THE ENGINEERING EDGE

EDGEWOOD CHEMICAL BIOLOGICAL CENTER

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ECBC ENGINEERING

Design→Build→Test→Support

WOMEN IN SCIENCE & ENGINEERING

In honor of National Women's History Month in March, the Engineering Edge recognizes the contributions of females to science, engineering and the U.S. Armed Forces.

To access the electronic version of this newsletter visit: **http://www.ecbc.army.mil/news/ENG/**

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This newsletter was published through the Balanced Scorecard.

For article suggestions, questions or comments please contact **Ed Bowen** at **ed.bowen8.civ@mail.mil**.

Awareness Tip: Women's History Month

March National Women's History Month was first celebrated in 1987, six years after Sen. Orrin Hatch (R-UT) and Rep. Barbara Mikulski (D-MD) cosponsored the first Joint Congressional Resolution proclaiming a "Women's History Week."

In 1987, the National Women's History Project petitioned Congress to expand the celebration to the entire month of March. Since then, the National Women's History Month Resolution has been approved every year with bipartisan support in both the House and Senate.

The theme for March 2012 Women's History Month is "Women's Education – Women's Empowerment." The theme recognizes the women who endured arguments that women were not as smart as men, and fought gendered stereotypes and inequalities that women faced. Title IX of the Education Codes of the Higher Education Act Amendments, which prohibits gender discrimination by federally funded institutions, paved the way for women to be considered equal to men in education and beyond.

Join Edgewood Chemical Biological Center in celebrating Women's equality through attending the Second Annual Women in Science and Engineering Panel event on 5 March where female members of ECBC's workforce will share their experiences about being a woman in the science and engineering fields.

This year's panelists include: Nan Ramsey, Associate Director of Engineering; Suzanne Milchling, Director of Program Integration Directorate; Cindy Swim, CB Detection Division Chief (R&T); Mary McNally, Protective Equipment Test Branch Chief (ENG); Jadey Pareja, Chemical Engineer in the Protective Equipment Test Branch (ENG) and Nichole Au, Chemical Engineer in the Detection Engineering Branch (ENG).

The discussion will be moderated by Nicole Funk, ECBC Engineering Board of Directors member and Senior Vice President, Booz Allen Hamilton. Gain insight from women in the science and engineering fields about their successes and challenges. You will have the opportunity to ask questions of our panel members.

Date: Monday 5 March, Time: 1130-1300, Location: E3549, Berger Auditorium

** A light lunch will be available to purchase beginning at 1130, with proceeds benefiting the O Day Planning Committee. Visit ECBC's SharePoint site, https://cbconnect.apgea.army.mil/ENG/WISE, for additional resources pertaining to Women in Science and Engineering.

ECBC Engineering Directorate HR Tip of the Month: Thrift Savings Plan Catch-Up Contributions

Federal employees who participate in the Thrift Savings Plan (TSP) and will turn 50 years old during calendar year 2012 are eligible to make TSP catch-up contributions. "Catch-up contributions" are supplemental tax-deferred contributions that employees age 50 or older (or turning age 50 during the calendar year 2012) can make to the TSP, beyond the maximum amount they can contribute through regular contributions. *Please visit the TSP website http://www.tsp.gov/ for additional information regarding catch-up contributions.*

For more information about your HR policies, please contact Engineering Workforce Management Representative **Sabre Harper at ext. 5-2722.**

Safety Tip: Cold Weather

Dehydration, most commonly associated with hot weather, is a lack of water in the body. It is very easy to become dehydrated in cold weather, and many individuals fail to drink enough liquids, underestimating fluid loss from sweating. Proper hydration is especially important in cold weather because dehydration adversely affects the body's resistance to the cold, increasing the chance of injury.

Security Tip: How Do I Renew my CAC?

Employees can renew their Common Access Card (CAC) using the online CAC renewal appointment scheduler at http://apg.army.mil/AKOSSOprompt/cacrenewal.cfm. Appointments should be scheduled within 90 days of CAC expiration date.

Pyrotechnics and Explosives Branch Chemical Engineer Amee Labonte: A Fully Integrated Member of the Team

Each month, the Engineering Edge features a member of the Engineering workforce, discussing their work, their career path and why they have chosen to serve in the Department of Army with ECBC. This month, the Edge spoke with Amee Labonte, a chemical engineer of the Pyrotechnics and Explosives Branch to learn more about her role within the Engineering Directorate.

How did you get started with the Pyrotechnics and Explosives Branch at ECBC?

