

United States Public Health Service

# MACHINATORES VITAE

Engineer Community Newsletter

## From the Chief Engineer Officer



**Randall J.F. Gardner, P.E.**  
Rear Admiral, US Public Health Service  
Assistant Surgeon General

Spring 2016

### Impact, Partnerships and Results

Recently I was asked what "PHS" meant by someone I thought should have known. That intrigued me to search where the Public Health Service (PHS) is identified and to consider how commonly known we are outside the PHS Commissioned Corps. I challenge each of you to find 10 people that are not familiar with the Commissioned Corps and tell them our mission, your program mission, and as engineers, what we contribute to that mission. Also, let them know where they can find out more about our programs within the Department of Health and Human Services (DHHS) and about the Commissioned Corps.

Partnerships - I just like the way that sounds. It probably goes back to grade school where the teacher told me we would be working in pairs and the nervous feeling of not knowing who my partner would be. For me the word partner means someone who is willing to help you, and we can always use help, especially with the challenges in public health. If you are not helpful to your partner and vice versa, then it probably isn't a true partnership. Learning what others do, networking, and finding ways to compliment and help each other is a good way to form partnerships and possibly find connections that you may not be expecting. I am interested in forming more and stronger partnerships between the once organized Public Health Agencies (CDC, FDA, IHS, etc). Through partnerships, we can strengthen the leadership and enhance the capabilities of our respective programs.

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I have been very lucky to associate with such dedicated and accomplished professionals as those that work in the DHHS and the results we get. On a site visit this past year, as I entered into a laboratory anticipating what I may see and learn, I realized those engineers and scientists were also anticipating the purpose of my visit and the message I would bring. The message is clear and simple - that we (the public) want results. As I finished my tour and discussion with the group, I was not only impressed by what I saw and learned, it was exactly what I wanted. We are seeking and getting results, which improve the public's health and quality of life. I encourage all of us to step up to the challenges and forge away at solving the routine and unexpected public health issues we face. The work on your desk is truly important and staying ready to respond to emerging public health crises and threats when our country needs us is equally important.

Last February I had the privilege to present awards to several engineers and an architect for the work they performed in their assignments, during deployment, and in leadership roles. During the award presentations, my comments were about how their work impacted public health, the importance of partnerships, and the results they achieved. Congratulations again to the awardees for their contributions to their profession, and their programs.

To our readers, thank you all for your commitment to making an impact in public health, the partnerships you form, and the results you achieve.

RADM Randall J.F. Gardner, P.E.

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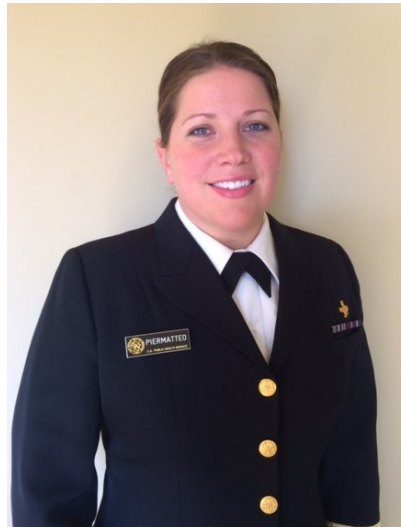
If you have any questions or comments related to the Engineer Category or EPAC activities, feel free to contact any of the following EPAC members.

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Rules (Chair-Elect)	CDR Kurt Kesteloot	NPS	<a href="mailto:Kurt_Kesteloot@nps.gov">Kurt_Kesteloot@nps.gov</a>
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## 2016 EPAC Chair

*LCDR Kimberly Piermatteo, MHA*



Greetings, my fellow PHS Engineers and Architects! I am honored to have the opportunity to serve as the EPAC Chair and represent the Engineer Category in 2016.

I would first like to thank our outgoing EPAC voting members: CDR Nathan Epling (NPS), CDR Robert Hemberger (IHS), CDR Janis McCarroll (DHS) and Lcdr Nazmul Hassan (FDA). I thank them for their time, service and dedication.

Secondly, I'd like to welcome five new voting members: CDR Francis Chua (IHS), CDR Bradley Cunningham (FDA), Lcdr Peter Littlehat (IHS), Lcdr Samuel Russell (EPA) and LT

Praveen K.C. (IHS). These new members bring unique ideas and valuable leadership skills to the EPAC and I appreciate their commitment to our category. Additionally, we have one returning voting member, Lcdr Deborah Hirst (CDC). I appreciate her continued leadership as she begins her 2<sup>nd</sup> three year term.

