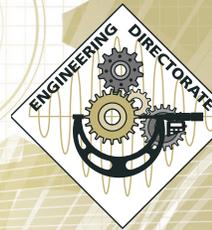


# THE ENGINEERING EDGE

EDGEWOOD CHEMICAL BIOLOGICAL CENTER

Volume 4, Issue 8

August 2012



ECBC ENGINEERING

Design→Build→Test→Support

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

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

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

ADM and LEAD worked together to design and create a production plan for the Macaw Fire Suppression System (FSS) Mount. The Mount will allow for fire rescue supplies to be stored in an easily accessible place, so that Warfighters can use them when needed. ADM will begin fabrication of 10 prototype units

"When an MRAP gets hit by a Rocket Propelled Grenade (RPG) or an Improvised Explosive Device (IED), many soldiers die from things like smoke inhalation, or getting trapped in burning vehicles," said

ADM and LEAD worked together to design and create a production plan for the Macaw Fire Suppression System (FSS) Mount, which will allow easy access to fire rescue equipment.

Mark Schlein, ADM Division Chief. "When the rescue personnel would arrive to the scene, the equipment to get the Warfighters out of the MRAP and save their lives was hard to find. Sometimes the rescue personnel would be too late to help."

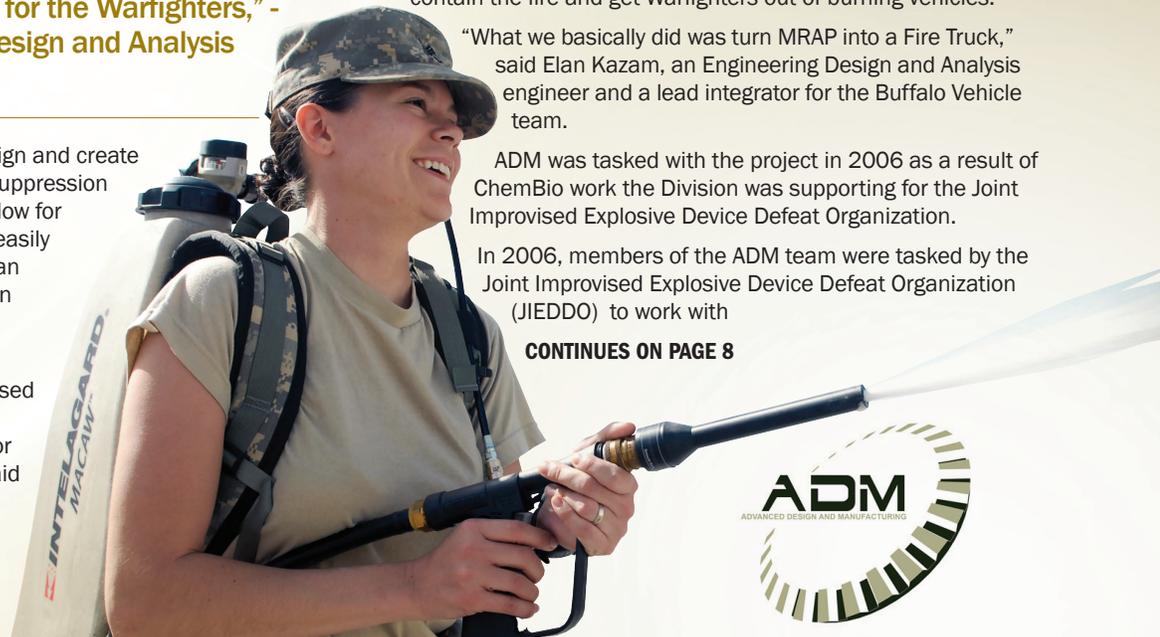
ADM and LEAD worked together to engineer a solution to create external locations on the vehicle where a backpack containing the Macaw Fire Suppression System and Halligan Pry Bar could be placed. That way, a fire rescue team could use these materials to contain the fire and get Warfighters out of burning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

"What we basically did was turn MRAP into a Fire Truck," said Elan Kazam, an Engineering Design and Analysis engineer and a lead integrator for the Buffalo Vehicle team.

ADM was tasked with the project in 2006 as a result of ChemBio work the Division was supporting for the Joint Improvised Explosive Device Defeat Organization.

