as many as 98 percent. The Hard to Fit program targets the remainder who need special-fit equipment to make a difference for their country. According to Learn, the group fit 100 people in 2011 and has fit 30 so far in 2012.

"Whether the need for a special fit mask is due to natural size or asymmetry, or an injury sustained that may have changed the contour of the face or head, our goal is to fit the user so he or she can be successful in the mission," Learn said. "We have issued only one Non-Deployable Memorandum since I started working with this program in 2006. We do our best to attain the mask with the best fit for those who need them."

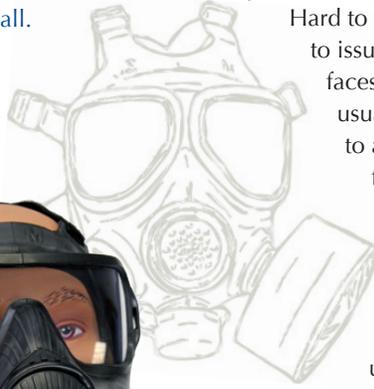
The Hard to Fit Program does not redesign a new mask for the servicemen and women who need fitting. Instead, each mask has removable nose cups and face blank sizes that each come in five and four sizes respectively. The group alters a mask to fit a particular

person's face by mixing and matching these parts. In some cases, the Hard to Fit Program has received approval from the Pentagon to issue masks from the U.K. to people with much smaller faces. The process of fitting and ordering the needed sizes usually takes two to three weeks, but the group is working to accelerate the process. Once a person obtains their mask from Hard to Fit, it is theirs to keep for life.

"Sometimes we get last minute requests from groups who are just about to deploy to come in and fit someone," said Joint Service Respirator Sustainment and Test Technology Branch Chief, Jim Church. "But usually people know before two or three weeks that they will need a different sized mask."

Organized Solutions

Hard to Fit's biggest customer base comes from Fort Dix Chemical School in New Jersey because it is a mobilization site and the mask is the last item to be checked before deployment. The program also gets a lot of requests from Fort Leonard Wood Chemical School in Missouri since it is a large training site. Church said the Hard to Fit Program has roots dating back to the late 1970s, when engineers would custom make someone a mask, which took time and money. "Later during Desert Storm in the early 1990s, people who could not be fitted with the M17 mask wore the M40 mask before it actually became the M40," Church said. "But since Cindy came on board, the program has become more formalized and more visible. I think we are definitely in a place to help more people than we ever were before."



Church said prior to Learn's involvement with the program, obtaining a mask with different sized parts was a more disorganized process where the person in need would ask around and whoever they talked to would see what they could find.

"Now, the program partners with TACOM to control the inventory and track usage, while we perform a quality check on all the masks. Improved organization and communication with

the Navy, Marines and Army allows the Warfighter access to the mask fit resources available with greater ease and quicker service, so the progress made since 2006 is immense," Church said. ♦

For more information about Hard to Fit, see Army Technical Bulletin TB 3-4240-341-20-1

Engineering's ADM Prevents Fire Related Injuries for Warfighters with Letterkenny Army Depot Partnership



Edgewood Chemical Biological Center (ECBC) Engineering's Advanced Design and Manufacturing Division (ADM) is partnering with the Letterkenny Army Depot (LEAD), near Chambersburg, Pa., to help save Warfighters from smoke inhalation and other fire effects of Mine Resistant Ambush Protected (MRAP) vehicle damages.

ADM and LEAD worked together to design and create a production plan for the Macaw Fire Suppression System (FSS) Mount. The Mount will allow for fire rescue supplies to be stored in an easily accessible place, so that Warfighters can use them when needed. ADM will begin fabrication of 10 prototype units "When an MRAP gets hit by a Rocket Propelled Grenade (RPG) or an Improvised Explosive Device (IED), many soldiers die from things like smoke inhalation, or getting trapped in burning vehicles," said Mark Schlein, ADM Division Chief. "When the rescue personnel would arrive to the scene, the equipment to get the Warfighters out of the MRAP and save their lives was hard to find. Sometimes the rescue personnel would be too late to help."