EPAC activities are already underway for 2016. Subcommittees have identified their initiatives and are diligently working on numerous issues including website migration, recruitment, readiness, mentoring, special events, award recognitions, and many more. I look forward to another productive and impactful year!

Additionally, this year I will be working with each of you to improve our communication. I often remind myself of this quote: "The two words 'information' and 'communication' are often used interchangeably, but they signify quite different things. Information is giving out; communication is getting through" (Sydney J. Harris). We must get through to each other and not just pass on information. Many times we are overwhelmed with the number of emails we receive and some of them may land in our "trash" folders without being completely read or fully understood. With your help I plan to develop a communication plan for our category which provides consistent, timely and relevant information. This plan will not just guide how we share information among ourselves but also how we communicate to the Chief Engineer, other PACs, the Surgeon General, etc. My vision is that with improved communication, we can each play a more active role in the advancement of our category.

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Lastly, I'd like to reaffirm the purpose of the EPAC and why is it so important. EPAC is charged with providing advice and consultation to the Chief Engineer, who in turn reports to the Surgeon General on matters relating to the professional activities and personnel issues affecting Civil Service and Commissioned Corps Engineers and Architects. That sounds like a lot of responsibility and you know what...*it is!* The EPAC plays a vital role in the promotion and advancement of our category. I commend all of those who have, who are and who will serve on the EPAC and take on this great responsibility. If you are not already involved with the EPAC, I challenge you to get involved. You don't have to be a voting member to contribute. If you are interested, please feel free to contact me or a current member.

I look forward to working with each of you this year as we promote and advance our category! If you would like to share any ideas, concerns or questions, please feel free to contact me ([kimberly.piermatteo@fda.hhs.gov](mailto:kimberly.piermatteo@fda.hhs.gov)).  
Machinatores Vitae!

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## How to Get Your Work Published

*LCDR Deborah V.L. Hirst and CDR Tanya Davis*

You have just returned home from a 30-day deployment setting up a field hospital for the Ebola response in Liberia. You designed a new innovative wastewater treatment system to serve a remote Alaskan village. You completed an engineering control survey at an indium-tin oxide plant to reduce worker exposure to indium. All of these accomplishments (along with your normal daily job duties) are what the USPHS mission is about. We protect, promote, and advance the safety and health of the Nation. Why would we not want our accomplishments or our daily job duties published for other engineers or categories to read and learn about? Engineers have cool jobs and we do cool things. As members of the Public Health Engineering Practice Subcommittee, we constantly hear other engineers say that they do not know what to write about or they do not have the interesting variety of projects that engineers in other agencies may encounter. If you are an engineer, then you do have something to write about and you can get your work published in peer and non-peer reviewed journals. For the next two newsletters, we will give you some pointers to help you with writing and we will also guide you to specific journals that may be suitable in your area of expertise.

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## Why Get Published?

There are many reasons to get your work published. For one, authorship of publications is part of the *Progression of Leadership Potential* benchmark (Performance Precept).<sup>1</sup> Sharing your published article with the public and/or peers at professional associations and conferences boosts an officer's value under the *Presentations and Outreach* benchmark (Officership Precept).<sup>1</sup> Publishing can also help your career through networking opportunities created by your paper. Having an article published is the primary way that you can communicate the work that you are doing to others in the same field and is a record of your accomplishments.<sup>2</sup> Your work, experience, insight, and/or research are important and can be used by the public, policy makers, industry, and your peers only if it is available and they are aware of its existence.<sup>3</sup> Your publication adds to the body of knowledge. The exposure or attention that your article receives by publication can lead to funding resources for your work.

Publishing improves your skills and expands your knowledge base. Practicing writing in a specific, structured, focused, and precise language improves one's writing skills. Working through your material and data properly, addressing comments and edits, identifying the main points or findings and reviewing the painstakingly small details of your article are valuable experiences. The peer review process of your article often provides you with additional insight into your own work. Finally, through identifying appropriate publishers for your work, you will learn about different publications, writing styles, editorial processes, channels and rankings.