In 2006, members of the ADM team were tasked by the Joint Improvised Explosive Device Defeat Organization (JIEDDO) to work with

CONTINUES ON PAGE 8



## Word from the Wise: Packaging Branch Preserves Past Lessons Learned for Future

Engineering's Packaging branch retired two influential members of its team at the end of 2011 - Nancy Waltman, previous Chief of the Packaging Branch and Dean Hansen, a senior packaging specialist.



With Waltman and Hansen having 60-plus years of combined experience, it would seem that 2012 would leave the seven remaining Packaging Branch team members with painful transitions and possible gaps in the knowledge base. However, thanks to strategic foresight on the parts of Waltman and Hansen, as well as excellent teamwork between the remaining Branch members, those 60 years of knowledge were able to remain, despite Waltman's and Hansen's departures.

"I think Nancy really understood the importance of retaining knowledge in an aging workforce," said Ed Bowen, Strategic

ECBC's award-winning Packaging Branch continues to provide excellence despite the departure of two veteran senior team members.

CONTINUES ON PAGE 6



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## INSIDE THIS MONTH'S ISSUE:

**pg.1,8 | Engineering's ADM Prevents Fire Related Injuries for Warfighters with Letterkenny Army Depot Partnership**

**pg.3,7 | In the Army Now**

**pg.3 | Homegrown:** ADM's Rich Wallace Describes his Journey from Student Intern to Team Leader

**pg.1,6 | Word from the Wise:** Packaging Branch Preserves Past Lessons Learned for Future

**pg.4-5 | Engineering's Test Division Branches Increase Efficiency, Decrease Labor to Work Stream**

**pg.7 | Mandi Yocum:** "One Step at a Time"

## Awareness: August 14, 1945 –V-J Day

Victory over Japan Day, better known as V-J Day or Victory in the Pacific Day, is recognized as the day that the Japanese made their initial World War II surrender announcement. Following the United States' atom bomb attacks on Hiroshima and Nagasaki, Japan accepted the terms of the Potsdam Declaration on 15 August 1945, Japan Standard Time.

There are several days celebrated for V-J Day. The official surrender date was 15 August 1945 in Japan, but due to time differences, was recognized on 14 August 1945 in the United States. Also, the United States government commemorates V-J Day on 2 September, the day a formal surrender ceremony was performed in Tokyo Bay, Japan, aboard the USS Missouri battleship.

August 15 is celebrated as Liberation Day in Korea. The Japanese surrender freed Korea from Japan's rule following WWII. ⚙️



Photo from Office of the Chief Signal Officer collection, American servicemen and women gather in front of "Rainbow Corner" Red Cross club in Paris to celebrate the unconditional surrender of the Japanese.

## Safety Tip: A Small Work Break can Lead to an Increase in Productivity

*Courtesy of ECBC Safety Office and NSC.org*



Did you know overexertion is the third leading cause of unintentional injuries in the United States, accounting for about 3.2 million emergency department visits?

Heavy lifting, repetitive movements and sitting at a desk all day can take a toll on your back and make it hard to concentrate on your job. It cannot only plague your workdays, but your free time as well. You are not stuck with it though - take time to examine your work environment, address situations that might aggravate your back and develop habits that reduce strain placed on the back.

Visit [http://www.nsc.org/nsc\\_events/Nat\\_Safe\\_Month/Documents/2012\\_Ergonomicspublic.pdf](http://www.nsc.org/nsc_events/Nat_Safe_Month/Documents/2012_Ergonomicspublic.pdf) to learn more about Ergonomics and find ways to redesign your work environment to make it work for you. ⚙️

This newsletter was published through the Balanced Scorecard.

For article suggestions, questions or comments please contact **Ed Bowen** at [ed.bowen8.civ@mail.mil](mailto:ed.bowen8.civ@mail.mil).



## Ask a Tech Tip: Keeping your Coffee Carafe Crystal Clear



**Mike Kauzlarich**, of the Pyrotechnics and Explosives Branch, reveals how the techniques and lessons learned in labs can help you solve your household problems. Submit a question to him at [usarmy.APG.ecbc.mbx.engineering-directorate@mail.mil](mailto:usarmy.APG.ecbc.mbx.engineering-directorate@mail.mil).

Do you have a glass carafe coffee pot that has brown coffee stains? These coffee stains can be tough to get out and the white powders sold at traditional grocery stores do not always work effectively.