ADM and LEAD worked together to engineer a solution to create external locations on the vehicle where a backpack containing the Macaw Fire Suppression System and Halligan Pry Bar could be placed. That way, a fire rescue team could use these materials to contain the fire and get Warfighters out of burning vehicles.

"What we basically did was turn MRAP into a Fire Truck," said Elan Kazam, an Engineering Design and Analysis engineer and a lead

integrator for the Buffalo Vehicle team.

ADM was tasked with the project in 2006 as a result of ChemBio work the Division

was supporting for the Joint Improvised Explosive Device Defeat Organization. In 2006, members of the ADM team were tasked by the Joint Improvised Explosive Device Defeat Organization (JIEDDO) to work with several others to rapidly develop and produce the Buffalo Mine Protected Clearance Vehicle training surrogates, which aided in training combat units for IED defeat missions. After the surrogates were created, ADM engineers and the Buffalo Integration team created a Memorandum of Understanding in which members of ADM would be a part of the Buffalo Integration Team, which would make needed Capability Insertions (CI) to the Buffalo Vehicle. In 2010, the Integration Team needed to create a way in which fire rescue equipment would be accessible for the Buffalo. The team was able to create an effective solution for the vehicle.

"We came up with a good solution for the Buffalo along with a technical data package, and we were able to get tasked with building 90 of the fire equipment mounts with the help of Aberdeen Test Center (ATC)," Kazam said.



The work from the Buffalo led Joint Project Officer for MRAP to ask ADM to bid on an Urgent Universal Needs Statement (UUNS) in 2011, where the fire rescue mounts would be placed on the MRAP Cougar vehicle as well as the MRAP All-Terrain Vehicle (MATV). When the contract set out, Letterkenny and ADM were both bidding for the contract. Rather than bid against one another, Schlein took a collaborative approach and instead joined with the Army Depot to submit a co-bid on the work.



“We worked together on the Buffalo, so we knew that we would do an even better job working together on this task as well,” Schlein said.

To make life easier for the Warfighters, JPO MRAP requested that the fire equipment be mounted using a similar system for both the Cougar and MATV, a task that took creative thinking on the part of the engineers.

“The kit is just a backpack placed on the vehicle, but the challenge is every vehicle is built differently, so it was tough to find a common way to mount the FSS, but we were able to do it,” Kazam said. Kazam and his team were able to mount the FSS in a unique location that is a little high up, yet the group was able to design a lowering system to make the FSS easily accessible during an emergency. This type of innovation, is what Schlein said keeps the JPO happy with the work that ADM produces.

“At first the Marine Corp wanted to award the contract to a Marine Corp organization since the Cougar and M-ATV are Marine-used vehicles,” Schlein said. “But after they saw the type of work we do, and the type of innovative minds we have here, they ended up having us do the work because they know that we have the capabilities to really get the job done.”

“This project was one of those where the key was satisfying the customer, which eventually led to more opportunities for us and for the Warfighters,” said Lester Strauch, Engineering Design and Analysis Branch Chief.

Schlein hopes the good customer service can continue to forge meaningful work partnerships with other Army Depots as well as find new ways for ADM to save the lives of Warfighters.

“It is very interesting how this type of work can develop,” Schlein said. “Work like this helps maintain ECBC’s capabilities so when ChemBio missions come up in the future, we still have the engineering capabilities to tackle those.” ♦

scientific communities unless Congress and the President take action to prevent the pending sequestration.”

<http://www.faseb.org/Portals/0/PDFs/opa/9%2018%2012%20OMB%20Sequestration%20Report%20Reaction%20FINAL.pdf>

Sarepta Therapeutics’ Lead Therapeutic Drugs for Ebola and Marburg Viruses Receive FDA Fast Track Designation

Sarepta Therapeutics News Release

September 18, 2012

“Sarepta Therapeutics, Inc...today announced that the...(FDA) has granted Fast Track status for the development of its lead infectious disease drug candidates, AVI-7288 and AVI-7537, for the treatment of Marburg virus and Ebola virus, respectively.”

