



NEW SENIOR EXECUTIVE SERVICE POSITIONS AND ORGANIZATIONAL CHANGES HAPPENING AT EDGEWOOD

*Permanent
Orders 12-4,
12 January 1998
reorganized CBDCOM,
SSCOM, and Surety
Field Activity on a
provisional basis. The*



**U.S. Army Chemical and
Biological Defense Command**



new organization is designated as the U.S. Army Soldier and Chemical, Biological Command (SCBCOM) (PROVISIONAL). Effective date of provisional organization was 15 January 1998. All correspondence will be addressed to Cdr, U.S. Army Soldier and Chemical, Biological Command (Provisional). No change in physical location. All personnel will remain in place. UCMJ authority will remain with existing commanders. Command and control authority will transfer on 1 October 1998.

To some change is invigorating – to others it is very scary. At the Edgewood Enterprise many employees are experiencing some of these feelings or a combination of them as we continue to experience a number of changes. In addition to the announcement of a reorganization of our command (CBDCOM), merging with the Soldier Systems Command, we are experiencing new leadership as the result of the appointment of two individuals into Senior Executive Service positions at the Edgewood RDE Center. And, as this issue goes to press, we are awaiting the announcement of the appointment of a new Technical Director for the Edgewood RDE Center.

First, the appointment to the Senior Executive Service of our newest leader, Dr. I. Gary Resnick, was announced in December 1997; and he was assigned as Director of Research and Technology at the Edgewood RDE Center. Dr. Resnick comes to Edgewood from Dugway Proving Ground, where he was the Technical Director since 1994.

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This newsletter is distributed to over 600 addressees throughout the Joint Services and would be a good vehicle to publicize what is going on where you are. Please submit articles to Technical Director, Edgewood Research, Development and Engineering Center, ATTN: SCBRD-ASC, Aberdeen Proving Ground, MD 21010-5423, or by electronic mail to scbrd-asc@apea.army.mil. The editors reserve the right to edit, including verification of facts, removing redundant or ambiguous language, and proofreading. The newsletter is prepared for publication by the Corporate Enhancement Team:

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(Continued from front cover)

Dr. Resnick said, “I believe I am a good fit for the organization at this time in its evolution.” When asked, “Why me, why now, why the Edgewood RDE Center? Dr. Resnick provided the following thoughts:

- My principal professional interests are in chemical and biological defense research and technology
- While I have worked with both chemical and biological defense, my principal strength is in biological defense
- I am quite familiar with the overall CB community
- I have worked with the Edgewood community since 1980, but I have not been enmeshed in its culture. I bring a fresh perspective with a relatively shallow learning curve.
- I believe very strongly in our need to adapt to a changing environment, and enjoy the challenges associated with pursuing cultural change



Dr. I. Gary Resnick

Dr. Resnick grew up in the Northeast area and is a Cornell Undergraduate, obtaining a bachelor of science in “Ecology and Mammalian Physiology” in 1971. He obtained his masters of science in “Medical Science” in 1974, a doctorate in “Microbiology” in 1978, and was a Post-Doctoral Research Fellow in “Toxicology” in 1980. Dr. Resnick is also a registered Medical Technologist.

In 1980, he went to work at Dugway Proving Ground as a staff scientist and worked his way up through the traditional chain of the organization to become its Technical Director in October 1994. Dr. Resnick has worked his whole career with pathogens, bringing to the position of Director of Research and Technology a strong scientific viewpoint coupled with the organizational perspective of a Technical Director of an installation. He has taken an installation through challenges similar to those facing the Edgewood RDE Center, so he has an appreciation for the difficulties that the Center is facing. His career progression and the experience he has gained provide the understanding of how to balance competing internal needs, in order to optimize long term mission performance.

Philosophically, Dr. Resnick shares the philosophy of other senior leaders in the organization and is a firm believer in the “5th Discipline – The Art and Practice of The Learning Organization” by Peter M. Senge. He believes in the concept of *Personal Mastery*, where an organization is only as strong as its *personal mastery* across its personnel. He also attests to the concept that “Leadership is to foster the growth of personal mastery by providing mentoring, encouragement and a constructive work environment that is conducive to professional risk taking.” Dr. Resnick stated that he is “actually energized by change and that this is a great period in the life of the Center because of its changing internal and external environment.” Dr. Resnick describes himself as a systems thinker and a strong believer in the concept of a learning organization. He points out that “the system is created, the product ordained.” Therefore, if we are not satisfied with our products, or the cost of producing them we should examine our systems/processes to see if change is needed. Considering the dramatic changes occurring internally and externally, it would be surprising if some internal system level change would not be desirable.

When talking about goals, Dr. Resnick said that he looks forward to:

- developing, with the rest of the RDA Enterprise a “Team of Teams.” He restated (Ret) Major General Walter G. Busbee’s reiteration of the motto “One Team, One Fight,” and said he wished to add an additional thought – “One Voice”
- continuing the evolution of the empowered team management concept
- developing technological solutions to the wider range of requirements facing the CB community
- utilizing novel acquisition tools and strategies for enhanced mission performance

Dr. Resnick stated that throughout his career he has had three priority goals for his team (listed in order of importance):

1. Safety First
2. Have Fun
3. Do Quality Work (A given– if you are having fun, you will do quality work)

Dr. Resnick said that he believes that with the appointment of two SES positions during the past year and another soon to be appointed, along with our rising mission requirements, are indications of the long term viability of the RDA Enterprise. “I am very please to have this opportunity to work with the extremely capable scientists of the Research and Technology Directorate, the supporting contract workforce, and the greater CB community. Working as an integrated team we can develop the innovative technical solutions to the pressing CB threat.”

The other appointment, which was made in April 1997, was the assignment of Dr. John M. Ferriter as the Director of Engineering for the Edgewood RDE Center. Just prior to this appointment, Dr. Ferriter was the Director of Research and Technology at the Center. He was a very logical choice for this new assignment since he has been Director of Concurrent Science and Engineering, Director of Munitions, and Director of Detection here at the Center. He also served as the principal advisor to the Technical Director on Joint Service technology base matters.

Dr. Ferriter is a native of Massachusetts. He holds a bachelor of science degree in “Chemical Engineering” from the University of Massachusetts, a masters of science degree in “Management Science” and a masters of science degree in “Environmental Engineering” from Johns Hopkins University, and a doctor of science degree in “Engineering Administration” from George Washington University. He is also a graduate of the Command and General Staff College. Dr. Ferriter is a licensed professional engineer in the State of Maryland.



Dr. John M. Ferriter

Dr. Ferriter served as a commissioned officer in the U. S. Army Chemical Corps for three years starting in 1971. He entered government service in 1974 as a chemical engineer concentrating on the binary munitions.

As Director of Engineering, Dr. Ferriter directs the efforts of engineering personnel conducting development, engineering and production in areas of non-medical chemical and biological defense and smoke/obscurants. He also manages strategic and long-range planning for these programs.

When asked about his management philosophy, Dr. Ferriter said, “My philosophy is consistent with Steven Covey’s *Principle Centered Leadership*. I focus on the four aspects of this philosophy: personal (how I feel about myself), interpersonal (how I relate and interact with others), managerial (working with others to get the job done); and organizational (building a work environment for people and the organization to grow). Trust is my foundation - do people trust me to do what is right for them and the organization, do I trust others to do what is right, and do we focus on a win-win situation.”

One of Covey’s leadership habits is *seek first to understand, then to be understood*. “I couldn’t agree more with Covey,” said Dr. Ferriter. “I must listen with my eyes, my heart, and listen for feelings when individuals and I discuss problems, concerns, and issues. I can then understand the needs of the people and the organization. Only then will I have the information to make good decisions. Being Irish, I liken this to the Irish Proverb - ‘*listen to the river and you’ll catch the trout.*’ It tells me I must listen with more than my ears,” he said.

“We are once again at a new beginning with the merger of Soldier Systems Command and the Chemical and Biological Defense Command (CBDCOM) into a single organization. All of us have first-hand experience from when we formed CBDCOM. It is more important than ever that we listen and understand the issues so we can make progress and our journey will be a success. To achieve this success, we must maintain our integrity, balance, courage and consideration, and have an abundance mentality (thinking there is a meaningful position for everyone),” he continued.

When asked to consider his goals, Dr. Ferriter responded, “A personal goal for me is adding a single grain of sand to the mountain of knowledge. I have been working on this goal for some time, and I still have not achieved that goal. I believe that by doing what is best for the organization, I will achieve that goal and I will make a positive difference. A second goal is happiness. Happiness means something different to everyone. By happiness, I mean having something to do that makes a difference and having something to hope for. I do feel good about this goal.”

“Henry Kissinger said the job of a leader is to *get people from where they are to where they have not been*. I will need your help, support and trust as we continue our journey to where we have not been. And when I make a mistake, I ask for your support, help, and understanding. We will be successful on our journey.”

In closing, Dr. Ferriter said, “I have been fortunate throughout my career to have had the opportunity to work with good and talented people. It is no different now. Our goal now is to have others recognize what we already know. We produce quality products, provide quality services, and above all we are a national asset. Together we help others understand what we already know.”

Besides his duties as Director of Engineering, Dr. John M. Ferriter is the Army representative to the Joint Service Materiel Group. His duties are to provide day-to-day oversight of Army products and processes supporting the Joint Service Materiel Group.



Since last April, Dr. Ferriter has been spending several days a week in Washington. In order to foster this “directed viewing” approach and embed this interaction with the Enterprise, Mr. Horace Pearce, the Acting Director of Research and Technology, has been accompanying him to Washington. Both directors took an active role in orchestrating events within the Joint Service Chemical/Biological community. The Director of Engineering is currently a member of several “groups” and Chairs the technology panel for the Office of the Secretary of Defense on Chemical and Biological Defense. Due directly to his active involvement, our share of the programs and the program dollars have increased dramatically. Until his intervention, our once solid monopoly of the chem/bio programs was being nibbled away by the other three services.

And now, with two new managers in place, the third selection has just been announced. Mr. Michael A. Parker, Deputy to the Commander of the U.S. Army Chemical and Biological Command announced the selection of Mr. Joseph H. (Jim) Zarzycki to the position of Technical Director, Edgewood Research, Development and Engineering Center (ERDEC). Mr. Zarzycki currently is a senior vice president for the Dynamac Corporation in Rockville, MD, and previously served as the Director, Physical Protection, within the former U.S. Army Chemical Research, Development and Engineering Center (CRDEC). Mr. Zarzyck’s reporting date is currently being negotiated.

In closing, I quote from an unpublished paper by Ms. Pamela Barrett, our Career Development Advocate:

“If I were to compare the RDA Enterprise to a car, at the beginning of this study, I would have said that we were stalled. Having taken my own step backwards and viewed the Enterprise through the lens of three models and various organizational learning theorists, I can now hear the motor purring. The Enterprise is merely in “neutral” waiting for a driver to appear. The engine has had a recent tune-up, the fluids have been checked and changed. If the new owner ‘reads the manual’ and learns how to best operate his or her new machine, checks the map for the curves in the road, I believe that we have made the strides that will carry the Enterprise successfully into the next century.”

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DOMESTIC PREPAREDNESS TRAINING AND EXERCISE ACCOMPLISHMENTS

Compiled statistics are providing insight into the breath of the Domestic Preparedness training and exercise efforts. A total of 2,328 individual trainers received training during the first part of FY98, with a total combined course attendance of 4,589. The totals cover 3 cities trained, including that portion of New York City training which was initiated during the last days of September 1997. Training was scheduled to take place in 13 cities during January, February, and March 1998.

Starting with the initial Domestic Preparedness training and exercise in Philadelphia, PA, in August 1997, a cumulative total of over 3,140 individual trainers from 7 cities received training through the end December 1997, with a cumulative total, combined course attendance over 6,600.

During the October-December 1997 time frame, 2 chemical tabletop exercises were conducted (Los Angeles and San Antonio); 12 were scheduled for January-March 1998.

The Domestic Preparedness program supported New York City in the design and successful conduct of a November 9th field exercise and medical exercise, as part of the ICE series. The ICE exercise is similar to the Domestic Preparedness program's planned functional exercises; and for New York City, the ICE is considered a completed DP functional exercise. The ICE series includes exercise activities for the City's departments, agencies, medical facilities, and State, Federal and private sector organizations. The Domestic Preparedness program tabletop and functional exercises are performed to reinforce training, provide feedback on what was learned and not learned, and to evaluate the training for improvements.

Multiple efforts were initiated this quarter to maintain the high quality and standards of the DP training courses.

Training Course Update. Training courses were updated during October 1997 based on input received from training held in New York City, Philadelphia, Boston, Detroit, and Chicago. CBDCOM and our Federal partners considered and adopted changes via a boarding process. Course modification results included the following:

- Overall, a more focused approach was taken to concentrate on the train-the-trainer techniques.

- *Incident Command Course.* The course was expanded to 6 hours in lieu of the original 4-hour course. That portion of the course dealing with the "Role of Federal Agencies" was expanded, along with the time required to conduct the exercise at the end of the course.

- *Responder Awareness Course & Responder Operations Course.* The redundancy between the two courses was eliminated by modifying the "Responder Actions Module" in the *Responder Operations Course*. The decontamination section of the *Responder Operations Course* was also expanded.

- Starting in January 1998, the *Technician/Hazardous Materials (HAZMAT)* course became a 12-hour stand-alone course. Portions of the *Responder Awareness Course* and *Responder Operations Course* have been incorporated, eliminating the need for HAZMAT technicians to attend *Responder Awareness* and *Responder Operations* courses as prerequisites. The modification results in a more focused technician based course.

Instructor Validation. Medical and non-medical training instructor validation procedures were instituted. All new instructors, regardless of their professional origin, require validation.

The validation process begins with identifying potential instructors based on developed course instruction qualifications. Candidates meeting the qualifications are required to observe training, review course materials, and present before a validation board. Validated instructors then participate in instructional classes in a back-up role, followed by actual city training.

