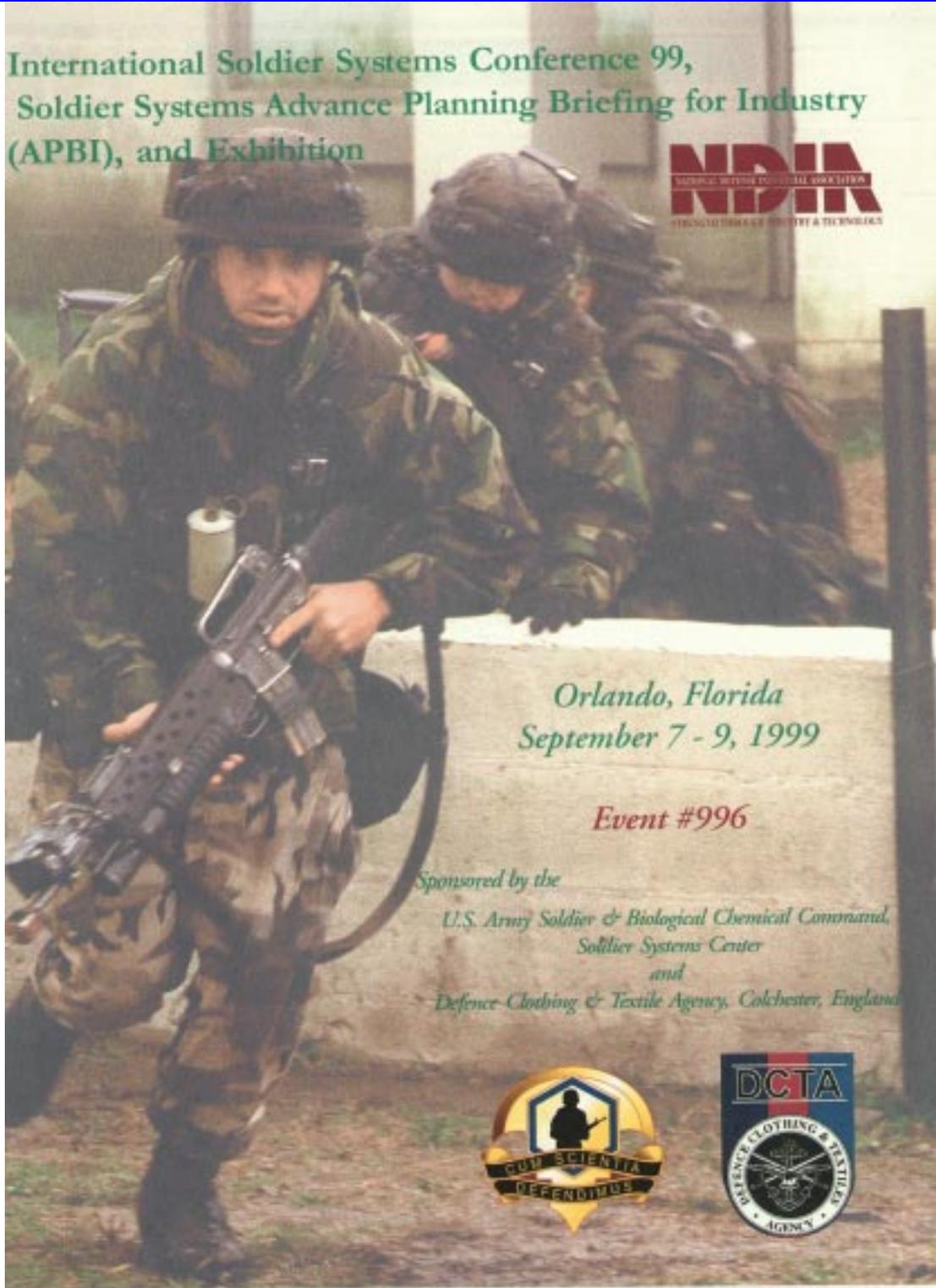




International Soldier Systems Conference 99,
Soldier Systems Advance Planning Briefing for Industry
(APBI), and Exhibition



Orlando, Florida
September 7 - 9, 1999

Event #996

Sponsored by the
U.S. Army Soldier & Biological Chemical Command,
Soldier Systems Center
and
Defence Clothing & Textile Agency, Colchester, England



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This journal is distributed to over 900 addressees throughout the Joint Services, industry, and academic R&D community and would be a good vehicle to publicize what is going on where you are. Please submit articles to Technical Director, Edgewood Chemical Biological Center, ATTN: AMSSB-RAS-C, Aberdeen Proving Ground, MD 21010-5424, or by electronic mail to the Corporate Enhancement Team at cet@sbccom.apgea.army.mil. All submissions are accepted at the discretion of the editor and are subject to editing. This journal is prepared for publication by the Corporate Enhancement Team:

Team Leader: Brenda C. Eckstein
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DISNEY WORLD™ IS THE SITE OF SBCCOM'S SOLDIER SYSTEMS ADVANCED PLANNING BRIEFING FOR INDUSTRY INTERNATIONAL SOLDIER SYSTEMS CONFERENCE 99

“There’s nothing Mickey Mouse about the International Soldier Systems Conference and the SBCCOM Soldier Systems APBI,” was heard time after time during the three-day event at the Disney World Hilton Resort in Orlando last September. SBCCOM partnered with the United Kingdom’s Defence Clothing and Textile Agency (DCTA) and the National Defense Industrial Association (NDIA). Participants hailed from France, Germany, South Africa, Australia, Finland, Canada, Denmark, Turkey, the Netherlands, and the United Kingdom.

The exposition included equipment, technology demos and capabilities by more than 45 exhibitors. Presentations on R&D programs and future contract opportunities for industry were presented at several sessions.

The objective of the combined event was to provide a platform for the attending Allied soldiers of the best in equipment, clothing, food, and protection in the world. SBCCOM also wanted to promote standardization and interoperability among NATO and other allied forces. The first day was a general session with presentations by keynote speakers and International Soldier Systems Program views. The second day was comprised of two concurrent sessions, one addressing Soldier Programs, and the other addressing Soldier Support Programs.

Major General John Doesburg, SBCCOM’s commanding general, welcomed the nearly 450 attendees, promising them what was to become a comprehensive showcase of international accomplishments for the defense and protection of the allied war fighter.

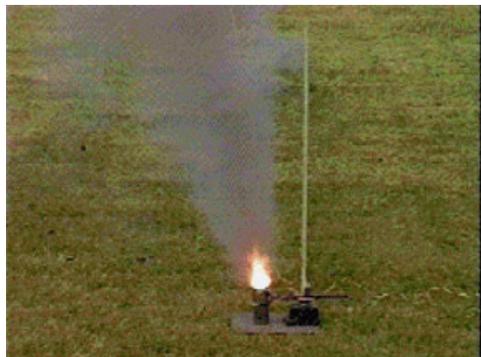


TEAM NBC DEFENSE:

(From left) Mr. Wayne Davis, Product Manager for Protective Masks, Mr. Rick Decker, Team Leader for the Joint Service General Purpose Mask, and SFC Lester Ashley were all key players in the exposition of CB defense systems at the conference.



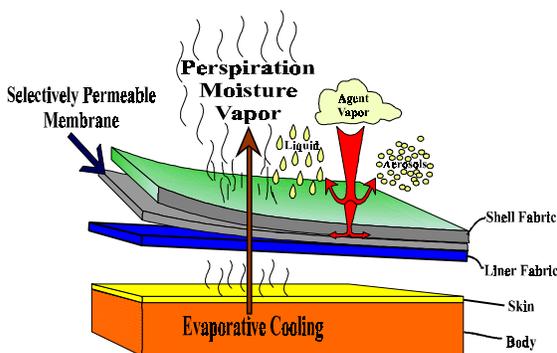
Major General John Doesburg, SBCCOM's commanding general, welcomed the nearly 450 attendees to the conference and APBI, promising them what was to become a *comprehensive showcase of international accomplishments for the defense and protection of the allied warfighter.*



EGAD: Mr. Joseph Domanico, team leader for pyrotechnics research for the Edgewood CB Center, presented his work on *Non-Lethal Pyrotechnical Techniques for Soldier Protection*. This paper included proposals for non-lethal ammunition containing Stingballs that offer an acceptable baseline, as well as pyrotechnics offering a wide variety of options: smoke, riot control agent, Dragon Eggs (crackling microstars), strobes, concussion, and whistles. Pictured in the inset is *EGAD* or his Expendable Ground Acoustic Device in action.

Also representing the CB defense R&D community was Dr. Eugene Wilusz, Chemical Technology Team, Natick Soldier Center, who presented his team’s work on “Lightweight Chemical Biological Protection for Future Soldier System.” His colleagues are Quoc T. Truong and Donald Rivin, also of the Natick Soldier Center.

***Science and Technology
for Percutaneous
Chemical Biological
Protection***



The objective of their work is to develop chemical/biological (CB) protective clothing systems which are lighter in weight and more comfortable than those currently in use without sacrificing protection. One novel approach to reducing the weight of CB protective clothing is based on the use of selectively permeable membranes. Membranes are used throughout the worldwide chemical industry for carrying out gas separations, in the purification of water by reverse osmosis, and in medical applications. In this work, thin membranes are coupled with lightweight fabrics to create material systems that serve as a barrier to hazardous chemicals while allowing moisture vapor transport (MVT). The intent is that the MVT will provide some measure of relief from heat stress through evaporative cooling.



LAND WARRIOR WITH NEW WEAPON:

Ms. Joann Brucksch, associate exhibit manager with the SBCCOM Edgewood CB Center, confirmed, "Size does matter." SGT Petrie of the TRADOC Systems' Manager-Soldier, definitely stood out in the crowd in the exposition hall.

The Land Warrior system includes everything the dismounted soldier wears and carries. The subsystems are Computer/Radio Subsystem; Integrated Headware Assembly System; Weapon Subsystem; Protective Clothing and Individual Equipment; and Software Subsystem.



JSLSCAD



Hamed Borhanian, a Turkish representative from Aspen Systems, Inc., discusses the merits of the JSLSCAD with Ms. Joann Brucksh, of the SBCCOM Edgewood CB Center. The Joint Service Lightweight Standoff Chemical Agent Detector is a state-of-the-art detection system designed to provide U.S. Forces with enhanced capability in detecting chemical warfare agents. It is a lightweight, passive and fully automatic detection system that scans the surrounding atmosphere for chemical warfare agent vapors. It furnishes on-the-move, 360° coverage from a variety of tactical and reconnaissance platforms at distances up to 5 kilometers. It is a second-generation system that significantly improves on the capabilities of the currently-fielded M21 Remote Sensing Chemical Agent Alarm. The JSLSCAD will provide war fighters with enhanced early warning to avoid chemically-contaminated battle spaces. When avoidance is not possible, the JSLSCAD will give personnel extra time to don Mission Oriented Protective Posture Gear.



Mr. David Caretti of the Edgewood CB Center presented his work on “Respirator Encumbrance Model (REM): Predicting Soldier Task Performance Based on Respirator Component Design.” Shown here at the Battelle Memorial Institute exhibit in the ISSC Exposition Hall is a demonstration of the software-based prediction model.



SBCCOM’s Program Manager for NBC Defense Systems exhibited many systems in their wide product lines of reconnaissance, detection, and protection equipment. (*From left:*) Ms. Georgianne Shepperd, Ms. Carol Hillen, and Mr. John “Skip” Richardson answered hundreds of inquiries about the fielded and future chemical-biological protective mask systems.



Distinguished British Co-Sponsors: The Defence Clothing and Textiles Agency (DCTA) delegation included (from left:) Ms. Paula Forshaw, Mr. David Congalton, Mr. Robert Horn, Mr. Steve Pike, Mr. Derrick A. Russell, and Mr. Ron Staples. At far right is Dr. Wayne Hobbs of the UK's Defence Science and Technology Organization. DCTA, located in Colchester, Essex, was formed in 1994 to assume responsibility for the procurement of clothing and textiles for all British Armed Forces and certain other UK Government organizations.

POC: Ms. Brenda C. Eckstein, Corporate Enhancement Team, Commercial (410) 436-2879, DSN 584-2879, or email brenda.eckstein@sbccom.apgea.army.mil



PULSED ELECTRIC FIELD PROCESSING PROMISES FRESHER FOODS FOR WARFIGHTER

The Natick Soldier Center has teamed up with academia and industry in a new Dual Use Science & Technology (DUST) project to advance nonthermal ration processing technologies, specifically pulsed electric field processing.

Natick's DoD Combat Feeding Program hosted a meeting to kick off the collaborative science and technology project in June.

According to Dr. C. Patrick Dunne, of the Combat Feeding Program's Advanced Processes team, pulsed electric field processing is an ideal pasteurization process for fresh or fresh-like fluid foods, such as orange juice, apple juice, apple cider, cranberry juice, and even carbonated beverages. The process can be used to enhance commercial food processes as well as to extend high-quality shelf life of refrigerated products.

Dunne explained that the pulsed electric field process inactivates the vegetative forms of microorganisms without adversely affecting product quality. This process may be used to produce shelf stable acid foods, where bacterial spores are not a problem.

Scientists involved in the DoD Combat Feeding Program at Natick work continuously to improve the variety, taste, nutrition, and shelf life of combat rations developed for the nation's military personnel. The pulsed electric field process will enhance quality of life for the war fighter by improving combat ration nutrition with pumpable, nutrient-dense items, such as dairy products packaged in convenient flexible packaging.

According to Dunne, the purpose of the collaboration is to conduct a series of commercial feasibility studies on pulsed electric field technology with a variety of military and commercial product candidates. The project's goal is to verify the technical readiness and economic viability of pulsed electric field technology in a

commercial operation. The result will be the development of high quality commercial products with potential dual use as combat rations.