Difficult as it may seem, those brown stains are not hard to remove when you use the right chemicals. First, pour some household bleach into your coffee carafe and carefully swirl it around. You will notice that much of the brown stain will disappear before your eyes. Then fill the carafe the rest of the way with warm water and let it sit in the sink for a few minutes. Make sure to keep an eye on it; usually within 10-15 minutes the pot looks brand new. Rinse well, then rinse again. Problem solved. ⚙️

## Homegrown: ADM's Rich Wallace Describes his Journey from Student Intern to Team Leader



**Engineering Edge (EE):** How did you get your start at ECBC and in your current position?

**Rich Wallace (RW):** I did not know that Aberdeen Proving Ground existed until my sophomore year of college. It was there that I happened to meet a girl from Aberdeen, MD who would later become my wife. While talking about how much I needed to find

a good summer internship to bolster my resume for graduation, she suggested that I apply for a student contractor position at Edgewood Chemical Biological Center (ECBC), where her father worked.

I was one of the fortunate few selected to work for the Computer Aided Engineering (CAE) Division in the Engineering Directorate, which would later become the Advanced Design & Manufacturing (ADM) Division. I spent the next two summers with CAE learning Computer Aided Design (CAD) software and the business and program processes. Upon graduating from college, I was accepted as a full-time, government engineer, and have been with the Division ever since. After nine years of design and project leadership experience, a government-funded Master's Degree and a temporary assignment with another Division in the Engineering Directorate, I've worked my way up to become ADM's Engineering Design Team Leader, and I am currently serving in a six-month assignment as the Executive Officer to the ADM Division Chief.

**EE:** What is your favorite part of your job?

**RW:** Anyone who knows me well would tell you that I am and always have been an "engi-nerd." Working at ECBC, I have access to technologies that most of my other friends who are engineers working in industry have never seen or used. Having the ability to design parts based on such a wide variety of technologies gives me an unprecedented degree of flexibility as a designer, and makes my job much more exciting.

**EE:** What project are you currently working on, or have worked on in the past that you learned the most from or that you found particularly exciting?

**RW:** One of the projects that I am most proud to have been a part of was probably also one of the shortest projects I have been involved with. A few years ago, Tank Automotive Research, Development and Engineering Center, and Aberdeen Test Center asked that we provide CAD and manufacturing support for an emergency project they were working on. In a matter of days the team was able to develop a universal gunner's restraint for light Mine Resistant Ambush Protected (MRAP) vehicles and get the first kits delivered to theater. It didn't take long before we heard back from the field that these kits were preventing serious injuries and saving lives. While it may not have been one of the most technically challenging projects I have ever worked on, knowing what I helped accomplish is something that will stay with me for the rest of my life.

**EE:** What skill do you use in your job that you initially did not think you would need?

**RW:** I have not been surprised by any skill requirement. I feel that my college did a very good job of preparing us for what we would face when we started out as engineers. My supervisors and mentors at ECBC have done an excellent job preparing me for each new position I have taken on in my career thus far.

Confidence is one of the most difficult things to learn as a young engineer. You must realize that even in a room full of veteran designers, manufacturers and leaders in technological fields, you must be comfortable to speak up when you think you have a good idea or if you have a concern. Sometimes it takes a fresh set of eyes to see the solution or to recognize a serious problem, so share your ideas because they will be valuable. ⚙️

## In the Army Now: MRE's provide hearty well balanced meals for Soldiers

**"In the Army now" is a regular series in the Engineering Edge featuring information pieces addressing frequently asked questions about the Army culture and structure. In this month's "In the Army Now," we look at the typical rations provided to Soldiers in the field.**

The primary source of nutrition for Soldiers in the field is the Meal, Ready-to-Eat (MRE). The MRE is a self-contained, individual field ration in lightweight packaging bought by the United States military for its service members for use in combat or other field conditions where organized food facilities are not available. The MRE replaced the canned Meal, Combat, Individual rations in 1981 and is the intended successor to the lighter Long Range Patrol ration developed by the U.S. Army for Special Forces and Ranger patrol units in Vietnam.

The MRE has been in continual development since 1993. In an array of field tests and surveys, Soldiers requested more entree options and larger serving sizes. By 1994, commercial-like graphics were added to make the packets more user-friendly, while biodegradable materials were introduced for nonedible components, such as spoons and napkins.