To date 32 new instructors, 8 of which are Reserve Component personnel, have received such validation. Of the 32 instructors, 11 are medical and 21 are non-medical instructors. Of the 8 Reserve Component instructors, 1 is a medical instructor, and 7 non-medical. Significant added value is gained by the participation of local emergency response and Reserve Component personnel. This group of trainers become their communities' experts, who can continue to identify opportunities to expand local responder expertise across the country.

Course Accreditation. We are attempting to gain accreditation for the Domestic Preparedness training courses. Continuing education units (CEU) and continuing medical education (CME) units can now be obtained for successfully completing the program's medical training courses. The accreditation was expedited and obtained through the U.S. Army Medical Command, Ft Sam Houston, TX. Physicians can earn 7 CME units, and nurses can earn 8.4 CEUs by successfully completing the *Hospital Provider* course. Emergency medical technicians/paramedics can earn 8.5 CEUs for successfully completing the *Technician/Emergency Medical Services* course. The Domestic Preparedness program is working to secure similar accreditation for the non-medical courses.

Training Video. A video of the Domestic Preparedness training course will be produced as a training device for the cities. The video will

assist in maintaining current quality and consistency of the Domestic Preparedness training. The professionally produced video will offer yet another quality method for cities to train emergency responders and refresh city trainers.

FBI Video. The Federal Bureau of Investigation (FBI) is responsible for presenting the threat portion of the *Responder Awareness Course*. The threat portion of the presentation has been converted to a video to reduce FBI instructor burden and provide the cities with an additional training tool. The video was used during training in Los Angeles and San Antonio.

Employee Awareness Video. This video is designed to acquaint a diversified audience (i.e., 911 operators, security guards, ticket takers, hospital support staff) with the signs and symptoms associated with nuclear, biological and chemical (NBC) terrorist incidents and how to respond accordingly. Within the video there is a separate module for 911 operators/dispatchers. The video is accompanied by a facilitator's guide, a training brochure, and a 911 operator/dispatcher checklist.

Federal Partner Training. The Domestic Preparedness training curriculum was provided to an audience of Federal partners including Reserve Component personnel in November 1997. The training was to provide Federal partner personnel with first hand knowledge and experience in Domestic Preparedness city training. This value-added experience provides trained personnel with skills to better communicate the program's services to the cities. An alternate purpose was to allow Reserve Component personnel, designated as potential future instructors, to experience and observe the training. A total of 128 individuals received instruction in multiple classes, yielding a total combined course attendance of 419.

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MONITORING SUPPORT PROVIDED TO THE ENVIRONMENTAL PROTECTION AGENCY IN CINCINNATI, OHIO

Individuals representing the Edgewood Research, Development and Engineering Center's Chemical Support Division, the Center for NBC Environmental Technology, and Idaho National Engineering Laboratory participated in a Community-Based Environmental Program Study in the Winton Hills/Place area of Cincinnati, Ohio, with the Environmental Protection Agency and the Hamilton County Department of Environmental Services. This area of Cincinnati encompasses a number of facilities that emit toxins into the atmosphere, which have become of great concern to the low-income and minority citizens living in the vicinity. Ms. Carol Browner, Environmental Protection Agency Administrator, previously promised local residents that steps would be taken to enhance the environmental quality of the area. Mr. Fred Hanson, Environmental Protection Agency Assistant Administrator, was a lead advocate for the study.

The 2-week, multi-tasked effort began in October 1997 and included conducting point source monitoring at selected industries, source emission characterization, urban air quality monitoring in an Environmental Justice area, and the evaluation of open path monitoring for performing this type of ambient air monitoring. Both open-path Fourier Transform Infrared Spectrometers and Differential Optical Absorption Spectrometry systems were used in the monitoring study.

The Fourier Transform Infrared was capable of detecting all the analytes requested by Environmental Protection Agency Region V and Hamilton County Department of Environmental Services. The Differential Optical Absorption

Spectrometry, operated by Environmental Protection Agency's Office of Enforcement, also performed extremely well.

The Center for NBC Environmental Technology is currently analyzing the data collected during the study. This data will provide much needed information to further assay the air quality in Winton Hills/Place area, and it will provide support to policy makers and regulators taking appropriate steps to enhance the air quality of the area. Additionally, the study provided training to Environmental Protection Agency Region V and Hamilton County Department of Environmental Services staff in the operation of the Open Path-Fourier Transform Infrared and Differential Optical Absorption Spectrometry systems. Final data analysis will also help to determine the effectiveness of open-path monitoring technologies when used as a tool for source oriented and urban air monitoring.

A letter was forwarded from Mr. E. Timothy Oppelt, Director of the Environmental Protection Agency's National Risk Management Research Laboratory, to MG George E. Friel, Commander, CBDCOM, commending the staff of the Center for NBC Environmental Technology for "outstanding performance" in conducting the Cincinnati field study.

POC: Mr. John T. Ditillo, Operations Directorate, Commercial (410) 671-4679 or DSN 584-4679, or email jtditill@apega.army.mil, or Ms. Cindy Dietz, Operations Directorate, Commercial (410) 671-4427 or DSN 584-4427, or email ckdietz@apega.army.mil.



AMC CHEMICAL AGENT SAFETY AND HEALTH POLICY ACTION COMMITTEE

The U.S. Army Materiel Command Chemical Agent Safety and Health Policy Action Committee held its quarterly meeting in October 1997 at the Edgewood Area of Aberdeen Proving Ground. The meeting included sessions related to chemical safety and health issues impacting operations throughout the Army and was an overwhelming success.

The committee is now into its fifth year, and it continues to grow both in the number of attendees and the quality of the work being produced. Among the many issues addressed during the October meeting, the following stand out:

- new M40 protection factors
- new chemical agent exposure standards
- studies being performed by the Center for Health Promotion and Preventive Medicine regarding personal air sampling and igloo filter evaluations

Attendees were also able to hear from working groups on Chemical Agent Safety Policy, Ventilation/Monitoring, Building Demolition, and Chemical Agent Standards.

The highlight of the two-day session was a presentation given by MG George E. Friel, Commander of CBDCOM. MG Friel discussed the past successes of the committee. He emphasized the fact that the committee was one of the first working groups formed that showed AMC how teaming can be used to improve efficiency and productivity without a corresponding increase in staffing.

For the future, MG Friel has tasked the committee to continue on its path of developing safety policy that makes sense to the field and to begin to leverage our existing capabilities in developing better standards associated with new equipment and processes. He also asked the committee to begin generating new ideas that will assist the chemical storage sites, chemical demilitarization, Chemical Stockpile Emergency Preparedness Program, and Domestic Preparedness in meeting their challenges for the future.

POC: Mr. George E. Collins, Jr., Operations Directorate, Commercial (410) 671-4414, DSN 584-4414, or email gecollin@apea.army.mil.



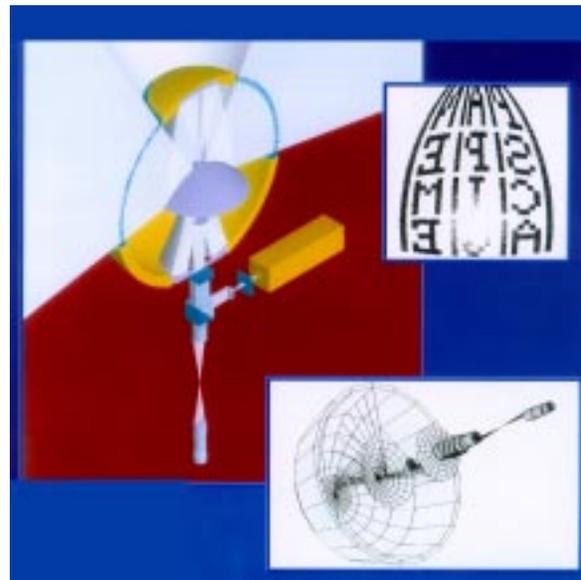
REMOTE SENSOR PATENT

Patent number 5,708,503, "Panoramic Infrared-Imaging Spectroradiometer with Reverse Phase-Modulated Beam Broadcasting," was issued January 13, 1998, and assigned to the United States as represented by the Secretary of the Army, Washington, D. C., Arthur H. Carrieri, inventor.

Department of the Army now has patent protection coverage for an Ultra High-Speed Infrared Spectroradiometer System named PANSPEC. The Optical Society of America (OSA) chose to feature PANSPEC on the March 1997 cover of the Journal of Applied Optics — Lasers, Photonics and Environmental Optics division.

PANSPEC is a computer-designed sensor that images a panoramic infrared environment and spectroscopically searches for a chemical cloud 30-kilometers distance and beyond within this field of view. Detection of the chemical gas is accomplished once an absorption or emission thermal spectrum, characteristic of the chemical species, is resolved pixel-by-pixel at the sensor's focal-plane array. It combines wide-angle imaging optics (panoramic camera) and a high-speed solid-state interferometer (FTIR spectrometer) element into a single unique structure.

This optical design required several months of dedicated, intense, computer optimization runs and image analyses. PANSPEC employs neural network pattern recognition electronics for ascertaining chemical presence in the environment rapidly (millisecond), during passive operation. (RE: patent 5,631,469) Its *optical fusion* design allows for the communication of chemical cloud presence and heading by the (omnidirectional) transmission of an encrypted laser beam with modulated amplitude.



Panoramic Chemical Vapor Sensing and Tracking

PANSPEC produces a balanced diffraction-limited circular infrared image of the panorama, 6.3 mm across, 10 line-pairs per mm spatial resolution at 50% spatial modulation, and a f/2.3 working speed.

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DEMONSTRATION OF ENVIRONMENTALLY FRIENDLY ELECTRONICS CLEANING SYSTEM

Our Technical Integration Office has developed a non-aqueous, non-ozone depleting system to cleanse circuit boards and sensitive equipment prior to repair. The project was funded by a U.S. Air Force contract and by the Joint Program Office for Special Technologies Countermeasures. In addition to being able to support electronics cleaning for large scale maintenance operations, the technology used in this system, advanced vapor degreasing, has the potential to meet the requirements of the Non-Aqueous Equipment Decontamination System.

On January 28th, a live demonstration of the system was held for representatives of the U.S. Army Chemical School, the Maneuver Support

Battle Lab, and the Joint Services Materiel Group. On the following day, a live demonstration was held for representatives of Headquarters, U.S. Army Training and Doctrine Command; the Survivability Lethality Assessment Directorate, Army Research Laboratory; the Operational Test and Evaluation Center; and the U.S. Army Nuclear Chemical Agency. It was the consensus of those observing the demonstration that the technology used in this system has definite promise for chemical, biological, and nuclear decontamination of electronic and sensitive items.

POC: Dr. John R. Kennedy, Technical Integration Office, Commercial (410) 671-3048 or DSN 584-3047.

QUALITY CERTIFICATION PRESENTED TO ILC DOVER

At the recent (CP)2 Presentation Ceremony at ILC Dover, MG George E. Friel signed the (CP)2 Memorandum of Agreement as the representative for the Army Materiel Command and Mr. Homer Reihm, President, signed for ILC Dover. In the formal ceremony, MG Friel awarded the (CP)2 plaque and flag to Mr. Reihm. All employees of the company attended the ceremony and were cited for their contributions to the team effort which took several years to accomplish. Dignitaries attending the meeting included Congressman Castle, representatives of Senator Roth and Senator Biden, the Commander of Defense Contract Management Area Office-Philadelphia, representatives of major contract holders (Boeing, NASA, etc.), and members of the local press.

The company has since applied for ISO 9000 registration, and the third party audit team not only registered them on the first audit but had no findings against the quality system. ILC Dover felt the primary reason for these extraordinary results was the effort they put into the (CP)2 Program.

\$85 MILLION EARMARKED FOR MUSTARD DISPOSAL

In the early 1990s, they wanted to burn it; today, they are looking for ways to "neutralize it." Stockpiled mustard agent – a World War I blistering agent designed to incapacitate the enemy – has long been a concern at Aberdeen Proving Ground.

But thanks to a whopping \$85 million in Congressional funds in the FY 1999 budget, APG's mustard woes may end, according to a press release from Sen. Paul Sarbanes (D-Md.). By the year 2004, the 1,625 tons of agent stored in the Edgewood Area of APG – enough one-ton containers to cover a football field – should be disposed of.

The funds will be used to build a 130,000-square-foot facility – next to the storage yard where the agent is kept – and to complete development and testing of a neutralization process, the press release says.

Neutralization is a hydraulic process, according to Mickey Morales, spokesman for the Chemical Stockpile Disposal Program at APG. Water at 194 degrees Fahrenheit is mixed with the mustard agent in a large vat, he explained. The water and agent have a chemical reaction and become a biodegradable compound, known as thiodiglycol.

Next, creek sludge is mixed with the resulting compound and bugs within the sludge eat the compound, Morales added. The end result is a "safe liquid" that goes to the APG sewage treatment plant and into the Bush River.

"The funding included in the president's budget is an important step forward toward reducing the risks associated with the chemical weapons stockpile at Aberdeen Proving Ground," Sarbanes said in a press release. "It has been through the hard work of the local community and the Army in determining an environmentally safe alternative to incineration that is enabling us to begin moving forward with the destruction of these weapons."

George Englesson, owner of the New Ideal Diner in Aberdeen and co-chair of a citizens advisory commission, is one of several residents who have been instrumental in getting the Army to look at alternatives to burning the agent.

"We didn't want to wait for the next generation to learn that we shouldn't have incinerated [the mustard agent]," said Englesson, who was appointed to the advisory commission when Schaefer was still governor. "We didn't know what would go out into the atmosphere."

Englesson said he feels the neutralization process is a "success" for both the Army and area citizens, adding "it's gratifying to know that your concerns – the public's concerns – are being listened to."

Once the facility is built and the operation full scale, the Army will have the capability of neutralizing two tons of mustard agent per day, Morales said. At that rate, it should take about one year to neutralize the entire stockpile.

Before that can happen, however, Chemical Demilitarization must develop an environmental impact statement and an environmental risk assessment; it must obtain building permits and requests for proposal; it must await completion of construction and, once the facility is constructed, it must run a year long pilot program to assure safety, Morales said.