## What Should I Write About?

As a USPHS engineer, you can write about past and present deployments, volunteer work, completed projects, laboratory and/or field research, and case studies. The topic areas are endless. For example, two recent publication topics included eliminating the risk of *Legionellosis*<sup>4</sup> and providing a potable drinking water system to a small community.<sup>5</sup>

## Where Do PHS Engineers Get Their Work Published?

Engineers publish their work in journals, books, newspapers, and other literary works. *The Military Engineer* and the *Machinatores Vitae* are just two examples of countless non-peer reviewed literary mediums. For USPHS engineers, the most common literary medium is *The Military Engineer*.<sup>6</sup> *The Military Engineer* is published bi-monthly by the Society of American Military Engineers ([SAME](#)).<sup>7</sup> This

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magazine contains information on various engineering disciplines, including environmental, construction, and architectural. The *Machinatores Vitae* is a newsletter published twice annually by the EPAC. The newsletter covers a variety of topics ranging from personal accomplishments to deployments. We will go into more detail about publishing in non-peer reviewed literature in the next issue.

Engineers can also publish their work in a peer-reviewed journal or book. A peer-reviewed article or chapter is one that has been examined by people with credentials in the article's field of study before it is published.<sup>8</sup> The process of publishing in a peer-reviewed written work is not as expedient as publishing in a non-peer reviewed journal or book. The proposed written work may have to undergo several revisions and reviews before a journal or book will agree to publish it. This process could take a couple of months to years. We will discuss peer-reviewed journals and books in a later issue.

### **A Few Points to Remember**

You are an engineer in the USPHS. You have a story to tell to the engineering and public health community. You *can* have your written work published in either a non-peer reviewed or peer-reviewed literary medium. In the next newsletter, we will discuss non-peer reviewed journal publications and how to get *your* work published in a non-peer reviewed article. Stay tuned!

- 1 [http://dcp.psc.gov/ccmis/PDF\\_docs/2016%20ENGINEER%20Benchmarks%20-%20Final.pdf](http://dcp.psc.gov/ccmis/PDF_docs/2016%20ENGINEER%20Benchmarks%20-%20Final.pdf)
- 2 [http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2007\\_04\\_06/caredit.a0700045](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2007_04_06/caredit.a0700045)
- 3 Wilson, L. [1942]. *The Academic Man: A Study in the Sociology of a Profession*. Oxford: Oxford University Press.
- 4 Gumapas, L.A. [2016]. Eliminating *Legionellosis* risk at the National Institutes of Health. *The Military Engineer* 108(700):53-54.
- 5 <http://themilitaryengineer.com/index.php/staging/item/280-water-for-life>
- 6 <http://themilitaryengineer.com/>
- 7 <http://www.same.org/>
- 8 <http://hsl.lib.umn.edu/biomed/help/identifying-peer-review-journals>





## Engineer Category Awards Ceremony

*CDR Alex Dailey*



RADM Randall Gardner speaking at the 2016 Engineer Category Awards Ceremony

The U.S. Public Health Service (USPHS) Engineer Category celebrated National Engineers Week by recognizing several outstanding engineers at its annual awards ceremony on Thursday, February 25, 2016, at the National Institute of Allergy and Infectious Diseases (NIAID) Building in Rockville, Maryland. LCDR Kimberly Piermatteo, 2016 EPAC Chair, served as Mistress of Ceremony and provided opening remarks on the perspective of engineers and their contributions to society. RADM Randall J.F. Gardner, Chief Professional Officer of the Engineer Category, gave the keynote address and read a proclamation by the Surgeon General, VADM Vivek H. Murthy, highlighting the role of PHS engineers in accomplishing our mission of protecting, promoting and advancing the health and safety of our Nation.

RADM Gardner and LCDR Piermatteo presented this year's awards to the following recipients:

- |                                |   |
|--------------------------------|---|
| • Dr. John Sammarco, PhD       | PHS Engineer of the Year                      |
| • LCDR Diana Wong, PhD         | RADM Jerrold M. Michael Award                 |
| • LCDR Samantha Spindel, PhD   | FDA Engineer of the Year (Commissioned Corps) |
| • Dr. Changfu Wu, PhD          | FDA Engineer of the Year (Civil Service)      |
| • Christopher S. Pan, PhD, CPE | CDC Engineer of the Year                      |
| • CDR Alexander Dailey, P.E.   | IHS Engineer of the Year                      |
| • LCDR Chris Fehrman, P.E.     | NPS Engineer of the Year                      |
| • Mr. Paul J. Howey            | NIH Architect of the Year                     |
| • LT Shane Deckert, P.E.       | PHS Engineer Responder of the Year            |

