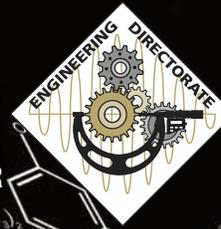


# THE ENGINEERING EDGE

EDGEWOOD CHEMICAL BIOLOGICAL CENTER

Volume 5, Issue 3

March 2013



**ECBC ENGINEERING**  
Design→Build→Test→Support



## INSPIRING INNOVATION *through* IMAGINATION

### ECBC Commemorates 2013 Women's History Month

In honor of National Women's History Month in March, The Engineering Edge has dedicated this issue to recognizing the contributions females from the ECBC Engineering Directorate have made to science, engineering, and the U.S. Armed Forces. This month, we are also pleased to include features recognizing the successes and dynamic narratives of the female engineers and scientists at ECBC. Check out the back page for more information on how the Center will celebrate Women's History Month.

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 [edward.c.bowen8.civ@mail.mil](mailto:edward.c.bowen8.civ@mail.mil)



## Awareness: National Women's History Month

Women's History Month is celebrated each March and honors the contributions that Women have made in society throughout history and today. What started in 1981 as Women's History week was expanded to Women's History Month in 1987 by the United States Congress. The original intent was to promote gender equality in classrooms.

Several states within the United States have adopted educational curriculum around Women's History Month to be taught in schools. Since 2010, Women's History Month has been given an annual theme. This year, the theme is "Women Inspiring Innovation with Imagination, Celebrating Women in Science, Engineering and Mathematics." In the past, themes were "Writing Women Back into History" in 2010; "Our History is Our Strength" in 2011 and "Women's Education - Women's Empowerment," in 2012.

In honor of Women's History Month, ECBC will host a weekly Speaker Series throughout the month of March where female leaders from APG and the community will share advice and insights on a variety of topics concerning females.

Check out our back page for a calendar of events! ⚙️



## HR Tip: Federal Employee Health Benefit (FEHB) Deduction



If you made an FEHB Open Season election, be sure to review your Leave and Earnings Statement (LES) to make sure your deductions are coming out. If the deductions for your new FEHB plan are not reflected on your LES, please contact the Army Benefits Center-Civilian (ABC-C) at 1-877-276-9287, as soon as possible. Their hours of operation are listed on the website. [www.abc.army.mil](http://www.abc.army.mil)

For information about ECBC HR policies, please contact **Sabre Harper** at [sabre.d.harper.civ@mail.mil](mailto:sabre.d.harper.civ@mail.mil). ⚙️



## Ask a Tech Tip: Getting Tough Stains out of Sensitive clothing

**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).

Recently, someone tried to get a pasta stain out of his shirt using a petroleum-based chemical. The results were poor. Instead, try a chemical that is so good that it will remove crude oil but is gentle and effective enough to take crude oil off of marine wildlife - dishwashing liquid.

Put some on a greasy stain and work it a bit with warm water and rinse, then put some more Dawn on the spot and wash the item in your washing machine. It usually works like magic. Remember, always start with the least aggressive chemical and work your way to harsher chemicals. ⚙️

## Hands On Success: ADM's Lisa Smagala's Hands-On Approach to Life and Career Shaped Strong Work Ethic and Advanced Skills



ADM Engineer Lisa Smagala (pictured third from right in the above) spends her spare time staying active with recreational volleyball and kickball leagues.

Lisa Smagala used to be afraid of heights, until she took a hot air balloon ride to challenge her fear. Guns made her nervous, so she went to a shooting range to test a few out. When Smagala thought she was an awful distance runner, she signed up for her first half marathon.

"I just like throwing myself into things," said Smagala. "The only way I fully understand something is to touch it and feel it, so figuring out how things work and facing a problem head on is how I always approach things."

**"You have to be committed to your job, be excited and want to see your programs succeed. I try to instill that value in our team to encourage members to work hard because our Warfighters deserve a certain level of service, and we need to be able to deliver on that."**

—Lisa Smagala, Systems Integration Team Leader

Smagala, currently the Systems Integration team leader within the Advanced Design and Manufacturing Division's Technology and Systems Integration Branch, has used her no-fear personality and disciplined work ethic to advance her skills as a systems engineer, bring success to her team and add value to her many projects at the Edgewood Chemical Biological Center.