The Army already has conducted numerous toxicology and lab tests and has been neutralizing mustard agent on a small scale since 1994, Morales added. Mustard agent is stockpiled at seven other sites in the United States: Tooele, Utah; Umatilla, Ore.; Pine Bluff, Ark.; Pueblo Colo.; Blue Grass, Ky.; Newport, Ind.; and Anniston, Ala.

SMALL BUSINESS IS SMOKING



On January 24th, 1998, Minowitz Manufacturing Co., Roseville, MI, was awarded the Mid-Western Region 5 *Best Prime Small Business Contractor for FY97*. Tank and Automotive Command-Armament and Chemical Acquisition Logistics Activity (TACOM-ACALA), in cooperation with PM Smoke, Edgewood RDE Center at Rock Island, and the chemical group at TACOM-ACALA, coordinated the preparation and submittal of the nomination package for Minowitz. The M157A2 "Multifuel" Smoke Generator Set contract was a competitively-awarded, Best Value, performance specification-based new production contract to retrofit kits and associated spare and repair parts. The contract was awarded March 30th, 1998, and the first CBDCOM/TACOM-ACALA effort was completed in accordance with the Acquisition Reform Act of 1996.



Minowitz successfully accelerated the First Article Test and combined the

contractor and Government Production Qualification Test at Dugway Proving Ground, UT. Over 400 systems or retrofit kits have been delivered and over 350 M157A2s have been deployed to date. Our customers are pleased with the product, and we have experienced a delightful reduction in Operational and Sustainment Costs.

Minowitz now competes with the other nine regional awardees for the national award. The regional awardees and the national selectee will be honored in Washington, D.C., in June 1998 at a special banquet.

Representatives from the joint PM Smoke, TACOM-ACALA, and the Edgewood RDE Center at Rock Island Arsenal M157 team plan to attend this event.

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SMOKING IN SOUTHWEST ASIA

After Operation Desert Shield/Storm, the Royal Saudi Land Forces (RSLF) were approved in 1992 for a Government-based Foreign Materiel Sale (FMS) of up to 180 M157 Motorized Smoke Generator Sets (SGS). Large area smoke is a proven “Combat Multiplier,” and the RSLF will use these assets to “Protect their Force.”

Since the M157A1 Materiel Change added critical safety and operational improvements to the basic system and was nearly complete, the Product Manager for Smoke directed that the procurement of the systems be suspended until the RSLF could modify their case to incorporate the improvements of the M157A1. Independently, the U.S. Department of State suspended the entire FMS to establish priorities and conserve funding resources. The large area smoke systems were eventually placed in the secondary band of priority and delayed until additional funding became available.

This delay had a “silver lining.” Based on an exceptional research and technology breakthrough, the “Multifuel” Materiel Change was accelerated and Type Classified, standard, logistic code A, in December 1994 as the M157A2. The RSLF FMS case was modified to reflect the M157A2, and an option was included in a competitive, best-value production contract. This contract was based on a performance specification in accordance with the Acquisition Reform Act of 1996 and awarded to Minowitz Manufacturing Company on March 30th, 1996. After a successful First Article Test and Production Qualification Test, PM Smoke revisited the possibility of FMS.

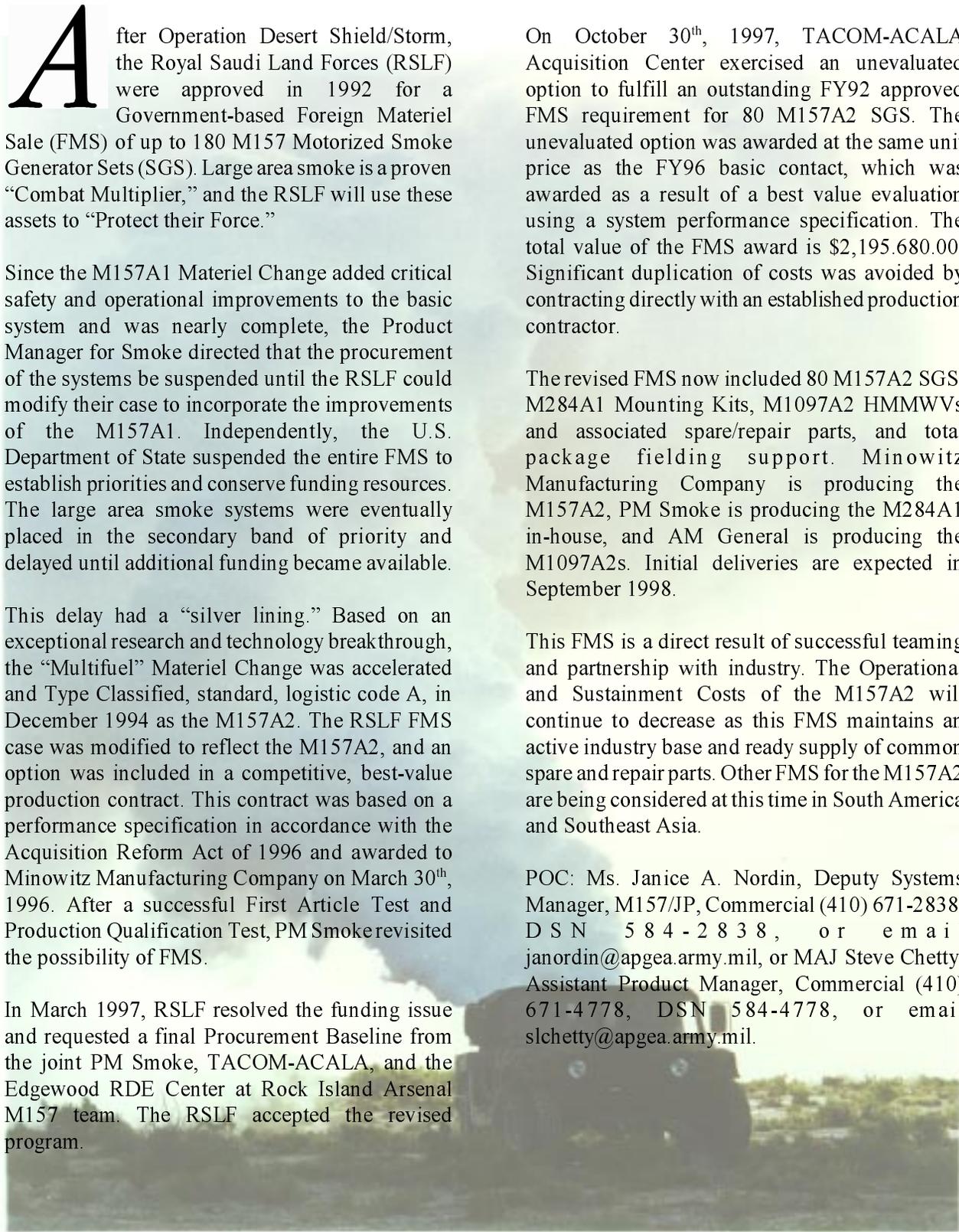
In March 1997, RSLF resolved the funding issue and requested a final Procurement Baseline from the joint PM Smoke, TACOM-ACALA, and the Edgewood RDE Center at Rock Island Arsenal M157 team. The RSLF accepted the revised program.

On October 30th, 1997, TACOM-ACALA Acquisition Center exercised an unevaluated option to fulfill an outstanding FY92 approved FMS requirement for 80 M157A2 SGS. The unevaluated option was awarded at the same unit price as the FY96 basic contact, which was awarded as a result of a best value evaluation using a system performance specification. The total value of the FMS award is \$2,195,680.00. Significant duplication of costs was avoided by contracting directly with an established production contractor.

The revised FMS now included 80 M157A2 SGS, M284A1 Mounting Kits, M1097A2 HMMWVs and associated spare/repair parts, and total package fielding support. Minowitz Manufacturing Company is producing the M157A2, PM Smoke is producing the M284A1 in-house, and AM General is producing the M1097A2s. Initial deliveries are expected in September 1998.

This FMS is a direct result of successful teaming and partnership with industry. The Operational and Sustainment Costs of the M157A2 will continue to decrease as this FMS maintains an active industry base and ready supply of common spare and repair parts. Other FMS for the M157A2 are being considered at this time in South America and Southeast Asia.

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ABRAMS ARE SMOKING



In 1985, the Department of Defense released DOD Directive 4140.43, Fuel Standardization, which requires all Army combat equipment to use JP8 fuel. The use of JP8 *Single Fuel Forward* significantly reduces logistic burden and cost of all deployments. Concurrently, JP8 cannot produce an effective smoke in the Vehicle Engine Exhaust Smoke System (VEESS). Specifically, JP8 produces a thin, low persistence smoke cloud compared to either diesel or smoke generator fuel [SGF-2](fog oil). The primary reason for lack of smoke is that JP8's high volatility causes quick evaporation. PM Smoke, in cooperation with the Edgewood RDE Center, tried to resolve the JP8 problem to sustain armor vehicles' self-screening smoke.

The Edgewood Center's Research and Technology Directorate completed tests at Dugway Proving Ground in 1988 that proved JP8 will not produce effective smoke. Comparison of smoke performance, with fog oil "goodness of smoke"

measured as 1 (100%), gives diesel performance of 0.8 (80%), and JP8 0.06 (6%) The Edgewood Center terminated the JP8, fog oil replacement program in March 1988. The replacement effort encompassed 3 years of research of over 20 technologies at a cost of \$5 million. **CONCLUSION:** No technology exists to produce an effective armor vehicle self-screening smoke with JP8 or JP8 additives; therefore, fog oil and diesel fuel are the only materials proven for use with VEES.

In response to the 1988 test conclusions, the Product Manager for Smoke, in cooperation with the Program Manager for Abrams, recommended a separate fog oil storage reservoir be added to the combat vehicles so they can use existing VEES hardware. The cost estimate to put fog oil tanks on the M1 Abrams was \$4.6 thousand per vehicle. The hardware cost is \$2.8 thousand, and an installation cost is \$1.6 thousand (20.9 hours @ \$75/hr). Fog oil to supply existing large area smoke generators is currently available in

Division, Brigade Support Areas; however, M1 fog oil tanks were unfunded in 1988 due to higher priority Abrams issues.

In January 1997, PM Smoke, in cooperation with PM Abrams and the Armor Center and School responded to a requirement from GEN Crouch, Vice Chief of Staff of the Army (at that time, Commander, U.S. Army Europe), to return a VEES capability to the V Corps' Abrams, prior to deployment to Bosnia to support **Operation Joint Endeavor**.

PM Smoke with PM Abrams, Aberdeen Test Center, and the Armor Center and School investigated short-term solutions. The most effective solution was a lightly armored, external fog oil reservoir. PM Smoke tested this item and provided successful results to U.S. Army-Europe Field Assistance in Science and Technology and others. Interest in rapid VEES progress caused Deputy Chief of Staff for Operations and Plans to fund a second generation VEES development program to return self-protective smoke to Abrams starting in FY99.

Existing Abrams have VEES pumps and injectors set up for vehicle fuel. Since vehicle fuel is no longer a smoke material, a small fog oil tank must now be attached to VEES. VEES pumps and nozzles will also be upgraded during VEES restoration. PM Smoke agrees with PM Abrams and the Armor Center and School that a fog oil tank can be effectively applied under armor during scheduled Abrams overhauls; e.g., Abrams Integrated Management. Alternatively, an exterior reservoir could meet more urgent requirements; applied at the unit commander's discretion with a Maintenance Work Order.

In preparation for the VEES Restoration Program, Mr. Rick Decker, PM Smoke, met with COL Cowan, TRADOC Systems Manager, and the Armor Center and School in November 1997. COL Cowan insisted that the VEES restoration be applied to the entire Abrams fleet. VEES controls must be compatible with Vehicle Integration Defense System automation to fully integrate rapid and self-protective screening

capabilities. To address resupply logistics, VEES cannot increase overall Abrams weight. The Army Center and School and PM Smoke propose weight requirements be met by replacing heavy M250 grenade launchers with improved, lighter, M6 grenade launchers compatible with the Vehicle Integrated Defense System. This will offset fog oil tank weight.

PM Smoke, PM Abrams, PM Survivability, and the Armor Center and School will work together to restore and improve the VEES. To identify additional funding for the Vehicle Integrated Defense System improvements, PM Smoke has submitted through higher headquarters a proposal to include the lighter, improved grenade launchers, mounting hardware, wiring harness, and control box. This unfunded requirement is being favorably considered by the Department of the Army.

Smoke is a proven combat multiplier. VEES should be a standard feature of all U.S. armored vehicles. Other forces, such as the NATO Quick Reaction Force in Bosnia have smoke-generating capability. Other U.S. services such as the U.S. Marine Corps are interested in restoring the VEES and may integrate the results of VEES restoration once it is available. They may, however, use available DF-M in place of fog oil. For the Army, the use of available fog oil will result in a system, which produces denser, larger clouds than previous VEES. Technical Report TRAC-WSMR-TR-28-87, Comprehensive Smoke Study (CSS), U.S. Army TRADOC Analysis Command, ATTN: ATRC-WDB, White Sands Missile Range, NM 88002-5502, October 1987, lists two specific means by which VEES enhances performance of Abrams to more effectively approach, defeat, and consolidate hostile objectives when dedicated, large area smoke is unavailable. In the frequent instances when armor units will not enjoy priority to use limited large area, armored smoke systems, the VEES will provide force survivability and effectiveness enhancements that are critical to ensure Abrams' mission accomplishment.

Due to long-standing Armor School requirements along the Comprehensive Smoke Study analysis,

PM Smoke will execute the scheduled 1999 program to deliver VEES to the force in 2001. The contribution of VEES is critical to enable fewer Abrams to do more difficult missions. In addition, VEES is a simple and cost-effective applique that will require little, if any, additional maintenance or training. PM Smoke is presently working closely with the Armor Center and School, PM Abrams, and PM Survivability to add definition and detail to the FY99 full-scale development start.

PM Smoke is preparing a booth, highlighting the VEES, for the upcoming May 1998 Armor Conference at Fort Knox, KY, and has invited

members of the Armor Center and School, PM Abrams, PM M1A1, and the Chemical School to attend a side-bar discussion on the VEES program. A follow-on discussion with the Chemical School is also proposed during the World-Wide Chemical Conference in Anniston, AL, in June 1998.