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2016 Engineer Category Awardees with RADM Gardner (From Left to Right): Dr. Changfu Wu, CDR Alexander Dailey, Dr. John Sammarco, RADM Randall Gardner, LCDR Diana Wong, Mr. Paul Howey, and LT Shane Deckert

Dr. Sammarco, CDR Dailey, and LCDR Spindel also represented their respective agencies at the Federal Engineer of the Year (FEYA) Award Ceremony sponsored by the National Society of Professional Engineers. The 2016 FEYA Ceremony was held the next day at the National Press Club in Washington, DC. Estevan López, Commissioner of the Bureau of Reclamation, U.S. Department of the Interior, delivered the keynote address.

The Awards Ceremony Planning Committee was comprised of the following members: CDR Alex Dailey, LCDR Kim Piermatteo, Erica Sorrelhorse, CAPT David Harvey, CAPT Carol Rogers, Aretta Hubbard, Char Romero, LT Michael Simpson, and LCDR Matthew Hunt.





## Navajo Nation Improves Environmental Health with Vacuum Sewer System

*Colin Daly, P.E.*

Every autumn, farmers in Shiprock, New Mexico harvest, steam, and dry their corn to make traditional Nas chizhi stew. Fertile soils and irrigation canals make the town's Mesa Farm area great for farming--but problematic for on-site wastewater disposal. Over three hundred homes in the area use septic tanks with drain fields to dispose of wastewater on-site. Irrigation raises the water table, preventing many drain fields from emptying properly. Instead, wastewater accumulates and then surfaces in yards or homes, causing serious environmental health concerns.

In 2004, Shiprock's community leadership requested that the Indian Health Service (IHS) Division of Sanitation Facilities Construction (DSFC) program plan a community sewer system to eliminate the use of drain fields in the Mesa Farm area. The IHS DSFC program exists to improve the health of Native American people by improving access to sanitation facilities like water and wastewater infrastructure.

The IHS project team began planning a gravity sewer system. However, the team soon discovered many obstacles to a gravity sewer system in the Mesa Farm area. Flat topography required sewer depths exceeding twenty feet in some areas. Narrow roads and existing utilities, like high voltage power lines and aging asbestos cement water lines, provided little space for excavating the proposed deep trenches. The water table was near the surface in some places and the soil was unstable for trenches. The team determined that construction costs for a gravity sewer were too expensive.



Vacuum Sewer Line Installation

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The IHS team investigated other types of sewer systems and determined that a vacuum sewer system was more cost effective than a gravity sewer system. Vacuum sewer systems assist wastewater movement using vacuum pumps and air valves. A vacuum sewer system usually allows for more line placement options, shallower trenches, and easier field alignment changes. Therefore, vacuum sewer capital costs can be significantly lower where high groundwater, unstable soils, congested utilities, flat or difficult terrain, right-of-way restrictions, or other challenges exist. Operations and maintenance costs may be higher for vacuum sewer systems unless one vacuum station can replace several proposed gravity lift stations. A vacuum sewer system may be the most economically feasible solution when site constraints make gravity sewer prohibitively expensive.



Inside a Vacuum Station

### **The Vacuum Sewer Solution**

Vacuum sewer systems assist wastewater flow by using vacuum pumps and air valves to maintain a pressure difference between outside and inside the collection system. Wastewater flows from each home by a gravity sewer service line. This service line connects to a community valve pit shared by up to four homes. The valve pit has two chambers. The upper chamber is always at atmospheric pressure and is not exposed to wastewater. Inside the upper chamber, an air valve separates the collection system piping, which is always under vacuum, from the lower chamber, which is normally at atmospheric pressure. When the wastewater level in the lower chamber reaches approximately ten gallons, a pneumatic controller opens the air valve for 3 to 5 seconds. The difference in

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pressure between outside and inside the collection system forces a mixture of air and wastewater from the lower chamber into the system at high velocity. Once in the system, both gravity and the pressure differential created each time a valve opens move the wastewater downstream.