The project consortium is led by Ohio State University, with Professor Q. Howard Zhang of the Department of Food Science and Technology serving as the principal investigator. Other consortium members include PurePulse Technologies, Inc., Tetra Pak, American Electric Power, General Mills, Kraft Foods, Nestle R&D, Americal Foods, and Hirzel Canning.

As a result of the effort, the United States will maintain the lead in pulse electric field technology. More importantly, U.S. troops, as well as civilians, will enjoy fresher, safer, and more nutritious food products.

POC: Public Affairs Office, U.S. Army Soldier



This yogurt dessert is one of the many pulsed electric field prototype products being developed by academia, industry, and the DoD Combat Feeding Program.

Systems Center, Commercial (508) 233-4300 or
DSN 256-4300.



CRITICAL REAGENT REPOSITORY

The Edgewood Chemical Biological Center recently opened the Critical Reagent Repository. The Joint Program Office for Biodefense established the repository to store and validate all biodetection reagents for the Department of Defense. This facility includes a uninterrupted coolant, remote facility monitoring, backup generator, secured access, and a validation laboratory for quality

assurance and quality control on reagents for fielded systems.

In addition to large scale fermentation, the CRR established a Hybridoma Production Laboratory that will support validation activities. This program ensures standardization of methods, accessibility of information, and validation of processes and products.

POCs: Dr. James J. Valdes, Chief Scientist for Biological Sciences at Edgewood CB Center (james.valdes@sbccom.apgea.army.mil) or Dr. Dave Cullin, Program Manager, Critical Reagent Repository (CRR). The CRR (Cullind@jpobd.osd.mil), Advanced Concepts Requirements (ACR) and Research, Development and Acquisition (RDA) Domain simulation to evaluate equipment needs for a future military combat organization.

PROJECT SAFEGUARD

Project Safeguard provides an airborne capability to detect, quantify, and map gaseous chemical clouds. In July, we briefed the Environmental Protection Agency's (EPA) Chief of Staff on Project Safeguard. EPA Region 7 participated in an open house hosted by the Safeguard team and coordinated by the Army Office of Congressional Legislative Liaison in Olathe, Kansas, in July. EPA has interest in acquiring this technology as an emergency response monitoring tool to aid in forensic investigation of chemical accidents.

POC: Dr. Robert T. Kroutil, Commercial (410) 436-1709, DSN 584-1709



WEB SITE ON LINE

Please visit SBCCOM's world wide web. Our url address is:

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

SATISFACTION GUARANTEED

The Product Manager for Smoke/Obscurants continually works with the fielded units to provide operation, maintenance, and supply support help. Our customers provide valuable feedback which our logistics personnel use to influence design recommendations and improvements for the M56 Coyote and M58 Wolf systems. Both systems deliver visual and infrared screen smoke to protect our armed forces from detection and destruction by enemy reconnaissance, intelligence, surveillance, and target acquisition threats. Our ultimate goal is to provide the best possible equipment for our soldiers in the field. We strive for customer satisfaction and we work hard to guarantee this satisfaction.

To this end, the Product Manager, Smoke/Obscurants, requested the Operational Forces Interface Group (OFIG), located at Natick, to conduct a survey on the performance of the M56 and M58 smoke generator systems. OFIG prepared questionnaires with help from the M56 and M58 logistics teams. The goal of this survey was to obtain feedback on the overall performance of the M56 and M58 smoke generator systems. The site selected to conduct the survey was Fort Hood. Thirty-five M58s and twenty-four M56s have currently been fielded to three Fort Hood units.

Feedback on the operation of the M56, a HMMWV-mounted smoke generator, was provided by the 181st Chemical Company. A strong relationship was established between the 181st Chemical Company and PM Smoke/Obscurants during the January 1999 fielding. The constant communication has led to the 181st being selected as the test unit to prove-out the Driver's Vision Enhancer for use on the M56 during a March 2000 Customer Test.

The 46th Chemical Company, responsible for twenty-eight systems, completed questionnaires on the M58 Wolf. The M58 uses the same smoke

generator as the M56 Coyote but integrates it into a modified M113A3 chassis. A thermal viewer, the AN/VAS-5, provides nighttime and "see through smoke" driving capability; and an M8A3 provides NBC contamination-filtered air to crew members. The 68th Chemical Company operates the remaining seven Wolf Systems at Fort Hood. They are not represented in this survey.

The overall hardware performance and quality on both smoke systems received high ratings. Also, the overall performance on the difficulty of performing maintenance on both smoke systems was considered somewhat-to-moderately easy. The one area on both smoke systems that required improvement was the lack of space for the crew and combat gear. This area is being looked into and viable solutions are being researched and are forthcoming.

In conclusion, the M56 and M58 systems are proving to be vital in our Armed Forces. Soldiers rated the ease of performing various mission-related tasks as being between "moderately easy" to "very easy." This ease of operation and user friendliness ensure the continued use and benefit of these systems to our soldiers. They are continually being looked at for improvement so that the current reliability of both systems continues to be an asset for the soldier in the field. The suggestions/comments provided by the soldiers through these questionnaires are being considered as changes on the future improved systems currently being designed by PM Smoke/Obscurants.

POC: Ms. Carol Sweatt, Commercial (410) 436-4083, DSN 584-4083, or email carol.sweatt@sbccom.apgea.army.mil



JOINT-SERVICE TEAM DEVELOPS NEW PROTECTIVE MASK

by Jim Garamone
American Forces Press Service

ABERDEEN PROVING GROUND, Md. – It will be the lightest, most comfortable protective mask service members have ever used, Army Col. Steven V. Reeves said. Reeves, project manager for nuclear, biological and chemical defense systems, said the Joint Service General Purpose Mask will replace five different masks used by soldiers, sailors, airmen and Marines.

Impetus for the new mask was the Gulf War. “We set up a repair facility and we had soldiers, sailors, airmen and Marines bringing us seven different types of masks,” said Rick Decker, mask project team leader. “We had a heck of a job trying to establish the logistics trail, getting the spare parts for each mask.”

Military officials said the services experience the same type of environment, so there really was no need for each service to develop its own mask. The joint-service mask, being developed at the Army's Soldier and Biological Chemical Command here, will protect wearers from battlefield concentrations of chemical and biological agents and toxic industrial chemicals. The services will buy 3.5 million masks.

Reeves said joint-service officials sought to make the mask more comfortable. It's lighter than the current M-40 mask and easier to see through than previous masks.

“Unlike some prior masks that had binocular eyepieces, the joint-service mask has a single eyepiece,” Reeves said. “This gives the service member much greater field of view. We're testing this vision piece to ensure it will interface with night vision equipment, any weapon-sighting systems, as well as individual weapons.”



Soldier Models Joint Service General Purpose Mask

Photo by Jim Garamone

He said the filter technology is probably the biggest and most radical change advancement. One team objective is to reduce breathing resistance by half, he said. This means it won't be so tiring to use because it will take less work to breath.

“There is a counterpoint,” Reeves said. Joint forces operating in urban environments could be exposed to toxic industrial chemicals, he noted. The traditional mask protection in such arenas is to use denser filters, which makes it harder for wearers to breathe. He said the team is committed to creating an extra-strength filter with no breathing penalty.

The M-40 series of masks used today by the Army and the Marine Corps is the best in the world. Reeves said. It protects users against current battlefield chemical and biological threats, but not industrial chemicals, he noted. Another drawback, he said, is the NATO standard filter canister that be mounted to either side of the mouth. The new mask integrates the filters back into the mask, Reeves said.

Other aspects joint service planners are designing into the mask will make it easier to maintain. "One unique aspect of the filter is something we're calling the 'service-life indicator,' Reeves said. "We're going to embed a small color patch in the mask filter – green will mean the filter is ready to go; red means you need to replace the filter." The planners got the idea from similar indicators used on toothbrushes.

Another idea is to color-code parts inside the mask that need maintenance. "We're making the valves blue. That'll make it easier for service members and those maintaining the mask," Decker said. "[The valves] don't have to be black or green; we're not camouflaging the inside of the mask." The one-piece design makes the mask easy to clean, he added.

Reeves said the team hopes to hold the cost to \$50 per mask. At that low price, the mask is virtually disposable if it becomes unserviceable, he said.

POC: Mr Richard W. Decker, II, Commercial (410) 436-6024, DSN 584-6024, or email rwdecke@apgea.army.mil

Designers are testing the mask with soldiers, sailors, airmen and Marines. Decker said tests are planned aboard an Aegis cruiser; at Eglin Air Force Base, Fla.; during a Marine Corps amphibious exercise at Camp Lejeune, N.C.; and at Fort Polk, La.

Finally, there is the new issue of homeland defense. The mask design is intended to be certified by the Occupational Safety and Health Administration and the National Institute on Occupational Safety and Health, Reeves said.

"So as we start looking at the terrorist threat around the United States, we also had to have a mask that first responders -- police departments and fire departments -- could also use," he said. "Many states and counties require OSHA and NIOSH certification for lifesaving apparatus."

Related Site of Interest: Aghast Mask
<http://www.defenselink.mil/news/Sep1999/n09091999_9909093.html>



Fieldings

 <p><i>M56 Smoke Generator</i></p>	<p>11th Cml Co., Ft. Lewis, WA 371st Cml Co., Ft. Jackson, SC</p> <p>POC: Randal H. Loiland AMSSB-PM-RSM-M, DSN 584-2806</p>	<p>Sep 99 Nov 99</p>
 <p><i>M58 Smoke Generator</i></p>	<p>APS5, Kuwait</p> <p>POC: Peter F. Annunziato AMSSB-PM-RSM-L, DSN 584-2362</p>	<p>Oct 99</p>
 <p><i>M157A2 Motorized Maintenance Work Order (MWO) Retrofit Kit</i></p>	<p>342th Cml Co, USARC, Ft. McCoy, WI</p> <p>POC: Janice A. Nordin AMSSB-PM-RSM-V, DSN 584-2838</p>	<p>Sep 99</p>
 <p><i>M157A2 Mechanized Maintenance Work Order (MWO) Retrofit Kit</i></p>	<p>140th Cml Co., California NG, Ft. Irwin, CA 135th Cml Co., Illinois NG, TBD</p> <p>POC: Janice A. Nordin AMSSB-PM-RSM-V, DSN 584-2838</p>	<p>Nov 99 Dec 99</p>
 <p><i>Light Vehicle Obscuration Smoke System (LVOSS)</i></p>	<p>Various Inf/MP Div., Cbt Spt Cos., Ft. Bragg, NC Various MP/Hvy Divs., Cbt Spt Cos., Ft. Hood, TX Various Inf AASLT, 101st MP Div, and 194th Cbt Spt Co., Ft. Campbell, KY</p> <p>POC: Henry St.Pierre AMSSB-PM-RSM-R, DSN 584-5527</p>	<p>Sep 99 Nov 99 Nov 99</p>

 <p><i>Biological Integrated Detection System P31</i></p>	<p>5th Platoon, 7th Cml Co., Ft Polk, LA TRADOC, Ft. Leonard Wood, MO (Training only)</p> <p>POC: Bruce W. Jezek AMSSB-RBD, DSN: 584-3351</p>	<p>Oct 99 Dec 99</p>
 <p><i>M93A1 FOX/MICAD</i></p>	<p>USMC, Camp Pendleton, CA</p> <p>POC: MAJ John M. O'Regan AMSSB-PM-RNN-T, DSN 584-6551</p>	<p>Oct-Nov 99</p>
 <p><i>M40A1/M42A2 Mask</i></p>	<p>Tennessee NG, Nashville, TN Michigan NG, Detroit, MI 70th RSC, Yakima, WA Ohio NG, Columbus, OH Alaska NG, Anchorage, AK Maryland NG, Baltimore, MD Virginia NG, Newport News, VA North Carolina NG, Charlotte, NC Kansas NG, Ft. Riley, KS</p> <p>POC: MAJ John M. O'Regan AMSSB-PM-RNN-M, DSN 584-6551</p>	<p>Sep 99 Nov-Dec 99 Nov-Dec 99 Nov-Dec 99 Nov-Dec 99 Feb 00 Feb 00 Feb 00 Apr 99</p>
 <p><i>M45 Aircrew CB Protective Mask</i></p>	<p>2nd ID, Camps Casey and Stanley, Korea 101st AA, Ft. Campbell, KY TF 160th SOAR Aviation School, Ft. Rucker, AL Chemical School, Ft. Leonard Wood, MO 82nd AA, Ft. Bragg, NC North Carolina NG, Raleigh, NC South Carolina NG, McEntrye, SC 3rd ID, Hunter Army Airfield</p> <p>POC: MAJ John M. O'Regan AMSSB-PM-RNN-M, DSN 584-6551</p>	<p>Oct 99 Nov 99 Nov 99 Dec 99 Jan 00 Mar 00 Mar 00 Mar 00 Apr 00</p>

 <p><i>M41 Protection Assessment Test System</i></p>	<p>2nd ID, Camp Casey, Korea</p> <p>POC: Michael E. Busch AMSSB-REN-EM, DSN 584-5773</p>	<p>Oct 99</p>
 <p><i>Improved Chemical Agent Monitor</i></p>	<p>1st CAV, 4th ID, Ft. Hood, TX III Corps, Ft. Hood, TX</p> <p>POC: MAJ John M. O'Regan AMSSB-PM-RNN-M, DSN 584-6551</p>	<p>Feb 00 Feb 00</p>
 <p><i>M22 Automatic Chemical Agent Alarm</i></p>	<p>4th Cml Co., Camp Casey, Korea Special Forces, Okinawa, Japan Special Forces, Stuggart, Germany 82nd Airborne DIV, Ft. Bragg, NC</p> <p>POC: MAJ John M. O'Regan AMSSB-PM-RNN-A, DSN 584-6551</p>	<p>Oct 99 Oct 99 Nov 99 Mar 00</p>

END ITEM UPDATES:

NBC DEFENSE EQUIPMENT

Program Managers assigned to the Office of the Program Manager for NBC Defense Systems submitted proposals and were awarded Operating and Support Cost Reduction (OSCR) funding in the amount of \$356K during FY99. OSCR funding for modifications to the M1 Chemical Agent Monitor (CAM) and the M22 Alarm, Chemical Agent, Automatic, represent nearly 40 per cent of the funds made available to SBCCOM by AMC. It is estimated that OSCR savings generated by funding and implementing these projects will be over \$20.2M during the next 5 years.