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MODERNIZATION THROUGH SPARES OR ELSE

Once upon a time, a Product Manager would develop, test, procure, and deploy a new or improved piece of equipment. At the end of this cycle, the PM would throw the product over the fence and leave it to the Integrated Materiel Management Center to sort out the life cycle logistic support issues. Depending on the readiness of the product, the Integrated Materiel Management Center would adjust the quantities of spare or repair parts in the inventory. This resulted in some inequities. If a product readiness was poor but it was critical to the mission, it was rewarded with additional funding to "fix" the problem. This approach rewarded failure not excellence. With the recent draw down in the Army and funding reductions, we have to find a better way to maintain our readiness at a lower cost.

The Undersecretary of the Army for Research, Development and Acquisition considers the Acquisition Reform Act of 1996 and Total Ownership Cost critical to the success of "Army After Next." The operational effectiveness of an individual commodity is being considered concurrently with cost effectiveness and Efficiency of Force.

Modernization Through Spares is a new approach for improving systems capabilities and will be accomplished via the spares procurement process. The Modernization Through Spares tasking memorandums to Program Executive Officers, Product/Program Managers, and Major Subordinate Commands and the Modernization Through Spares strategy are now on the Internet at the following addresses:
<http://amc.citi.net/amc/rda/milspec/authorizingmemo.html> and
<http://amc.citi.net/amc/rda/milspec/strategydocument.html>. These documents should be reviewed by Integrated Product Teams with the goal of selecting Modernization Through Spares candidates in accordance with guidelines contained in the strategy document.

PM Smoke is working "today" to support the "Army After Next." In October 1992, PM Smoke initiated a materiel change to the M157 Smoke Generator Set to incorporate critical safety and reliability improvements.

PM Smoke first formed a dedicated Integrated Product Team that included outstanding engineers and technicians within PM Smoke, TACOM-ACALA and the

Edgewood RDE Center at Rock Island. The IPT asked the customer after Operation Desert Storm to assess the existing system and provide suggestions for improvement. The IPT also examined the existing sustainment data and identified either high demand or sole source spare or repair parts for consideration. The first spare/repair candidates targeted by the materiel change were identified during this process.



Most notable were the Fuel Can Lid Assembly and Thermal Switches.

The original Fuel Can Lid Assembly was a single piece cap, which relied on three quick release mechanical disconnects and required complete removal prior to refilling the Jerry fuel can. The joint team redesigned the Lid Assembly to include a pass-through, which allows hot refueling without removal and exposure to dirt/dust contamination. The new Lid Assembly also eliminates three aircraft



quality quick disconnects, which experience poor reliability in a harsh combat environment. The new Fuel Can Lid Assembly costs \$800 dollars less than the existing item.



During the materiel change, the existing thermal switches were re-evaluated for reliability and cost. The engine run switch and high temperature cut-off switches are critical to safe mobile smoke operations. Both items were sole source items. The manufacturer mistakenly understood that they were prohibited from selling the exact same part to outside commercial customers. With the Government as their only customer, the low quantity and cost was unacceptable. We were surprised to discover that the same vendor has commercial equivalents and alternative parts that were previously rejected by the Government because they were not in accordance with the detailed Technical Data Package. Also, the reliability and performance of

the commercial part was continuously improved, while the original Military Specification component became more obsolete and expensive. The commercial thermal switches demonstrated over a 250 percent increase in reliability over the Government component.

After completion of the first M157 materiel change and type classification of the M157A1, the production funding was eliminated by the Department of the Army. The readiness of the M157 continued to decline. At one point, the projected percentage of M157 systems that were operationally functional dropped into the low 60s. PM Smoke challenged the joint PM Smoke, the Edgewood RDE Center at Rock Island, and TACOM-ACALA Integrated Product Team to consider alternative ways to accelerate the introduction of these new spare/repair parts, which were common to the existing fleet of M157 gasers. We selected parts that combined lower procurement costs with operational improvements. Our approach was to exhaust the original spare/repair part inventory through attrition and introduce the improved and less expensive replacements. Since these items were common with the existing M157 and future M157 system, early introduction of these parts accelerated our organic support and inventory for the future systems. As a result of these improved parts, the overall fleet readiness improved from 60 to 70 percent to over 90 percent despite a lower budget to procure the items.

Our Modernization Through Spares success and readiness improvements, combined with a technical breakthrough by the Edgewood RDE Center resulted in the Department of Army funding a follow-on materiel change for the M157. This new M157 could generate heat for vaporization of large area obscuration using any of the mid-viscosity fuels. Our IPT team was expanded to include our new partners in industry, and we expanded our investigation of potential Modernization Through Spares candidates. One of our successes was the replacement of the existing fire sensor.

The original fire sensor on the smoke generator was a “fusible link” wire, which melted when exposed to heat. The loss of continuity caused an immediate shutdown of the smoke generator. Unfortunately, the fusible link could only be used one time, and the replacement cost was staggering— \$1.8K each. The joint IPT discovered that there was a commercial fire sensor used on military aircraft with increased sensitivity and significantly lower cost. These sensors also automatically reset themselves at the end of the exposure and were reusable for the entire life cycle of the equipment. These fire sensors cost less than \$100 dollars each.

After the M157A2 Multifuel Smoke Generator System was type classified in December 1994, we continued our Modernization Through Spares efforts. The IPT awarded a best value production contract based on a performance specification for both the end items and the spare and repair parts to a small business contractor. The joint IPT was further expanded to include our newest prime contractor Minowitz Manufacturing Company. After formal team and partnership training, we continued our investigation of potential Modernization Through Spares candidates. Two of our biggest success stories are the commercial replacement of the pressure sensors and an improved fire detector.

Using the performance specification, Minowitz identified a commercial replacement for the pressure sensors. The existing sole source vendor had a commercial replacement, that was slightly larger, but identical in performance. The best part

was that the cost was significantly less. The commercial pressure sensors were \$90 less expensive than the original Government part. Minowitz was able to integrate this new switch both into their new production and simplify spare and repair replacement.



Members of our IPT firmly agree that Modernization Through Spares works. Our readiness has increased and our spare/repair part inventory has never been healthier. The joint IPT and our partners in industry have eventually introduced nine improved and less expensive spare/repair parts for the M157 family of smoke generators. The total life cycle cost savings in procurement of new production was over \$1.1M and the annual cost savings in sustainment was over \$600K. The Army After Next needs Modernization Through Spares to succeed, and we believe we are doing our part.

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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	1-410-671-3912 (TOLL CALL)
Smoke/Obscurants	1-888-246-1013	1-410-671-2702 (TOLL CALL)
CB Helpline (NONEMERGENCY TECHNICAL ASSISTANCE)	1-800-368-6498	1-410-612-0715 (TOLL CALL)
Environmental Quality	1-410-612-6588 (TOLL CALL)	1-410-671-8484 (TOLL CALL)

Fieldings

 <p>M58 Smoke Generator</p>	<p>Chemical School, Fort McClellan, AL</p> <p>POC: Peter F. Annunziato AMCPM-SM, DSN 584-2362</p>	<p>Jan 98</p>
 <p><i>M157A2 Motorized Maintenance Work Order (MWO) Retrofit Kit</i></p>	<p>71st Cml Co., Fort Shafter, HI 340th Cml Co. (reserves), Waco, TX</p> <p>POC: Richard W. Decker AMCPM-SM/157, DSN 584-8374</p>	<p>Feb 98 Mar 98</p>
 <p><i>New M157A2 Smoke Generator/M284A1 Mounting Kit on M1097 HMMWV</i></p>	<p>130th Cml Co. (reserves), Fort Indiantown Gap, PA 398th Cml Co. (reserves), Fort Chaffee, KS 349th Cml Co. (reserves), Yakima, WA</p> <p>POC: Richard W. Decker AMCPM-SM/157, DSN: 584-8374</p>	<p>Dec 97 Feb 98 Feb 98</p>
 <p><i>M157A2 Mechanized Maintenance Work Order (MWO) Retrofit Kit</i></p>	<p>172nd Cml Co., Fort Riley, KS</p> <p>POC: Richard W. Decker AMCPM-SM/157, DSN 584-8374</p>	<p>Apr 98</p>
 <p><i>M42A2 Combat Vehicle Mask</i></p>	<p>81st Armor BDE, 16th CAV, Fort Knox, KY KS, NE, IA, MO, IL NG units, 89th RSC, Fort Riley, KS & Fort Leonard Wood, MO 2nd ID & Non-Division Units, Camp Casey, Korea, Camp Humphreys</p> <p>POC: CPT John M. O'Regan AMCPM-NNL, DSN 584-6551</p>	<p>Mar 98 Apr 98 Apr - May 98</p>

END ITEM UPDATES

APPROVAL OF REQUIREMENTS DOCUMENTS:

Joint Chemical Agent Detector (JCAD), CARDS number 12003.

Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD), CARDS number 12001.

VALUE ENGINEERING CHANGE PROPOSALS (VECP):

M40A1\M42A2 Mask Program — Savings of \$1.234M were reported for first quarter FY98 on four VECPs submitted to TACOM-ACALA by Mine Safety Appliances Company and approved for incorporation into Contract DAAE20-95-C-0100. These savings are shared equally between TACOM-ACALA and CBDCOM. The VECPs incorporate changes to the microphone, mask lenses, outsert lenses, and packaging, which resulted in improved performance with a decrease in the cost of the M40A1\M42A2 Masks and related spare parts.

M22 Advanced Chemical Agent Detector Alarm (ACADA) — A VECP to remove the sun shield from the M22 system will decrease the end item cost by approximately \$6.00, which is a projected production savings of \$106,000 through FY01.

EQUIPMENT UPDATES:

M93A1 Fox NBC Reconnaissance System – In November, TACOM-ACALA awarded a contract for U.S. unique FOX (a German manufactured vehicle with most spare parts being manufactured by international firms) spares to Gebr. Wagschal, Lilienthal, Germany, in the amount of \$121,670.00. A 100 percent option was included. The award was accomplished via an Integrated Product Team effort between the PM NBC Defense Systems and the team at Rock Island. This award will support initial fielding of the upgraded M93A1 system.

Radiacs – A “skunk works” proposal for a low-level radiation version of the AN/PDR-75 was approved. If successful, we will be able to detect and measure down to environmental levels of gamma radiation. This will allow us to meet the new Operational Exposure Guidance being promulgated by NATO with the DT-236 Dosimeter.

M40A1/M42A2 —

- **Chemical Biological Protective Mask and Spare Facepiece Assembly** – ILC Manufactured Products Division received First Article Test approval in October for the M40A1 and M42A2 Mask Assemblies and the Spare Facepiece Assembly on TACOM-ACALA Contract DAAE20-97-C-0031. A total of 4,219 M40A1 and 1,438 M42A2 mask assemblies were accepted by the Government for the month of November 1997.

- **Mask Spares** – In February, a 3-year consolidated requirements contract was awarded to Louis J. Hansen Enterprises, Cicero, IL. This contract is for three items: Inlet Disk Valve, Internal Drink Tube, and Outlet Cover for use on the M40A1\M42A2 Mask. It is anticipated the first delivery order will be issued in 4th quarter FY98. Total acquisition value is estimated at \$741k.

M14 Tester Spares – In February, a 5-year consolidated requirements contract was awarded to Air Techniques Division of Hamilton Associates Inc., Owing Mills, MD. The procurement was a competitive small business set aside. This contract is consolidated for three items: Small, Medium, and Large Test Head Assemblies for use on M14 Tester, used to test M40 series protective masks. Total acquisition value is estimated at \$822K.

M291 Skin Decontamination Kits – In December 1997, a contract was awarded to Truetech, Incorporated, for the blending of 15,000 lb of Decontaminating Resin (Ambergard XE-555). Total contract value is \$1,162,950. The Decontaminating Resin is used at Pine Bluff Arsenal for production of the M291 Skin Decontamination Kits, and this sole source award averted a possible break in production. This contract award was accomplished in only 28 days.

M295 Individual Equipment Decontamination Training Kit – An Operating and Support Cost Reduction (OSCR) project for an M295 Individual Equipment Decontamination Training Kit was approved for immediate funding. The proposal, which was developed by our Sorbent Decon Team, is expected to save over \$3M over the next 10 years. The OSCR program is designed to fund engineering projects that will result in cost savings for Army Working Capital Funded items.

Decon Check Kit for Evaluation of Personnel and Equipment – A kit was developed under an Army Research Office Small Business Innovative Research project for the nondestructive evaluation of the adequacy and thoroughness of a decontamination procedure for chemically-contaminated ensembles, shelters, or equipment. An orange dye solution is sprayed onto the entire surface of a contaminated item. Failure to remove the tacky dye solution from a surface site, crevice, or seam is an indication of the possible failure to have removed the chemical contaminants from that site during the decontamination procedures. The kit also has potential application for training in decontamination procedures. The dye solution is non-hazardous and biodegradable. A video and Demo Kit are available at the Edgewood RDE Center.

Storage Container for DS2 – Our Sorbent Decon Team hosted a demonstration of a possible bulk storage container for the DS2 stockpile. Attendees included the U.S. Army Chemical School, the U.S. Marine Corps, All-Pak Inc., Spartanburg Steel Products, Micro Matic USA, Inc., and Guild Associates. Under study is the possibility of repackaging the bulk DS2 (5-gal carbon steel pails) into 55 gal cans. The team purchased and tested three 55-gal, keg-type, stainless steel cans with pressure valve inserts. The valve would provide a means to maintain the nitrogen blanket above the DS2 and allow the transfer from 5-gal pails to the 55-gal cans in a closed loop system.

Light Vehicle Obscuration Smoke System (LVOSS) – In March, the LVOSS launcher hardware production contract was awarded through the Small Business Administration to the Centech Group, an 8(a) firm located in Arlington, VA. The basic contract value (FY98) is \$627,571.15. The contract contains options for both launchers and spares. Centech negotiated a building lease with the Choctaw Nation in Hugo, OK, and will perform the production efforts there.