As a female team lead in a field historically driven by males, Smagala never lets being the "small girl in the room" deter her from immersing herself in a field that truly piqued her interest.

"I really don't mind getting dirty, or climbing around the vehicles turning wrenches," Smagala said. "Although these days I don't get to do it as much as I used to, that type of work is what really excites me. I'm a hands on learner."

Smagala has been in the systems engineering line of work for more than 10 years, and spent her undergraduate years studying industrial engineering.

"A majority of my studies and the jobs that I've held were heavily male dominated," Smagala said.

While she is used to the environment and feels comfortable in the atmosphere, she has encountered some difficult attitudes from time to time.

"Never at ECBC, but I have been in several situations where male customers would ask another male questions even though I'm the person in charge, or I may get treated differently. The best way I combat that is to just show them what I am made of," Smagala said. "Work ethic, good results, drive and skill all speak on their own. While they may not ask me questions initially, it doesn't take long for them to realize that I am capable."

Although Smagala, is someone who has always pushed herself, hard work is a trait that comes naturally. A strong work ethic and building relationships are the traits that Smagala thinks are essential to any engineer's career – male or female.

"You have to be committed to your job, be excited and want to see you programs succeed," Smagala said. "I try to instill that value in our team to encourage members to work hard. Our Warfighters deserve a certain level of service, and we need to be able to deliver on that."

Smagala's first foray into engineering was not unlike her approach to conquering her fear of heights or challenging her ability to run long distances - she took a head-first and hands-on approach. At just 18 years old, Smagala worked a summer job at the General Motors (GM) factory assembly line near her Delaware home. In her time with GM, Smagala started as a summer intern and became a full time engineer by the time she graduated from the University of Delaware with a Bachelor's Degree in Industrial Engineering.

"I stayed with GM for about seven years and really enjoyed my job. Unfortunately the plant began to show signs of closing down, so I couldn't stay as long as I wanted," Smagala said. "It was because of the real exposure to the working world in manufacturing that I found the field exciting and fast paced."

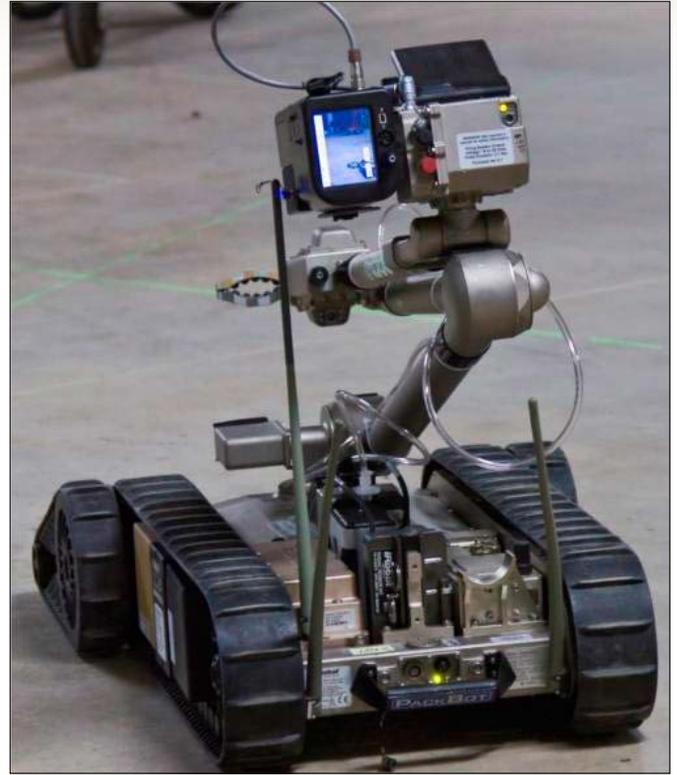
After GM, Smagala ventured into a completely different side of engineering and took on a job at WL Gore working with

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## Advanced Technology Demonstration Branch Gains Extension to Continue Rapid Area Sensitive-Site Reconnaissance Evaluation



Pictured above: the Laser Interrogation of Surface Agents (LISA) Manportable Phase 3 (MPP3) sensor was selected as the host platform by ITT Exelis and QinetiQ-North America team.