Reconnaissance, Detection, and Identification –

Automatic Chemical Agent Alarm (ACADA), M22 – The State Department is preparing purchase orders for three M22 ACADAs, accessories, and spare parts. The ACADA team will modify the existing production contract and Nuclear Regulatory Commission (NRC) registration to support this effort. The NRC has agreed to expedite the licensing application. The State Department is also purchasing additional CB equipment through SBCCOM to equip their CB response personnel.

Chemical Agent Monitor (CAM) – The Value Engineering Change Proposal on the Printed Circuit Board for the CAM released a performance specification (EA-PRF-2168) for the item. Previously, the Printed Circuit Board was built to a Technical Data Package design that contained proprietary parts. The ICAM contractor, Intellitec, developed and tested the performance specification in order to use current and future technology. The Technical Data Package design was limited to component availability; the new design can be programmed during production and eliminate the need for special test equipment. The contract is being modified to incorporate this change proposal, resulting in concurrent cost savings of \$157, 857.54 against SBCCOM spares contract DAAE20-97-C-0213.

Joint Warning And Reporting Network (JWARN) – In August, JWARN support was provided to the Ulchi Focus Lens (UFL) exercise. The UFL is a combination of live and simulated activities where most of the live maneuvers took place in Korea and most of the simulated command and control operations occurred in Fort Hood. An understanding of how JWARN Phase I was used in NBC Operations, as well as how JWARN can be improved, was gained to improve future NBC Operations requirements in the digital battlefield.

Advanced Technology Demonstration Biological Aerosol Warning System (BAWS) –

- In August, members of SBCCOM's Advanced Technology Demonstration (ATD) Team and the Maneuver Support Battle Laboratory, Fort Leonard-Wood, MO, participated in a CONUS-segment of Exercise Ulchi Focus Lens at the Yakima, WA, Fire Range. This yearly exercise is sponsored by the Special Operations Forces Command at Fort Lewis, WA. The BAWS was used in conjunction with simulated biological agent attacks to alert/warn deployed special operations forces of impending hazards.

- During the last week in August and the first week of September, members from SBCCOM's ATD Team participated in the Joint Expeditionary Force Exercise (EFX) in Indian Springs, NV. The purpose was to technically demonstrate the force protection capability offered by the BAWS to early deploying forces. The sponsor for this exercise was the USAF Force Protection Battle Laboratory, Lackland AFB, TX.

Individual Protection –

Mask Surveillance – The FY97-98 mask surveillance report was reviewed by the DoD Inspector General, modified, and coordinated with the other service members who took part in the surveillance program. Basic conclusions are that mask maintenance is poor and the condition of fielded masks is poor due to lack of maintenance. The report recommends that mask surveillance continue, that senior operational personnel and commanders be made aware of the results, and that processes be considered to improve mask maintenance in the field. The report is being printed and will be sent to the Joint Service Materiel Group and Joint Service Integrated Group.

M40 Series Mask –

- A maintenance advisory to remove the faceform packaging support to the field is on hold pending a review by the USMC. The USMC may wish to continue to use this item. If so, we may revise the joint manual to allow the USMC to continue to use it and the Army to remove it.

- An Engineering Change Proposal was prepared to reinforce the M40A1 and M42A2 Masks' carrier designs. The proposed change reinforces the carrier by introducing a box stitch to the hook and pile materials; adding a bar tack requirement to the straps; and increasing the overall stitches per inch requirement at the final assembly of the carriers. This change was in response to feedback received from the field. The proposed change is expected to be incorporated into the current spare part contract for the carriers.

M45 Mask – The Faceblank Assembly Special Packaging Instructions were revised to correct marking requirements and increase the shipping container size and type to accommodate two unit packs instead of four.

M48 Chemical-Biological Apache Aviator Mask – A contract was awarded to Micronel, Inc., Frederick, MD, for the rework of 5,650 Lightweight Motor Blowers. The motor blowers will be shipped from Pine Bluff Arsenal, AR, to Frederick, MD, and return. This rework corrects a latent defect in the blower housing and is being conducted in accordance with the warranty clause in the original production contract. The motor blowers will be disassembled, reworked with new cover shells and housing gaskets, inspected, and tested to the original production requirements.

XM50/XM51 Joint Service General Purpose Mask (JSGPM) –

- A contract for eight additional SMARTMAN agent test fixtures was awarded to ILC Dover, Inc. Dugway Proving Ground was impressed with this fixture and provided the Office of the Program Manager for NBC Defense Systems with funding to procure five of these items to support their activities. The remaining three fixtures will be used by the Chemistry and Physiology Laboratory to support JSGPM testing. This fixture is rapidly becoming the definitive fixture for agent testing..

- Evaluation of the source selection proposals is still in progress.

Collective Protection –

200 CFM Filters – The performance specifications for the 200 CFM Particulate Filter and 200 CFM Filter Set are in the final stages of completion. These specifications will incorporate the requirements for the Navy HEPA media design for the particulate filter. This new design will double the life of the filter set.

M28 Collective Protection Equipment –

- The production contract with Intellitec is proceeding on schedule. The Air Force Type II quantities were delivered with the exception of some add-on quantities that are being negotiated. The first Chemically Protected Deployable Medical System Hospital Unit Base has been delivered.

- Since the M28 system has two different configurations, an Air Force and an Army, the Technical Manual for both configurations needs to be verified. The USAF has agreed to perform their verification during a fielding. The Army is looking at the possibility of conducting the verification for their configuration with current stock at an Army installation. If both sites can perform these verifications, substantial savings can be achieved. The completion of these verifications needs to be done by the end of January 2000.

Fixed Installation Filters –

- Pine Bluff Arsenal (PBA) submitted a proposal for the use of an alternate tubing on the 1200 CFM filter housing that promises to achieve a very significant cost savings. The Fixed Installation Filter Team is working on a test plan for proving out the design modification to verify its effectiveness.

- Filters from PBA's first production lot of the baffled Z design were tested at the Edgewood CB Center for lot acceptance in August. All were extremely good, with several lasting 2 hours (minimum requirement for the agent simulant challenge is 60 minutes). This lot is designated for the Air Force's Pacific Air Command.

Decontamination –

M17 Decon Apparatus – The Command's Decon Team continues to work with the U.S. Marines and the Tank-Automotive Command's Procurement on an Alpha Contract for a 2-cycle heavy fuel engine for the M17 Decon Apparatus. The engine designer is 2 Stroke International, and date for award of the \$6 million contract was September 1999.

Individual Equipment Decontamination Kit M295 – The shelf life for the M295 Kit, manufactured by Truetech Corporation, has been extended by 2 years. The kits were due to start expiring in September 1999 but successfully passed surveillance testing. Since there is a large quantity of these kits in the field, the extension will save the Army significant amounts of money; for example, USARPAC has over \$1 million worth of these kits in their inventory, which now will still be usable.

Sorbent Decontamination Systems (SDS) –

- The official nomenclature for the new sorbent applicator system that will replace the M11 and M13 decontamination apparatuses is **Decontamination Apparatus: Sorbent Applicator, XM24.**

- Human engineering testing of the new sorbent applicator determined that the amount of sorbent provided is more than enough, particularly when compared to the M11.

- The applicator also passed rough handling and packaging tests.

Joint Modular Decontamination System – The initial production contract (an option from the development effort) for the M22 High Pressure Washer was awarded to the CENTECH Group, Inc., of Arlington, VA. Work will be performed at their new plant in Hugo, OK.

Decontaminating Solution 2 (DS2) – A **Maintenance Advisory Message** on DS2 was sent out on 10 August 1999. The message advises the user community that all DS2 has exceeded the shelf life period (2 years extendable) and has been placed in condition code D (serviceable, awaiting test modification). Action is underway to test the DS2 to ascertain the feasibility of extending the shelf life. Test results already received indicate that all DS2 is passing the reactivity tests, meaning it will neutralize chemical agents as designed. However, testing must be completed prior to returning the DS2 to condition code A. Units are being advised not to dispose of the DS2 prior to receipt of notification that their lots have failed testing. Lot testing priority will be given to DS2 in the hands of the war fighters.

SMOKE SYSTEMS

In August, Pine Bluff Arsenal (PBA) arranged a tour of their facilities for LTC Billy Welch, Product Manager for Smoke/Obscurants. LTC Welch met with COL Chapman, Commander, PBA, and was briefed on the history of PBA and the status of PM Smoke managed items.

Coyote Smoke Generator, M56 –

- The M56 team is coordinating a 12.7-foot simulated air drop test of the M56/DVE system with Natick personnel. We are planning on conducting the test in November-December at Fort Bragg with a fielded M56 system.

- Robotic Systems Technology retrofitted 24 M56 systems with new fuel tanks prior to fielding to Fort Drum. The fuel tank is made out of a different material and is expected to resolve a previous leakage problem.

- RST delivered the 202nd M56 system under the current contract in August. This is 72% of the total contract quantity of 279 M56s now negotiated into the contract. Negotiations for FY00 M56 quantities continue.

Wolf Smoke Generator System, M58 –

Pallets of infrared (IR) material were delivered to Fort Riley. Office of the Product Manager for Smoke/Obscurants provided refresher and/or IR module training to the 172nd Chemical Company. With this training, the 172nd becomes the first active army unit trained and capable of using the IR screening material in the Continental United States.

Generator, Smoke, Mechanical: Pulse Jet, M157A2 – Two contracts were awarded to Bell Machine Products, Inc., for M157A2 modification kit components. One contract is for 70 control panel brackets, and the second contract is for 90 engine head wrenches. In September, the M157A2 Team packaged and delivered 26 engine head wrenches to New Cumberland Army Depot to support the Item Manager.

Light Vehicle Obscuration Smoke System (LVOSS) – The LVOSS New Materiel Release package was distributed in July, and input was requested by August 17th. LVOSS is applying for a full material release. The release covers the M7 Discharger, M90 Grenade, the M304, and M310 Installation Kits.

Grenade, Discharger, Anti-Riot, Irritant, CS, XL96E1 and Grenade, Discharger, Anti-Riot, Practice, XL97E1 –

- Headquarters, DA, Office of the Judge Advocate General completed the legal review required by DOD Instructions and Army Regulations. The XL96E1 is consistent with the international law obligations

of the U.S. including the law of war. Since the XM97E1 (training round) does not have an intended effect of injuring, destroying, or disabling enemy personnel, materiel, or property, it is not a weapon. Further review of the XL97E1 is not necessary.

- U.S. European Research Office, UK, is awarding a contract to CBD Porton Down, UK, for configuration management support. PM Smoke is funding the contract with Foreign Comparative Test funds. PM Smoke and Porton Down jointly developed the XL96 & XL97 grenades.

Non-Lethal Grenades XM98/99 –

- The XM98/99 Engineering Design Test (EDT) was scheduled for August-September in support of a final design review prior to build of Production Qualification Test grenades.

- The U.S. Army Insensitive Munitions Board was briefed on the XM98/99 design and the proposed Insensitive Munitions testing. The Board concurred with the proposed test matrix that substitutes Department of Transportation Hazard classification tests for the Insensitive Munitions tests, where applicable, to save cost and schedule by eliminating test replication.

- The Acquisition Decision Memorandum for the XM98 and XM99 Non Lethal Grenades was approved in July. The program will proceed into a combined phase I/II development, leading to a Milestone III in Dec 00.

M8 TA Smoke Pot – The Smoke Pot Materiel Change Committee and the user decided to proceed with a Conditional Materiel Release Action for the current M8 Smoke Pots; this action was required in order to provide the Chemical School with smoke pots to use for training at Fort Leonard Wood beginning in FY00. Secondly, the decision was made to return the M8 Smoke Pot to development status to resolve the various design deficiencies.

GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM (GIDEP):

Through GIDEP, SBCCOM received 11 Urgent Data Requests from various sources within the government and private sector. We were able to respond to seven and received kudos for our efforts. GIDEP is a partnership between Government and Industry teamed to share technically valid, fact-based information. GIDEP is the DOD's center for acquisition, management, and dissemination of Diminishing Manufacturing Sources and Material Shortages.

STANDARDS/SPECIFICATIONS:

Reviewed Federal Specifications **NNN-D-345**, Platinum Dish, 11 Jan 63; and **NNN-M-560**, Mortar and Pestle, 26 Oct 62. The review included a market research in which a Multiple Award Schedule covering the Federal Supply Class (FSC) for the above items was found. In accordance with Military Specification Reform Policy Memorandum 98-7, DoD-prepared Federal specifications, the above Federal specifications should be canceled since they are no longer needed for procurement.

Reviewed Federal Specification **GG-B-671**, Breathing Apparatus, Self-Contained, 28 Jun 88. In accordance with Military Specification Reform, Policy Memorandum 98-7, DoD-prepared Federal Specifications, subject document should be canceled since it is no longer needed for procurement.