I knew Engineering's Pyrotechnics and Explosives Branch (Pyro Branch) had recently lost an engineer to retirement, and their administrative support contract was not renewed. I thought that would be the appropriate time for me to see if the team could use my skills, coming from the highly disciplined and similar area of large scale agent testing.

What skill do you use for your job that you initially did not think would be required?

I came to the Pyro Branch expecting to learn pyrotechnic chemistry. However, before learning pyrotechnic chemistry, I needed to use my learning skills to become proficient in the operation of scientific equipment. I have had to learn to use ultra-high speed and infrared videography, as well as a Differential Scanning Calorimeter (DSC) and Thermogravimetric Analyzer (TGA), both equipment I was not expecting to use. I owe my new found understanding to long time Pyro Technicians like ECBC's Mike Kauzlarich who have taken the time to explain the safe operation of very dangerous equipment and pyro operations to me. His depth of knowledge and experience in pyro and explosives has been very helpful in my becoming a fully integrated member of Engineering's Pyro Branch.

What is your favorite part of the job?

The best part of this job is that every day is different. One day I might be researching chemicals, another I might be in the cubicles preparing experimental pyrotechnic compositions or pressing those mixes into smoke grenades. On other days, I might also be out in the field performing live fire testing, or I could even be giving a demonstration to a class of middle school students. It is wonderful to come in each day and have something new to tackle.

What projects are you currently working on that you can tell other ECBC employees about?

I actually just completed a series of experiments to be presented at an international conference. I have also been assisting Joe Domanico on HX smoke development, which is expected to be the obscurant of the future for the U.S. Armed Forces. The amazing thing about HX smoke composition is that it is applicable through the entire spectrum, i.e. hand grenades, smoke pots, mortars and large caliber indirect fire weapons.

ECBC-Rock Island Annual Safety Trivia Contest Delivers Rewards

ECBC Rock Island hosted its annual Safety Trivia Contest to test their knowledge of workplace safety awareness. These contests are based on monthly safety briefings held throughout the year.

While Edgewood Chemical Biological Center-Rock Island's (ECBC-RI) Management takes employee safety seriously, it is not averse to having a little fun while reminding its employees that safety is everyone's responsibility.

ECBC-RI hosts an annual Safety Trivia Contest, which was held on December 6, 2011. Each team took on a different name, inspired by a famous scientist. Team BOHR took home the winning title in 2011, earning team members bragging rights associated with the glory of being a winner.

The purpose of the ECBC-RI Safety Program is to ensure that all employees know the necessary safety precautions of their job. Every month the Safety Program committee works together with employee presenters to determine the subject matter of the month's presentation. Changing presenters monthly allows different people to gain visibility and practice with leading briefings.

"The ECBC-RI Safety program has evolved over the last four years. The 45-minute briefings are presented in an interactive format, and presentations consist of content relevant to actual work performed and other situations employees may experience," said Kevin Lee, Deputy for Sustainment Support at ECBC Rock Island, and Safety Trivia Contest Moderator.

The workforce also gains a fresh perspective on safety rules, topics and procedures through different presenters. The meetings are scheduled the first Tuesday of every month, and all ECBC employees are expected to not only attend, but also participate. The monthly presentations are creative, interactive, educational and generate challenging trivia question content.

"The trivia questions are developed after the safety briefings and collected over the course of the year so the questions are on-point to the actual discussion. The presentations are interesting and the questions are intentionally designed to be difficult," Lee said.

This year's presentations spanned a variety of topics from "Preventive Measures for Musculoskeletal Disorders (MSD) in the Office Place," to "Chemical and Biological Agents Around Us," presented by Chemical Engineer, Olga Jennings.

"We put effort into the presentations so that the information is useful and generates a lively discussion that leads to a safer environment," Jennings said.

The event consisted of 25 questions, each worth two points. Teams could earn a total of 50 possible points. The questions were delivered via PowerPoint slides and read aloud by Lee, then the teams collaborated and agreed upon an answer to each question. The team's response sheets were collected after each group of questions. Participants were banned from using Google, meetings notes and cellphones to answer questions.

At the end of the competition while the Safety Committee tabulated the scores,the questions and answers were reviewed again to reinforce the most important part of the game: safety awareness. It was a close competition, but after the third group of questions, Team BOHR maintained the lead, becoming the official Safety Champions of 2011.