Each time a valve opens, however, the system vacuum level diminishes. To maintain a sufficient level of vacuum in the collection system, vacuum pumps remove air from the collection line pipes. They maintain the system vacuum level between 16 and 20 inches of mercury. The pumps are located at the lowest point in the system in a vacuum station. Air removed from the collection lines is typically exhausted into a biofilter to remove odor.

Because of the high velocity of air and wastewater in the system, vacuum sewer collection lines can be laid at 0.2% slope regardless of pipe diameter. This is a significantly shallower slope than allowed for gravity sewer design. The lines must be installed at grade but no manholes or cleanouts are necessary anywhere in the collection system because of the high velocity of the air and wastewater mixture. Vacuum collection line layout can be altered in the field without a complete redesign of the vacuum collection system. Vacuum sewer installation is therefore more flexible than gravity sewer installation, which require extensive redesign for line layout alteration.

A vacuum sewer system can even raise the sewer pipe elevation in small increments using "lifts". A lift uses two 45° vertical bends to raise the sewer pipe invert 1 to 1.5 feet. Wastewater collects in the upstream pipe at the bottom of the lift but still allows the vacuum pumps to remove air from the entire system. When a valve opens on the upstream side of a lift, the incoming air and wastewater mixture lifts the collected wastewater from the bottom to the top of the lift where it can continue flowing downstream. The number of lifts that can be installed in a system is dependent on the amount of energy used at each lift. Lifts can also provide vertical separation between sewer lines and existing utilities encountered during construction.



Installing a Sewer Lift



## A Successful Project

The IHS team finalized a design in August 2013 and the contractor, the Navajo Engineering and Construction Authority, began construction the same month. The Indian Health Service purchased the vacuum and sewage pump skids, control panel, air valves, and valve pits from AIRVAC of Rochester, Indiana.

The project installed approximately 12,200 feet of 4" polyvinyl chloride (PVC) pipe; 16,300 feet of 6" PVC vacuum sewer main; a vacuum station containing two 25 horsepower vacuum pumps; two 25 horsepower sewage pumps; and a 2,000 gallon storage tank. From the vacuum station, wastewater travels to the Shiprock Wastewater Treatment Plant via 5,300 feet of 6" high density polyethylene sewer force main. The project also included 57 vacuum valve pits and approximately 3,500 feet of 3" PVC vacuum sewer service line connecting the valve pits to the main lines.

The Navajo Tribal Utility Authority began operating and maintaining the system after a final inspection was conducted with the IHS. The project successfully eliminated 83 on-site septic tank and drain field systems. There are still several hundred homes in the Mesa Farm area waiting for subsequent phases of the sewer project. The Indian Health Service is seeking funding for these additional phases.

The Shiprock Mesa Farm area sewer system is the first vacuum sewer system on the Navajo Nation. This project will serve as a case study for other communities on the Navajo reservation seeking to extend community sewer services into areas where gravity sewer systems may not be feasible.

Colin Daly, P.E. is a field engineer for the Indian Health Service's Division of Sanitation Facilities Construction and can be reached by email at [colin.daly@ihs.gov](mailto:colin.daly@ihs.gov).



## Access to Engineering Standards at Work - A Recent Survey of PHS Engineers

*LCDR Julia Kane, P.E., National Park Service*

As engineers, many of us write, update, and review construction specifications. Accurate and detailed construction specifications are critical for delivering high quality facilities for the people we serve. Key components of any construction specification are the engineering standards that it references. Engineering standards are documents that specify characteristics and technical details that must be met to ensure minimum performance, meet safety requirements, and make sure that the product/system/process promotes productivity, reliability, and efficiency.<sup>1</sup>

As the author of this survey and a PHS Engineer Officer for over 12 years, it became apparent to me that many PHS engineers have limited access to engineering standards (e.g. ASTM, ANSI, AASHTO, ACI), which would seem to affect their ability to develop high quality construction specifications. The EPAC Public Health Engineering Practice (PHEP) subcommittee is the only EPAC committee that focuses on day-to-day technical issues that are faced by PHS engineers. As such, the PHEP subcommittee was an appropriate avenue to conduct a survey to assess whether PHS engineers feel they need better access to engineering standards and codes they rely on to write or reference technical specifications and to review design and construction submittals.