Reviewed Federal Specification **O-E-751**, Petroleum, Technical-Grade, dated 11 April 1956, for possible conversion into a Commercial Item Description.

Completed the initial release of Performance Specification, M37 Manually Carried Riot Control Agent Dispenser, **EA-PRF-2124**.

Completed a draft of a new detail specification, **EA-DTL-2201**, Headharness Assembly. The draft is needed for an upcoming procurement action and was based on input from the Product Engineering Office (PEO) at Rock Island. The specification has been provided to the PEO for review and comment.

Initiated a market investigation regarding a potential Item Reduction Study in FSCs 1040, Chemical Weapons and Equipment; and 1365, Military Chemical Agents.

Information was provided to the Defense Personnel Support Center regarding out-of-stock procurement items in FSC 6640, Laboratory Equipment and Supplies. Recommendation was made that most items can be procured through commercial catalogs in accordance with Military Specification Reform.

Filter media medium grade HB-7583 from the Hollingsworth & Vose Company met all of the criteria for the certification test in accordance with **ASME AG1**, section FC (replace MIL-P-51079D). The test results and certification congratulation letter were provided to Hollingsworth & Vose Company. This filter media is in compliance with the ASME AG1 section FC requirement and accepted to be on the ECBC filter certification list for the next 5 years if the production process remains the same.

SUPPLY BULLETINS:

SB 740-90-4, Masks, Chemical-Biological (All Types), and Ancillary Items, is being reviewed for changes. A review of Appendices A, Q, R, and S, initiated by Blue Grass Army Depot, was completed in June in a joint effort between APGEA and RIA SBCCOM teams.

NRC LICENSE AMENDMENT ACCEPTED

The Nuclear Regulatory Commission (NRC) accepted our amendment application for ECBC License Number 19-00294-21. The amendment will allow us to receive a new gamma irradiator for use in our Chemical Transfer Facility (CTF). The primary purpose of the new irradiator is to ensure any viable biological organisms present in unknown samples are thoroughly sterilized prior to analyzing the sample. This will increase the safety of our personnel handling the samples, while at the same time ensuring minimal effects upon the sample prior to our analysis. This will allow ECBC to become a one-stop shop for analysis of unknown material for chemical, biological, or radiological agents.

HELP LINES/TOLL-FREE NUMBERS

	<i>Telephone No.</i>	<i>fax no.</i>
Chemical Maintenance	Germany 0130810280 Korea 0078-14-800-0335 CONUS 1-800-831-4408	1-410-436-3912 (TOLL CALL)
Smoke/Obscurants	1-888-246-1013	1-410-436-2702 (TOLL CALL)
CB Helpline (NONEMERGENCY TECHNICAL ASSISTANCE)	1-800-368-6498	1-410-436-0715 (TOLL CALL)
Environmental Quality	1-410-436-6588 (TOLL CALL)	1-410-436-8484 (TOLL CALL)
Operational Forces Interface Group (OFIG)	1-508-233-5341 (TOLL CALL) DSN 256-5341	

BRIEFS

CENTER FOR DOMESTIC PREPAREDNESS. In August, the Center for Domestic Preparedness successfully completed its first Chemical Accident/Incident Response and Assistance (CAIRA) exercise. This is as a result of the U.S. Army Chemical School's training mission relocating to Fort Leonard Wood and the Department of Justice assuming control of the live agent training facility at Fort McClellan. Through the existing interagency agreement between SBCCOM and the Department of Justice, SBCCOM continues to serve as an integral partner in the Center's mission.

DOMESTIC PREPAREDNESS EXERCISE. In August, the City and County of Milwaukee conducted a Domestic Preparedness Exercise at the Department of Veterans Affairs Medical Center. The purpose of the exercise was to examine Milwaukee's overall emergency response to a mock terrorist chemical attack causing mass casualties. The City and County of Milwaukee have trained their response personnel over the past year to prepare for such an incident. Numerous local, state, and federal agencies participated in the exercise. The exercise went very well with about 60 victims participating in unusually cool weather.

INDUSTRIAL BASE. The Industrial Base Planning Office introduced us to the Army Diminishing Manufacturing Sources and Material Shortages (DMSMS) Identification Notification Flagging Operation (INFO) System. The DMSMS INFO System is one of several government initiatives designed to combat DMSMS. The U.S. Army Tank-Automotive and Armaments Command developed the DMSMS INFO System and web site for use by all Major Subordinate Commands and Headquarters, Army Materiel Command, to support the Army in meeting the current DoD DMSMS mission requirements. The DMSMS INFO System receives official DMSMS notifications from the Government Industry Data Exchange Program database, performs the required screening processes for "Army" only alerts, and then informs all affected Army activities, organizations, and systems. The Industrial Base Planning Office will be the focal point for SBCCOM's alerts and will establish a direct routing process to forward the alerts to authorized personnel for resolution.

RM&S PROJECTS. In SBCCOM's first attempt at competition in the Reliability, Maintainability & Supportability (RM&S) program, the Command has successfully gained \$1.076M in FY00/01 funding for two projects. The projects are expected to provide the Army savings to investment ratios of 53 to 1 and 42 to 1. The two projects involve better production qualification test methodologies, one supporting chemical protective uniforms, and the other supporting Army Rations. The RM&S program funds RDT&E projects that reduce total ownership costs.

SUPPORT TO THE WINTER OLYMPICS. The Department of Energy (DOE) is working to field a biodetection capability for the Winter Olympics in Salt Lake City in 2002. DOE developed a concept called the "Sentry and Consequence Management Information System (SCMIS)." The intent is detect-to-treat, to assist in early identification of exposure, and to assist in medical planning. Because of the limited time to field a capability, SCMIS will use tested, off-the-shelf technology or components. The SCMIS program seeks to conduct a full-scale system demonstration by the winter of 2001 and has allowed a final year to integrate and refine operational characteristics of the chosen components. DOE contacted us for information on technologies that we are currently investigating at Edgewood, which may be of benefit in the SCMIS concept, and to discuss potential areas of collaboration.

SUPPORT TO THE U.S. NAVY. In September, the Office of the Secretary of Defense and Central Command led the Joint Military Cooperation Conference in Bahrain to discuss military cooperation between the United States and the Bahraini Defense Force (BDF). At that time, several of our subject matter experts traveled to Bahrain at the request of the U.S. Navy's Fifth Fleet stationed at NSA Bahrain to inspect NBC equipment that has been in storage for many years. The team will verify if the equipment still meets U.S. Military Standard operational requirements.

COMBAT RATION SUPPORT TO U.S. COAST GUARD (USCG) HURRICANE RELIEF OPERATIONS. In September, the Natick Soldier Center provided Meals, Ready-to-Eat to the U.S. Coast Guard's Integrated Support Command in Boston, MA, to support Hurricane Floyd Relief Operations. This urgent request was coordinated through the Deputy Comptroller of the Integrated Support Command and the Joint Project Director of the DOD Combat Feeding Program as part of the U.S. Coast Guard's contingency planning operations for domestic disaster relief. These individual combat rations will be made available for immediate response in the event of critical, emergency conditions as a consequence of a natural disaster within the Northeast region. We also provided the U.S. Coast Guard with a subsistence point of contact at the Defense Supply Center in Philadelphia, PA, for acquisition of additional bulk ration supplies.

CHEMICAL WEAPONS CONVENTION. During the end of August through the first week of September, an inspection team from the Organization for the Prohibition of Chemical Weapons Technical Secretariat conducted highly successful inspections of chemical weapons storage facilities at Umatilla Chemical Depot and Anniston Chemical Activity. These inspections are a part of the series of systematic inspections conducted of chemical weapons storage facilities throughout the Army. The inspection of Umatilla was termed the "smoothest inspection ever" by the East Oregonian-Hermiston Edition on 1 September. This year, inspections have been completed at nine Army storage facilities at seven geographical locations, with two storage inspections yet to be completed. The Army continues to meet all of its Chemical Weapons Convention obligations and successfully host fully compliant inspections of chemical weapons storage, former production, Schedule 1, and destruction facilities.

HUBZONE AWARD

The Office of the Project Manager for NBC Defense became one of the first organizations to make significant progress in the new Historically Underutilized Business Zone (HUBZone) Program. The SBCCOM M40 Mask Team, along with TACOM-ACALA, awarded a contract to a local Baltimore business, ATC, for universal second skins. On August 2nd, PM NBC Defense Systems and TACOM-ACALA received the HUBZone award recognition in Washington, D.C.

CUSTOMER SATISFACTION

We contracted with Booz-Allen & Hamilton to survey our customers. Approximately 270 customers received the survey and 129 responded. The 47% response is excellent, as 30% is considered good. One of the main findings was that of the performance attributes most important to customers, they applauded SBCCOM's cooperative and competent people, but want improvements in delivery on-time, within budget, and meeting their needs.

Note: Our customer satisfaction Email address is cu-team@apea.army.mil

EX-PRISONER OF WAR RECALLS LIFE IN GERMAN ARMY

In the fateful autumn of 1938, William Kilberth, a strapping young Sudeten German learning to be a forester, was drafted into the mainstream of 20th century history.

The deadly drift toward World War II began in Europe in 1938. Spring came like an outbreak of plague with Hitler's march into Austria, the *onschluss* that absorbed Austria into Germany. Fall brought the Munich Pact, appeasement and the dismemberment of Czechoslovakia. Britain and France acquiesced as Hitler grabbed a considerable chunk of that benighted country on the pretext that Sudeten Germans belonged in Germany.

Kilberth, now a semi-retired farm maintenance man in Port Deposit, Maryland, and an American citizen whose two sons fought in Vietnam, was about to be recruited into the Czech army when the Germans occupied the Sudetenland. Germans took over the government, its papers and Kilberth. He was inducted into the German army.

He was launched on a remarkable odyssey that swept him through the Second World War like an atom through a cyclotron. He entered Paris with the victorious Germany Army. He retreated from Moscow before the avenging Soviet army. He ended the war a POW at Edgewood Arsenal (now SBCCOM), a piece of flotsam, washed ashore in the United States from the foundering debris of the Third Reich.

He was 20 years old when he left Komotau, the German name for the town where he was born, where his father was director of the citizens bank. Few Czechs lived there then; no Germans now. Germans were expelled from the Sudetenland at the end of World War II and now Komotau is a Czech town called Chomutov. It's perhaps 10 miles from the border with East Germany, about 50 miles northwest of Prague.

Edgewood's POW Camp (1940-1945)

On August 4th, 1944, a Prisoner of War Camp for Germans was established at Edgewood Arsenal. This was to alleviate the critical labor situation within the Arsenal and the surrounding farm communities. From its inception to 1945 the camp grew from 50 to a peak of 760 residents.

The administration of prisoners of war was governed by the Geneva Convention of 1929. At Edgewood the prisoners were, for the most part, housed in existing facilities. Approximately 150 were housed in winterized tents. At first the prisoners of war were issued rations identical to those issued to American troops in the interior zone. In May 1945 menus were designed, using non-critical foodstuffs but maintaining the minimum caloric intake required by the terms of the Convention. Clothing was issued in amounts authorized by War Department regulations. A dispensary was set up within the stockade for daily medical and dental treatment by post doctors. German protected personnel (medical corpsmen) were used to assist in the dispensing of medical and dental aid.

Edgewood used the labor of prisoners of war; although, as stipulated by the Geneva Convention, this labor was not used in direct relation to war operations. Nevertheless, this source was a valuable contribution toward the successful operation of the Arsenal. The prisoners were used in the mess halls, warehouses, motor pools, station hospital, commissary, post exchange, and various other operations. In addition, a number were used to fill demands for farm labor in Harford County.

In the beginning, prisoners were assigned to post details with not a lot of regard to their civilian or military background. This was inefficient, so a system very similar to the current-day MOS designation was adopted. The prisoners were shifted to jobs for which they were better qualified. This increased the efficiency and productivity of the work performed.

(Continued on the next page)

The Sudeten Germans felt themselves an oppressed minority in Czechoslovakia. They welcomed the German occupation. But they were soon disappointed.

“I was drafted and sent to Bonn,” Kilberth says. “Bonn’s today the capital, in those days just a little town. And there came the first disappointment.

“The ‘Empire’ Germans didn’t recognize us as Germans. They thought we came from faraway east – a toothbrush was something new to us, indoor plumbing we didn’t know. They looked down on us. We saw we really didn’t gain anything. Because the Czechs tried to push us down. Now we were down again.”

A saying evolved. “It sounds better in German,” says Kilberth. “‘Before Hitler we had it good. Now since Hitler is here we have in better. But it would be better if we had it good again.’ Understand? You had to be very careful saying that in public. One of the Gestapo would visit you.”

He was sent to the Westwall, the fortifications on Germany’s western frontier the Allies knew as the Siegfried line. The second-class status of Sudeteners was reinforced when they were held in reserve by the German army, in the “third wave.”

“We went through Luxembourg, Belgium, France,” he recalled. “We went southeast aiming right at Paris. And before we got to Paris the war was over.

France had fallen. Kilberth had another four years of war ahead of him.

“I carried a rifle during the whole war,” he says, “and never fired a shot.”

His voice is firm and strong and still colored with a rich German accent. He’s 67 now, a vigorous well set-up man with a nice ironic sense of humor. He’s telling his story from a straight-backed chair in the handsome, comfortable sitting room in the early 19th century home belonging to Walter and Gabrielle Buck.

Buck manages Mount Ararat dairy farm, where Kilberth had worked as a prisoner of war in 1945 and 1946. Gabrielle Buck’s father, Frank D. Brown, Jr., sponsored his return in 1952. Kilberth brought his family and he’s been at Mount Ararat ever since.

