

2022 USPHS Scientific and Training Symposium

Category Day

Wednesday, May 25, 2022

Engineer Agenda

8:00 AM - **Opening Remarks**
8:30 AM

8:30 AM - **Managing the Largest IHS Hospital at the Beginning of a Pandemic**
9:00 AM *Douglas Barber*

This session will discuss the planning and execution of engineering measures, put into place to prepare for and respond to the initial phase of the COVID-19 pandemic, at the largest Indian Health Service direct service hospital in the nation. Engineering measures put into place included the conversion of 10 ICU rooms to negative pressure, conversion of OR rooms to intubation rooms, changing airflow patterns in dental areas, converting labor and delivery room pressures, converting an outpatient floor to inpatient surge unit, and managing two USPHS engineering deployment teams.

At the end of this session participants will be able to:

1. Identify a common resource in a healthcare facility that an engineer can use to create negative pressure in a room.
2. State the CDC Guidelines for dental care during the first summer of the COVID-19 Pandemic.
3. Identify key considerations for using exhaust techniques and HEPA filters in an HVAC system to protect staff and patients.

9:00 AM - **Public Health Engineering: How We Can Improve Outcomes in Communities**
9:30 AM *LT Kayla DeVault Wendt*

As engineers, we might not immediately visualize ourselves as servants to public health, but we undoubtedly play an important role. Whether we are engineering solutions for improved facilities or remediation processes in our ordinary work or volunteering abroad to improve WASH-related outcomes, it's more than just the numbers we crunch that have a lasting impact. The ways we engage with communities to build relationships that last, the unique avenues we explore to reaching solutions, and the open-mindedness to cultural and social nuances can substantially impact how our projects succeed or fail in the long term. For those of us who work with marginalized communities, it is vital we are especially cognizant of not just our actions but of our room for improvement. In this presentation, I would like to provide examples of what outcomes engineers can control, best practices through experience in the field, and situations where project failures have occurred and why. I will draw on my own experience with Engineers Without Borders as well as critical analysis research and theory development through my education in American Indian Studies and Public Health. Although only a junior officer, I hope to provide insight useful to all ranks and experiences.

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At the end of this session participants will be able to:

1. Critically analyze the project.
2. Provide examples of how cultural intelligence can positively or negatively impact project outcomes.
3. Present best practices of how engineers can engage in their work to produce better results, including specific approaches to public health solutions.

9:30 AM - **Icebreaker Activity**

10:00 AM

10:00 AM - **The Building 40A Vaccine Research Center Laboratory Expansion at the**

10:30 AM **National Institutes of Health**

CAPT Gretchen Cowman

The National Institutes of Health will be constructing a six story, 90,000 gross square foot addition to the Building 40 National Institute of Allergy and Infectious Diseases (NIAID) Vaccine Research Center (VRC). The NIAID Vaccine Research Center (VRC) is in the forefront of developing vaccines for infectious disease threats, including coronaviruses (SARS-CoV-2, MERS-CoV, SARS-CoV), influenza, HIV-AIDS, and Ebola. The VRC is frequently called upon to address biodefense threats and global pandemic emerging infectious disease (EID) threats. Building 40A will double the available laboratory space of the VRC, and it will house BSL-2 and specialty laboratories, laboratory support space, administrative support space, and conference/meeting rooms. The COVID-19 pandemic highlighted the urgency of the need for this research facility expansion, and construction funding was made available through the Coronavirus Aid, Relief, and Economic Security (CARES) Act. Design of this complex facility was a 2.5-year process and was completed in September 2021. Construction is anticipated to take at least 30 months, beginning in January 2022.

At the end of this session participants will be able to:

1. Explain the technical considerations that go into designing a complex laboratory facility.
2. Plan and Implement a high-profile construction project that requires input and coordination of multiple stakeholders.
3. Describe the HHS approval process for major capital projects.

10:30 AM - **Implementing COVID-19 Wastewater Surveillance in Tribal Communities**

11:00 AM *Benjamin Chadwick*

The COVID-19 pandemic has been a source of ongoing challenges and presents an increased risk of illness among rural populations, especially tribal communities. The Centers for Disease Control and Prevention (CDC) and the US Department of Health and Human Services (HHS) have determined that surveillance of wastewater streams for the presence of SARS-CoV-2, the virus that causes COVID-19, can be an effective way to provide information on the presence and level

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of viral transmission in communities as well as trends in infection rates. It may also provide tribal and public health leaders with more advance awareness of outbreaks or increases in transmission, compared to relying on testing of individuals. Sustainable wastewater surveillance requires coordination between tribal leaders, health officials (tribal, federal and state), utilities, labs, and clinical researchers. Data collected from wastewater samples can also be incorporated into public-education and tribal community outreach campaigns.

At the end of this session participants will be able to:

1. Explain wastewater sampling procedures and testing methods for COVID-19.
2. Describe the essential elements of an effective surveillance plan (community outreach and buy-in, a strategy for sampling, appropriate interpretation of data, and public communication).
3. Engage in discussions with tribal partners on the value of COVID wastewater surveillance.