M56 Coyote Large Area Smoke Generator – The fourth program year of the multi-year contract for the M56 Coyote Smoke Generator and M58 Wolf Smoke Generator Component Sets was awarded in January in the amount of \$12,108,179. The contractor is Robotic Systems Technology, Inc., Westminster, MD, a small business firm.

Rapid Obscuration Systems (ROS) – Edgewood RDE Center's Engineering Directorate has approved and funded a "skunk works" proposal submitted by Mr. Steve Colclough, Computer Aided Engineering Team, and Mr. Kevin Shetterly, ROS Team, for a Feasibility Study and prototyping of a redesigned M6 Grenade Discharger. One goal is to reduce the manufacturing cost by modifying the current M6 design and exploring

the use of aluminum casting or conductive injected molded plastics. This effort will cut the current production costs by half, saving \$12M. Prototypes of the redesigned M6 will be fabricated for future evaluation.

Foreign Comparative Test XL96E1/XL97E1 Riot Control Grenade Program – A contract for \$68K was recently awarded to the UK Chemical Biological Defence, Porton Down. The contract purchases 604 XL97E1 grenades for U.S. qualification testing. The XL97E1 is a training round for the XL96E1 Riot Control CS Grenade.

M234 64mm Riot Control System –

- During a recent demonstration, the Dismounted Battlespace Battle Lab's non-lethal group expressed interest in Edgewood's M234 64mm Riot Control System. The M234 System is the only approved ***less than lethal*** kinetic energy system that has undergone actual blunt trauma testing with pathology confirmation and is type classified for use with the M16A1 rifle. The Battle Lab is exploring interest in modification of the M234 for use with the M16A2 and the M4 carbine. For infantry use, part of this modification may need to be the ability to switch between non-lethal and lethal at a moment's notice. The Battle Lab is also coordinating an effort to evaluate the M234 System in the federal prison system.

- Representatives from the Military Police School have also expressed an interest in a modified M234 launcher. Personnel from our Research and Technology Directorate have responded to this interest by performing investigative modifications and testing with on-hand hardware funded under an Edgewood "skunk works" program. Our Engineering Directorate personnel prepared a detailed proposal and cost estimate for the modification program. The Test and Evaluation Command and the Army Test Center provided us with a cost estimate for a safety release and safety confirmation testing. Personnel at Rock Island have initiated a worldwide query to all field units to determine how many launcher systems remain with the troops and would require potential modification.

XM37 Midsize Riot Control Disperser – In February, Defense Technology Corporation, Casper, WY, was awarded a contract for the XM37 Midsize Riot Control Disperser. The customer's requirement is broken into two phases: Phase-I Engineering and Fabrication and Phase-II is a production option. This performance-based acquisition is the result of a concerted effort of PM Soldier, the Military Police School, the Edgewood RDE Center, and the AMC Acquisition Center.

Individual Riot Control Agent Neutralizer – In February, the FY99 Soldier Enhancement Program panel selected 45 proposals out of 175 submitted. The Individual Riot Control Agent Neutralizer (IRCAN) was one of 13 proposals approved. The U.S. Army Military Police School will be the proponent; our Engineering Directorate will be the developer for the IRCAN program and the Detection/Decontamination Core Team will take the lead. The duration of this program will be 18 months.

Respiratory and Collective Protection – In late February, our Respiratory and Collective Protection Team completed testing a prototype two-stage airlock it developed for application with Air Force expedient collective protection shelters in Korea. The airlock is designed to be constructed locally of materials such as plywood and lumber. It uses a dedicated 200 cfm filter blower unit for purging and has a Chemical Agent Monitor port to check for completeness of purge. Plans are to employ such airlocks when collective protection systems are applied to existing buildings at air bases.

Microtest Screening Kit – Dugway Proving Ground is currently testing the four aqueous Microtests from Mr. Novak's prototype Microtest Screening Kit. Last year, Mr. Novak of our Research and Technology Directorate developed the Kit for the Defense Special Weapons Agency to provide a tool for Chemical Weapons

Convention inspectors to rapidly screen environmental samples onsite. The testing of the Microtests from the Kit will last approximately two weeks and is on-schedule. Mr. Novak calculated the cost of the Microtest Screening Kit and found it to be very economical, at a cost of \$2.75 per Microtest.

BRIEFS

UNSCOM's CW MONITORING LABORATORY. In December, the Nationally syndicated television show "Good Morning America" featured a segment on UNSCOM activities. For the first time, U.S. cameras were allowed access to the UNSCOM Chemical and Biological Monitoring programs in Iraq. The Baghdad Monitoring Laboratory, which is located in the Canal Hotel, Baghdad, was prominently displayed showing the three mobile chemical laboratories which were designed, fabricated, and installed by our personnel.

CHEMICAL TRANSFER FACILITY. In December, the Chemical Transfer Facility destroyed the G-agent precursor DF (difluoro, methylphosphonic difluoride) that had been declared under the Chemical Weapons Convention. Several batches of DF were destroyed by hydrolysis in the presence of Organization for the Prohibition of Chemical Weapons inspectors from Zimbabwe, Venezuela, and the United Kingdom; and samples (9 hydrolysates) were sent to the Analytical Chemistry Team for product analysis and the determination of residual DF. We used ³¹P and ¹⁹F nuclear magnetic resonance spectroscopy to analyze the single-phase products; all hydrolysates showed >99.99% destruction of the DF and the major phosphorus products were found to be methylphosphonic acid (>94%) and methylphosphonofluoridic acid (2-6%). All analysis results were provided to the Chemical Transfer Facility within 24 hours of receipt of the samples. Documentation for the method of analysis and reference spectra of DF and the hydrolysis products were provided to the inspectors. The representative from Zimbabwe and members of the On-Site Inspection Agency's escort team accompanied the samples on two occasions to witness our Analytical Chemistry Team's chain-of-custody procedures and the analyses of three of the samples.

EDGEWOOD CENTER SUPPORTS CHEMICAL STOCKPILE EMERGENCY PREPAREDNESS PROGRAM. Mr. William K. Blewett of our Research and Technology Directorate's Respiratory and Collective Protection Team conducted a technical assessment of newly installed collective protection systems in 11 public schools in communities near Umatilla Chemical Depot in Oregon. Eight of the schools assessed were meeting the performance requirements specified by guidelines; three need further work. This visit also included a meeting with the engineer of a local hospital to review options for a collective protection system. This assessment was funded under the Chemical Stockpile Emergency Preparedness Program.

COOPERATIVE R&D WITH INDUSTRY AND ACADEMIA

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

Northeastern Maryland Technology Council (NMTC)

We hosted the December council meeting in which local government, regional academia, and industry participated. Following the meeting, Dr. Roy Thompson conducted a tour of our Process Engineering Facility. Dr. Gell of Cecil Community College and Dr. LaCalle of Harford Community College are very interested in working with us to put student contractors into the facility for on-the-job training.

Mr. Roy C. Albert attended the Council Meeting in January 1998. Dr. Wason, J.M. Huber Corp., gave a presentation on "Globalization Lessons." The newly-elected officers for 1998 are: Chair - Warren Mullins, Battelle; Vice-Chair - Robert Gell, President, Cecil Community College; Secretary - Roy Albert, Edgewood RDE Center; and Treasurer - James Penrose, J.M. Huber Corp.

As far back as 10 years ago, the Harford County government in conjunction with our key academic institution, Harford Community College, and encouraged by the military leadership at Aberdeen Proving Ground, began planning a complex for enhancing the county's economic landscape. This initiative resulted in the Higher Education and Applied Technology (HEAT) Center, research and development park, on 152 acres of State-owned land. The Nu-Tek Precision Optical Corp., a manufacturer of high technology mirrors and other optical components will be the first corporate tenant in the HEAT Center. The benefits of the Center range from getting people together for a sharing of technological ideas and resources to the political benefits realized in attracting high-quality jobs to the county.

Cooperative R&D Agreement (CRDA)

Two CRDAs were signed between Science and Technology Corporation and the Edgewood RDE Center in December 1997. These CRDAs involve research and development of an immunological and DNA-based biosensor employing flow cytometry techniques.

A CRDA between Altus Biologics Inc., Cambridge, MA, and the Edgewood RDE Center, was also approved in December. We developed OPAA enzymes useful in the decontamination of various chemical agents, while Altus Biologics, Inc., developed a patented technology called Cross Linked Enzyme Crystals (CLECs), which is generally applicable to enzymes. The purpose of this CRDA is for the research and development of CLECs containing the OPAA enzymes, which are of interest to both the U.S. Army and the commercial sector (i.e., decontamination of pesticide contamination).

In January, personnel from Firefreeze Worldwide (FFW), Inc., Rockaway, NJ, came to witness the follow-on compatibility test. The initial test was successfully completed at FFW, and we are now running experimentation of the enzyme activity. After the COLDFIRE, one of FFW's products and our enzyme are mixed; and after all the tests are completed, we plan to enter into a Patent License Agreement with FFW to market a new dual-use product.

A CRDA between Purified MicroEnvironments and the Edgewood RDE Center was approved in January. This CRDA will lead to cooperation on the design, fabrication, and testing of a new filter capable of achieving the necessary air flow across the open face of the current laboratory hood of our modular AMC Treaty Laboratory. This new filter is expected to be smaller, lighter, more efficient, and may have commercial application.

A CRDA with New Horizons Diagnostics Corp, Columbia, MD, was approved in February. The Edgewood RDE Center has developed unique antibodies and antigens with excellent utility for the rapid identification of bacteria and toxins. Under this CRDA, New Horizons Diagnostics will develop a rapid, hand-held assay kit for detecting botulinum toxin and for domestic preparedness use throughout the United States.

Patent License Agreement (PLA)



Left to right: Mr. William J. Drumgoole, Jr., co-inventor; Dr. James A. Baker, Acting Technical Director; Mr. Win VanBasten, President of ZUMRO, Inc.; and Mr. John Biffoni, CBDCOM Patent Attorney. Mr. James A. Genovese, co-inventor was absent.

Negotiated the licensing terms and conditions for a PLA with Zumro, Inc., Willow Grove, PA. The technology involved in this PLA is the Chemical Biological Explosive Containment System. Messrs. Jim Genovese and Bill Drumgoole are the co-inventors. We announced the availability of this licensing opportunity in the Federal Register in September 1997 and a PLA was recently signed.

Dr. Arthur Carrieri received a patent for "Panoramic Infrared-Imaging Spectro-radiometer with Reverse Phase-Modulated Beam Broadcasting," which gives the Department of the Army patent rights for this system named PANSPEC (see article on page 9).

Testing Service Agreement (TSA)

Government laboratories are authorized, for an appropriate fee, to test materials, equipment, models, computer software, and other items for any person or entity, according to the Interim Draft Department of Defense guidance implementing 10 U.S.C. 2539b, "Authority to Sell," April 17, 1997.

To make this process effective and efficient here at the Edgewood RDE Center, we prepared guidelines; and we are having great success.

We have had a great increase in demand for TSAs. The processing time for TSAs has been reduced dramatically; one TSA was signed within a day! The following lists some of our current agreements:

- Environmental Technologies Group, Inc., Baltimore, MD, to test ICAM-APD detectors using surety materials to collect signature data. The available commercial laboratories are not able to perform temperature and humidity range testing with surety materials, whereas our personnel have unique processes that enable them to perform the tests in the Government's environmental chamber that is approved for surety material.
- Parmatic Filter Corporation, Denville, NJ, to perform rough handling, DMMP gas life, and air flow resistance testing on the filter sets provided by Parmatic Filter Corporation. (As a result of everybody's cooperation, the processing time for this TSA took less than a week.)
- Geomet Technologies, Inc., Germantown, MD, to determine the reaction rate and identify the reaction products for humid acid samples with GB and HD.
- Environmental Technologies Group, Inc., Baltimore, MD, to verify performance of three upgraded M43A1 chemical detectors and two ICAM-APDs, as they are exposed to several battlefield interferents.

- General Dynamics Amphibious Systems, Woodbridge, VA, to conduct vibration tests of the Advanced Integrated Collective Protection System's gas and particulate filters.

- Environmental Technologies Group, Inc., Baltimore, MD, to translate Computer Aided Design files into rapid prototyping models.

- Parmatic Filter Corporation, Denville, NJ, to test four additional filter sets and carbon samples. We already have a TSA with Parmatic to test eight gas and particulate filter sets and carbon samples.

- Scott Safety and Health Products, Monroe, NC, to do gas life testing of Scott's canisters using AC, CS, and CN.

Miscellaneous

Mr. Jerry Boartman, National Institute of Justice, Office of Law Enforcement, Technical Commercialization, visited Edgewood in January to look at systems that might have use in the law enforcement community. Mr. Boartman also conducts an annual mock prison riot at an old, unused prison in West Virginia. During this week of mock riots, he tests systems to determine their useful capabilities in realistic settings. He provided us with his "wish list," which we forwarded to our Research and Technology Directorate. Additional information will be provided to him on some of our systems.

POCs: Mr. Roy C. Albert, Technology and Science Information Team, DSN 584-4438, Commercial (410) 671-4438, email address is rcalbert@apega.army.mil, or Ms. Stella Lee, Office of Research and Technology Applications, DSN 584-5386, Commercial (410) 671-5386, email address is sychung@apega.army.mil.

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A Memorandum of Understanding for the Development and Implementation of Science and Technology related to counterterrorism and arms control was signed and implemented between

Lawrence Livermore National Laboratory and the Edgewood RDA Business Area. The memorandum was signed by Dr. C. Bruce Tarter, Director of Lawrence Livermore National Laboratory, and by Dr. I. Gary Resnick, Director of Research and Technology at Edgewood. Dr. Resnick signed for Mr. Michael A. Parker, Deputy to the Commander, CBDCOM.

POC: Dr. Dennis J. Reutter, Chief, AMC Treaty Laboratory, DSN 584-2840, Commercial (410) 671-2840, email address is djreutter@apega.army.mil.