“When the French war was over,” he says, “I was three months in Paris, living like a king. And then the whole unit got sent back to Germany and we started a new division. And then always east, always east.”

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Prisoners on military work were under the supervision of either American enlisted or civilian supervisors at all times. Because of the heavy demand for farm labor, the bulk of the guard personnel were assigned to farm work.

The War Department placed the responsibility for the proper use of prisoner labor on farm work on the War Manpower Commission and the War Foods Administration. During the fall of 1944, contracts for farm labor were drawn up with individual farmers. During inclement weather, prisoners allocated to do farm work were used at the Arsenal to do necessary military work.

Higher headquarters required periodic reports on strength, labor output, and money value of labor performed. Detailed records were kept on each prisoner, which included his past political background and his attitude while detained. A full-scale program was instituted to acquaint the prisoners of war with the American way of life. This was accomplished through selected books, music, films, magazines, and newspapers.

The use of prisoner of war labor at Edgewood enabled enlisted personnel to accomplish more important assignments and offset the lack of available civilian laborers. Reports indicate that the work accomplished by the prisoners was as effective as the work performed by the civilian labor.

He had a leave and rejoined his unit in Yugoslavia and three weeks later they were in the middle of Russia. The German army had pushed as far as it was going to go in Russia, almost to Moscow.

“The Germans made in one week over one million prisoners,” Kilberth says. “Russian prisoners. They didn’t know what to do with them. There was not enough to eat for the Germans. The Russians destroyed everything when they went back. You couldn’t find the village. They burned it down. Everything destroyed. The Germans had the million in a small place, maybe a place as big a Cecil County. One million Russian soldiers there.”

The Russian resistance was being built. The winter war started.

“The American help was visible. When we took trenches back you could find American cans and other things, rifles and ammunition. The American help made it possible for the Russians to come back.”

The Germans tried to hold the Russians in Smolensk.

“The Russians came with the T-34, the tank T-34,” he recalls. “The Germans never saw them. Our anti-tank guns – you could see the projectiles jump off. They never dented the armament.

“When we were holding we had to dig in. There were no buildings. It was cold – 40 below, 50 below. You didn’t feel it – that it was cold – but [if] you put your naked hand out, [it] got black. Fifty below, that’s cold.”

They lived in dark windowless bunkers until somebody thought of a use for their empty whiskey bottles.

“We got alcohol. We got branntwein. It’s like whiskey. It’s made from the leftovers when they make wine. Cheap, cheap alcohol. We got with two men one bottle every day. These were clear glass bottles. So one guy got the idea to set the bottles in a hole in the back wall away from the front. And we had daylight.”

The battle raged back and forth through the winter. Spring came and the smells of this spring were the smells of death. “The snow start melting and start smelling. Oh, my God, there were mountains of dead Russians in the snow. As long as they were frozen, fine, but when the spring came . . .”

He still hadn’t fired his rifle. But he was wounded three times, twice by shrapnel while he was laying telephone lines, and once in the neck by a bayonet when Russian troops broke through his bunker. But he got off the Russian front only when he got off the Russian front only when he got food poisoning from pudding cooked in an artillery shell: “My stomach got me out.”

“I could spend some time in Germany, which was no fun either because the bombing every day, the Americans by day, the English by night. And when you were not with a fighting unit the food was very poor, very little.”

This was the end of 1944. The end of the war was near.

“You had to be really stupid not to know what’s going on,” Kilberth says, “that the war has to be over.” He didn’t want to go back east to the Russian front. And with the help of a confenial sergeant and half a side of bacon and half a load of bread he was sent west: “If I had more, I probably wouldn’t have gone anywhere,” he says.

He was assigned to a brand new unit.

“The soldiers were either 16 years old or 60 years old,” he says. “So we start moving to the West front. We got to the Rhine. We crossed the Rhine River. And after we crossed the Rhine River, the officers disappeared, too.”

He got “lost” near Mannheim. His platoon of teen-age communications men joined him.

“I never was really on the Western front. While we were hanging around, the Americans crossed the Rhine River also in spots.”

He started looking for Americans to surrender to.

“You know, it took me 10 days to get in captivity being behind the American lines,” Kilberth says.

“I think it was a Sunday morning, March the 23rd, in ‘45. We were sitting in little trees, like you would plant for Christmas trees, and we had lice. Oh, we had lice! Both legs – a whole battalion marching up.”

He and the boys had their pants off killing lice when Americans passed maybe 100 feet away.

“I said, ‘Boys, get dressed! Get dressed!’”

Fifteen minutes later he was a prisoner of war.

“There were already American officers who spoke German. And one of them said, “Welcome! Welcome! Are you boys hungry? Thirsty? Do you have a smoke?”

“And from this moment on was the *best* time in my whole military career!”

POC: Ms Joann J. Brucksch, Commercial (410) 436-5383, DSN 584-5383, or email joann.brucksck@sbccom.apgea.army.mil



COOPERATIVE R&D WITH INDUSTRY AND ACADEMIA

R

Recent significant achievements and actions in our continuing commitment to *technology transfer* follow:

Northeastern Maryland Technology Council (NMTC)

For additional information on the NMTC, visit their web site at www.geosol.com/nmtc/index.htm.

HEAT CENTER

APG Science and Technology Board

In September, we hosted the Patuxent River Partnership. They were briefed on the S&T Board, HEAT Center, Northeastern Maryland Technology Council, Harford County Economic Development, Army Alliance, and University of Maryland initiatives. Following the briefings, several members toured Edgewood CB Center facilities to see areas where there may be mutually-beneficial areas of opportunity to form partnerships. Visit the APG Science and Technology Board web site at <http://stb.apg.army.mil>.

Lab-to-Market Program

For over 5 years, the Edgewood CB Center has been cooperating with the University of Baltimore Merrick School of Business on its Lab-to-Market Program. The University has taken our patents and studied them in their MBA Courses to determine if they have commercial application. We are presently negotiating a CRADA with the University of Baltimore and the UMBC School of Engineering that will use our technologies for studies in a post-baccalaureate "Certificate in Technology Commercialization." The plan is to move back in the technology cycle to determine early on if there is any commercial application for a technology. If there is, then we decide how to proceed to commercialize it.

Cooperative R&D Agreement (CRADA)

A CRADA has been signed with Majesco Biologicals, Inc., which is an effort to enhance immunochromatographic strip detection capabilities.

Two CRADAs were recently signed that will allow the Edgewood CB Center to cooperate and partner in the following areas: Infrastructure Protection (vulnerability; threat assessments; protective system design, development, and testing; and technical studies); Rapid Prototyping; Domestic Terrorism (training and exercise support, equipment evaluations and assessments, technical and programmatic studies, and market surveys); and Information Acquisition Processing and Dissemination.

Testing Services Agreement (TSA)

A TSA was signed with ITT; two with other companies are about ready for signature. There are three additional agreements in process.

POC: Mr. Roy C. Albert, Office of Research and Technology Applications, DSN 584-4438, commercial (410) 436-4438, email address is roy.albert@sbccom.apgea.army.mil

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TECHNICAL INDUSTRIAL LIAISON

Small Business Innovation Research (SBIR)

The Army Research Office announced the Band 1 winners for the FY00 Phase II SBIR cycle. Topic A98-146 titled "Development of a Lightweight Micromachined Aerosol Collector" made the list. The contractor is MesoSystems Technology, Inc. All appropriate personnel have been notified to begin preparing the necessary documentation in order to award the contract within the time established by SBIR regulations.

Currently, the Edgewood CB Center is monitoring 10 Phase I SBIR contracts. Proposals to continue

these efforts in Phase II are due by October 13th. Based on the progress attained to date, eight of these contractors are being invited to submit Phase II proposals. The decision to invite the other two contractors will be delayed until next spring to allow them to progress further with their Phase I efforts. Phase II proposals are accepted by invitation only. In addition, we are inviting two contractors who performed Phase I contracts in FY98 to submit their Phase II proposals for a second time. Their Phase II proposals were favorably evaluated at Edgewood but not considered of sufficient priority to receive SBIR funding in FY99.

This office has put out a call for topics for the 00.2 DOD SBIR Solicitation, which will open in Jul 00. The Edgewood CB Center was allotted five topics

in that solicitation. The SBIR program funds innovative technologies that have both military and commercial applications. Proposed topics are due to this office by 01 Dec 99.

SBIR Solicitation 99.2 closed in August. We received 45 proposals on the following topics:

- Microfabrication Based Biodetectors (25)
- Self-Contained Surface Biosampling Apparatus (6)
- Synthetic Receptors for Reagentless Biosensors (14)

These proposals are currently under evaluation.

Broad Agency Announcement (BAA):

BAA 99-1 has been open for proposal submission since February 1999. To date, we have received 38 proposals. One proposal has resulted in a contract and four others are being considered for contract award. Most of the remaining proposals are still under evaluation.

POC: Mr. Ronald P. Hinkle, Technical Industrial Liaison, DSN 584-2031, commercial (410) 436-2031, or email ronald.hinkle@sbccom.apgea.army.mil.

<i>Upcoming Conferences</i>		
<i>Date and Place</i>	<i>Title</i>	<i>POC</i>
<p><i>The Scientific Conference on Chemical and Biological Defense Research will NOT be held this November. Several other government agencies have expressed an interest in combining several smaller conferences with this meeting; and Edgewood CB Center is exploring the possibility of a joint conference. It is anticipated that the next conference, be it joint, or the CB Defense Conference will be held in November 2000.</i></p>		
<p><i>11-13 October 1999 Washington, DC</i></p>	<p><i>AUSA</i></p>	<p><i>Ms. Brenda Eckstein (410) 436-2879 email: bceckste@apgea.army.mil</i></p>
<p><i>1-3 November 1999 Miami Beach, FL</i></p>	<p><i>Technology 2009</i></p>	<p><i>Mr. Roy Albert (410) 436-4438 email: rcalbert@apgea.army.mil</i></p>
<p><i>12-14 Sep 2000</i></p>	<p><i>APBI IR&D Conference</i></p>	<p><i>Mr. Ronald P. Hinkle (410) 436-2031 email: rphinkle@apgea.army.mil</i></p>

INTERNATIONAL COOPERATIVE R&D

Multilateral Agreements

Memorandum of Understanding on Chemical Biological Defense Test and Evaluation Working Group

Mr. Michael D. Smith met with Dr. Peter Biggins of the United Kingdom in August to attend the Test and Evaluation Working Group Meeting. The meeting took place under the auspices of the US/UK/CA MOU on CB Defensive Materiel.

Vaccine Project Arrangement

A meeting was held in August with John Anderson, Rick Kenyon, and Vicki Pearson at the Program Manager for the Joint Vaccine Acquisition Program (JVAP) offices at Fort Detrick to continue to develop the international agreement documentation for the incorporation of the United Kingdom and Canada into the joint vaccine development process. The international effort will take the form of a project arrangement under the new CBR MOU, and will focus solely on Smallpox vaccine. Documentation outlining the U.S. position on all critical elements of the draft project arrangement was developed.

Program Officers/ Requirements Officers Meeting

The semiannual Program Officers/Requirements Officers meeting on the Memorandum of Understanding on Chemical and Biological Defense was held in September at Brooks Air Force Base. All current activities being pursued under the memorandum of understanding were reviewed, including: Toxicology and Detection of ITF-28 Compounds, Operations in a CW Environment, Development of Tripartite Antibodies, Cooperation on Chemical Detection, cooperation on medical countermeasures (including vaccines), and the cooperative efforts on demilitarization. In addition, the program officers authorized three new international task forces (ITFs) to begin immediately: an ITF on scenarios for operations other than war, an ITF to

address issues related to warning and reporting of tripartite NBC information, and an ITF on the next generation BW detector. The next PO/RO meeting is scheduled for March at Porton Down, UK.

Meeting of Opportunity Under TTCP CBD Group

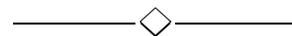
Dr. John Weimaster met with MAJ Mark Sheldord, United Kingdom in September to attend a meeting in his capacity as Decontamination Business Area Manager for the Joint Science and Technology Panel for CB Defense. He was invited to present the U.S. DOD Program overview. This meeting gave Dr. Weimaster the opportunity to interact with allied scientists working on decontamination science and technology programs. He received first hand information from foreign investigators and can integrate this information into the U.S. Programs.

TTCP Establishes Web Site

The Washington Deputies of The Technical Cooperation Program (TTCP) announced the formation of a home page for general information concerning TTCP at <http://www.ttcp.osd.mil>

Quadripartite Working Group on NBC Defense

The 15th meeting of the Quadripartite Working Group on NBC Defense will meet in the United States in October to review current US/UK/CA/AS efforts to standardize operations in an NBC environment. The QWG focuses on such efforts as common reporting procedures, interoperability of equipment, interchangeable components, and joint concepts of operations.



Bilateral Agreements

Geneva Environmental Data Exchange Annexes (DEAs)

Dr. Ronald Checkai met with BDIR Lennertz, German Technical Project Officer for Defense Technology and Procurement in July and again in September regarding the US/GE Environmental Technology Data Exchanges 1311/1520/1521/1522. Dr. Checkai is the U.S. Assistant Project Officer and in that capacity he reviewed technical progress and administrative issues concerning the four Data Exchange Annexes. He coordinated tri-service participation, assessed programs, and recommended future direction of the DEAs.

SN Information Exchange Annex

In August, the first U.S. Army (and the second overall) IEA was signed by the Ministry of Defence of Singapore and the United States. The initial focus of this IEA (IEA-99-SN-1583) will be in three key areas: (1) current SN technologies for the monitoring of chemical agents in water, (2) U.S. biological detection capabilities applied to aqueous monitoring, (3) doping of polymers with oximes.



