

## SERDP & ESTCP Announce Plans for Annual Symposium

This Year's Program to Feature 15 Technical Sessions & Three Short Training Courses

**THE PARTNERS IN** Environmental Technology Technical Symposium and Workshop, sponsored by the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP), will be held 27–29 November 2012, at the Washington Hilton. The Symposium will offer a dynamic opening plenary session, 15 technical sessions, three short courses, approximately 450 poster presentations, and a variety of networking opportunities for attendees from the government, academic, and private sectors.

### Preliminary Technical Program

- Climate Change, Fresh Water, and Installation Sustainability
- Defense Coastal/Estuarine Research Program (DCERP): Past and Future
- Marine Mammal Research: Next Steps
- Transferring Emerging Energy Efficiency Technologies to Department of Defense (DoD) Buildings
- Smart, Secure, and Integrated Installation Energy Management for Energy Security and Cost Savings
- Distributed Generation in Support of DoD Energy Security and Renewable Energy Goals
- Waste-to-Energy Conversion for Overseas Contingency Operations
- Implementation of Sustainable Surface Engineering Technologies on Weapons Systems
- Lead-Free Electronics: Challenges and Solutions
- Future Options for Site Closure of Contaminated Groundwater Sites
- Vapor Intrusion from Contaminated Groundwater Sites: Understanding the Groundwater to Indoor Air Pathway
- Emerging Contaminants: Fate, Transport, and Treatment
- Management of Contaminated Sediments: Innovations and Future Perspectives
- Detection and Classification of Munitions Underwater
- ESTCP Live Site Classification Demonstrations



### Training Opportunities

- Passive Sampling Methodologies for Monitoring Contaminated Sediments
- Best Management Practices for Controlling Munitions Constituents on Operational Ranges
- Decision Support System for Matrix Diffusion Modeling

### The Sponsors

SERDP and ESTCP are DoD's environmental research programs, harnessing the latest science and technology to improve DoD's environmental performance, reduce costs, and enhance and sustain mission capabilities. SERDP and ESTCP promote partnerships and collaboration among academia, industry, the military Services, and other Federal agencies. Both manage investments in five program areas, each of which focuses on a specific component of DoD's environmental responsibilities:

1. Energy and Water
2. Environmental Restoration
3. Munitions Response
4. Resource Conservation and Climate Change
5. Weapons Systems and Platforms

They are independent programs managed from a joint office to coordinate the full spectrum of efforts, from basic and applied research to field demonstration and validation. For more information, visit [www.serdp-estcp.org](http://www.serdp-estcp.org).

### Additional Information

For additional information, please visit <http://symposium2012.serdp-estcp.org>, send an e-mail to [partners@hgl.com](mailto:partners@hgl.com), or call the Symposium Contact Line at 703-736-4548. If you would like to receive the Symposium and technical program brochure and are not yet in the SERDP and ESTCP mailing database, please subscribe at [www.serdp-estcp.org](http://www.serdp-estcp.org) or send an e-mail to [partners@hgl.com](mailto:partners@hgl.com). 

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## Army Draws on Navy Process to Reduce Greenhouse Gas Emissions

Aviation & Missile Command Adopts Helium Leak Detection Process

**THE ARMY HAS** leveraged technology originally implemented by the Navy at the Fleet Readiness Center (FRC) East aboard Marine Corps Air Station (MCAS) Cherry Point, NC to significantly reduce greenhouse gas (GHG) emissions at aviation maintenance facilities.

The Army Aviation and Missile Command (AMCOM) G-4 Technology Integration Branch (TIB), based out of Redstone Arsenal, AL, was tasked with researching possible replacements for Sulfur Hexafluoride (SF<sub>6</sub>) gas used in leak checking H-60 helicopter rotor blades on Army installations. In conducting this research, G-4 TIB personnel learned of a new process being used at FRC East. This process had replaced SF<sub>6</sub> with Helium and a specialized leak detector for use in H-60 rotor blade leak checks. G-4 TIB personnel spoke with Jack Fennell at FRC East to discuss the specific applications and nuances of such a switch.