<http://investorrelations.sareptatherapeutics.com/phoenix.zhtml?c=64231&p=RssLanding&cat=news&id=1736031>

Dry-Run Experiments Verify Key Aspect of Sandia Nuclear Fusion Concept

Sandia News Release

September 17, 2012

“Magnetically imploded tubes called liners, intended to help produce controlled nuclear fusion at scientific “break-even” energies or better within the next few years, have functioned successfully in preliminary tests...”

https://share.sandia.gov/news/resources/news_releases/nuclear_fusion/

IU Chemist Develops New Synthesis of Most Useful, Yet Expensive, Antimalarial Drug

Science News

September 13, 2012

“In 2010 malaria caused an estimated 665,000 deaths, mostly among African children. Now, chemists at Indiana University have developed a new synthesis for the world’s most useful antimalarial drug, artemisinin, giving hope that fully synthetic artemisinin might help reduce the cost of the live-saving drug in the future.”

<http://www.sciencenewsline.com/articles/2012091316410014.html>

Radiation-Enabled Computer Chips Could Lead to Low-Cost Security Imaging Systems

Tel Aviv University News Release

September 12, 2012

“...Dr. Eran Socher of Tel Aviv University’s Faculty of Engineering is reconfiguring existing complementary metal-oxide-semiconductor (CMOS) chips designed for computers and turning them into high frequency circuits. The ultimate goal is to produce chips with radiation capabilities, able to see through packaging and clothing to produce an image of what may be hidden underneath.”

<http://www.aftau.org/site/News2?page=NewsArticle&id=17178>

Students Create Low-Cost Biosensor to Detect Contaminated Water in Developing Nations

Rebecca Howe

Arizona State University News Release

September 5, 2012

“...group of undergraduate students from Arizona State University is working to develop a low-cost biosensor – a simple device that would detect contaminated drinking water.”

https://asunews.asu.edu/20120906_waterbiosensor

MRICD GEMS Program Focuses on the Technologies of Chem-Bio Defense

by Cindy Kronman, MRICD

Once again this summer, the US Army Medical Research Institute of Chemical Defense opened up its labs and administrative space to host elementary and middle school students participating in the Army Educational Outreach Program (AEOP) GEMS, or Gains in the Education of Mathematics and Science. Building on last summer's accomplishments and evaluating what worked well and didn't work in their first year, MRICD GEM's coordinator, Christina Weber, and resource teacher, Linda McDonough, created two fun-filled weeks packed with activities that the participants really enjoyed.

"The GEMS program was some of the coolest stuff I've seen and experienced in my life," said a Bel Air sixth grader in his group's final day slide presentation.

A Fallston seventh grader, a second year GEMS participant, found GEMS to be "an awesome program that everyone can have fun in," and a Joppa sixth grader "liked all the labs."

"I learned a lot of new things that were interesting," she continued. "I enjoyed my time at GEMS!"

A goal this year for Weber and McDonough was to plan activities and experiments that related to MRICD's mission of developing medical countermeasures to chemical weapons and neurotoxins, specifically "to create a curriculum to revolve around the latest scientific methods in the chem-bio arena." Additionally, says Weber, they grouped the participants by grade, welcoming "beginning GEMS," students in the fifth and sixth grades the first week, 9–13 July, and "intermediate GEMS," seventh and eighth graders, the second week, 16–20 July.

"The intention is to bring kids in at 5th grade and continue to promote them up the ladder year after year," explains Weber. "The hope is that they eventually 'graduate' to the Science and Engineering Apprentice Program for high school students, and then to the College Qualified Leaders program. Both programs are currently active at MRICD, and we hope to have a steady stream of students in the AEOP system that will one day generate a pool of qualified applicants for civilian jobs."

Twenty-two students participated in the program each week. Two students in week one had participated last year, whereas eight from week two were returning participants.