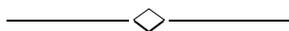
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In December 1997, Dr. Joseph DeFrank and Dr. James J. Valdes, Research and Technology Directorate, met with Dr. Oskar Zaborsky, Director of the Marine Biotechnology and Biosystems Engineering Laboratory, Hawaii Natural Energy Institute, University of Hawaii, to discuss areas of mutual interest in marine microbiology and enzymology. Edgewood's participation in a potential National Science Foundation Engineering Research Center was also discussed. The goal of the effort is to build the foundations of scientific and engineering research for 21st century marine biotechnology enterprises. Towards that end, the University of Hawaii, University of California at Berkeley, and the Edgewood RDE Center submitted a proposal to the National Science Foundation to set up the Marine Bioproducts Engineering Center (MarBEC). The MarBEC would consist of the University of Hawaii at Manoa, the University of California at Berkeley, Argonne National Laboratory, the Edgewood RDE Center, the Eastern Regional Research Center, the U.S. Department of Agriculture, and the Bishop Museum. This MarBEC proposal was selected as a finalist of National Science Foundation funding, and a site visit was held in February. Dr. Oskar Zaborsky (U. Hawaii), Dr. Harvey Blanch (U. California at Berkeley), and Dr. Jay Valdes (Scientific Advisor for Biotechnology at the Edgewood RDE Center) collaborated on the presentations for the site visit. Under the MarBEC structure, we would provide

the biomanufacturing and enzymology capabilities for marine bioproducts developed by the MarBEC partners. The National Science Foundation is expected to make an award in May.

Dr. Peter Emanuel (Edgewood RDE Center), Jessica Dang (Geo-Centers), and Dr. Eileen Nakano (Hawaii Biotech) successfully completed cloning of a recombinant antibody cell line which binds to the surface of Dengue virus. This antibody is one of two that will be used to construct a Dengue-ALERT hand-held immunoassay to provide an inexpensive, field-hardy means to track Dengue virus for environmental monitoring. It will be shipped to our collaborators in Hawaii for extensive study. Dr. Pamela Sweeney (Geo-Centers) conducted high cell fermentations to increase yield of a nerve-agent-decontaminating enzyme. A fed-batch scheme using chemically defined medium was used to obtain an optical density of 100, approximately 50 times the cell density achieved in batch growth. Although this specific protein expression is not as high as the values of nearly 60% observed in batch growth, the increase in cell mass means that the volumetric yield is at least 20 times greater than in batch growth. Mr. Darrel Menking and Ms. Suzanne Kracke began testing a rapid bacterial DNA detection system using a one-step field sample cleanup in conjunction with a one-step PCR amplification/detection event. The amplification/detection step will be accomplished with the use of the Idaho Technologies LightCycler which reads the fluorescence of a probe at the end of each cycle. The probe is configured to fluoresce only when bound to the target DNA. This system will reduce the time required for DNA detection from over 4 hours to less than 30 minutes.

POC: Dr. James J. Valdes, Scientific Advisor for Biotechnology, Commercial (410) 671-1396, DSN 584-1396, or email jjvaldes@apgea.army.mil.



TECHNICAL INDUSTRIAL LIAISON

Small Business Innovation Research (SBIR)

DOD SBIR Solicitation 98.1 closed in January. We received 61 proposals for evaluation, and 9 were selected for award, which address the following topics:

- Label-Less Methods of Biodetection (2)
- Microfabrication Based Biodetectors (1)
- Large Scale Production of Antibodies in Transgenic Animals (1)
- Intermolecular Force Measurements for Molecular Identification (2)
- Fast, Low Power Consumption Gas Chromatograph (1)
- Hand-Held Gas Chromatography-Mass Spectrometry (2)

The contracts are to be awarded in May 1998.

Advance Planning Briefing for Industry (APBI)

The annual CB Mission Area APBI was held in April in Laurel, MD. The purpose of the meeting was to provide an overview of the DoD's Chemical Biological Program and highlight future contract opportunities. The keynote speakers were: MG George Friel, Commander, U.S. Army Chemical and Biological Defense Command; BG Walter L. Busbee, USA (Ret), Deputy Assistant Secretary of Defense for Counterproliferation and Chemical Biological Defense; and Dr. Theodore M. Procriv, Deputy Assistant to the Secretary of Defense for Chemical Demilitarization. Future planning drills, such as Joint Vision 2010 and the Quadrennial Defense Review, and recent world events have increased the visibility, and, in some cases, funding for the CB program. An overriding theme of the APBI was the additional platforms that the CB program must address. Whereas the program has traditionally focused on protecting the warfighter, the program must now address protection of fixed military sites, both home and abroad, as well as U.S. cities. Future contract opportunities regarding the development and procurement of defense equipment were presented

for the five CB commodity areas (contamination avoidance, decontamination, medical, individual protection, and collective protection). The Army's smoke program was also covered. The APBI included presentations regarding the current status and future of the chemical demilitarization program as it is being driven by the Chemical Weapons Convention. Finally, the APBI provided a forum for a panel discussion on contractor logistics support. Approximately 380 industry and government representations attended the APBI. The proceedings are available upon request by contacting the undersigned.

POC: Mr. Ronald P. Hinkle, Technical Industrial Liaison, Commercial (410) 671-2031, DSN 584-2031, or email rphinkle@apega.army.mil.

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HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

In 1995, Dr. Fu-Lian Hsu was invited by Prof. X. Bu, Chemistry Department, Clark Atlanta University, Georgia, as a consultant on the project titled "Metal-Mediated Enantioselective Complexes of Schiff Bases for Bioactive Medicinal Agent Synthesis." This 3-year project has been funded by the National Institutes for Health beginning in February 1996. This year's review meeting was organized by Dr. Bu on December 15th. It consisted of presentations by Dr. Bu and two of his graduate students followed by a discussion. The meeting was attended by faculty members and postdoctoral and graduate students. The project focuses on the synthesis of Schiff Bases and chelation with various transition metals to study catalytic ability for enantioselective organic reactions. Schiff base-metal complexes are generally prepared in two steps, condensation of 1,2-diamine and aldehyde followed by chelation with transition metals. The chemical structure of the reported Schiff base-metal catalysts generally is either symmetrical or has a C-2 symmetry (two identical Schiff base moieties). Dr. Bu developed reaction conditions to introduce two Schiff base moieties in a sequential manner to trans-(1R,

2R)-1,2-diaminocyclohexane. From this two-step reaction, he was able to introduce one bulk, rigid Schiff base to enhance the enantioselectivity and another Schiff base for electronic "tuning-up" to promote metal-oxygen/nitrogen interaction (chelation). The synthesis of these metal complexes is underway. They also plan to introduce these catalysts into a polymer for use in a heterogeneous catalysis. At the Edgewood RDE Center, we are also interested in the synthesis of macromolecules in which a small, active reagent will be covalently bonded to a polymer backbone for use in detection and agent decontamination.

POC: Dr. Fu-Lian Hsu, Research and Technology Directorate, Commercial (410) 612-8811, DSN 584-8811, email flhsu@apega.army.mil.

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INTERNATIONAL COOPERATIVE R&D

Foreign Visits and Briefings

An Israeli delegation visited CBDCOM in January 1998. The delegation was headed by COL (Ret) Rami Yungman, Deputy Director for Arms Control and Regional Security and occurred under the auspices of the Office of the Secretary of Defense Joint Counter-proliferation Working Group. Displays, demonstrations, and briefing topics across the Chemical and Biological (CB) defense arena included: Technical Escort Unit; CB Rapid Response Team; CB Domestic Preparedness Program; as well as a technology review and a "hands-on" look at the equipment we have to support these programs. The visitors presented an informative video entitled "Home Front," which focused on their mission. They stressed it was an ongoing effort that operated around the clock during peace and war.

UK/US Cooperative Program

CBDCOM held the Program Officer/Requirements Officer meeting of the Memorandum of Understanding meeting on the Research, Development, Production and

Procurement of Chemical and Biological Defense Materiel in March at the Soldier Systems Command, Natick, MA. Program Officers and Requirements Officers shared information on their country's CB program, reviewed progress on several cooperative tasks, discussed the potential for new efforts and the status of revisions to the current Memorandum of Understanding. This joint effort by the Natick RDE Center and CBDCOM, in support of international cooperative activities, enhanced a growing team approach to conducting international cooperation programs for the new Command resulting from the merger of Soldier Systems Command and CBDCOM.

In preparation for this meeting, we hosted a U.S. Position Meeting in February, to review the progress of the International Task Forces. Other subjects discussed included: Cooperative Development Opportunities, the Medical Countermeasures Cooperative Efforts, Antibody

Development, Test and Evaluation Coordination, and the L96/L97 Cooperative Program.

Dr. Joseph DeFrank, of the Edgewood Center's Research and Technology Directorate, attended the 71st meeting of the NATO Army Armaments Group in Brussels in January. He provided an overview and update on the activities of NATO Project Group 31, which deals with non-corrosive biotechnology-based decontaminants. It was recommended that this group continue its work. This is the first meeting at which the Czech Republic, Hungary, and Poland participated as invited nations to NATO.

POCs: Dr. George R. Famini or Ms. Juanita M. Keesee, International Programs Office, Commercial (410) 671-2552/5376, DSN 584-2552/5376, or email grfamini@apea.army.mil or jmkeesee@apea.army.mil.

A FEW WORDS FROM OUR CUSTOMERS

We are committed to making our customers our No. 1 priority. To that end, we ask our customers to comment on the work we have done or are doing for them. Following are a few of their comments.

✍ **Battalion Chief of the Fire Department of Kansas City, MO, referring to our Domestic Preparedness Program - "The program itself is one of the best federal programs I've seen. The curriculum is concise and geared directly toward the target audience."**

✍ **Assistant Secretary of Defense referring to the Secretary of Defense's November Press Conference - "The impressive display of equipment you organized was a powerful testimony of our commitment to counter the threat of nuclear, biological and chemical weapons and protect our forces in the field."**

✍ **General Manager of Sensor Systems, Hughes Aircraft, Fort Wayne, IN, referring to the Acquisition Initiatives Forum held here in October - "In a word we found the opportunity to understand the Army CBD technology initiatives and to get feedback on our Hughes technology thrust to be very worthwhile and very positive."**

✍ **Commander, U.S. Army Materiel Command, Alexandria, VA, referring to the Joint Logistics Commanders' Conference held here in June - "I received many compliments about the professionalism and pride exhibited by all the personnel involved in showcasing the unique facilities and capabilities of the U.S. Army Chemical and Biological Defense Command."**

✍ **Chairman of the Federal Laboratory Consortium - "You and your facility are an outstanding example of why my association with the Federal Laboratory Consortium is time well spent."**

MERITORIOUS SERVICE MEDAL

Mr. Joseph A. Domanico of our Pyrotechnics Team was recently presented a *Meritorious Service Medal*.



Joe is a Lieutenant Colonel in the Maryland National Guard, and the citation was presented at a ceremony at the State Area Command Headquarters, or STARC, in Baltimore. Lt. Col. Domanico won the award for his knowledge, dedication, and sound judgment as a chief evaluator in the directorate of plans, operations, and training at STARC.

Brig. Gen. H. Steven Blum, the assistant adjutant general of the Maryland Army National Guard, participated in the proceedings. Lt. Gen. James F. Fretterd, the adjutant general of the Maryland National Guard, presented the award.



Article extracted from "The Aegis," pg C6, Wednesday, March 25, 1998.

HUMAN INTEREST

TENTH ANNUAL CBDCOM TOY AND FOOD DRIVE. A reception celebrating the tenth anniversary of the CBDCOM Toy and Food Drive was held in December. The donations of food, toys, and cash were presented by MG Friel to the Neighbors Involved in the Community of Edgewood (NICE) for distribution among many families in the community. Distinguished guests at the reception included Maryland Senator David R. Craig and Harford County Council Member Ms. Susan B. Hesselton. Council Member Hesselton presented a Proclamation from the County Executive and the County Council to CBDCOM and NICE for their continued outstanding efforts in providing assistance to Harford County families.

CAREER RELATED EXPERIENCE IN SCIENCE AND TECHNOLOGY (CREST) PROGRAM. The program is aimed to recruit science and engineering students as future leaders in areas of Army R&D by providing summer or part-time employment for an engineer or scientist position in the Army Intern Program upon graduation. For FY98, CBDCOM has two engineering and two scientist slots designated for the CREST Program. Interviews were held at the University of Maryland–Baltimore County Campus in February to screen engineering students for the CREST Program, and recruitment for the scientist positions will be conducted by our Research and Technology Directorate in the near future.

ADMINISTRATIVE/CLERICAL/SECRETARIAL APPRECIATION DAYS. Our Engineering Directorate sponsored a one-day workshop in October, entitled "Positive Self Projection–Tapping Into Your Inner Resources" for the Administrative/Clerical/Secretarial Employees in appreciation of their support. The workshops were attended by employees throughout the U.S. Army Chemical and Biological Defense Command and the U.S. Army Medical Research Institute for Chemical Defense. Guest Speaker, Lori Evans,

of the Evans Dynamic Communication Group, did an outstanding job of presenting a day of valuable information and enjoyable group exercises. Attendees learned how to “Communicate with Power and Confidence,” “Build Credibility in Your Wardrobe and Your Appearance,” and “Discover Ways to Boost Your Self-Esteem and Self-Confidence.” It was a very pleasant day with enjoyable topics that provided great networking and useful information that the attendees could take with them. The feedback from attendees was extremely positive with many comments of appreciation.

OTHER PEOPLE IN THE NEWS

Our Acting Technical Director recently announced that the following Edgewood RDE Center employees have been selected to receive a 1998 Excellence in Federal Career Awards from the Baltimore Federal Executive Board (FEB):

GOLD AWARD WINNER:

Dr. John R. White, Category IIa, Technical, Scientific and Program Support

SILVER AWARD WINNERS:

Mr. Christopher D. Myers, Category IIIa, Outstanding Para-Professional, Technical, Scientific & Program Support

Ms. Gwendolyn M. Vick, Category IV, Outstanding Clerical

BRONZE AWARD WINNERS:

Mr. C. Parker Ferguson, Category Ia, Outstanding Supervisor (Grades 13 & Above)

Ms. Sandra J. Johnson, Category Ib, Outstanding Supervisor (Grades 12 & Below)

Ms. Patsy A. Ham, Category IIIb, Outstanding Para-Professional, Administrative, Management & Specialist

The FEB Awards Ceremony and Luncheon was held Friday, May 1st.