SF<sub>6</sub> is the most potent GHG identified by the Intergovernmental Panel on Climate Change. By way of comparison, carbon dioxide has a Global Warming Potential (GWP) of 1 which pales in comparison to the GWP of SF<sub>6</sub> which is 23,900. SF<sub>6</sub> is on the Department of Defense's (DoD)



CCAD shop artisan testing the cuff of an H-60 blade.



CCAD artisan testing around the pressure release valve and Blade Inspection Method.

### For More Information

**FOR MORE INSIGHTS** into DoD's Strategic Sustainability Performance Plan, read our article entitled, "Going Green While Going Strong: DoD's Ambitious Sustainability Plan" in the winter 2012 issue of *Currents*. For more information about DoD's SF<sub>6</sub> management strategy, read our article entitled, "Sulfur Hexafluoride—The Good, the Bad & the Future: Managing a Mission-critical Greenhouse Gas" in our spring 2010 issue. To browse the magazine's archives, visit the *Currents* page on the Department of the Navy's Energy, Environment and Climate Change web site at <http://greenfleet.dodlive.mil/currents-magazine>.



### Rotor Blades are Hollow?

**YES—ROTOR BLADES** are, in fact, hollow. H-60 rotor blades are made from a long titanium spar that runs the length of the blade. The spar is a hollow beam that is surrounded by layers of honeycomb material and an outer composite skin that combine to form a strong, rigid and lightweight rotor blade.

The spar is pressurized with 15 pounds of Nitrogen during normal operation. The Nitrogen within the blades acts as a desiccant to prohibit water intrusion and corrosion. The rotor blades are also fitted with a Blade Inspection Method (BIM) regulator that provides indication of a leaking blade and thus its airworthiness. If a blade spar has a crack, the BIM will change color and artisans will begin the work of trying to identify the source of the leak. This is where the Helium and Helium detector comes in.

Emerging Contaminants Action List due to the risks related to potential cost increases, restrictions, or production bans.

Under Executive Order (EO) 13514, federal agencies were required to establish FY2020 reduction targets for non-tactical GHG emissions, measured from a FY2008 baseline. The EO requires separate targets for direct and indirect emissions from sources controlled by DoD (Scopes 1 and 2), and emissions from sources not owned or directly controlled by DoD (Scope 3). The Department set an aggressive 34 percent goal for Scopes 1 and 2 emission reductions by FY2020 in the DoD Strategic Sustainability Performance Plan established under EO 13514. Corpus Christi Army Depot (CCAD), aboard Naval Air Station Corpus Christi, reported using 500 pounds of SF<sub>6</sub> during the FY2008 timeframe.

In order to achieve a transition to the Helium and a Helium-specific leak detector, a demonstration/validation of the technology and process was coordinated by AMCOM G-4 between the vendor and the CCAD Blade Shop. This demonstration was carried out on 16 June 2010, with two different Helium detection technologies in order to assess the preferences of the blade shop artisans. The demonstration proved to be highly successful as all of the leaks typically seen were detected at a faster rate than could previously have been achieved with SF<sub>6</sub> and Halogen detection technologies. This increase in testing

and detection rates will allow for faster throughput of blades within the blade shop.

To help implement the new Helium technology and process, AMCOM G-4 TIB personnel, in coordination with CCAD, have developed new maintenance testing processes that allow for 100 percent Helium to be introduced to the blades in place of the 5-to-1 Nitrogen to SF<sub>6</sub> mixture that was used previously. These changes have been issued in the form of Maintenance Engineering Orders (MEO). AMCOM G-4 TIB personnel also developed and submitted requests for approval of these MEOs to the Army's Aviation Engineering Directorate (AED). AED has since approved this conversion and the detection technology.

This technology implementation will reduce CCAD's SF<sub>6</sub> usage by 95 percent and provide compliance with all policies and orders focused on SF<sub>6</sub> reduction.

This technology implementation will reduce CCAD's SF<sub>6</sub> usage by 95 percent and provide compliance with all policies and orders focused on SF<sub>6</sub> reduction. Faster throughput of blades will increase CCAD's mission in support of the warfighter. This transition will also provide a cost savings of \$16,303 per year as the cost of SF<sub>6</sub> is substantially greater than the cost of Helium. CCAD has procured two Helium detection units and is training maintainers in the blade shop on the proper use of the technology. Both the 1108th and 1109th Theater Aviation Sustainment Maintenance Groups (TASM-G) have also committed to upgrading to the Helium detection process at their facilities. Efforts are underway for the 1107th TASM-G to incorporate this technology as well. 