Pictured above: the Nu Delta Avalon sensor with iRobot PackBot 510 was selected as a platform by FLIR Systems.

The Rapid Area Sensitive-Site Reconnaissance (RASR) Advanced Technology Demonstration (ATD) has been extended for one additional year. Edgewood Chemical Biological Center's Advanced Technology Demonstration (ATD) Branch and the Laser Spectroscopy Branch from the Research and Technology Directorate helped support this effort sponsored by the Defense Threat Reduction Agency (DTRA). As the Technical Manager (TM), ECBC ATD Branch provided day-to-day technical direction during the RASR ATD by managing technical cost and performance, and working with the Risk Mitigation Lead, Massachusetts Institute of Technology Lincoln Laboratory to mitigate technical risk.

RASR ATD aims to decrease the time needed to survey large areas such as rooms, courtyards and fields for the presence of chemical warfare agents (CWAs), toxic industrial chemicals (TICs) and non-traditional agents (NTAs). Following an In-Process Review in September 2012, the RASR ATD Project Manager and Technical Manager are planning for a one-year Extended User Evaluation.

The RASR ATD program looked to improve the time to perform initial Sensitive-Site Assessment (SSA) threat characterization and map the Sensitive-Site Exploitation (SSE) keep-away envelope exploitation. This was done through providing detectors that are man-portable or mounted on an unmanned ground vehicle (UGV) that employed autonomous mapping capability.

"The RASR ATD sensor allows identification of hazards faster and at a standoff distance without having to handle the substance. This, in turn, keeps the Warfighter out of harm's

way when the hazards are still unknown," said Jack Tilghman, RASR ATD Test Manager.

DTRA awarded contracts to ITT Exelis and FLIR Systems in 2010 to obtain competitive prototypes for the RASR ATD. Each contractor's system consisted of a Contractor Detector Technology, a MultiRAE plus photo ionization detector and an AN/UDR-14 radiation detector integrated on a UGV. In this standard configuration, the contractor's systems needed to map and identify CWAs, TICs, and gamma radiation sources.

The ITT Exelis and QinetiQ-North America team selected the Laser Interrogation of Surface Agents (LISA®) Manportable Phase 3 (MPP3) sensor as their detection technology and the TALON™ robot as the host platform. FLIR Systems selected the Delta Nu Avalon sensor for their detection technology and the iRobot PackBot 510 with Hazmat Kit as their platform. ECBC's Laser Spectroscopy Branch conducted the testing of each contractor's unique detector. The test results provided data on the performance of each sensor, which the contractors used to improve the performance of their sensor.

"The Laser Spectroscopy Branch provided great insight and feedback to the contractors in their efforts to improve their sensor technology after each round of laboratory testing," said Doretha Green, RASR ATD Technical Manager.

The development of the RASR ATD Capabilities Traceability Matrix (CTM) was a collaborative effort led by Transition Manager, Joint Project Manager Nuclear Biological Chemical Contamination Avoidance, with support from ECBC ATD as

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## Department of Energy Tours TREB Facility to Observe Filter Testing

On 17 January 2013 members of the Department of Energy (DoE) and Qualified Products filter manufacturers spent several hours learning about the capability offerings at ECBC's Engineering Test, Reliability, and Evaluation Branch (TREB) and taking a tour of the facility. They observed the High-Efficiency Particulate Air (HEPA) and gas filter test processes and certifications, gaining more insight into ECBC and TREB's business development plan, in hopes of a future collaboration.

The twenty-seven representatives from DoE gathered at Berger Auditorium for an overview of ECBC, the Engineering Division, and TREB. Randy Laye, Deputy Director of the Engineering Directorate, and Mr. Do Nguyen, Branch Chief of TREB conducted the briefing. The presentation included a review of ECBC and TREB test capabilities, TREB customer relations and quality assurance, and HEPA filter/media and gas certification testing, which includes American Society of Mechanical Engineers (ASME) AG-1 certification tests and lot acceptance tests. "TREB's expertise is a valued resource as AG-1 committee experts look to this rewrite of HEPA procurement and standards," said Ted Wald from National Nuclear Security Administration, Los Alamos Field Office.