The number of entrées expanded to 16 by 1996 (including vegetarian options), 20 entrées by 1997 and 24 entrées by 1998. Today, Soldiers can choose from up to 24 entrées and more than 150 additional



items. The variety allows Soldiers from various cultures and geographical regions to find something palatable. In 1992, the military introduced the Flameless Ration Heater, a water-activated exothermic reaction product that emits heat, allowing a Soldier in the field to enjoy a hot meal.

**CONTINUES ON PAGE 7**

# ENGINEERING'S TEST

## INCREASE EFFICIENCY, DECREASE

Several branches within Edgewood Chemical Biological Center's Engineering Test Division are working together to reduce costs for their customers. The Permeation and Analytical Solutions Branch (PASB), Protective Equipment Test Branch (PET) and Test, Reliability and Evaluation Branch (TREB) teamed up to create a process in which the three branches will work together to share resources for the Joint Equipment Assessment Program (JEAP) customer.

**"These three test branches are coming together to build one repository for information and become a one-stop shop for our customers," – Brian Maclver, PASB Branch Chief.**

Brian Maclver, PASB Branch Chief, presented this information on behalf of the three branches at ECBC's Innovation Forum on 30 May.

"These three test branches are coming together to build one repository of information and become a one-stop shop for our customers," Maclver said.

In 2010, when Tank Automotive and Armaments Command (TACOM) funded JEAP customer came to the Engineering Test Division, there was no established preventative maintenance program or a method to collect and co-locate

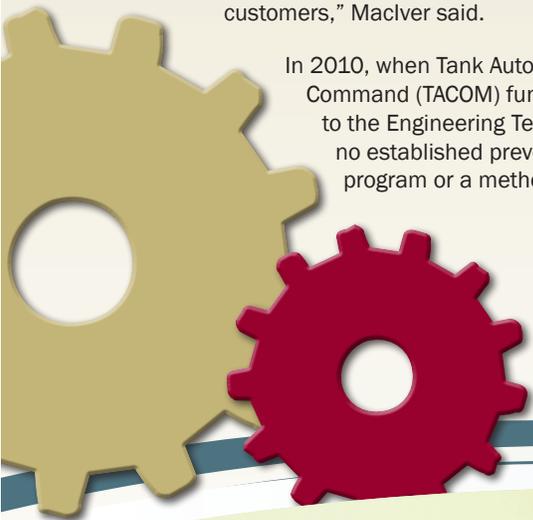
data that could be quickly accessed by the operator to ensure systems were working within specification and data was accurate and precise. Knowing that JEAP was a large test program, requiring multi-functional test needs, ETD embarked on a plan to bring more of this work to ECBC. PASB, PET and TREB joined forces to establish a unified test focal point to make it easier for the customer to establish test procedures, deliver test items and obtain test data.

The idea is to work across branches, and learn from each other's practices in order to come up with better solutions, rather than each branch working within itself, where efforts could be duplicated. This new work process will introduce efficiency by reducing labor without impacting the quality or delivery time of work.

The branches share detailed data about the project's progress via SharePoint, so members of all branches can refer to it for future testing. The SharePoint site will be used as a tool to share information with the customer, near real-time access to data and other pertinent information that will aid in more efficient communication for meeting customer goals and milestones. Internally, workbooks are being created to evolve data processing, so thousands of data points can be systematically sorted to give the operator quick reference to knowing whether test systems are functioning properly.

In order for the process to be successful for JEAP and future customers, the branches worked out a structure incorporating skill sets from the different branches. An overarching branch chief will oversee the entire process as well as a test administrator who will add uniformity to the data being entered.

The idea is to work across branches, and learn from each other's practices in order to come up with better solutions rather than each branch working within itself, where efforts could be duplicated. This new work process will introduce efficiency through reducing labor without impacting the quality or delivery time of work.



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# DIVISION BRANCHES

## LABOR TO WORK STREAM

“Working together will provide a consolidated analysis training program, drive down costs, provide timely and uniform reporting and increase our efficiencies,” Maclver said. In addition to working together between the branches, the group will also reach back to colleagues in the Research and Technology Directorate to support method development and unique analytical processes.

Collaborating on SharePoint will also ensure customers get timely reports by adding time stamps to data entered. A central quality manager will maintain the site to make sure reports are entered in and sent out to customers correctly.