In this year's labs, the week-one GEMS students learned about extracting DNA from a strawberry and then from their own cheek cells. They colored, labeled and assembled a paper model of the brain, before dissecting and identifying parts of a sheep's brain. They were taught the principles of DNA fingerprinting and the use of restriction enzymes to identify DNA from crime scenes and suspects. The DNA lab gave students the opportunity to learn the techniques of micropipetting, gel electrophoresis, and gel analysis. Other labs focused on chromatography and the structure of proteins, as well as on light microscopy, which was used with yogurt cultures to demonstrate the presence of microorganisms and the principles of disease identification.

Seeing what her DNA looked like was a highlight for a Havre de Grace fifth grader, while a fellow Havre de Grace fifth

grader preferred the chromatography lab, "because we got to split up the Hemoglobin and B12."

"My favorite lab was the microorganisms lab," said a Havre de Grace sixth grader, "because I got to look at a bunch of different living organisms found in yogurt and got to look at *E. coli*."



A high school student near peer mentor helps a sixth grader from Saint Margaret School in Bel Air dissect a sheep's brain in the brain anatomy lab. [Photo by Darrell Jesonis, MRICD]



A Meadowvale fifth grader from Havre de Grace examines microorganisms under an microscope during this summer's GEMS program at the USAMRICD [photo by Darrell Jesonis, MRICD]

During week two, the older GEMS students analyzed proteins using Bradford reagent and spectrophotometry and learned to navigate through DNA sequences on the National Center for Biotechnology Information website in a lab on bioinformatics. Additionally, in the pGlo bacterial transformation lab they learned techniques of sterile methods, micropipetting, streak plating and incubation techniques while transforming a non-disease-causing strain of *E. coli* with a plasmid that contained the gene GFP (green fluorescent protein) from jellyfish, which made the *E. coli* glow green under ultraviolet light. Using the techniques of polymerase chain reaction (PCR) and gel electrophoresis, students compared the DNA of plants that had been genetically modified with that of plants that had not been modified. The brain anatomy lab was also a part of the lab rotations for the older students, and its sheep brain dissection was selected by an Abingdon sixth grader as his favorite experience for his group's final presentation. An Edgewood seventh grader "enjoyed doing BIO-INFORMATICS!"

In addition to the labs, the students received a demonstration of electron microscopy from MRICD microscopist Tracey Hamilton and of

Continued pg. 22

three-dimensional computer modeling by Richard Sweeney. Members of the institute's Chemical Casualty Care Division, Laukton Rimpel, Angela Barrow and Staff Sgt. Gary Hall, showed off a training manikin, which is specially designed to exhibit several symptoms of nerve agent exposure, such as miosis, forehead sweating, lung sounds, oral cyanosis, heart rate changes and muscle twitching, and is used in the division's instructional courses to medical professionals and first responders.

"My favorite part of GEMS was looking at the manikin because I got to stick it with a fake needle," said an elementary school student from Aberdeen. A student from Bel Air appreciated the manikin's ability to "sweat, cry, and bleed." An Edgewood fifth grader preferred the 3-D modeling.

"It looked complicated," he said. "I liked the 3-D hemoglobin because it looked like a lava rock."

Again this year, the near peers, who mentor the GEMS students through their labs, activities and final presentations, were from the Science and Mathematics Academy (SMA) at Aberdeen High School, where McDonough is a teacher. Of the ten near peers, five had participated in MRICD's program last year.

"I feel very fortunate to be able to have students of that caliber helping to teach our GEMS participants for the second year in a row," said Weber. "I'm thrilled to maintain a strong relationship with the school."

New to the program this year was Jennifer Hamrick, a science teacher at Havre de Grace Middle School. Hamrick was hired to be the assistant resource teacher. In addition to observing the program, she helped to conduct the lab experiments.

Weber is already looking ahead to next summer and has been working with GEMS coordinators at the Army Research Laboratory at APG north to create an APG-wide GEMS initiative. The result, says Weber, will be one main application system, which she hopes will result in both sites being able to accept as many students as possible.