11:00 AM - **Break in Exhibit Hall**

1:00 PM

1:00 PM - **Lunch, CPO Spring Award Presentation, and USPHS Engineer Recruitment**

2:30 PM **Education & Training**

2:30 PM - **ATSDR Health Assessment of Vapor Intrusion: Determining the Source of**

3:00 PM **Indoor Vapors**

LCDR Sandra Miller

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency that protects communities from harmful health effects related to exposure to hazardous substances. ATSDR performs public health assessments to evaluate potential health impacts of environmental contamination and makes recommendations to prevent or reduce harmful exposures. Vapor intrusion is a way volatile chemicals in soil and groundwater can enter and accumulate inside buildings. At vapor intrusion sites, it's important to understand whether contaminants detected in indoor air are from subsurface, indoor, or outdoor sources. ATSDR compares concurrent subslab soil gas, indoor air, and outdoor air concentrations to determine how contaminants are moving in the environment and if the vapor intrusion pathway must be addressed. Other methods include comparing attenuation factors for contaminants with similar properties, comparing contaminant ratios in different media, and comparing measured indoor air concentrations to modeled indoor air concentrations. By determining the source of indoor vapors, ATSDR can make recommendations that better protect health. For example, when exposures are from indoor household product use and not from vapor intrusion, ATSDR recommends health education for building occupants on product use. This presentation will share the application of these methods in the health assessment process.

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At the end of this session participants will be able to:

1. List the types of environmental sampling data considered when conducting vapor intrusion analysis for a public health assessment.
2. Discuss the differences between contaminant vapors from subsurface sources versus indoor and outdoor sources.
3. Identify methods for minimizing risks to public health from contaminant vapors.

3:00 PM - **USPHS Engineer Careers in the Indian Health Service (IHS) and National Park Service (NPS)**

LCDR Travis Sorum; Lcdr Garrett Chun

LCDR Travis Sorum and Lcdr Garrett Chun will present on a typical day in the life of a USPHS Engineer employed within the IHS and NPS. USPHS Engineers are a perfect fit for work within the IHS and NPS and vice versa. USPHS Engineers employed within these two agencies work in water and wastewater as well as healthcare facility design. Specifically, we will discuss the water and wastewater engineering and design work that we are involved with. A successful service/project is only as good as your communication skills, organization of resources and the team that you surround yourself with. No one person can do everything and still be able to do it effectively. USPHS Engineers employed within these agencies are also often asked to take on ancillary roles as needed during times of emergency or reduced staffing, at times on short notice. Our typical daily in addition to ancillary roles play well in preparing us to be deployable assets on US Public Health Service Commissioned Corps deployments. The presentation will discuss our day-to-day work and the value that it brings to the United States PHS Commissioned Corps. The purpose of the presentation is to educate USPHS Engineers on the exciting and unique opportunities to serve in the IHS and NPS and the significant impact in everyday as well as emergency situations that our work has on the many people visiting National parks across the country and to American Indian and Alaskan Native communities.

At the end of this session participants will be able to:

1. Identify projects that a typical IHS and NPS Engineer encounters.
2. Discuss the roles beyond engineering and construction management that Engineers take on within IHS and NPS and why it is so important to the United States PHS Commissioned Corps.
3. Explain the value of soft skills in our work and the importance of ongoing development of these skills

3:30 PM - **Break**

3:45 PM

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3:45 PM - **Healthcare Facilities Assessment Training**

4:15 PM *CDR Joseph Jones; LCDR Praveen K.C*

This session will provide baseline understanding of codes and regulations (NFPA-101, NFPA-99, FGI, and CDC requirements) pertaining to healthcare facility assessments in order to increase the readiness of USPHS Engineers to respond and deploy to these facilities.

At the end of this session participants will be able to:

1. Define the codes, and what they apply to.
2. Demonstrate how to navigate the codes.
3. Take follow on actions to implement the code.

4:15 PM - **Dynamic Leadership (Tips and Lessons Learned about leadership and teamwork on deployment)**

4:45 PM

CDR Thomas Armitage; CDR Matthew Mergenthaler; LCDR Travis Sorum

CDR Tom Armitage, CDR Matt Mergenthaler and LCDR Sorum will present on challenges faced in a fluid deployment environment and how the team adapted and led. Leadership comes in many forms, in very difficult situations officers on the team stepped into roles not by titles but to fulfill needs and functions. Without abundant resources the team was able to solve complex problems while keeping everyone safe at the site. This presentation will highlight the unique roles of engineers and how engineers can step into various leadership roles and serve in whatever capacity needed from translators, facility engineers, health support functions, planning, operations, logistics and much more. The deployment team consisted of roughly 70% engineers with overlapping skills. The presentation will demonstrate how engineers are capable of much more than generally believed, by working together and applying our problem-solving skills. The purpose of the presentation is to provide feedback to engineers throughout the category of the importance of recognizing the strengths of engineers around us and tips on how engineers can fill such roles in future deployments.

At the end of this session participants will be able to:

1. Communicate the purpose and importance of engineer deployment roles
2. Explain dynamic leadership and what that means
3. Explain how engineers unique skills can solve various deployment challenges, how we can be part of the solution on deployments.

4:45 PM - **Closing Remarks**

5:15 PM