Maclver said ETD is working on another TACOM funded project, which is to build duplicative test capability at Pine Bluff Arsenal (PBA), incorporating the Aerosol Vapor Liquid Assessment Group (AVLAG) permeation test fixture. Discussions have also turned to developing a collaborative relationship with PBA in an attempt to perform verification and validation testing under the Deputy Under Secretary of the Army (DUSA) T&E test initiatives through the T&E Capabilities and Methodologies Integrated Product Team (TECHMI). ⚙️



## Word from the Wise: Packaging Branch Preserves Past Lessons Learned for Future

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Planning and Business Operations Branch Chief. “As an original member of the Engineering Balanced Scorecard Core Team, she helped the group establish the IP 11 Retain Knowledge and Expertise Relevant to Core Competencies Strategic Objective as a part of the strategy. She put it into practice with her Branch as well.”

**“Every day is not perfect, there are still struggles. Nancy and Dean had many, many more years of experience that we can’t gain in just five months. It will take time to learn everything to their level, but we know we have the resources at hand to get to that point,” said Debbie Brooks-Harris, packaging specialist.**

In November 2011, in an effort to maintain the momentum of the Branch’s success, Waltman and Hansen hosted Knowledge Retention workshops to pass on their combined 60-plus years of knowledge to the seven remaining members of their Branch. Their first was a Stand-Down, where the Branch set aside their projects for the afternoon to meet in Waltman’s office and discuss the business operations and strategic management aspects of packaging work.

While hosting the Stand-Down was a more formal method for transitioning knowledge, Packaging team members say it was the everyday practices that set them up for success in the absence of Waltman and Hansen’s knowledge base.

“We were pretty involved in the kind of work that Nancy and Dean were doing before they left,” said Debbie Brooks-Harris, packaging specialist. “We worked alongside them rather than under them. That way, nothing was completely new to us, because they really shared the work and shared the processes with us. We didn’t have to start from scratch.”

Brooks-Harris said that working together helped build the team’s confidence to maintain momentum without Waltman and Hansen,

and helped the team familiarize themselves with the work that goes on at the top.

“Keeping knowledge retention at the forefront is essential, especially at this time,” Bowen said. “With the Baby Boomer generation due to retire within the next five years, years of experience is due to walk out the door, but with concerted efforts such as in the Packaging Branch, all that does not have to happen. The IP11 Strategic Objective outlines several Directorate-wide solutions to keeping knowledge readable and accessible.”

Another BSC strategic objective that goes hand-in-hand with IP11 is IP10, Establish a Documentation Repository. “We want to ensure that we have historical documents readily accessible,” said Bowen. Toward that end, Mike Brown is leading the initiative of scanning historical documents into a searchable format that is available to the Engineering workforce via a SharePoint site.

“The historical documents are very helpful,” Brooks-Harris said. “Sometimes it helps to look through older handwritten documents to learn how something was done in the past.”

The resources available have helped the Packaging Branch transition to working without Waltman and Dean, but hard work and teamwork have also helped the group move forward as well.

“It has been a challenge, and they are hard shoes to fill, but I think we’ve done well,” said Brooks-Harris. “Nancy and Dean are definitely missed, but luckily we still have a great team here who is able to step in when needed and do what needs to be done.”

“We all have our own styles and talents, so the way we combine our skills together to solve a problem may not be the tried and true method, but we end up discovering a new way to do something that is just as effective,” Brooks-Harris said.

In May, the Packaging Branch was awarded with the Packaging Excellence Award from work done in 2011 before Waltman and Hansen retired. The team is confident that there will be more awards in the future.

“Every day is not perfect, there are still struggles,” Brooks-Harris said. “Nancy and Dean had many, many more years of experience that we can not gain in just five months. It will take time to learn everything to their level, but we know we have the resources at hand to get to that point.”



ECBC Engineering Packaging Branch’s Karyn Merson and Thomas Jennings participated in the branch’s “Stand Down” day and knowledge transfer process this past winter.

## In the Army Now

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Each MRE provides about 1,200 calories. They are intended to be eaten for a maximum of 21 days (the assumption is that logistics units can provide superior rations by then) and have a shelf life of three years, depending on storage conditions.

Each MRE weighs 18 to 26 ounces, depending on the menu. Because MREs contain water, they weigh more than freeze-dried meals providing equivalent calories.