Visits

Dr. Bill Macmillon and Mr. Doug Wakefield from the Canadian Embassy in Washington, and MAJ Paul Ohrt, CA Liaison Officer to the Test and Evaluation Command visited the Edgewood CB Center in July. In addition, Dr. Macmillon is also the CA Counselor for The Technical Cooperation Panel (TTCP), a scientific/technical base collaboration between the US/UK/CA/AS. This was the first visit from a member of the CA Embassy to the Edgewood CB Center in over 5 years and will, hopefully, yield to an increased cooperation among the CBD communities in CA and the United States. This visit took place under the auspices of the U.S./UK/CA Memorandum of

Understanding on Chemical and Biological Defensive Materiel.

Dr. Paul Norman, Technical Manager for CB Systems (Protection and Decontamination), Mr. Matthew Chinn, Lead Scientist (Protection Programs), Defence Evaluation and Research Agency, UK; and Mrs. Selina Wright, UK Embassy, visited in July. This was a follow-on meeting between Mr. Carmen Spencer, Director of the CB Defense Directorate, DTRA, and the UK visitors. Overviews were provided on CB Protection and Decontamination and round table discussions took place to address specific questions posed during the overviews.

BG Andrew Figgures, Mr. Paul Taylor, LT COL Ian Harris, and MAJ Neil Smith, from the United Kingdom visited the Edgewood CB Center in August. They were accompanied by Mr. James Paterson from the UK Embassy. The purpose of this visit was to tour U.S. NBC related facilities and discuss CA/UK/U.S. Memorandum of Understanding on NBC including existing and future U.S./UK collaborative projects, UK applied research programs, and NBC miscellaneous equipment issues. This marked the first visit of BG Figgures to the command. Mr. Taylor discussed the current level of cooperation (through the MOU) between Porton Down and Edgewood regarding existing and future U.S./UK collaborative projects and programs, and expressed his confidence that this upward level would continue. As a result of this visit, Mr. Taylor and BG Figgures both commented that the level of complementary and overlapping programs between the two organizations was quite large, and that even a stronger cooperation than is currently ongoing could be achieved.

Mr. Yacov Ashani, Israel, will visit MRICD, on an intermittent basis from 1 Aug 99 through 31 Dec 99. The purpose of these visits is to do work with prophylaxis with butyl cholinesterase and low-level long term exposures to chemical warfare agents. Dr. R. Sheriden is the point of contact for these visits.

Dr. Robert Angus, Dr. S. Joan Armour, Dr. Camille Boulet, COL William Fulton,

COL Jean-Robert Bernier, LCOL Robert Schlosser, and LCOL Francis Souter from Canada, visited Brooks Air Force Base, TX, in September. They attended the SBCCOM-sponsored meeting of the Program Officers and Requirements Officers of the U.S./UK/CA Memorandum of Understanding on Chemical and Biological Defense.

Ms. Christine Chui, Canada, will visit the Edgewood CB Center, intermittently between July and September, to work in Mr. Peter Stopa's Laboratory to learn how to use the flow cytometer to specifically count vibrio cholerae cells preserved in formalin.



**International Armaments Cooperation
Training Conference**

The International Cooperative Programs Activity, U.S. Army Materiel Command, hosted a 2-day

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Conference in August. The briefings were aimed at guiding International Points of Contact through the latest developments in staffing international agreements and managing international research and development programs. Following briefings by Army and Office of the Secretary of Defense leaders on current challenges and future strategies for international cooperation, each U.S. Army Research, Development and Standardization Group (Australia, Canada, France, Germany, and the United Kingdom) provided briefings from their perspective. In addition, the international points of contact briefed on international programs specific to their major subordinate command. Dr. George Famini presented the SBCCOM programs. Dr. Wes Kitchens, AMC Principal Deputy for Technology and other senior managers attending the conference were very impressed with the level of international cooperation being conducted at SBCCOM.

TEXTBOOK EXAMPLE OF EXCELLENCE

Natick's Dr. Linnea Hallberg Featured in Cornell University Textbook

In addition to her all-important task of helping to feed the nation's soldiers, Dr. Linnea Hallberg is now inspiring college students. Hallberg is one of five science professionals profiled in John McMurry and Mary Castellion's *Fundamentals of General, Organic and Biological Chemistry*. The textbook is used in premed and nursing classes at Cornell University.



This laser-scanning, confocal microscope enables scientists like Dr. Linnea Hallberg to investigate the physical-chemical processes at work in various food products developed for the military at Natick. Scientists then use this knowledge to improve food quality, texture, and freshness.

Hallberg is a food technologist in the DoD Combat Feeding Team in the Natick Soldier Center at the U.S. Army Soldier Biological and Chemical Command. Hallberg, along with her esteemed colleagues, strives continuously to improve the variety, taste, nutrition, and shelf life of combat rations developed for the nation's military personnel.

Food Research done at Natick has led to a new understanding of how to maximize a soldier's performance by developing rations that contain just the right mix of nutrients, are easy to prepare

in remote locations, survive transport and distribution, and most importantly, taste good.

As Hallberg noted in the textbook article, "Recently, Natick had to develop a sandwich that wouldn't go stale or spoil over a long period of time. To do this, we needed to investigate what chemical processes were at work in the sandwich. One of the factors we examined was its water content. We knew that we could stabilize a food by reducing its water content or by reducing the mobility of the water."

The food technologist said a dye was dissolved into the water in a model sandwich. A specialized scanning microscope was used to watch the movement of water over a period of time.

According to Hallberg, "We were then able to excite electrons in the dyes to higher energy states with laser beams and then observe the light emitted by the electrons when they returned to lower energy levels. We measured intensities of the light over time and used them to gather information about the movement of the water within the food."

Hallberg excels at her job because she has a true concern for the soldier as well as a longtime love of science.

As she noted in the Cornell textbook article, "The work I do every day as a food technologist is very firmly rooted in my knowledge of basic chemistry. Whether I'm working in the lab or sharing research findings at a conference with my colleagues, I am continually learning new information and constantly presented with fresh challenges. It is this ongoing process of learning and investigating that I find to be most exciting about my job. That's why I loved chemistry back in school, years ago—because it can explain so many mysteries in our lives, and we can use it to improve the quality of our lives."

The scientist is also working on the Radio Frequency Processing (RFP) of combat ration components. According to Dr. Hallberg, “RFP is a direct heating method that has greater penetration and uniformity in large multi-serving packaging than microwave or conventional retorting (canning). It can commercially sterilize without overheating surface areas, avoiding initial destruction of flavor, color, texture and nutrition. Consequently, longer shelf-life can be achieved than with conventional processing.”

According to Hallberg, “Heat is created during RFP through the friction of magnetically polarized molecules (like water), flipping or realigning at 27 million times a second in response to an alternating electric field applied above and below the food.”

RFP will provide the potential for several new and improved ration options for the warfighter, including higher quality, nutritious “fresh-like” pastas, crunchy-cooked vegetables and whole-muscle meats. The process will also help fill a void in breakfast rations components by potentially allowing for such entrees as ham and cheese omelets.

Hallberg says that Natick hopes to advance RFP technology through collaborative efforts with Washington State University, as well as Kraft and Oscar Meyer Foods.

In addition to all the good work she does to improve life for the soldier, Hallberg devotes much of her personal time to helping others. She, along with several other Natick employees, volunteers through the Salvation Army to cook and serve dinners to the homeless and hungry. She also cycles for “Ride FAR” (For Aids Resources), a biannual, five-day, 500-mile bikathon. All proceeds from the event go directly to Project Inform, the Pediatric AIDS Emergency Assistance Program, as well as twenty-five community-based AIDS service organizations.

For all her good works, Dr. Hallberg is indeed a textbook example of scientific expertise and of selfless service to the soldier and to humanity as a whole.

This article was authored by Jane Benson

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DOMESTIC PREPAREDNESS TEAMS AWARDED

In late 1996 our predecessor organization, CBDCOM, faced an immense challenge – leading an interagency effort to transfer military chemical-biological and radiological expertise to the civilian emergency response community. This was an imposing challenge and one which the Command readily accepted. The process started slowly since this was the first time anything of this magnitude had been tried in this area. The Command focused on teamwork and through careful communication and coordination the program has become a success and is making a difference across the Nation. The success of this interagency effort is primarily due to the Domestic Preparedness team. Without their efforts and dedication to making a difference, the difference would not have been made.

In an awards ceremony in August, MG John Doesburg, Commander of SBCCOM, gave awards to various members of the Domestic Preparedness Team. Please note that only those individuals who received awards at the ceremony are listed here. They are as follows:

Commander's Award for Civilian Service

By most accounts, the Domestic Preparedness Program has been a success story and because of this the Command, as the program leader, has enjoyed an enhancement of our reputation. This enhancement of our professional and organizational reputation has been a direct result of the many fine efforts of individuals and teams within the Domestic Preparedness program at SBCCOM. These individuals were instrumental in the program definition and formative stages of development. It is their dedication and willingness to go the “extra mile” and “work outside the box” that has allowed the DP program and SBCCOM to achieve such success. Each of the following individuals has been extremely successful in their respective area:

William Compton
Jose Irizarry
Elaine Stewart-Craig
Richardson Hutchinson
Karen Quinn-Doggett
May Doak
James Farlow
Raymond Miller
Valerie Lee

Achievement Medal for Civilian Service

The CW IRP Team: This team has been responsible for conducting an intensive series of table-top exercises to investigate the problems inherent in a CW terrorist attack. In addition, they conducted a field test of the improvements in mass-casualty decontamination and in forces ventilation to reduce hazard levels in structures following a CW attack:

Randy Laye
William Lake
Uday Mehta
Alan Goodman
Steve Marshall
Paul Fedele

The BW IRP Team: This team formulated a strategy to address how a city should respond to a BW terrorist act. To accomplish this they conducted a series of five intensive workshops with the multi-agency team to develop an integrated approach, preparing a detailed BW Response Template applicable to a range of BW agents and scales of attack to show how a community could respond to such an attack. Finally, they developed an initiated a testing program to demonstrate components of the BE Response Template and to fill key gaps and improvements in the area of BE response:

Kimberly Bender
Mohamed Mughal

FSL and Special Exercise Team: Another major portion of the Domestic Preparedness Program concerns the conduct of the federal, state, and local exercises; one each year for a period of five years. FSL Measured Response 2-97, the first such exercise was conducted in 1997 in Denver, Colorado, and was called "Measured Response 2-97." This massive exercise involved 500 federal participants in a pre-staged federal deployment for a special event - the Summit of the Eight. It demonstrated how federal and state assets would function under the direction of the local incident commander at the incident site:

Robert Cahoon

Domestic Preparedness Program Management Support Team: This team provides broad planning guidance to accommodate the frequent changes in program direction resulting from budgetary and other decisions made at the highest levels of DoD and USG. The team insures that funds are available to accomplish the plans and provides required administrative and logistical support to the program execution elements in the field. Additionally, they provide a consistent interface with other Federal Partners, the First Responder community, senior government officials, and other interested parties:

Gus LaComb
Dodie Hertzog
Lorraine Whitney
Patsy Garcia
Elaine Macko

Public Affairs Office: The Public Affairs Office provides communication support for all areas of the Domestic Preparedness Program. They engaged the Pentagon, multiple federal agencies and cities in planning media events at dozens of

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cities across the United States where elected officials, firefighters, law enforcement and federal officials announced endorsements for the quality of Domestic Preparedness Program execution. In addition to media events, they developed brochures, fact sheets, videos, web pages, and answered thousands of calls to promote accurate communication of the Domestic Preparedness Program:

Ann Gallegos
Susan Krs

Domestic Preparedness Equipment Team: This team evaluated commercial equipment intended for use by local responders for responding to a terrorist incident utilizing chemical or biological warfare agents. They bought equipment off-the-shelf, tested it, and provided information on its performance to the consumer for purchasing decisions:

Frank DePietro
Richard Belmonte
Lee Campbell
Robert Lindsey
Alex Pappas

Equipment Team: This team was responsible for coordinating with the Program Director and Legal Office to obtain the loan agreement between DoD and the cities. They manage the coordination and approval of city equipment requests. The team has established a system to track city equipment:

William Sarver
Paul Grasso
Georgia Braun



1999
RESEARCH & DEVELOPMENT
ACHIEVEMENT AWARDS

Mr. Arthur H. Carrieri, Edgewood CB Center, was directly responsible for designing, developing, and applying the concepts of ultra high-speed interferometry and panoramic imaging to the remote sensing problem (**Panoramic-Infrared Imaging**). The patented system call PANSPEC incorporates both these features, and was designed, optimized, and simulated by intense computer calculations via efficient optical design algorithms. PANSPEC also comprises an effective sensor fusion design where interferometry and beam communication events are done with a common set of polarization-modulation optics. Moreover, processing of data produced by PANSPEC is accomplished by applying an advanced neural network pattern recognition system, also integrated into PANSPEC, that allows for the real-time detection of threat chemical cloud.

Dr. H. Dupont Durst, Edgewood CB Center, was responsible for planning, conducting, and directing diversified research projects on the synthesis and use of novel dendritic polymers (**Dendrimer-based Hand-held Nanodevice for Bio Agent Detection**). These polymers have demonstrated utility in the areas of: chem/bio nanodetector, nanoencapsulation for chem/bio countermeasures, nanoreactors for chemical decontamination, nanoemulsions for potential chemical and biological decontamination, and mild chem/bio decontamination solutions. Dr. Durst's research efforts on this project are at the interface of chemical and biological disciplines where he has successfully integrated the research results to build a unique portfolio of nanomaterials technology that specifically tackles chemical and biological defense problems. Dr. Ray Yin, Army Research Laboratory, was also awarded a 1999 R&D achievement award for his research efforts.