Perspectives from Women in SCIENCE &

In recognition of National Women's History Month, Edgewood Chemical Biological Center (ECBC) Engineering Directorate presents a special blog series featuring candid responses from female ECBC employees and leaders on their experiences as females in the science and engineering fields. Here are some excerpts from the blog series. To read each woman's complete blog and more visit ***http://edgewoodchembio.blogspot.com.***

"Throughout my career, though I have always worked in male-centric fields, fortunately, I have never had instances where I have faced challenges based on my gender. I believe that this has to do with the confidence I have in the work I do. I have always been able to stand behind my work, because it is mathematically accurate and professional, a combination that works in any environment."

AZRA MALIK

Computer Scientist, Advanced Design and Manufacturing Division (ENG)

"Since I joined the Protective Equipment Test Branch in 2005, the number of women working within the branch has vastly increased. Currently the team consists of thirteen females and ten males, which is a tremendous shift compared to the 1980-1990 team organization."

JADEY PAREJA

Chemical Engineer, Protective Equipment Test Branch (ENG)

"My experiences as a woman in the DoD have made me a stronger, more confident person. The job I have, which we fondly refer to as 'herding cats" at times, requires me to be assertive and sharp in front of groups, whether they include both men and women or not. I find that because my meetings are mostly male-dominated, I've recognized the importance of overcoming my shyness and naturally timid nature."

SHAWN BOWEN

ECBC Decision Analysis Team (DPI)

ENGINEERING

"Today, I take great pleasure in seeing more young women establish careers in engineering and science—especially at ECBC. There was a day not far in the past where I attended meetings at various levels and was the only female present."

CAROL EASON

ECBC Risk Manager (DPI)

"You have to put aside your fear of failure, and you can surprise yourself with your ability to rise to the occasion. People have difficulty with the concept that it is OK to struggle; everyone has to go through similar challenges."

NICHOLE AU

Chemical Engineer, Detection Engineering Branch (ENG)

"The advice that I can offer any female, who wants a job in a predominantly male field, is to not back down. Stand your ground and don't let people push you around. You are the only one who will carve your path in life and you are the only one who can make things happen for you. If you know something works or your idea is a good one, continue to push it until someone listens."

NICOLE MCKEW

Biologist, currently Executive Management Specialist —Visit Coordinator/protocol (DPI)

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ECBC Engineering employees make time to educate future generations in science, technology and math fields

The statistics for science, technology, engineering and mathematics (STEM) education in the U.S. are sobering. A recent University of California Los Angeles study published in the New York Times showed that nearly 40 percent of students working towards engineering and science majors end up switching to other subjects or fail to get any degree. A National Center for Education Statistics (NCES) study shows that degrees in Science, Technology, Engineering and Math (STEM) degrees have decreased by nearly half over the years. The NCES study shows Biology and Computer Science have decreased since the mid-80s. The amount of Engineering Bachelor's Degrees earned in the mid-80s was at nearly 10 percent versus five percent in 2010. Other studies within the Computer Science field have also dropped from a 1980s rate of four percent to two percent in 2010.

Combating these numbers has become a national goal. With the White House recently hosting its second annual White House Science Fair in February, Edgewood Chemical Biological Center (ECBC) Engineering employees are also doing their part to remind students that STEM fields are not your typical, boring science lesson.

Pyrotechnics Branch Chief Sparks Youth Interest in Fireworks and Pyrotechnics Through Local STEM Presentations

Photo credit: Jennifer Carroll, U.S. Army Edgewood Chemical Biological Center
ECBC Pyrotechnics Engineer Joseph Domanico engages more than 100 Bel Air Middle School students in the science behind pyrotechnics, while intertwining chemistry with its practical application in pyrotechnics.

Joseph Domanico, Chief of the Engineering Directorate's Pyrotechnics and Explosives Branch at the Edgewood Chemical Biological Center (ECBC), found a way to turn his passion into his job, a hobby and an extracurricular activity. His resounding love for the sparkles and mystery behind fireworks landed him an invitation to four interactive "science behind pyrotechnics" presentations at Havre de Grace Middle School. The presentations to eight middle school classrooms earned him the unofficial title of "local expert."

Havre de Grace's invitation came after the school heard about Domanico's presentation at Bel Air Middle School this past December where he addressed more than 100 eighth-graders about the science behind pyrotechnics. Domanico's presentations are designed to encourage middle school students to pursue STEM disciplines.

Domanico bears light on traditional science lessons through the real-world application of subjects like chemistry and physics.

"I enjoy sharing my knowledge and passion for fireworks with students in school presentations. It's earned me the nickname 'Dr. Pyro,'" said Domanico.