In the July and August 2015 issues of the Announcements from the Chief Engineer, a survey link was provided by the PHEP subcommittee to query engineers about their access to engineering design and construction standards at work and whether they feel access is adequate to do their job well. The survey asked engineers whether they reference standards in their work, what type of access they have, and how well it works for them. Thirty four engineers responded to the survey, approximately 5% of PHS Engineer Officers.

- 85% of respondents reference engineering standards in their work, such as AWWA, UL, NFPA, IEEE, etc.
- Over 50% of respondents stated that less than half of the standards they rely on are readily available in their full text, and 75% of these engineers feel it is necessary or very necessary to have access to the full texts of the standards
- Over 50% of respondents said that less than half of the standards they rely on are available in their most up-to-date version

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- 42% said in order to gain access to some needed standards they have to contact a co-worker because the co-worker is the only person in the office, region, or agency who has a hard copy or an electronic version on their computer.
- 67% of those who have to contact a co-worker to obtain access said this does not work well for them.
- 38% said they have access to some standards through a limited number of licenses on a network server, and 75% of these engineers said they are able to gain access in a timely manner this way.
- 44% said they have to purchase some standards individually on an as-needed basis in order to have access; 60% of those who have to do this say it does not work well for them.
- 70% of respondents think they need better access to standards in order to do their job well.
- Breakdown by agency: 61% IHS, 18% FDA, 9% NPS, 6% CDC, 3% EPA, 3% CMS

My hope in asking these questions was to determine the extent of this issue in the workplaces of all PHS engineers and whether engineers feel it hinders them in their job. As PHS engineers we are tasked with quality control, i.e. verifying whether equipment, systems, products and processes comply with the standards required in our technical specifications. We rely on access to complete and up-to-date standards to adequately design, review, and inspect public health facilities and practices.

The PHEP Subcommittee will take the next step in seeking additional data on the issue and/or exploring potential solutions to address access to engineering standards across agencies. We will solicit and develop ideas and publish our findings. The PHEP Subcommittee welcomes your input and interest at our next meeting. Find us on the USPHS EPAC website.

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1 <http://tryengineering.org/ask-expert/what-engineering-standard-what-are-advantages-and-disadvantages-using-standards>



## PHS Engineers Recognized by SAME's Washington, DC Post

PHS Engineers have recently attended and been in the spotlight at several events hosted by the Society of American Military Engineers (SAME) - Washington DC Post. The events include the Post's scholarship dinner, inaugural Leadership Lab dinner, holiday party and awards lunch. In particular:

**LT Diana Wong, PhD** was recognized on December 3, 2015, at the Army Navy Club in Washington, DC. Past DC Post President and SAME Fellow, CAPT Nelson Mix, PE, CHMM assisted in the presentation of her award. Each year at its annual holiday party, the Post recognizes the performance of service members and makes a donation to a veteran oriented charity. The Post gave \$750 to Team River Runner and \$750 to Final Salute.

LT Wong was cited for her work as an Analytics Engineer for Department of Homeland Security (DHS), Office of Health Affairs (OHA), National Biosurveillance Integration Center (NBIC). As a member of the Analytics Development Team, LT Wong researched, developed and implemented new data sets and analytic methodologies to support the Center's mission of situational awareness and early warning of biological events. LT Wong consistently demonstrated leadership and initiative in forging and strengthening partnerships with key agencies, including DHS/Customs and Border Protection (CBP), CDC's Division of Global Migration and Quarantine (DGMQ), Federal Aviation Administration (FAA) and DoD. For example, she established the first NBIC liaison to CBP in order to improve information coordination.

During the Ebola outbreak in West Africa, LT Wong played an important role in communicating information between key agencies. She was instrumental in identifying potential data sets for biosurveillance and building processes to facilitate data sharing. During Ebola response, she personally coordinated with the CBP Crisis Action Team in a high pressure environment, facilitating sharing of air passenger volume data which was critically important to inform DHS response planning at the border. In addition, her thorough research and analysis benefited NBIC, CBP, and CDC/DGMQ as the agencies worked to understand and validate data from their respective sources. She regularly received praise for the quality of her technical work and her interpersonal skills. LT Wong served to protect the public health by ensuring sources of data pertaining to dangerous global outbreaks (i.e. Ebola, MERS CoV, etc.).