*Photos by Casey Yeary*

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## NESDI Program Launches Annual Call for Fleet Needs

FY13 Effort Includes a Rapid Response to Address Emergent Needs

**ONCE AGAIN, THE** Navy Environmental Sustainability Development to Integration (NESDI) program is launching its needs collection process—this time for Fiscal Year 2013—including a streamlined process to provide a rapid response to your emergent needs.

Although you can submit a need at any time, the program’s formal needs collection process runs from the beginning of June until the beginning of August each year. For the NESDI program, a “need” defines a requirement to eliminate or reduce an environmental constraint that:

1. Addresses a Fleet operational challenge
2. Identifies an existing gap in knowledge, technology, and/or capability
3. Is associated with an environmental constraint or regulatory driver

Needs are the fundamental basis of the NESDI program as all of its technology investments are based on recommended solutions to the need.

When submitting a need, you are encouraged to provide as much information as you can about your existing challenge. What is the challenge? How big is it? Is it due to a current or impending regulatory requirement that now makes your job more difficult? Is it a technology gap? Is it a Fleet operational challenge? Is the problem unique to your facility or is it applicable across the Navy? How urgent is the need? If the need is truly urgent, the NESDI program can respond quickly with the resources and expertise necessary to address the need.

To submit your need for consideration by the NESDI program, visit the “Environmental Needs” section on the NESDI web site at [www.nesdi.navy.mil](http://www.nesdi.navy.mil) by 1 August 2012. Once there, click on the “Submit A Need Now” button. This will take you to the “NESDI Environmental Needs Submission Form.”

### The Basics About the NESDI Program

**THE NESDI PROGRAM** seeks to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials, and filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Fleet readiness. The program accomplishes this mission through the evaluation of cost-effective technologies, processes, materials and knowledge that enhance environmental readiness of naval shore activities and ensure they can be integrated into weapons system acquisition programs.



The NESDI program is the Navy’s environmental shoreside 6.4 Research, Development, Test and Evaluation program. The NESDI technology demonstration and validation program is sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command (NAVFAC). The program is the Navy’s complement to the Department of Defense’s Environmental Security Technology Certification Program (ESTCP) which conducts demonstration and validation of technologies important to the tri-Services, U.S. Environmental Protection Agency and Department of Energy.



To submit your need for consideration by the NESDI program, visit the “Environmental Needs” section on the NESDI web site at [www.nesdi.navy.mil](http://www.nesdi.navy.mil) by 1 August 2012.

Use this on-line form to tell NESDI program personnel everything you know about your need. Once you submit your need, technical experts assembled by NESDI program management will assess, validate, and rank it. You will be notified about the ultimate status of your need once this ranking process is complete.

For more information, download the program’s Reference Guide: Submitting and Evaluating Needs from the NESDI web site by clicking on the “Environmental Needs” button from the home page. Direct any questions about the use of the program’s web site to Eric Rasmussen at 732-323-7481 and [eric.rasmussen@navy.mil](mailto:eric.rasmussen@navy.mil).

For more insights into the NESDI program’s needs submittal process, contact Leslie Karr, the program manager, or members of the Technology Development Working Group—the program’s management team. 



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## N45's Living Marine Resources Program Launches First Solicitation for Needs

Deadline for Submittals is 31 August 2012

The Living Marine Resources (LMR) program is soliciting for Fleet and System Commands (SYSCOM) needs. And if you want your need to be considered in the Fiscal Year (FY) 2014 evaluation cycle, it must be submitted by 31 August 2012.

Sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (N45), the LMR program seeks to develop, demonstrate, and assess data and technology solutions to protect biological marine resources by minimizing the environmental risks of Navy at-sea training and testing activities while preserving core Navy readiness capabilities. This mission is accomplished by:

1. Providing science-based information to support Navy environmental effects assessments for at-sea training and testing.
2. Improving knowledge of the ecology and population dynamics of marine species of concern.
3. Developing the scientific basis for the criteria and thresholds to measure the biological effects of Navy generated sound.
4. Improving understanding of underwater sound and sound field characterization unique to assessing the biological consequences of underwater sound (as opposed to tactical applications of underwater sound or propagation loss modeling for military communications or tactical applications).
5. Developing technologies and methods to mitigate and monitor environmental consequences to living marine resources resulting from naval activities on at-sea training and testing ranges.

In an effort to identify ongoing challenges in the Fleet and SYSCOMs, the LMR program is opening up its needs collection process. All LMR program decisions and investments are based on environmental needs which meet the following conditions:

- Identifies an existing gap in knowledge, technology, and/or capability
- Is associated with an environmental constraint or regulatory driver
- Can be categorized under one of the program's investment areas

To have your need considered in the FY 2014 evaluation cycle, it must be submitted by 31 August 2012.

Anyone within the Navy may submit their needs for consideration by the LMR program. (For more information about submitting a need, see our reference guide entitled "Submitting and Evaluating Need" available via the LMR web site.)

To submit a need to the program, visit the LMR program web site at [www.lmr.navy.mil](http://www.lmr.navy.mil) then select "Needs" from the navigational menu on the left. You will be taken to the following page:



Once on the “Environmental Needs” page, select “Submit Your Need Now” and you will be taken to the following page where you can actually submit your need:

Once you have provided all of the above information, select “Spell Check” to correct any data entry errors then select “Submit Need.”



Once a need is submitted, it is evaluated by technical experts assembled by program management—the program’s requirements advisory committee or LMRAC. After reviewing the needs, the LMRAC makes recommendations to the LMR program manager and N45 resource sponsor who make the ultimate decision about which needs will move forward to the next stage in the process—the solicitation for proposals to address priority needs.

In order to complete this needs submission form, you will need to enter the following information about your need:

- Contact information for the need originator
- Title of the need
- Detailed description of the need
- Explanation of the ramifications if the need is not met
- Key Navy policy and regulatory drivers
- Suggested solutions to the need

For help submitting your need, contact your corresponding LMRAC member at the phone numbers and email addresses listed below.

For more information about the LMR program and its needs solicitation process, contact Bob Gisinier, acting LMR program manager. [↕](#)

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## NAVAIR Develops New Environmentally Compliant Solvent Cleaning Unit

Unit Designed for Use on Bearings & Other Critical Components

**DUE TO THE** obsolescence of the existing platform degreaser units in the fleet and the transition to the new class of solvents, the Naval Air Systems Command (NAVAIR) has field tested a new environmentally-friendly closed-loop solvent parts cleaning unit—the PCS-10. This unit is specifically designed for use on bearings and other critical components that cannot be exposed to water. NAVAIR's Maintenance of Aeronautical Antifriction Bearings for Operational, Intermediate and Depot Level Maintenance (NAVAIR 01-1A-503) manual stipulates that certain steps must be adhered to during the cleaning process.

The Clarus PCS-10 is manufactured by Clarus Technologies of Bellingham, Washington, and is designed to clean bearings and other small parts through agitation in a turbulent solvent bath. Variable timed cleaning allows for cleanliness to be achieved through a range of geometries and contamination levels. This unit is designed to provide a greater degree of versatility for solvent cleaning compared to existing units through the use of vertical agitation, spray jets, and variable timing.

Existing degreaser units are used in both land-based and shipboard activities. Consequently, the PCS-10 has been designed and tested to meet shipboard shock, mechanical vibration, and electromagnetic interference requirements. The unit is being installed to support 500 Division (Tire and Wheel Shop) operations on ships and at Fleet Readiness Centers.

Perhaps the most challenging testing that the unit had to undergo was the Volatile Organic Compound (VOC) testing to meet emission requirements for solvent cleaning units.



The PCS-10 undergoing contractor testing.

At the inception of the PCS-10 project, the air quality control district in the Central Valley of California had the most stringent requirements. This organization, formally known as the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), is the controlling regulatory body for the air pollution standards that Naval Air Station Lemoore must meet. To regulate the emissions from organic solvent degreasing operations, SJVUAPCD developed Rule 4662.