The Command established an Equal Employment Opportunity award program to recognize outstanding achievement in the EEO arena. This year's nominees were from Pueblo Chemical Depot and the Edgewood RDE Center. Mr. Michael J. Smith, Research and Technology Directorate, was the award winner and Mrs. Mary Barnes Hagy, Engineering Directorate, was the runner-up for this year's EEO Award. During the awards ceremony in March, MG Friel presented Mr. Smith and Mrs. Hagy with a plaque, a CBDCOM Commander's coin, and \$500 and \$250, respectively, in recognition of their equal opportunity support to the organization, demonstrated initiatives, and positive impact on the EEO Program.

Ms. Sally Edler and Mr. Robert Thresher of the BIDS team received from the 203d Military Intelligence Battalion certificates of appreciation for their technical support during Exercise BOLD KNIGHT 98-1 conducted in November 1997.

Ms. Joann Brucksch of our Advanced Systems Concepts Directorate attended the ***10th year of Exhibitor Show***. The show was very well attended with over 50 of the seminars sold out. After completing the tests for the seminars she attended this year, Ms. Brucksch will need only one more seminar to complete the required 28 seminars for certification as a Trade Show Marketer. The next step is a 3-hour comprehensive written exam and then completion of a thesis project. When all of the requirements are completed, the University of San Francisco will notify Ms. Brucksch that she is a Certified Trade Show Marketer.

Ms. Deborah A. Dennis successfully completed the *USDA Graduate School Aspiring Leader Program*. This 6-month program provided participants with intensive training in customer service, presentation skills, conflict management, teaming, and a host of other areas recognized as necessary skills for future leaders within the federal government.

Dr. James J. Valdes participated in an evaluation of the Army Research Office's biology programs as a member of both the Executive Coordinating Committee and the Technical Board of Visitors.

Dr. Valdes was appointed to the Thesis Committee of Ms. Tracey Coliano, a Masters candidate at the University of Maryland School of Medicine.

Dr. Valdes is adjunct Professor of Toxicology and participated in Ms. Coliano's thesis proposal defense.

Dr. William White is currently teaching a graduate level course at the University of Maryland - Baltimore County on phosphorus chemistry. The course covers both empirical and theoretical aspects of phosphorus compounds and reactions. The content ranges from purely chemical topics such as structure, bonding, and synthesis to biochemical areas such as nucleic acids, cellular energy, and cholinesterase inhibition.

In March, Mr. Garcia won the Gunpowder Toastmasters Club International Speech Contest and then won the Toastmasters' Area 24 (the four clubs in Harford County) International Speech Contest. Mr. Garcia received the Advanced Toastmaster Gold award, which is the highest communication recognition awarded by Toastmasters.



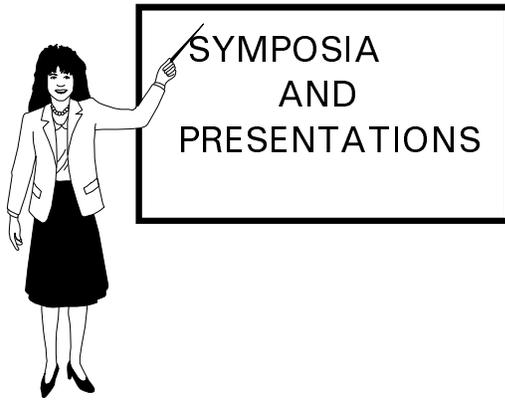
WEB SITE ON LINE

Please visit the NBC RDA Business Area of CBD COM, known as the Edgewood Enterprise, on the world wide web. Our url address is:

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

IMPORTANT

<i>Upcoming Conferences</i>		
<i>Date and Place</i>	<i>Title</i>	<i>POC</i>
<i>27-29 April 1998 Edgewood RDE Center</i>	<i>Smoke/Obscurants Symposium XX</i>	<i>Ms. Dorothy Berg (410) 671-4883 email: dxberg@apgea.army.mil</i>
<i>10-15 May 1998 Stockholm, Sweden</i>	<i>6th International Symposium on Protection Against Chemical and Biological Warfare Agents</i>	<i>Ms. Brenda Eckstein (410) 671-2879 email: bceckste@apgea.army.mil</i>
<i>9-11 June 1998 St. Petersburg Bayfront Hilton Hotel, St. Petersburg, FL</i>	<i>Decontamination Conference</i>	<i>Mr. Jeff Taylor (410) 612-7467 email: jstaylor@apgea.army.mil</i>
<i>15-18 June 1998 Norfolk Convention Center Norfolk, Virginia</i>	<i>21st Army Science Conference</i>	<i>Ms. Jean Thomas (757) 357-4011 fax (757) 357-5108</i>
<i>23-25 June 1998 U.S. Army Chemical School Ft. McClellan, AL</i>	<i>Worldwide Chemical Conference</i>	<i>Ms. Joann Brucksch (410) 671-5383 email: jjbruck@apgea.army.mil</i>



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

The 1997 *Scientific Conference on Chemical and Biological Defense Research* was held in November 1997 at the Edgewood Area Conference Center. A total of 380 people attended the 4-day conference. Forty visiting scientists from 11 foreign countries attended. BG (Ret.) Walter Busbee delivered the keynote address, entitled "The DOD Chemical/Biological Defense Program." Eighty-four oral presentations were given, and 92 posters were presented.

Drs. Salem and Olajos participated in the "Focus on Environmental Communication" meetings in December 1997 and received Certificates of Appreciation from the Environmental Engineering Division of the American Society of Mechanical Engineers for their contribution to the development and presentation of this meeting. The meetings were held to promote incorporation of sound science into risk-based decisions for protecting human health and environmental quality. These meetings were part of the *X-Change '97 Conference* sponsored by the Department of Defense, Department of Energy, the American Society of Mechanical Engineers, and the Florida International University.

Mr. Jeffrey Smart, CBDCOM Historian, presented a computerized slide show on the history of the

Edgewood Area and demilitarization procedures to 35 visiting state legislators. The legislators were from the various states with chemical stockpile storage facilities. Mr. Smart also presented a historical presentation on the Civil War in Harford County to the entire 8th grade class at Southampton Middle School in January. The presentation helped prepare the students for their upcoming social science sessions on the Civil War.

In November 1997, the Army Materiel Command hosted an Industrial Base Symposium at the University of Maryland at College Park. Dr. John Ferriter, the Industrial Base Advocate, presented an executive summary of our Industrial Base Management Plan FY98-99. The plan included an update of FY96-97 projects, current sector assessments, procurement plans, project submission resorting from the Joint Service Integrated Product Team for Industrial Base, and other related Industrial Base topics.

Two Industrial Base Courses were presented at CBDCOM, in October 1997. Dr. John Starns, from the Analytic Sciences Corporation presented the "Industrial Base Post Cold War Posture." Mr. James Collis, NAVAIR, presented the importance of maintaining a warm Industrial Base due to the Diminishing Manufacturing Sources and Material Shortages (DMSMS). Personnel from Department of the Army, Soldier Systems Command/Natick RDE Center, Defense Logistics Agency/Defense Personnel Support Center/IASO, Army Materiel Command/Industrial Engineering Activity/Armament and Chemical Acquisition and Logistics Activity, Joint Service Materiel Integration Group, U.S. Navy, Office of the Surgeon General, and CBDCOM attended these courses.

Monica Heyl was a Session Chair at the *Sixth International Conference On-Site Analysis* in January. The session, "Field Analytical Challenges," presented an overview of current technologies in the areas of chemical, biological, nuclear, and high explosives that have field applications. A paper, entitled "Analysis of

Airborne Chemical Warfare Agents by the SpectraTrak 572 Transportable GC/MS System,” was presented at the conference. The paper is the result of a Cooperative Research and Development Agreement between Viking Instruments and the AMC Treaty Laboratory and details test results and improvements made to the Viking instrument as a result of those tests. Richard Simak, Darlene Merkel, and Dennis Reutter from the AMC Treaty Laboratory are co-authors.

In December 1997, Dr. Pamela Sweeney prepared a poster, “Biomanufacturing Process for Nerve Agent Degrading Enzymes,” for presentation at the **Defense Manufacturing Conference**. Co-authors were P.J. Sweeney, J.C. Anderson, M.J. Ciocci (Geo-Centers), and T.C. Cheng, J.J. DeFrank, and J.J. Valdes (Edgewood RDE Center). Ms. Jessica Dang presented a poster, entitled “Bioprocess Engineering of Recombinant Antibodies,” at the Conference. The co-authors were P.A. Emanuel, D.E. Ramirez, M.J. Ciocci, and J.J. Valdes.

The Automated Configuration Management System is an effort to develop an Army-wide standard system for managing engineering data and the process for providing all necessary information to the acquisition community for preparation of a solicitation (what we have traditionally called the complete Procurement Package Input). The Edgewood RDE Center hosted a meeting on the **Automated Configuration Management System** in February. We were asked to host this meeting because we are the only Major Subordinate Command to have an operational, fully integrated and fully digital Engineering Data Management system. We demonstrated our system on the last day.

Members of our Protection Team, and the Armament and Chemical Acquisition Logistics Activity and Industrial Operations Command participated in a Market Research course offered by George Washington University in February. The course discussed sections of the Federal Acquisition Regulation. Knowledge of and ability to perform market research by the Integrated Product Teams is important as current acquisition

reform policies require all buys over \$100,000 to have a market research/survey performed.

In March, Mr. Rosso attended the **Pittsburgh Conference (PITTCON 98)** in New Orleans. This conference showcases the latest in analytical instrumentation and techniques.

In February, Mr. Gervasoni attended the **BW Breakfast Seminar** sponsored by the Chemical and Biological Arms Control Institute. The speaker was Hon. Donald Mahley, Deputy Assistant Director for Multilateral Affairs, U.S. Arms Control and Disarmament Agency who spoke on “Current Perspectives on the Biological Weapons Convention.”

Dr. Valdes was invited to participate in Pacific Northwest National Laboratory’s **Workshop on Microbial Cell Signaling**. The workshop is designed to focus Pacific Northwest National Laboratory’s new laboratory initiative in “Molecular Biology: Cell Signaling and the Environment” and to consider the appropriate roles to be played by the national laboratories in future environmental R&D.

In February, Dr. John Carpin was a guest lecturer on the topic of “air filtration” at the Johns Hopkins University School of Hygiene and Public Health. This lecture was part of a series of lectures in the graduate course, entitled “Airborne Particles,” which is a requirement for those individuals receiving advanced degrees in industrial hygiene, environmental engineering, or public health. According to Dr. Patrick Breyse, Director of the Industrial Hygiene Program, the presentation by Dr. Carpin was full of timely information and was well received.

Dr. Jana Kesavanathan, a National Research Council postdoctoral scientist working with Dr. Carpin, is one of the faculty teaching a Comprehensive Industrial Hygiene Review Course at the Johns Hopkins University.

Ms. Razulis was invited to present a paper during the Arms Control Working Group at the 66th

Military Operations Research Society Symposium in June 1998. She will present a paper on the development of our Chemical Assistance Program.

By invitation of the Commandant of the Armor School, PM Smoke will have a small exhibit at the upcoming ***Armor Conference*** in May at Fort Knox, KY.

This year will mark the 80th anniversary of the Chemical Corps, and the Chemical School at Fort McClellan would like to do one last ***Worldwide Chemical Conference*** at this location before it moves to Fort Leonard Wood next fiscal year. We were notified that the dates for the conference will be 24-25 Jun 98. This year's theme is "NBC Force Protection - Full Spectrum Support." Registration for the conference will begin on 23 Jun 98.

We fielded a CBDCOM/Joint Service Materiel Group exhibit at the annual ***Association of the United States Army/Training and Doctrine Command Winter Symposium*** in February, despite the torrential rains that flooded our originally assigned site at the Radisson Twin Towers Conference Center in Orlando. The display covered the entire mission of CBDCOM and the goals of the Joint Service Materiel Group. The theme of the symposium was "Laying the Foundations: From Army XXI to Army After Next."

At the ***Infrared Information Symposium***, Specialty Group on Targets, Backgrounds and Discrimination, Mr A. Richardson presented a paper on the "Reduction and Presentation of Millimeter Wave Attenuation Data for Obscurant Cloud Characterization." Mr. W. Rouse, Edgewood Research, Development Engineering Center and Mr. M. Perry, Battelle, were co-authors.

In February, Dr. Joseph DeFrank, Environmental Technology Team, was an invited speaker to the ***Multidisciplinary University Research Institute Program on Nanoparticulates*** at Northwestern University, Evanston, IL. The topic of his presentation was "Use of Enzymes for Chemical Warfare Agent Destruction." Dr. DeFrank also met with faculty members of Northwestern University Department of Chemistry who have research programs within the Multidisciplinary University Research Institute program that involve both nanoscale particulates/surface properties and enzymes. Several of these programs may have direct relevance to our enzyme efforts. The Multidisciplinary University Research Institute plans on inviting other Edgewood RDE Center researchers to speak at Northwestern University on a variety of topics related to the Multidisciplinary programs.

Tom Gervasoni attended the ***Chemical and Biological Arms Control Institute Breakfast Seminar*** in March. The presenter was Mr. Robert Bell, Special Assistant to the President for National Security and Counselor to the Assistant to the President for National Security Affairs. The topic was "The Clinton Administration's Arms Control and Nonproliferation Priorities."

A ***Decontamination Conference*** will be held in June to promote interaction between Government, Industry, Academia, and Foreign Governments in the development of decontamination solutions, and bring forward any decontamination efforts that may be of potential use to the U.S. Government. To accomplish these objectives, we will provide the audience with a well-rounded presentation of the current decontamination program to include the overall Chemical and Biological Defense Program.