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LT Diana Wong and CAPT Nelson Mix with US Coast Guard engineers at the 2015 DC Post holiday party

**LCDR Samantha Spindel, PhD** was recognized by the DC Post of the SAME on January 14, 2016 at the National Press Club in Washington, DC. Chief Engineer, RADM Randall J.F. Gardner, PE assisted in the presentation of her award. LCDR Spindel was recognized for "Outstanding Contributions to Technology or the Engineering Profession" for her contributions to bioengineering research regarding medical devices. Her winning award nomination was forwarded to the SAME National Awards Committee for consideration for another SAME award at the national level.

LCDR Spindel's nomination specifically cited the following engineering and research contributions:

- First-author of a published peer-reviewed journal article regarding optical detection method for measuring multiple proteins simultaneously using nanoparticles called Quantum Dots.
- First-author of a published peer-reviewed journal article regarding point-of-care biosensors.
- First-author of a book chapter entitled *In Vitro Fluorescence Resonance Energy Transfer (FRET) Sensing, Diagnostics and Personalized Medicine*.

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- Conducting experiments for a research project that investigated a pressing threat to medical device safety, specifically the re-use of medical devices.
- Serving on the Committee for the Advancement of FDA Science and helping to improve policies for managing scientific issues and expertise in biomedical engineering when evaluating and scoring research project applications for various FDA grants.
- Serving as an FDA Liaison to the Association for the Advancement of Medical Instrumentation for the development of an international consensus standard regarding the use of chemical sterilants in hospitals.
- Conducting biocompatibility reviews for medical device pre-market applications of varying intended uses, such as for gastric or cardiovascular applications.
- Leading an office-wide working group to conduct a quantitative and qualitative analysis on employee satisfaction.
- Presenting research at numerous engineering conferences over the past three years, including the Mid-Atlantic Micro/Nano Alliance Symposium.

Congratulations to LT Wong and LCDR Spindel!



LCDR Samantha Spindel, RADM Gardner and 2015 DC Post President Mr. Brian Moore, PE (USN Ret.)





## Meet an EPAC Member

The EPAC welcomes the following officers who became voting members in 2016:



**LT Praveen K.C.** works as a Health Facility Engineer with the Indian Health Service (IHS) serving the Alaska Native Tribal Health Consortium (ANTHC) in Anchorage, Alaska. LT K.C. provides engineering services for sanitation and health facilities throughout Alaska. He has played a key role in the development of ANTHC's Rural Energy Program through design of alternative energy and energy efficiency projects. He routinely works in extreme arctic environments. LT K.C. completed his Bachelor of Science in Mechanical Engineering from Tribhuvan University, Nepal in 2002. In 2005, he came to the United States for graduate study and received his Master of Science degree in Mechanical Engineering from Lamar University, Beaumont TX in 2007. LT K.C. also graduated with a Bachelor of Science degree from University of Alaska Anchorage in 2012.

LT K.C. was born and raised in Nepal, where clean water, sewer and power were privileges, not granted. In 2009, he moved to Alaska to work for ANTHC, which gave him an opportunity to travel and work with Alaska's rural communities. LT K.C. is motivated to serve underserved Alaskan communities, since he comes from a similar background.

**CDR Frank Chua, PE, BCEE** is a Project Manager with the Division of Facilities Management, Indian Health Service (IHS), Tucson Area. He is responsible for providing professional design, project management, and construction management services for projects in support of federal direct service healthcare facilities in the IHS Tucson Area. Prior to his current duty station, CDR Chua served as a Supervisory Environmental Engineer in Opelousas, Louisiana with the Sanitation Facilities Construction (SFC) Branch, Indian Health Service Nashville Area. There he provided professional engineering, project management, and construction management services for the SFC Program addressing sanitation deficiencies for eight tribes across five states.

CDR Chua is a Board Certified Environmental Engineer and is a registered professional engineer in California and Louisiana. Prior to commissioning, CDR Chua spent 11 years in the private sector with an environmental engineering consulting firm focused on the design of advanced wastewater reclamation facilities. On the EPAC, CDR Chua is the Events Subcommittee Chair and is also a member of the Deployment Preparedness, Mentoring, and Career Development subcommittees.