In his presentations, Domanico first gives a snapshot of his personal career and the history of fireworks, and then he unveils the science behind pyrotechnics.
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ECBC Engineers show and tell careers at local schools to spread STEM awareness

Photo credit: Jennifer Carroll, U.S. Army Edgewood Chemical Biological Center
Joppatowne High School pre-engineering students Tejha Patton, MacKenzie Noonan and Erin Pfeiler design and build packages to protect the raw egg from damage during the drop test, while ECBC Packaging Specialists David Vincitore and Karyn Rafferty (from left to right) serve as coaches.

Across the Engineering Directorate, several employees have devoted time and creative efforts to classroom visits and presentations to inspire and encourage future generations to give careers in STEM a chance, using interactive and exciting hands-on activities.

"Teaching students more about what we do and how a STEM education can be applied in a practical way is personally rewarding," said Debbie Brooks-Harris, a packaging specialist in Engineering's Packaging Branch.

David Vincitore, also a packaging specialist agrees. "These activities are rewarding because we are helping shape the future of our profession," Vincitore said. "We have to keep in mind that someday these students could be our replacements, so we want to expose them to all of the different possibilities early on. It will let them see, first-hand, how packaging, or engineering in general, is a viable career option."

Packaging Branch conducts an egg drop activity for their STEM presentations where students use household products to design, build and test phases of a package. Students must develop a package that prevents a raw egg from damaging during a five-foot drop test and an incline shock test.

"We provide them with a mix of materials from Christmas wrapping paper to toilet paper rolls. Some materials work and some do not. We want to get their minds working and help them realize that there are many ways to get one job done," said packaging specialist Karyn Rafferty.
(Continued on page 7)

Pyrotechnics Branch Chief Sparks Youth Interest in Fireworks and Pyrotechnics Through Local STEM Presentations

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Through videos and real-world demonstrations, students became familiarized with the concepts of exothermic chemical reactions and energy release as well as additive and subtractive colors.

This approach allows middle school students to translate chemical compounds in the periodic table into colors that are emitted in pyrotechnics products through chemical reactions.

"When I look at the periodic table, it comes alive to me," Domanico said. "I see potassium as purple, barium as green and sodium as yellow. Based on this chart, we know which chemical elements to use to create an array of different colors in pyrotechnics products."

Domanico went a step further to visualize how energy and color production can be manipulated by adding different fuels and elements. By intertwining chemistry with its practical application in pyrotechnics during his presentation, he reinforced that the acquisition of in-depth knowledge in STEM disciplines will empower them to pursue rewarding career paths and impact the world around them.

"It takes a multi-disciplinary team approach to develop pyrotechnics products the right way," Domanico said. "To name some of the subject matter experts in demand for this type of work, we need electrical engineers for the wiring, mechanical engineers for the structure design and chemists to create the colors."

To read more about the Engineering Directorate's STEM Outreach involvement visit the ECBC blog at ***http://edgewoodchembio.blogspot.com.*** *If you or your team are interested in supporting ECBC's STEM educational outreach initiatives, please contact the Center's Community and Educational Outreach Program Manager Mary Doak at* ***mary.l.doak.civ@mail.mil*** *or Outreach Specialist Jennifer Carroll at* ***jennifer.j.carroll2.civ@mail.mil****.*

ECBC Engineers show and tell careers at local schools to spread STEM awareness

(Continued from page 6)

Photo credit: Jennifer Carroll, U.S. Army Edgewood Chemical Biological Center
ECBC Electronics Technician Mark Hull assists pre-engineering student James Byrd from Joppatowne High School to test the concept and design of his package with a drop test apparatus.

Recently, Cindy Learn, Joint Service Respirator Sustainment and Test Technology; David Love, Protective Equipment Test Branch; and Mary McNally Chief of the Protective Equipment Test Branch took part in Engineering is Elementary (EiE) ® at Joppatowne Elementary School. The EiE project fosters engineering and technological literacy among children. At Joppatowne, the engineers used the storyline from the book "Yi Min's Great Wall" to show students the design and build process. In the book, a fictional bunny makes several attempts to invade a garden. For the exercise, students had to build and design a protection wall or fence to keep the fictional bunny from invading their own garden.

In addition to traveling to schools, ECBC employees have also opened up their workspace to allow students to explore their STEM options, and experience the work life of an engineer first hand. This past December the National Defense Education Program sponsored an event where 24 Joppatowne High School pre-engineering students had the opportunity to tour and experience real-world research and development processes conducted at ECBC.