Given the success of this year's program, it's something the students can look forward to as well.

A Roland Park seventh grader not only found her experience to be "fun and educational," but added "I would like to come back next year!"

"The labs were very interesting and fun," concurred another seventh grader from Baltimore. "I would definitely recommend [GEMS] to others." ♦

Please visit our website at <http://usamricd.apgea.army.mil/> and our Facebook page at <http://www.facebook.com/USAMRICD>.

New Technology Allows Early Closure of NNSA Monitoring Station, Saves Taxpayer Dollars

The National Nuclear Security Administration (NNSA) today announced that it has closed its Transparency Monitoring Office (TMO) in Novouralsk, Russia ahead of schedule. The early closure was made possible by the successful use of U.S.-designed unattended monitoring technology in Russia and will save U.S. taxpayers approximately \$1 million.

The TMO provided a long-term capability for U.S. technical experts to monitor the conversion of Russian weapons-origin highly enriched uranium (HEU) into low enriched uranium (LEU) at the Ural Electrochemical Integrated Enterprise (UEIE) under the 1993 U.S.-Russia HEU Purchase Agreement. Although TMO is closing, U.S. monitors will continue to observe HEU downblending operations at UEIE during six annual "special monitoring visits." During these visits, U.S. experts receive and review Russian nuclear material accounting and shipping documents, observe HEU processing firsthand, perform measurements to confirm that HEU is weapons grade, and retrieve data from the U.S.-designed Blend Down Monitoring System (BDMS).

The BDMS performs continuous, unattended measurements of the HEU to LEU conversion process and is currently installed at UEIE and three other Russian facilities that downblend HEU under the 1993 agreement. The BDMS provides high-quality transparency monitoring data while reducing the impact of continuous, in-person U.S. monitoring at the Russian facilities. The successful installation and maintenance of the BDMS has allowed NNSA to gradually reduce and ultimately discontinue TMO staffing.

"The Transparency Monitoring Office has served a unique and important role as the first and only permanent U.S. monitoring presence in a Russian nuclear material processing facility," said NNSA Deputy Administrator for Defense Nuclear Nonproliferation Anne Harrington. "TMO monitoring activities have been highly successful, confirming the elimination of thousands of weapons worth of HEU. We are very pleased that NNSA and Rosatom have successfully transitioned from the need for a continuous in-person monitoring presence to periodic monitoring visits supplemented by data from our continuous, unattended measurement systems. This innovative technical approach makes monitoring in Russia more efficient while achieving cost savings for the U.S. taxpayer."

Under the 1993 HEU Purchase Agreement, Russia converts 500 metric tons (MT) of HEU from dismantled nuclear weapons into LEU fuel for commercial U.S. nuclear power plants. 500 MT of HEU is equivalent to 20,000 nuclear weapons. The program, popularly known as "Megatons to Megawatts," currently supports the production of enough nuclear fuel to power nearly one out of every ten light bulbs in the U.S.

The 1993 agreement contains transparency monitoring provisions to ensure that all LEU purchased by United States Enrichment Corporation, the U.S. commercial executive agent, is derived from dismantled Russian nuclear weapons and is used for exclusively peaceful purposes in the U.S.

Russia is on track to complete HEU to LEU conversion in Russia and the delivery of all downblended LEU to the U.S. in 2013. The early closure of the TMO is the first step toward the full completion of U.S. HEU transparency monitoring activities in Russia in 2013. ♦

View this press release online at <http://nnsa.energy.gov/mediaroom/pressreleases/tmo102212>



Historic CBRNIAC Information Resources

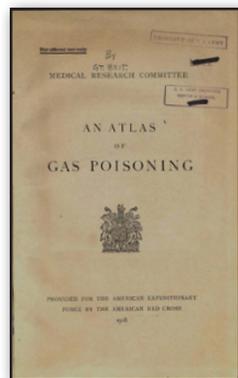
Jacobs, Morris B. **War Gases: Their Identification and Decontamination.** New York: Intersciences Press, 1942.