SJVUAPCD Rule 4662, entitled "Organic Solvent Degreasing Operations," provides the requirements for cold cleaning degreasers, open top vapor degreasers, and non-cold cleaning degreasers. In order for the PCS-10 to comply, it had to meet the VOC capture and control efficiency requirements of 85 percent efficiency by weight. Also, the overall emissions could not exceed those that would result from the use of a solvent with a VOC content of 25 grams VOC per liter (g-VOC/l) in the unit's emission control system. This meant that the MIL-PRF-680 solvent used for testing, with a VOC level of 770 g/l, required a control efficiency of 96.75 percent.

The PCS-10 utilizes a carbon filter assembly to control Total Gaseous Organic Concentration (TGOC) emissions. Capture Efficiency was determined using U.S. Environmental Protection Agency (EPA) Test Method 204 to verify that the washer meets the criteria for a Permanent Total Enclosure. To establish the Control Efficiency, total hydrocarbons concentrations were measured at the inlet

and outlet of the carbon filter to determine the percent reduction of TGOC emissions attributable to the filter. TGOC were measured using EPA Method 25A. TGOC concentrations were measured as propane, using a flame ionization analyzer. Testing was performed simultaneously at the inlet and outlet of the carbon filter.

Several filter designs and filter media types were tested to establish a media bed design that would provide the required emission control over the prescribed number of operational hours before reaching saturation. The first media to be tested was coconut-based activated carbon.

Several filter designs and filter media types were tested to establish a media bed design that would provide the required emission control over the prescribed number of operational hours before reaching saturation. The first media to be tested was coconut-based activated carbon.

This media failed to achieve the requisite emission control. Potassium permanganate was added to the filter media to enable molecular breakdown, thereby allowing the activated carbon to absorb more of the VOCs than it would otherwise. However, this filter media also failed in testing. Finally, a specialty type of wood-based activated carbon was used to meet the test requirements. This activated carbon was specifically designed for solvent vapor recovery operations. Unlike the coconut-based activated carbon, the wood-based activated carbon filter media absorbs the exhaust gases from the bottom up. This filter media was able to meet the SJVUAPCD Rule 4662 requirements. The final filter media configuration that provided the correct balance was a pelletized form of the wood-based activated carbon. With this filter media configuration, the unit was able to achieve a control efficiency of 99.8 percent.

Many often conflicting variables had to be reconciled in determining the final filter bed configuration for the PCS-10 unit. The amount of media necessary to achieve the requisite emission control had to be determined based on the stipulated preventive maintenance interval to minimize the need for frequent filter replacement. The arrangement/geometry of the media within the filter bed had to be designed to optimize functionality. A greater

amount of surface area exposure for each pellet would lead to greater absorption from the same amount of media. Similarly, the media had to be arranged in such a way to avoid “channeling” of the media whereby a minimal amount of the media is exposed to most of the exhaust gases. Finally, the amount of available space for the filter media within the unit was a limiting factor. The PCS-10 had to have a small overall envelope to minimize the amount of space used for shipboard installation.

While the above testing was done using a MIL-PRF-680 compliant solvent, it is not the only option for safe, effective use of the PCS-10 machine. The MIL-S-32295 class of solvents can also be used in the PCS-10. Fleet testing has shown that the unit will thoroughly clean a bearing in less than an hour using MIL-PRF-680 compliant solvents. Prewashing generally is not necessary.

The PCS-10 has been installed on land-based and shipboard activities beginning in August 2011. 

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## BE PART OF OUR WINTER LINE-UP!

### Submit Your Article by 19 October

It's not too late to join the *Currents* team. If you want to be in the line-up for our Winter 2013 issue, you need to submit your text and images by 19 October 2012.

brucemccaffrey@sbcglobal.net. Bruce is also available at 773-376-6200 if you have any questions or would like to discuss your article.

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### CURRENTS DEADLINES

- Winter 2013 Issue: Friday, 19 October 2012
- Spring 2013 Issue: Friday, 18 January 2013
- Summer 2013 Issue: Friday, 19 April 2013
- Fall 2013 Issue: Friday, 19 July 2013

You can also refer to your *Currents* calendar for reminders about these deadlines.