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If you or your team are interested in supporting ECBC's STEM educational outreach initiatives, please contact the Center's Community and Educational Outreach Program Manager Mary Doak at ***mary.l.doak.civ@mail.mil*** *or Outreach Specialist Jennifer Carroll at* ***jennifer.j.carroll2.civ@mail.mil****.*

New Hire Brown Bag Forum: Educational Outreach

Sponsored by: Edgewood Chemical Biological Center (ECBC), Engineering Directorate's Balanced Scorecard New Hire Orientation Initiative

There has been a significant decline in U.S. science and technology degrees. You can make a difference!

March 21, 2012 • Location: E3549 - Auditorium • Time: 1130-1230
Open to: ENGINEERING civilian employees hired within the last 3 years

The educational outreach program helps to shape a strong future by enabling ECBC scientists and engineers with the opportunity to reach out to the community and promote education in the science, technology, engineering and mathematics fields (STEM).

Transferring your knowledge and expertise is one of the best ways to inspire young people to get involved in education, their future and the nation's future STEM workforce.

Grab your lunch and join representatives from the ECBC Community and Educational Outreach Program.
They will be available to answer questions and provide information about the volunteering and educational outreach programs.
For more information contact Program Manager- ***Mary Doak: 410-436-7231*** *or* ***mary.l.doak.civ@mail.mil.***

ECBC Engineers Collaborate Across Branches and Skill Sets to Create Lightweight, Cost-effective Training Options for the Warfighter

Teachers use it to teach lessons, football players study their plays on it and now soldiers can use it as a one-stop device for training refreshers, an easy-to-carry installation manual and more.

"The Department of the Army and Army customers are looking to increase the use of mobile devices for Warfighters," said COL. Raymond Compton, military deputy of the Edgewood Chemical Biological Center (ECBC). "On one small mobile device, a Warfigher has a full library of information across different applications to support a device or even to support the operation of a full vehicle. If a Warfighter is carrying around a mobile device, the weight of their backpack is significantly less."

In addition to being cost-effective, the 21st Century advancements in technology coupled with a desire to equip the Warfighter with a single-source for everything needed, makes the use of iPad applications increasingly necessary. At ECBC, Engineering's Advanced Design and Manufacturing Division (ADM) Conceptual Modeling and Animation Branch, Technology and System Integration Branch and the Electronic Drawing Development Branch partnered together to create two iPad applications.

One application simulates the Husky Mounted Detection System Surrogate (HMDSS), and the other recreates the Mobile Counter Improvised Explosives Device Training (MCIT). Both iPad applications were handed over directly to the Joint Improvise Explosives Device Defeat Organization (JIEDDO). The MCIT application and HMDSS are Continental United States (CONUS) devices intended to be used by soldiers directly. The HMDSS iPad app will be delivered by JIEDDO to support locations where HMDSS vehicles are being used for training. The MCIT was being used both as a "marketing" tool for the system by JIEDDO as well as a direct informative device to be used by soldiers on various bases.

"The Technology and System Integration Branch contributed to functional translation of real world data into the virtual environment, Engineering Drawing helped with the virtual modeling, and Conceptual Modeling and Animation assisted with the software development and user interface," said Kevin Wallace, Technology and System Integration Branch Chief. "The great thing about the Conceptual Modeling and Animation Branch is that they have the ability to help other branches present their visions and further the potential of their ideas."

With the tap of a screen, Warfighters can reference the full HMDSS installation manual, as well as train themselves on the equipment. The iPad application gives an accurate visualization of the inside of an HMDSS allowing the user to use the functions that are in the actual vehicle. Users can practice reading the Ground Penetrating Radar which detects metallic and non-metallic explosive hazards, pressure plates, and antitank mines.

In the event of a malfunction, rather than flip through pages of a thick book, the Warfighter can get quick instructions from an easy-to-use-application and speed up the entire process. Wallace noted that booklet manuals wear and tear, and often cannot hold up while in theater.

"The intuitive care associated with carrying an iPad is much different than a book, which can be thrown into a backpack and easily torn and ripped," Wallace said.

ECBC Engineering's Advanced Design and Manufacturing Division (ADM) Conceptual Modeling and Animation Branch, Technology and System Integration Branch and the Electronic Drawing Development Branch collaborated to create iPad applications for the Joint Improvise Explosives Device Defeat Organization (JIEDDO) to supplement Warfighter training.

The story doesn't stop there! Learn more about ECBC Engineering's work to create these innovative iPad applications at ***http://edgewoodchembio.blogspot.com****.*