During the facility tour, the visiting group observed various aspects of the quality assurance, certification tests, and lot acceptance tests for both HEPA and gas filters. The DoE constituents and other filter manufacturers were interested in seeing what TREB's processes were for testing first hand, in an effort to share best process practices performed by TREB's teams.

HEPA filters must pass a series of tests including, but not limited to, visual inspection and aerosol penetration. Conducting these tests efficiently and meeting customer/manufacturer deadlines is crucial to the development of a DoE and ECBC partnership, and it is the responsibility of members of TREB and the Product and Material Evaluation Team, led by Myat Win, to ensure that these tests are performed properly. The group also observed a gas filter test performed by the Dimethylphosphonate (DMMP) Gas Life Tester. The TREB teams have designed and built the majority of their test equipment and stations, including this test stand, since Nguyen became Branch Chief.

DoE representatives were given the opportunity to view the filter rough-handling process where durability tests are

performed, as well as the visual inspection area. The HEPA filters are also put through extreme temperature/humidity conditions with high wind and water spray.

**"TREB's expertise is a valued resource as AG-1 committee experts look to this rewrite of HEPA procurement and standards,"**

**—Ted Wald, National Nuclear Security Administration, Los Alamos Field Office.**

Members of the DoE delegation are responsible for filter receipt inspection for all DoE filters, and utilizing ECBC TREB as a back-up for DoE testing could be a possibility, so the attendees were keenly interested in inspecting ECBC TREB's testing capabilities. Not only did TREB effectively define these capabilities, but ensured they could handle the potential DoE workload.

TREB's facilities hold several distinctive certifications including International Organization for Standardization (ISO) Certifications (ISO 17025), which TREB's laboratories have maintained for over nineteen years recertifying every two years, and Tank Automotive Command-Rock Island Certifications. The ASME NQA-1 Certification is one TREB is preparing for and adapting to, in order to ensure quality test practices in coordination with the DoE.

"What TREB has done for accreditation is impressive. It takes time and money to obtain the kind of accreditations they've acquired. It is looked upon highly within the DoE and across the government," explained Wald. ⚙️



Representatives from The Department of Energy visited ECBC's Test, Reliability, and Evaluation Branch to observe test processes and models.

## Teamwork, Innovation: Extends SNIFFER Test & Evaluation Pilot Program to Local City Program

The Edgewood Chemical Biological Center's Detection Engineering Branch, along with support from the Protective Factor and Toxic Chambers Branch (PFTCB) and the Chemical, Biological, Nuclear and Radiological (CBRN) Filtration Branch within the Research and Technology Directorate, collaborated to design and pilot a standard test methodology for testing stationary and autonomous commercially developed chemical vapor detectors. Supported by the US Department of Homeland Security Office of Health Affairs Chemical Defense Program (DHS OHA CDP), this effort aimed to better inform select cities in understanding the capabilities and limitations of a given commercial off-the-shelf (COTS) detector for use by city mass transit systems. The selected COTS detector is funded through the Fiscal Year 2009 Federal Emergency Management Agency Transportation Security Grant Program (TSGP).

In 2010, the Transportation Security Administration (TSA) and DHS OHA co-signed the *Chemical Detection Performance Specifications for Mass Transit and Passenger Rail Systems*. These specifications provide information to grantee cities of Transit Security Grants to make an informed decision on the types of stationary, autonomous chemical vapor detectors to purchase. The performance specifications list target chemical warfare agents (CWAs) and toxic industrial chemicals (TICs) to identify and to quantify at either the Acute Exposure Guideline Levels (Level-2) or the Immediately Dangerous to Life and Health (IDLH) level while operating in an environment with common interferent chemicals (e.g., paints, glues, rail dust) and varying environmental conditions. Determination of detector efficacy against these specifications thus required the development and implementation of a laboratory test and evaluation plan.