Dr. Calvin K. Lee and *Mr. John E. Buckley*, Natick Soldier Center, have successfully developed and demonstrated an innovative and new opening method for fabric ram-air gliding wings (**A New Opening Method for Parafails**). The method involves pulling down either the end cells or the center cells of a parafail, or a combination of both toward the payload during rigging of the parafail. This simple but effective method results in a controlled and staged opening of the parafail with low opening forces. Furthermore, this new method will also simplify the complicated and time-consuming construction of the parafail required by the present standard opening method. Dr. Lee and Mr. Buckley have not only advanced the technology of parafails, but will also increase airdrop mobility and safety of the U.S. warfighters and decrease life-cycle costs of their equipment.

Mr. Nicholas Rosato, *Mr. Walter Krainski*, and *Mr. John Lanza*, Natick Soldier Center, developed a highly effective and novel machine, which is capable of retracting a payload containing significant weight (**Parachute Retraction for Soft Landing System**). These individuals produced and tested a 1,000-pound capacity Parachute Retraction Soft Landing System successfully demonstrating use of this technology to soft land airdropped cargo. The team's efforts have resulted in the confirmation of a technique that represents a major advancement toward development of a virtual prototyping capability, that has the potential to help speed the introduction of this technology into the Army by reducing the scope and complexity of the testing required. Their innovative work has the potential to greatly improve the safety, efficiency, and state-of-the-art airdrop operations for the Army and others.

CIVILIAN SERVICE AWARDS

The *Meritorious Civilian Service Award*, the second highest honor bestowed upon civilian employees by the Army, was presented to Edward F. Colburn, a 28-year federal employee.

Colburn, who now is chief of the Army Center for Treaty Implementation and Compliance at SBCCOM, has worked extensively on the binary program to make chemical weapons, worked for Program Manager for Chemical Demilitarization to destroy chemical weapons, and worked with the U.S. Army Toxic and Hazardous Materials Agency to ensure chemical weapons are handled in an environmentally sound manner.

His award noted that “his extraordinary management skills and knowledge of chemical treaty compliance requirements were singularly responsible for preparing the Department of the Army to execute its responsibilities under the Chemical Weapons Convention of 1997.” The CWC is the most short-notice and complex arms control agreement yet agreed to by the United States.

The Havre de Grace native was responsible for the preparation of more than 57 sites declared under the CWC and developed a system of Treaty Compliance Offices at locations to assist local commanders to prepare for inspections. The Army executed the compliance requirements without defect.

The *Superior Civilian Service Award* was presented to Tim Blades, Edgewood CB Center, who was recognized as one of the Army’s premier chemical agent experts. Blades was honored for his achievements which have greatly improved the quality and posture of ECBC’s chemical and biological program. He has overseen and coordinated the U.S. support efforts to the United Nations Special Commission to Iraq.

A *Meritorious Service Medal* was presented to Dr. (Capt) Alan Samuels, ECBC, for his work on a groundbreaking program using millimeter and submillimeter wave technology for chemical and biological detection. That work led to the first open literature publication on “phonon modes” in biological systems, which could lead to advances in the future of detecting biological weapon agents.

OTHER PEOPLE IN THE NEWS

SCIENCE AND ENGINEERING APPRENTICE PROGRAM (SEAP). At the Edgewood CB Center, the 8-week summer apprenticeship for 22 high school students came to a close in August. The students presented technical papers to their peers and a small group of mentors on their scientific or engineering project. During the summer, students worked side-by-side with an ECBC engineer or scientist in a mentor-apprentice relationship. All students worked on programs vital to the Center’s mission. This is the 18th year for the SEAP at this activity and it continues to be an invaluable opportunity for the Center to expose students to science, math, and engineering which they will apply to their high school and college education.

SUMMER FACULTY AND STUDENTS. In August, the Natick Soldier Center bid farewell to two ARO summer faculty, two SEAP high school students, and one CREST college student. One ARO teacher and an SEAP student completed a comprehensive analysis and spread sheet model of UGR A-B-T and B ration menus that will serve as a basis for equipment design and selection for the next generation field kitchen. The CREST student completed a design study for a thermoelectric canteen water chiller. The second ARO teacher

continued work on chemical heaters. And, the second SEAP student helped to conduct test and evaluation of sanitation center equipment variables, to include climatic chamber tests. At least three Natick Technical Reports will be generated from this work.

Edgewood CB Center's Mr. Robert Gross, Mr. Mark Schlein, Mr. Peter Schlitzkus, and Mr. Vincent Younger are inventors eligible for a cash award for their patent application. The title of the invention is ***Indicator for Hand-Held Chemical Monitor***.

Edgewood CB Center's Mrs. Linda L. Szafranec was commended by the U.S. Army Center for Health Promotion and Preventive Medicine for her support of the Surface Water and Wastewater program addressing the Preliminary Assessment of Health Impacts for the Newport Chemical Demilitarization Facility. Dr. William F. Fifty, Program Manager for Surface Water and Wastewater, provided Mrs. Szafranec with a ***Memorandum of Appreciation*** for her interpretation NMR data that determined the concentration of VX-related chemicals, and elimination of the presence of VX and other VX-related byproducts below detection limit.

Dr. Mohamed Mughal served as one of four expert panel members for the **National Terrorism Preparedness Institute's (NTPI)** satellite broadcast *Biological Terrorism*, which aired on July 14th. The other three panel members were representatives from the Federal Bureau of Investigation, the Centers for Disease Control and Prevention, and the National Domestic Preparedness Office. The Director of NTPI stated that this was his organization's largest satellite broadcast to date, with over 10,000 first responders signed on nation-wide. In addition to participating in the panel discussions and answering call-in questions, Dr. Mughal provided viewers a full one hour on-air presentation of SBCCOM's BW IRP background and process; response template; conclusions and insights; and future program plans. The NTPI Director was extremely pleased with the presentations and has invited SBCCOM's participation in future broadcasts.

The Non-Atomic Military Research and Development Principals of The Technical Cooperation Program recognized the outstanding contributions of two SBCCOM employees: Dr. S. Randolph Long and Dr. Charles Wick. Dr. Long and Dr. Wick were presented awards for their contribution to the development of a methodology to determine the ambient particulate background in the atmosphere against which detectors of agents of biological origin must operate. A letter from the Deputy Under Secretary of Defense stated that they "contributed significantly to the research of the Detection of Biological Agents Technical panel of the Chemical, Biological and Radiological Defense Group of The Technical Cooperation Program."

ADDITIONAL RECOGNITION

PS Magazine's August issue contains the article "Smooth Smoking with PM." This article highlights key PM issues important in keeping the M157/M157A2 Smoke Generator Sets fully operational.



Our employees participate in many workshops, symposiums, and conferences; and many are recognized by outside organizations for their exemplary performance. It is our pleasure to share this information.

In June:

Dr. Robert Mioduszewski presented a technical overview of in-house low-level toxicology study results entitled, "The Relationship Between GB Vapor Exposure Concentration and Duration on the Probability of Toxic Responses in the Rat," to the **Steering Committee for Standards in Emergency Response, Remediation, Demilitarization, and Restoration of Chemical Warfare Materiel Work Group**. There was particular interest in how current study findings might impact upon health risk assessment issues in developing health criteria guidelines regarding exposure to chemical agent vapors.

In July:

Ms. Monica Heyl was the keynote speaker for the **Glovebox Society Conference** in San Francisco, CA. The topic was *The History of Chemical Warfare*.

AMCOM hosted a DMSMS Working Group conference in Huntsville, AL. The DMSMS program is designed to address issues related to non-availability and obsolescence. The conference was the latest in a series of meetings to discuss

how best to implement DMSMS as described in AMC Pamphlet 5-23 and the INFO support tool throughout the Army. In addition to the proponents from AMCRDA-AI, attendees consisted of representatives from the MSCs. Following the presentations by each MSC, an update was given on the Government Industry Data Exchange Program (GIDEP). GIDEP is the mechanism used to collect and disseminate information between government and industry that may have an impact on Defense materiel and readiness. The DMSMS/INFO system helps identify specific programs impacted by GIDEP alert and track the resolution. INFO is ready for MSC implementation upon training of the appropriate personnel. The MSC DMSMS focal points (Industrial Base Planning Offices) are to seek Command cooperation and support to implement the program. AMC is tasking the MSCs to brief and implement the DMSMS program to their respective Commands within the next 30 days.

Dr. Bill White gave a lecture on Chemical Threat Agents at a **Chemical and Biological Weapons Proliferations Class** in McLean, VA. (This course is administered by SAIC and offered about every 6 weeks. Each class has about 30 students from the intelligence agencies, State Department, Commerce Department, Explosive Ordnance, etc. The course consists of 2 days on chemical followed by a field trip on Wednesday, and concludes with 2 days on biological.) The class visited the Edgewood CB Center and saw an overview of the Fox Vehicle and ACADA, followed by tours of the Bioprocess Engineering Facility and CB Forensic Analytical Center. This visit provided a greater understanding of how these aspects fit into the overall picture presented in the course.

Representatives from the Industrial Base Planning Office attended a **Commercial Operations and Support Savings Initiative (COSSI)** Conference in Arlington, VA.

COSSI's mission is to develop and test a method for reducing DoD Operations and Support (O&S) costs by routinely inserting commercial items into fielded military systems. This program fits under the umbrella of the Industrial Preparedness Program element. The insertion of commercial items is expected to reduce DoD's O&S costs by reducing the costs of parts and maintenance, reducing the need for specialized equipment, increasing reliability, and increasing the efficiency of subsystems. COSSI seeks proposals submitted by firms or teams that include at least one for-profit firm. More information is available for this new initiative by DoD, just contact the Industrial Base Planning Office.

Dr. Hutchinson participated in the **BW IRP seminar war game sponsored by the National Defense University and the Potomac Institute for Policy Studies**. He provided a presentation on the BW Response Template. The seminar was successful in its goal to identify and prioritize advanced technology needs for BW consequence management.

In August:

Ms. Cynthia Swim and Mr. William Loerop were invited to present in their respective areas of expertise at the **Gordon Research Conference**, entitled "Illicit Substance Detection: Illegal Drugs." The conference was held in Newport, RI, and was sponsored by the DoD Counterdrug Technology Development Program Office at the Naval Surface Warfare Center in Dahlgren, VA. For more than six decades, this international forum has promoted discussions and the free exchange of ideas at the research frontiers of the biological, chemical, and physical sciences. For select conferences, Gordon Research Conference has expanded to include both science and policy discussions. By bringing representatives of these two communities together, the conference can influence new and existing policies by increasing the knowledge of policy makers with cutting edge science. Ms. Swim's presentation was entitled "Laser Standoff Detection of Drugs" in the session *Trace Detection Technology II*. Mr. Loerop's was entitled, "Next Generation Passive Standoff

Detectors for Drug Detection" in the session *Emerging Technologies II*. Both talks focused on educating the Counterdrug community, on standoff detection of chemical vapors and aerosols. Also, performance of current and planned systems was projected for detecting chemicals of interest in Counterdrug applications. A great deal of interest was generated, and further discussions and possibly projects with the Counterdrug community are anticipated.

Dr. DuPont Durst met with Professor J.F. Bunnett, Thimann Laboratories, University of California to participate in the **International Union of Pure and Applied Chemistry Meeting**. This group has been instrumental in providing the international scientific community with issues related to the destruction of chemical weapons and which support the Chemical Weapons Convention.

The paper entitled, "Preliminary Results of a Field Demonstration of the Effectiveness of Millimeter Wave Aerosols in Defeating a Battlefield Surveillance Radar," was presented at the **Institute of Electrical and Electronics Engineers 1999 Radar Conference** and was selected as one of the outstanding papers. Co-authors were Ben Perry, Georgia Tech and Jeffrey Hale, Edgewood CB Center.

COL Stephen Reeves, PM NBC Defense Systems, attended the **European Chemical Conference** in Heidelberg, Germany, and gave briefings during the conference.

Dr. Charles S. Harden, Edgewood CB Center, met with Professor Paul Thomas, University of Manchester Institute of Science and Technology (UMIST), UK. At UMIST Dr. Harden attended, chaired a session, and presented a paper at the **8th International Conference on Ion Mobility Spectrometry**.

Mr. Keith Knight attended the **Critical Infrastructure Vulnerability Assessment**

Course, which was sponsored by the Defense Threat Reduction Agency (DTRA). DTRA offered the course in support to the Critical Infrastructure Assurance Office to help Federal Government departments and agencies perform vulnerability assessments in response to Presidential Decision Directive 63 (PDD-63). The course was built on DTRA/Springfield Research Facility's and the National Security Agency's vulnerability assessments.

The U.S. Army Soldier and Biological Chemical Command hosted **Roadshow for the Millennium** at the Edgewood Area Conference Center Auditorium and Seminar Area. This symposium focused on Competitive Sourcing and Privatization. Managers, supervisors, key and interested personnel in all functional areas were encouraged to attend this important seminar. The one-day program featured executive presentations, workgroup exercises, and an executive panel discussion. Expert facilitators from AMC activities led the half-day workgroups that followed the Executive Session. An executive panel discussion concluded the seminar.