"In the war of today there is little distinction between combatant and non-combatant. The civilian is even more exposed to air attack than the soldier. The Army and Navy have their very important duties to perform. They cannot be expected to regulate and guard civilian life and property in addition to these duties. Indeed, such a step would merely serve to diminish their effective force for operations in the field. For these reasons, it is necessary for the civilian authorities to play an important role in safeguarding themselves and their community from the attacks of the enemy. The steady flow of supplies and material to the Army and Navy is the obligation of the civilian. This is, of course, dependent on the energy and morale of the civilian. It is one of the aims of the enemy to break that morale, diminish that energy, and create havoc and panic in the community by air and gas attack."

Abstract

CB-178650

An Atlas of Gas Poisoning. Rockville, MD: American Red Cross, 1918.



"The Medical Research Committee have made the necessary arrangements for the preparation and reproduction of the drawings shown in this Atlas."

Abstract

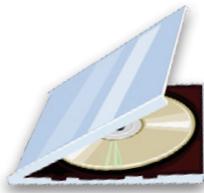
CB-034404

"Chemical Warfare." Nightline. ABC. 21 June 1988. Video.

"This episode of Nightline discusses the allegations that Iraq used poison gas in its war against Iran. Both the Iraqi Ambassador to the United States, Abdul-Amir Al-Anbari and the Iranian Ambassador to the United Nations, Mohammad Jafar Mahalati voiced their stories."

Abstract

CB-001417



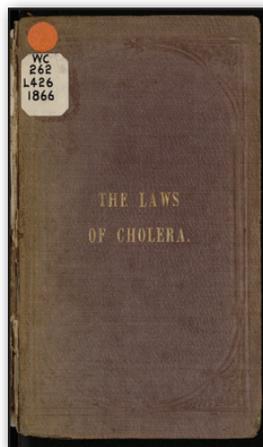
Operation Cue. Revision 1964. Washington, DC: Office of Civil Defense, 2004. DVD.

"Operation Cue" was the name given The Nevada Test in 1955, designed to explore the effects of small nuclear weapons upon buildings, towers and equipment of many kinds. The nuclear device used had an explosive force of 30 kilotons, equivalent to 30,000 tons of TNT. In this test, many of the structures damaged by the 30-kiloton bomb were approximately one mile from "Ground Zero." With a 20-megaton blast, they probably would be obliterated, and comparable damage would occur to a distance at least 8 1/2 or 9 miles. Therefore, while "Operation Cue" was valuable for research and test purposes, it does not reflect the full severity of today's larger thermonuclear weapons with their associated fallout hazard."

Abstract

CB-118427

The Laws of Cholera. London: Charles Knight, 1855.

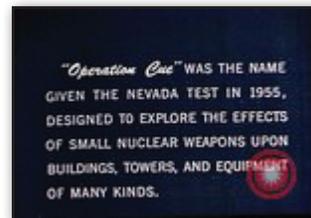


"It is now more than twenty years since this country experienced its first invasion from Asiatic Cholera; when its causes, nature, and treatment, were altogether unknown, except to the medical officers who had witnessed it in India, and those who had profited by their experience. Since that period, as might have been expected, it has been discovered that this epidemic, like every other form of epidemic disease, has lost much of its mysterious character, and is subject to conditions which regulate its appearance, its progress, and its departure, and which call for the study of all who are anxious

to escape the calamity in their own persons and families, and to assist in saving their country from the scourge, or mitigating its force. The investigations which have been conducted within the last twenty years into the causes of epidemic disease, have resulted in the most satisfactory demonstration of the truth, that, whatever may be their moral causes, they are traceable to conditions which are subject to human control, and that they disappear as those conditions are removed. Leaving it to others to interpret these pestilential scourges on higher principles, the writer of the following papers has endeavored to prove that the mission of this destroying angel is, to show the connection between physical impurity and deadly disease, and to summon individuals and governments to the grand work of sanitary reformation."

Abstract

CB-210640



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