During the test plan development, DHS OHA CDP requested that ECBC use the existing Sensor Nodes Inform and Facilitate Fast Emergency Response (SNIFFER) chemical detection system, designed by Sandia National Laboratories, as a test case for piloting the test procedures. Now that the standard test methodology has been developed and piloted, the chemical vapor detectors selected by each city will be tested using this plan. The results of this test and evaluation is to then inform the city on how well the detector performed, which can affect how the city's Concept of Operations Plan (CONOP) is written in the event of a chemical incident.

The concept for the test standard is that any qualified laboratory could use this standard test methodology to test chemical detectors to determine if they meet the TSGP requirements. During this project, the team's creativity and teamwork not only generated a community standard and great final product, but also secured for them a future project with CDP that will help the local community.

"The original program was to design a standard test methodology for chemical detectors that were required to meet numerous requirements in a highly variable real world environment, meaning many different operating conditions," said Nichole Mortin, Detection Engineering Branch team member and co-project manager for SNIFFER. "So given these conditions, we had to decide which chemicals and environmental conditions to test against and prioritize



**The Sensor Nodes Inform and Facilitate Fast Emergency Response (SNIFFER) chemical detection system, will be used to test detectors for the city of Baltimore.**

which elements were important, all while staying within the customer's budget."

In order to meet the customer's needs within budget, Mortin and the other project manager Kerrin Dame, also a team member of the Detection Engineering Branch, had to create some innovative solutions utilizing the facilities and expertise from across the Center.

"It was a group effort that got us here." Dame said. "We worked together to use the facilities and resources of ECBC to create the type of test chamber needed and did whatever we could to reduce the amount of labor and ultimately make this an effective and cost-conscious project."

The SNIFFER detector, in its full configuration, is larger than the space inside of a regular hood, so the group turned to the PFTCB large-scale test chambers and personnel. However, since the concept of this standard test methodology is to develop a standard that other qualified laboratories could use to perform the same testing, using ECBC's unique large-scale test chamber was not ideal. Also, the SNIFFER is a unique prototype, and the size of a typical commercial-off-the-shelf chemical vapor detector would most likely be smaller than the SNIFFER. In order to most accurately pilot the standard test methodology, the team needed to get more creative.

"Leonard Buettner and others from the CBRNE Filtration Branch worked hard with us to think outside of the box to address this issue," Dame said. The test team designed an environmentally-controlled test chamber in one of ECBC's walk-in hoods, and created a chemical vapor generation system that incorporated the multiple feeds required for the CWAs, TICs, interferent chemicals, and humidified and conditioned air streams.

"After the development of the standard test methodology and the success of the SNIFFER pilot, we were requested by the CDP to test chemical detectors for the Maryland Transit Administration (MTA) in Baltimore," Mortin said. "The city of Baltimore was selected as a pilot program for this effort, and due to the work we did to develop a sound test methodology, as well as our proximity to Baltimore, CDP requested ECBC to test the detectors selected by the city of Baltimore."

ECBC will use the developed standard test methodology piloted on the SNIFFER to test detectors selected by the city of Baltimore. Currently, the team is waiting for Baltimore to purchase their chemical detectors. Testing is expected to begin in the summer of 2013. 

## Hands On Success: ADM's Lisa Smagala's Hands-On Approach to Life and Career Shaped Strong Work Ethic and Advanced Skills

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**Lisa Smagala began her career at the age of 18 at the General Motors Factory Assembly Line in Delaware.**

the company's fabric division as a part of their testing lab/manufacturing support. The difference between working on vehicles versus working with fabrics was immense to her. "While it very different to transition from cars to fabric, I got a whole new view of manufacturing through the work we did in the lab," Smagala said.

Although Smagala enhanced her skills in Research and Development, and learned a lot through the process, she wanted to manage more than just a piece of the puzzle, so she started to pursue different opportunities –especially when she met Kevin Wallace through a mutual friend. Wallace, Smagala said, always talked about the exciting work he did at ECBC. It didn't take Smagala too long to send Kevin her resume to see if ECBC could be a good fit for her.

"I gave Kevin my resume and about six to eight months later I got a call from the Advanced Design and Manufacturing Division inviting me in for an interview," Smagala said. During

her time with ECBC Smagala said she has truly pushed herself and really grown as an engineer.