Books, Journals, and Magazine Articles

A book, entitled **Oxidants, Antioxidants and Free Radicals**, was co-edited by Harry Salem (Edgewood RDE Center) and Steven Baskin (Medical Research Institute for Chemical Defense). The book resulted from a symposium on this topic cosponsored by the National Capital Area Chapter of Society of Toxicology, the Association of Government Toxicologists, and Sigma Xi, held at the National Library of Medicine. Oxidants, antioxidants, and free radicals are important in the everyday biology of life and the environment. Some of the significant presentations from the symposium were provided as chapters for this book along with others from investigators active in the field. Dr. Salem also contributed three chapters to this book.

The Army Chief of Staff has asked MG Robert Scales, Commandant of the Army War College, to write a book that captures the essence of the Army After Next study. Twelve technology areas were selected, and the science and technology community was asked to provide input to the book. Dr. James Valdes, the Center's Scientific Advisor for Biotechnology, was selected to provide the input for Technical Area 6, Biotechnology.

“New Programs – Teaming Opportunities for Resource Managers” by C.E. Tornga was published in the *Armed Forces Comptroller*, **Vol. 42**, No. 4, Fall 1997.

“Liquid Chromatography/Electrospray Mass Spectrometry of Mustard-Related Sulfonium Ions” by D. Rohrbaugh and Y.-C. Yang was published in the *J. Mass Spectrometry*, **Vol. 32**, pp. 1247-1252 (1997). This paper describes the application of electrospray ionization for direct detection and identification of sulfonium ions in HD heels and hydrolysis products.

“Chemical and Toxicological Evaluation of Pyrotechnically Disseminated Terephthalic Acid Smoke” by W.T. Muse, Jr., J.S. Anthony, J.D. Bergmann, D.C. Burnett, B.I. Gaviola, and S.A. Thomson was published in the *J. Drug and Chemical Toxicology*, **Vol. 20(4)**, pp 293-302 (1997). This paper was presented in April 1997 at the Conference on Issues and Applications in Toxicology and Risk Assessment. Dr. Thomson was the co-chair for the combustion toxicology session. The work described on terephthalic acid was performed in support of the M83 grenade and M8 smoke pot developed by the U.S. Army as a training replacement for the more toxic hexachloroethane (HC) smoke.

“Epoxidation by Dimethyldioxirane: Kinetics for *cis*-Alkenes” was published in *Heterocyclic Communications*, **Vol. 3**, pp 393-396 (1997). This article was the result of a collaboration between Professor Alfons Baumstark's group at Georgia State University and Dr. Harold D. Banks at the Edgewood RDE Center. The manuscript describes part of the work done under subcontract as part of a grant to Clark Atlanta University, a Historically Black College and University (HBCU). It is the first in a planned series of papers concerned with elucidating the mechanism of oxidation by dimethyldioxirane and other mild oxidants with implications for demilitarization and decontamination. There are two reasonable mechanisms by which dimethyldioxirane could approach the alkene: either with a perpendicular (spiro) or planar (butterfly)

orientation. Calculations performed at the semi-empirical level (AM1) led to good to excellent predictions of the experimentally measured rates for several series of alkenes. The transition state in the reaction was determined to be the spiro form. It should be pointed out that even though considerably more sophisticated and time-consuming ab initio methods can be used, useful results can be obtained in a fraction of the time using this method. The collaboration resulted in an effective use of computational and experimental inputs to direct research efficiently.

“Enzymatic Hydrolysis of the Chemical Warfare Agent VX and its Neurotoxic Analogues by Organophosphorus Hydrolase” by Jan E. Kolakowski, Joseph J. DeFrank, S. P. Harvey, Linda L. Szafraniec, William T. Beaudry (Edgewood RDE Center), Kaihua Lai and James R. Wild (Texas A&M University) was accepted for publication by the *J. Biocatalysis and Biotransformation*.

“Discrimination of Two Closely Related u-conotoxins Using Silane Molecular Imprints” by S.S. Iqbal, M.F. Lulka, and J.P. Chambers (University of Texas at San Antonio), and R.G. Thompson and J.J. Valdes (Edgewood RDE Center) was accepted for publication in *TOXICON*. This paper demonstrates the ability of artificial receptors to detect picomolar levels of small molecular weight toxins and to discriminate between toxins which differ by only four amino acids.

Dr. Sharon Reutter has been asked by the Science Editor of the *J. Environmental Health Perspectives* to write a review article on the “Hazards of Chemical Weapons Release During War.” This article will be published in an annual review of Environmental Health Sciences as a supplement to the monthly journal.

“Thinking Critically about Critical Thinking in Higher Education” was accepted for publication in the *J. Research on Minority Affairs*. The paper was co-authored by Dr. A. Birenzvice and members of the Maryland Center for Thinking Studies at Coppin State College, Baltimore, Maryland. This study represents an example of the collaboration between our scientists and Coppin State College – a historically minority college.

Mr. Paul Rambo prepared an article for inclusion in the June 1998 edition of PS Magazine. This article outlines the recommended procedure for purging air from fog oil lines on the M157A2 Smoke Generator Set.

“Acquisition of Chemical and Biological Equipment” by Dr. Amnon Birenzvice was published in **Army RD&A Magazine**, March-April 1998.

An excellent presentation of the AMC Treaty Laboratory’s Fly-Away Laboratory technology was featured in the “A” pages in the first issue of *Analytical Chemistry* of 1998. The article highlighted an interview with Monica Heyl, one of the Fly-Away Laboratory developers. Ms. Celia Henry, Assistant Editor, *Analytical Chemistry*, visited the Laboratory in January. *Analytical Chemistry* has requested permission to profile the Laboratory as a unique National asset in an upcoming issue.



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>
ERDEC-CR-216	Computational Modeling of the Fluorescence of Bacterial Spores, February 1997, UNCLASSIFIED - public release.	H.F. Hameka J.O. Jensen J.L. Jensen C.N. Merrow C.P. Vlahacos J.O. Jensen
ERDEC-CR-219	Catalytic Oxidation of Cyanogen Chloride Over a Monolithic Oxidation Catalyst, April 1997, UNCLASSIFIED - public release.	J.M. Campbell J.A. Rossin D.H. Reed
ERDEC-CR-222	Infrared Screening Cartridge Testing, March 1997, UNCLASSIFIED - limited.	P.S. Morgan D.J. Hartman R. Malecki
ERDEC- CR-223	Proceedings of the Smoke/Obscurants Symposium XIX, Volume I, April 1997, UNCLASSIFIED - limited.	D.A. Berg J. Cole
ERDEC-CR-225	Decontaminating Apparatus, Skid Mounted, Diesel Powered, XM1, May 1997, UNCLASSIFIED - limited.	R.C. Kolander F. Wallace C. Woremband S.E. Day T.E. Witkowski
ERDEC- SP-049	Chemical Agents, Weapons and Defense Materiel Type Classified, Adopted, or Obsolete, April 1997, UNCLASSIFIED - limited.	G.D. Taylor
ERDEC-TN-018	Joint Service FY97 Tech Base Plan, March 1997, UNCLASSIFIED - limited.	None
ERDEC- TN-019	Evaluation of Piepenbrock IR Pyrotechnic Smoke (PPT-Type A and PPT-Type C), April 1997, UNCLASSIFIED - limited.	H. Schroers W. Rouse D. Anderson
ERDEC-TR-314	Energetic Compounds for Use in Shaped-Charge, Follow-Through Devices, March 1997, UNCLASSIFIED - public release.	P.A. Wade J.D. Sullivan, Jr. A. Turetsky

ERDEC-TR-339	Compatibility of Polyvinyl Chloride Filter Bags with Chloroform Vapors, May 1997, UNCLASSIFIED - limited.	C.J. Karwacki
ERDEC-TR-346	XM21 Remote Sensing Chemical Agent Alarm (RSCAAL) Risk Reduction Program, April 1997, UNCLASSIFIED - limited.	R.C. Lyons S.S. Milchling
ERDEC-TR-354	Chemical-Material Data Bases: Chemical Defense Material Data Base, April 1997, UNCLASSIFIED - public release.	W.J. Shuely
ERDEC-TR-357	Adsorption of Chloroform by the Rapid Response System Filter, January 1997, UNCLASSIFIED - limited.	C. Karwacki P. Jones
ERDEC-TR-358	Integration of Chemical-Material Test Methodology with a Database System, April 1997, UNCLASSIFIED - public release.	W.J. Shuely
ERDEC-TR-359	Protection Factor Testing of the M40A1 Mask While Wearing the M7 Amplifier and Candidates Using the "Sweat" Test Scenario, January 1997, UNCLASSIFIED - limited.	W.A. Fritch A.G. Pappas
ERDEC-TR-363	Hydrolysis of V-Type Nerve Agents in Equimolar Water, March 1997, UNCLASSIFIED - limited.	Y.-C. Yang L.L. Szafraniec W.T. Beaudry D.K. Rohrbaugh L.R. Procell J.B. Samuel
ERDEC-TR-371	Compatibility Study of Butyl Rubber and Ethylene-Propylene-Diene Rubber with the Components of U.S. Army Liquid Decontamination Solution 2 (DS2), June 1997, UNCLASSIFIED - limited.	A.T. Seitzinger W.J. Shuely V.M. McHugh
ERDEC-TR-373	Detection of Cholera Toxin by Optical Methods: A Mechanism-Based Approach to the Generic Detection of Protein Toxins, April 1997, UNCLASSIFIED - public release.	R.J. Young F.-L. Hsu
ERDEC-TR-374	Reactive Sorbents for HD and VX Destruction, March 1997, UNCLASSIFIED - limited.	R.A. Newton L.R. Procell
ERDEC-TR-377	Evaluation of Heat Flux From the XM16 Decontaminating Apparatus, Truck Mounted, Jet Exhaust for Decontaminating a CH47 Helicopter, June 1997, UNCLASSIFIED - limited.	T.H. Murphy S.E. Day

ERDEC-TR-378	Toxicity of Hydrolyzed Chemical Agents to Aquatic Organisms, March 1997, UNCLASSIFIED - public release.	M.V. Haley C.W. Kurnas J.A. Ware
ERDEC-TR-385	Caustic Hydrolysis of Sulfur Mustard, April 1997, UNCLASSIFIED - public release.	S.P. Harvey W.T. Beaudry P.C. Bossle J.E. Kolakowski L.R. Procell D.K. Rohrbaugh D.C. Sorrick A.N. Stroup L.L. Szafraniec Y.-C. Yang G.W. Wagner
ERDEC-TR-387	Preliminary Results on the Temporal and Spacial Distribution of Environmental Airborne Bioaerosols, May 1997, UNCLASSIFIED - public release.	D.L. Carlile A. Birenzvice C.H. Wick S.J.K. Cork
ERDEC-TR-390	Process for Long-Term Planning of Research, Development, and Acquisition, April 1997, UNCLASSIFIED - limited.	A. Birenzvice E. Stewart-Craig L. Sturdivan
ERDEC-TR-391	CBDCOM Contribution to the Evaluation and Validation of the Joint U.S./Finnish Sample Preparation Method, December 1996, UNCLASSIFIED - limited.	T.E. Rosso M.W. Ellzy L.G. Janes K.B. Sumpter
ERDEC-TR-399	Analytical Analysis of O-Isobutyl S-2-(Diethylamino)ethyl Methylphosphonothiolate by Gas Chromatography/Thermal Conductivity Detector (GC/TCD) and GC/Mass Spectrometry (GC/MS), April 1997, UNCLASSIFIED - limited.	E.L. Vickers K.B. Sumpter D.K. Rohrbaugh
ERDEC-TR-400	Evaluation of Candidate Screening Technologies, March 1997, UNCLASSIFIED - limited.	D.B. Affleck J.D. Walther H.F. Hildebrandt
ERDEC-TR-402	Evaluation of NICO Multispectral Pyrotechnic Smoke (NG-40/NG-41), June 1997, UNCLASSIFIED - limited.	H. Schroers W. Rouse D. Anderson
ERDEC-TR-403	Chemical Vapor Challenge Tests of the Chemically Hardened Air Management Plant, April 1997, UNCLASSIFIED - limited.	B.D. Cannon D.W. Reeves V.J. Arca W.K. Blewett

ERDEC-TR-407	Chemical Materiel Stockpile Reliability Report (CMSRR), November 1996, UNCLASSIFIED - limited.	O.E. Clark V.O. Lee J.C. Forbes A.L. McDaniel P.A. Phillips L.D. Riley M.A. Roberts K.R. Walton
ERDEC-TR-411	Construction and Analysis of Recombinant Mouse Anti-Botulium Antibodies, June 1997, UNCLASSIFIED - limited.	P.A. Emanuel D.E. Menking J. Wilson J.J. Valdes J. Dang M.J. Ciocci
ERDEC-TR-412	Integration of NBC Defense Equipment in Collectively Protected Armored Systems: Design Guide for Entry/Exit, June 1997, UNCLASSIFIED - limited.	W.K. Blewett
ERDEC-TR-413	Simulant Vapor Challenge Test of the XM32 Advanced Integrated Collective Protection System (AICPS), June 1997, UNCLASSIFIED - limited.	B.D. Cannon D.W. Reeves V.J. Arca W.K. Blewett
ERDEC-TR-415	Cleanout and Decontamination of a Mustard Agent Ton Container, June 1997, UNCLASSIFIED - public release.	D.W. Dalton
ERDEC-TR-417	Use of the Performance Assessment Battery to Determine Mask Wearability, June 1997, UNCLASSIFIED - public release.	D.M. Caretti
ERDEC-TR-418	Design of the XM45 Chemical-Biological, Aircrew, Protective Mask, June 1997, UNCLASSIFIED - limited.	J.A. Scavnicky



The **Edgewood Enterprise** is located at the Edgewood Area of Aberdeen Proving Ground, Maryland; a small detachment of about 30 people is located at Rock Island Arsenal, Illinois.



The U.S. Army Chemical and Biological Defense Command (CBDCOM) is primary focal point within the Department of Defense for NBC matters. The Edgewood Enterprise is the largest of three elements within CBDCOM that execute the NBC mission. The relationship between CBDCOM and the Enterprise is more that of a supplier and customer rather than that of a superior and subordinate. Each depends on the other for essential products and services.



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