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**LCDR Peter Littlehat** has served as an Environmental Engineer with the IHS DSFC in Many Farms, Arizona since January, 2011. He received a BS in Environmental Engineering from Northern Arizona University, then worked for the IBM Corporation in Essex Junction, Vermont for three years as a Facilities System Engineer. He then moved to Tucson, Arizona and received his MS and PhD from the University of Arizona in Environmental Engineering with a focus on Endocrine Disruption in wastewater. He then joined Brown & Caldwell, an environmental engineering firm in Phoenix, Arizona and later moved to Golden, Colorado as a Process Mechanical Engineer focusing on domestic wastewater treatment design. LCDR Littlehat is a licensed Professional Engineer in the State of Arizona.



LCDR Littlehat's current responsibilities include providing water and sewer facilities to individual homes, designing and managing the construction of waterline extensions, designing community water wells, and managing hydraulic models of water systems in the Navajo Area.



**LCDR Samuel Russell** is detailed to the Environmental Protection Agency in the Office of Ground Water and Drinking Water where he helps coordinate the National Tribal Drinking Water Program and manages the Safe Drinking Water Act's Arsenic Rule. LCDR Russell holds a BS in Civil Engineering from Clarkson University. Following undergrad he spent two years as a Peace Corps Volunteer in Cote d'Ivoire before moving to Kayenta Arizona in 2003 to work as a Field Engineer with the Navajo Area Indian Health Service and was later commissioned into the USPHS. LCDR Russell went from Field Engineer to Assistant District Engineer during his eight years stationed in Kayenta, and completed a Master of Science in Civil Engineering with the University of New Mexico. In 2011, he decommissioned to complete a Master of Public Health degree at the Johns Hopkins Bloomberg School of

Public Health. In 2013 LCDR Russell was reinstated into the Corps as a Transportation Safety Program Manager with the National Park Service in Washington, DC. In late 2015, LCDR Russell transferred to his current position with the EPA in Washington, DC. LCDR Russell is a registered Professional Engineer in the State of Arizona.



## New Engineer Officers

The EPAC would like to acknowledge the following engineers who have recently become Commissioned Officers. The EPAC welcomes each of you and hopes you will enjoy a long and prosperous career in the PHS.

Rank	Name	Agency	City	State
LTJG	Dara Zimmerman	IHS	Arcata	CA
LT	David Wilkinson	FDA	Boca Raton	FL
LTJG	Patrick Fox	IHS	Pawnee	OK
LTJG	Kevin Ulrich	IHS	Anchorage	AK
LT	Francis Pham	FDA	Winchester	MA
LTJG	Noah Buikema	IHS	Pierre	SD

## Fair Winds and Following Seas

The EPAC would also like to recognize the engineer officers who have recently retired from Commissioned Corps service. The EPAC sincerely appreciates your leadership and dedication to the mission of PHS engineers.

Rank	Name	Agency
CAPT	Michael Gressel	CDC
CAPT	Eric Crump	EPA
CAPT	Bryan Fischer	IHS
CAPT	Mark Thomas	HRSA
CAPT	Joseph Winkelmaier	INTERIOR
CDR	Stephen Christopher	IHS



Dear Readers,

*Machinatores Vitae* (Engineering for Life) is a publication of the EPAC, but we need help in bringing you the information and stories that you want to read. Please consider submitting an article for an upcoming issue or let us know when you or a colleague have reached a milestone, been recognized for an accomplishment, or have an experience to share. If you are an accomplished writer, send something along that is already polished. If you don't feel like a Hemingway or Dickinson, just send enough detail so the writing team can take hold of it and build the story for you.

The writing staff can only see a bit of the big world that is public health engineering. There are numerous accomplishments even within our readership that remain unknown except in the relatively small circles around you. If you have not presented at a national meeting, the likelihood is that no one outside of your agency, or possibly even your office, has ever heard about the project that you nearly exhausted yourself completing. Here is your chance to shine!

All ideas are welcomed. Remember that we do not have to solely focus on work going on within the PHS. Let us know if you hear of new technologies or applications, or just find an interesting story from the outside world. The rule of thumb is that if you as an engineer are interested in it, then others will be too!

Send your thoughts, suggestions, or a brief synopsis of a proposed article to the newsletter coordinator, CDR Matt Vojik at [vojik.matthew@epa.gov](mailto:vojik.matthew@epa.gov).

Thank you,

The Newsletter Team  
EPAC Information Subcommittee

*Machinatores Vitae* is published twice annually and posted on the USPHS Engineer Professional Advisory Committee website. The deadline for submitting articles for the **Fall 2016** edition is **August 31, 2016**.