High profile projects she worked on included the Buffalo vehicle, the Joint Explosive Ordinance Disposal Rapid Response Vehicle Surrogate (JERRV Surrogate) and the Husky Mounted Detection System Surrogate (HMDSS). In addition to her projects, Smagala earned a Master's of Business Administration from Wilmington University, and a Master's Degree in Systems Engineering from The Johns Hopkins University all within three years, while with ECBC.

"I just wanted to throw myself into it and complete all the programs. I felt very encouraged by my coworkers here who work so hard and are so passionate about what they do," Smagala said. "I wanted to become more well-rounded and do as much as I could to fully understand and appreciate every opportunity."

Smagala said her favorite project thus far with ECBC was the work with the JERRV Surrogate, a training vehicle for the Joint Improvised Explosives Defeat Organization. This was the first project that Smagala has had the opportunity to work with from cradle to grave. "I have been involved with JERRV from the start and I got to see it from the initial fielding, to sustainment, training and enhancements for a fleet of 80 vehicles, so I feel a personal tie with that one. We spent a lot of time with the Soldiers during training and practical exercises and really got an inside look into their needs."

Traveling 90 minutes each way to get to ECBC every day, Smagala uses the little free time she has to stay active in volleyball, kickball, dodgeball leagues and participates in obstacle course races. While her schedule can be stressful and exhausting at times, it is all worth it.

While her head first approach gets exhausting, Smagala believes it is hard to get stressed when you're having fun. "I get the opportunity to not only do something I love, but do it next to some of the most talented, intelligent people who are also enthusiastic about their jobs." ⚙️

## Advanced Technology Demonstration Branch Gains Extension to Continue Rapid Area Sensitive-Site Reconnaissance Evaluation

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the TM, ECBC R&T Directorate, Laser Spectroscopy Branch, Massachusetts Institute of Technology's Lincoln Laboratory, the Operational Manager Lead, Marine Corps Forces Pacific (MARFORPAC) and JPM Guardian. The CTM documented the desired performance parameters for the RASR ATD system and the methods used to verify the performance. The development of the CTM provided the roadmap for the technical and operational demonstrations planning. The information provided by the technical and operational demonstrations provided the data needed to characterize the capability of the technology developed by the contractors within the scope of the RASR ATD.

Having only one integrated system for the demonstrations was another challenge the RASR ATD team faced. To

manage this, the group worked closely with the Army Test and Evaluation Command (ATEC) to define the scope and agree on specific capabilities that could not be tested as part of the technical demonstration at West Desert Test Center, Dugway Proving Ground in August 2011 and the Operational Demonstration at the Muscatatuck Urban Training Center in Butler, Ind. in October 2011.

Once all the parameters were set, these demonstrations were successfully completed and the data was used to assess the system in the Joint Military Utility Assessment (JMUA) and the Operational Test Agency Assessment Report (OAR). The RASR system received a favorable JMUA and the OAR indicated that the system had military utility. ⚙️

# Schedule of the ECBC Women's History Month Events



## **LOUD AND CLEAR: FINDING YOUR VOICE IN THE WORKPLACE**

Tuesday, 5 March | Berger Auditorium | 1200-1300

**Sheryl Davis Kohl**  
President of Beacon Staffing  
Alternatives and member of multiple  
local Chamber of Commerce boards



## **WOMEN, THE DEPARTMENT OF DEFENSE AND THE FUTURE**

Tuesday, 12 March | Berger Auditorium | 1200-1300

**Jill Smith**  
Director of U.S. Army Communications  
Electronics Research Command  
(CERDEC)



## **SPONSORING FOR SUCCESS: HOW FINDING THE RIGHT ADVOCATES CAN CHANGE YOUR CAREER**

Monday, 18 March | Berger Auditorium | 1200-1300

**Denise B. Carnaggio**  
Deputy Director at Harford County  
Office of Economic Development and  
Harford County Base Realignment  
and Closure (BRAC) Coordinator



## **CAN YOU HAVE IT ALL? A DISCUSSION ABOUT WORK-LIFE BALANCE**

Monday, 25 March | Berger Auditorium | 1200-1300

**Nancy Kammerer**  
Deputy Director of the Joint Project  
Manager for Nuclear Biological  
Chemical Contamination Avoidance