Packaging requirements for MREs are strict. They must be able to withstand parachute drops from 1,250 feet and non-parachute drops of 98 feet. The packaging is required to maintain a minimum shelf life of three and a half years at 27 °C (81 °F), nine months at 38 °C (100 °F) and short durations from -51 °C (-60 °F) to 49 °C (120 °F).

General contents of MREs may include:

- Main course (entree)
- Side dish
- Dessert or snack (often commercial candy, fortified pastry, or HOOAH! Bar)
- Crackers or bread
- Spread of cheese, peanut butter, or jelly
- Powdered beverage mix: fruit flavored drink, cocoa, instant coffee or tea, sport drink or dairy shake.
- Utensils (usually just a plastic spoon)
- Flameless ration heater (FRH)
- Beverage mixing bag
- Accessory pack: Xylitol chewing gum 



## Mandi Yocum: "One Step at a Time"

Guest columnist Mandi Yocum gives you tricks and tips on how to avoid a cruel summer, and balance family, fun and work this August.



It's here, August 2012.

I intend for my extracurricular activities this month to include backyard baseball games, grilling, sprinklers, the beach, playgrounds, celebrating a toddler's birthday "firetruck style," home canning and trying to creatively prepare (ahem, disguise) an overabundance of zucchini, squash, tomatoes and cucumbers from my garden. After all, summer is supposed to be fun and relaxing, right?

**"Stress outlets are as diverse as summer opportunities, and maybe even as plentiful as internet zucchini recipes in the month of August. Finding an outlet for stress is an important part of our daily routine both at work and home," said Mandi Yocum, Engineering Edge guest columnist.**

While August simply marks the last month of rocket-high utility bills for some, it can also be a bittersweet mix of endless outdoor activities and preparing for the beginning of a new, long school year for others. As much as I love August, the month can be stressful when I try to cram outdoor fun in-between competing work and home priorities. Stress and all, there is a way to balance fun and responsibility while actually enjoying your last month of summer.

Stress management is a personal and professional responsibility that should not be dismissed in our balance of obligations. Here are some ideas to reduce, prevent and cope with stress. Hopefully it will spark your creativity and refresh your current stress management routine.

- Make a list to prioritize tasks, and reprioritize them daily.
- Work on tasks as they come up, do everything you can to avoid procrastination.

- Identify sources of stress and focus to correct your related habits and attitude.
- Stay physically active: take a walk, stretch, or exercise regularly.
- Maintain an organized environment at home and at work.
- Train yourself to look at life and work positively - a positive outlook goes a long way.
- Learn to be a smart multitasker - focus on one task for a set amount of time, then move onto the next.
- Use Outlook, Google, or one of your fancy phone apps to set schedule and maintain a household calendar.
- Say "No" when appropriate, be sure to manage the tasks already on your plate before you pick up more.
- Set time for interaction and conversation with co-workers, friends and family.
- Clearly communicate your timelines and prioritized task list with your customers and co-workers.
- Use healthy coping methods: eat healthy food and get regular sleep.
- Expect and plan for change: things always change, but don't let it stress you.
- Schedule a short staycation to knock out those lingering backburner household chores.
- Make time for something you love - perhaps a good book, massage, pedicure or workout.

Stress outlets are as diverse as summer opportunities, and maybe even as plentiful as internet zucchini recipes in the month of August. Finding an outlet for stress is an important part of our daily routine both at work and home. I hope that you enjoy your last days of summer, and if you find yourself stressed with an overabundance of cucumbers in your garden, I have an easy, stress free microwave pickle recipe that I would love to share with you! 

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

CONTINUED FROM PAGE 1

**"It's very interesting how this type of work can develop. Work like this helps maintain ECBC's capabilities so when ChemBio missions come up in the future, we still have the engineering capabilities to tackle those," said Mark Schlein, ADM Division Chief.**

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

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

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

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

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

"The kit is just a backpack placed on the vehicle, but the challenge is every vehicle is built differently, so it was tough to find a common way to mount the FSS, but we were able to do it," Kazam said.

Kazam and his team were able to mount the FSS in a unique location that is a little high up, yet the group was able to design a lowering system to make the FSS easily accessible during an emergency. This type of innovation, is what Schlein said keeps the JPO happy with the work that ADM produces.

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

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

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

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



ADM designed a universal Macaw Fire Suppression System mount for MRAP vehicles to ease the rescue of Warfighters from burning vehicles.