Mr. Bill Haskell represented SBCCOM (Edgewood and Natick) at the **15th Symposium on Occupational Health and Safety of the Fire Service**. This symposium is sponsored by the John P. Foundation of the International Association of Fire Fighters (IAFF), AFL-CIO, and was held in Honolulu, Hawaii. Mr. Haskell was invited as a guest of the IAFF to make a presentation by General President Mr. Alfred K. Whitehead and Director for Occupational Health and Safety Mr. Richard Duffy. His presentation was made during the Weapons of Mass Destruction Session and addressed On-going Efforts and Issues Related to Protecting the Emergency Responder. The presentation included highlights of SBCCOM test and evaluation of commercial protective equipment under the Domestic Preparedness Program and efforts by the Domestic Preparedness Chemical Team. Also included was SBCCOM support and participation on the National Domestic Preparedness Office Interagency Board (IAB) and proposed partnership with National Institute for Occupational Safety and Health (NIOSH) for

development of respiratory standards for chem/bio threat agents for non-military emergency responders.

Mr. Randy Laye presented a workshop at the "Ground Zero" **Weapons of Mass Destruction Conference** in Charleston, SC. Mr. Laye's presentation centered on the CWIRP process and accomplishments with a primary focus on the program's technical initiatives. Attendees were extremely receptive to the team's work and several expressed their gratitude for all of SBCCOMs efforts in working to help the first responder community.

Dr. Paul Fedele, Mr. Bill Lake and Mr. Bill Haskell participated recently in the **National Fire Protection Association (NFPA) Technical Committee Meeting on Hazardous Protective Clothing and Equipment** meeting in Portland, OR. SBCCOM has participated in this Technical Committee's meetings since October 1998 and supported them on incorporation of chemical and biological threat protection requirements and test methods into NFPA protective clothing and equipment standards. NFPA Standards are used by the professional fire fighter community in setting minimum performance requirements for individual protective ensembles. Mr. Lake presented efforts under the Chemical Weapons Improved Response Program and Dr. Fedele presented specific details on testing of protective clothing and equipment. The Technical Committee is chaired by Bryan Heirston from the Oklahoma City Fire Department and the committee is composed of representatives from professional associations, industry, federal organizations and active fire fighters and fire chiefs. The NFPA committee is drafting standards on Level B and Level C protective ensemble systems for hazardous materials, to include chemical and biological agents. The NFPA committee wants to include Man-In-Simulant Testing in their new requirements and

continue working with ECBC experts on CW agent protection.

In September:

Dr. Joseph DeFrank and Messrs. Joseph Hovanec and George Wagner met with MAJ Mark Shelford of the UK to attend the **International Technical Workshop on Chemical and Biological Decontamination** held at the University of Durham, UK. Dr. DeFrank was an invited participant and speaker.

Along with the Natick elements, the PM NBC Defense, PM Smoke/Obscurants, and the Edgewood CB Center's Detection/Decon Team participated in the **International Soldier Systems Conference and Natick APBI** held in Orlando, FL. An exhibit was developed showcasing our expertise in the areas recognized in the conference and subjects presented during the APBI. The Joint Service General Purpose Mask prototypes were displayed.

Dr. James Savage and Mr. Robert Gross attended the Desert Breeze 4 war game at the U.S. Central Command (CENTCOM). This war game was led by the deputy CINC LTG Dodson and held primarily with CENTCOM's joint office directors. The war game looked at WMD issues and how CENTCOM would react alone and with its coalition partners to respond to a WMD event. This is the fourth in the series and SBCCOM personnel has supported the OSD effort providing technical expertise on CB issues.

Several Edgewood personnel participated in the **1999 MASINT Chemical Warfare Science and Technology Symposium** held at CENTCOM Headquarters. The symposium was organized and sponsored by the Technical Coordinating Office of the central MASINT Organization. About 100 government employees (both civilian and military) and contractors gathered to discuss issues related to detection and identification of CW agents. The program consisted of programmatic talks by representatives of various organizations and R&D papers on selected research projects. Monica Heyl described the "Forensics Fly Away Lab" being developed for the FBI. Bill White discussed some "Chemical Agent Formulations." Cindy Swim reviewed "Active and Passive Standoff Detection at ECBC" and Russ Williams described the new "Data Collection and Spectral Database Project."

Upcoming Symposium

We will have an exhibit at the **Fall AUSA**, in Washington, DC, in October.

We anticipate a joint exhibit with Natick at the **Technology 2009**, in Miami Beach, FL, in November.

The next CB APBI is scheduled for 12-14 September 2000. It will include a two-day APBI followed by an IR&D conference and will be held at Edgewood.



Books, Journals, and Magazine Articles

Three papers were recently accepted for publication in *Toxicology Methods*. The research represents advances in virus analysis techniques using a near reagent-less instrument capable of counting and making a count of virus in near real time. The Integrated Virus Detection System (IVDS) instrument is a new physical based technology developed at the Edgewood Chemical Biological Center with patents pending, and a technology transfer license agreement granted to EnVirion, Richmond, VA. The papers are: “Characterization of Purified MS2 Bacteriophage by the Physical Counting Methodology used in the Integrated Virus Detection System (IVDS),” “Purification of MS2 Bacteriophage from Complex Growth Media and Resulting Analysis by the Integrated Virus Detection System (IVDS),” and “Passage of MS2 Bacteriophage Through Various Molecular Weight Filters.”

Dr. Robert Mioduszewski, et al., published a chapter in **Toxicity Assessment Alternatives: Methods, Issues, Opportunities**, Humana Press, July 1999, which highlights some of the work being performed as part of the ECBC Tech Base Core (S&T) program. An article entitled, *Validation of the Cytosensor Microphysiometer for In Vitro Cytotoxicity Testing* by R.J. Mioduszewski, C.J. Cao, M.E. Eldefrawi, A.T. Eldefrawi, D.E. Menking, and J.J. Valdes was previously accepted for publication in the same journal.

PS Magazine’s August issue contains the article “Smooth Smoking With PM.” This article highlights key PM issues important to keep the M157/M157A2 Smoke Generator Sets fully operational.

Mr. Rinaldo Bucci published an article entitled, *Improved Modular Decontamination Equipment*, in the September-October issue of **Army RDA Magazine**.

An article, entitled “The Biological Weapons Improved Response Program Leveraging the Army’s RD&A Expertise to Benefit Civilian Communities,” by Dr. Mohamed Athther Mughal has been accepted for publication in **Army RD&A Magazine**.

The August 5th, 1999 **Fort Hood Sentinel** newspaper’s front page sported photographs with the banner headline “Buffalo soldiers get their Foxes wet.” A very positive story about Troop F, 1st Squadron, 10th Cavalry Regiment, 4 Infantry Division taking its six newly fielded M93A1 Foxes for swim training in July.

TECHNICAL REPORTS

Published technical reports, when available, should be requested from the Administrator, Defense Technical Information Center, ATTN: DTIC-FDRB, 8725 John J. Kingman Road, Ste 0944, FT Belvoir, VA 22060-6218.

<i>Report No.</i>	<i>Title</i>	<i>Author(s)</i>
ECBC-CR-012	Design Verification Test Report for the M43A1 Upgrade, July 1999, UNCLASSIFIED - public release.	S.D. Kubicsko G.W. Weaver G.P. Lozos
ECBC-CR-013	Development of Sucrose-Fermenting Escherichia Coli K-12 Strains for Low-Cost Overproduction of Recombinant Proteins, June 1999, UNCLASSIFIED - public release.	Z. Lengyel
ECBC-CR-015	First Generation Mask Filter Prototype Design Analysis, August 1999, UNCLASSIFIED - public release.	K.C. Hofacre A.W. Richardson A.Wang B.L. Sheridan
ECBC-CR-021	Impregnated Poly-DVB for Immediate Decontamination Chemical Agent Simulant Evaluation, September 1999, UNCLASSIFIED - limited.	R. Brown J. Rossin K. Gerhart H. Mearns
ECBC-SP-001	Proceedings of the Joint Services Workshop on Biological Mass Spectrometry, January 1999, UNCLASSIFIED - public release.	S.R. Long T. Krishnamurthy A.P. Snyder
ECBC-SP-004	Proceedings of the 1998 ERDEC Scientific Conference on Chemical and Biological Defense Research, 17-20 November 1998, July 1999, UNCLASSIFIED- public release.	D. Berg
ECBC-SP-005	UNSCOM 229 Analytical Results, June 1999, UNCLASSIFIED - limited.	M.W. Ellzy W.T. Beaudry P.C. Bossle J.M. Lochner D.K. Rohrbaugh T.E. Rosso K.B. Sumpter L.L. Szafraniec

ECBC-TN-001	Test Procedure for Removing Polystyrene Latex Microspheres from Membrane Filters, July 1999, UNCLASSIFIED - public release.	J. Kesavanathan R. Doherty
ECBC-TR-001	Follow-on Production Verification Test Report for the M22, Automatic Chemical Agent Alarm (ACADA), July 1999, UNCLASSIFIED - limited.	D. Nowak O. Melles T. Mitchell R. Hawver J. Jump T. Witkowski M. Morris W. Markham M. Rahman E. Leschke D. Boston E. Catalano S. Angelucci
ECBC-TR-020	Evaluation of a Commercial MK19 40MM CS Grenade, March 1999, UNCLASSIFIED - limited.	J. Huerta
ECBC-TR-023	Comparison of U.S. and Foreign Military Respirator Drinking Systems, May 1999, UNCLASSIFIED - limited.	C.M. Caretti C.M. Pleva
ECBC-TR-040	Shelf-Life Studies of NDI and P31 BIDS Consumables, June 1999, UNCLASSIFIED - limited.	G.G. Olsen II K. Kearns M. Foley P Anderson P. Coon
ECBC-TR-041	Quantitative and Qualitative Gas Chromatographic Analysis of Reaction Masses produced from Chemical Neutralization of Isopropyl Methylphosphonofluoridate with Monoethanolamine, August 1999, UNCLASSIFIED - public release.	K. Morrissey B. Williams R. Cheicante J. Stuff D.H. Durst
ECBC-TR-042	Quantitative and Qualitative Gas Chromatographic Analysis of Reaction Masses Produced from Chemical Neutralization of Ethyl-2-diisopropylaminoethyl Methylphosphonothioate with Monoethanolamine, August 1999, UNCLASSIFIED - public release.	K. Morrissey B. Williams J. Ruth J. Stuff D.H. Durst
ECBC-TR-043	Material Study for the Joint Service General Purpose Mask, June 1999, UNCLASSIFIED - limited.	C.M. Grove
ECBC-TR-044	Review and Analysis of Integrated Mask-Helmet Systems, June 1999, UNCLASSIFIED - limited.	C.M. Grove

ECBC-TR-045	Chemical Vapor Challenge Tests of the Production First Article Field-Deployable Environment Control Unit, June 1999, UNCLASSIFIED - limited.	D.W. Reeves B.D. Cannon W.P. Ahearn W.K. Blewett
ECBC-TR-046	Evaluation and Modification of Plasmid DNA Purification Kits, July 1999, UNCLASSIFIED - public release.	D.E. Menking P.A. Emanuel J.J. Valdes S.K. Kracke
ECBC-TR-047	Test of Level B Suits - Protection Against Chemical and Biological Warfare Agents and Simulants: Executive Summary, July 1999, UNCLASSIFIED - public release.	R.S. Lindsay
ECBC-TR-048	Test of Level B Suits to Challenge by Chemical and Biological Warfare Agents and Simulants: Summary Report, July 1999, UNCLASSIFIED - public release.	R.S. Lindsay
ECBC-TR-049	Evaluation of a Candidate Solvent for Decontaminating Agent, Multipurpose (DAM). 2. Decontamination Efficacy of Calcium Hypochlorite in Sulfonanes and Water, July 1999, UNCLASSIFIED - limited.	P.W. Bartram V.D. Henderson L.R. Procell K.H. Park
ECBC-TR-050	Effectiveness of Closures Proposed for JSLIST Waterproof and Water-Resistant Chemical Protective Suits, August 1999, UNCLASSIFIED - limited.	B.D. Cannon W.K. Blewett V.J. Arca W.P. Ahearn L. Saubie
ECBC-TR-051	Exploding Wire Phenomena in Various Micron Diameter Graphite and Stainless Steel Fibers, July 1999, UNCLASSIFIED - limited.	L. Cash J. Duarte W.E. Kinne H. Smalley A. Ross D. Banner
ECBC-TR-054	Filtration Characteristics of MS2 Bacteriophage Using Various Molecular Weight Filters, August 1999, UNCLASSIFIED - public release.	C.H. Wick P.E. McCubbin
ECBC-TR-055	Removing Complex Growth Media from MS2 Bacteriophage Culture, August 1999, UNCLASSIFIED - public release.	C.H. Wick P.E. McCubbin
ECBC-TR-056	Characterization of MS2 Bacteriophage by IVDS Physical Counting Methodology, August 1999, UNCLASSIFIED - public release.	C.H. Wick P.E. McCubbin

ECBC-TR-057

Expression and Purification of Selenomethionyl
Prolidase from *Alternomonas* spJD6.5,
September 1999, UNCLASSIFIED - public release.

T-C. Cheng
V.K. Rastogi
J.J. DeFrank
W.R. Ashman
V. Champagne

ERDEC-TR-555

Effect of Temperature on the Desorption and
Decomposition of HD from Activated Carbons,
December 1998, UNCLASSIFIED - public release.

C.J. Karwacki
J.H. Buchannan
T.E. Rosso
L.C. Buettner
J.J. Mahle
G.W. Wagner

The Headquarters of the U.S. Army Soldier and Biological Chemical Command is located at the Edgewood Area of Aberdeen Proving Ground, Maryland.



Within the SBCCOM RDA Enterprise is the Research, Development and Engineering Center (RDEC). The RDEC consists of the Natick Soldier Center and the Edgewood CB Center. This publication is prepared at the Edgewood CB Center, incorporating CB-related information from the entire RDE Center.



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