

# **FACTSHEET:**

## **USPHS Engineering Capabilities and Deployment Roles**



**U.S. Public Health Service  
Engineer Professional Advisory Committee (EPAC)  
Readiness Subcommittee**  
<https://dcp.psc.gov/osg/engineer/deployment-preparedness.aspx>



**February 2018**

## **INTRODUCTION**

Historically U.S. Public Health Service (USPHS) deployments have been clinically oriented and the skill sets of the Engineer Category have been relegated to a support role of the clinical staff responding to the emergency. Engineers, however, are a critical component of a comprehensive public health response team. The Engineer Professional Advisory Committee believes that the roles of USPHS Commissioned Corps (CC) engineers during deployments could be expanded to fully utilize their technical skills.

This factsheet is intended to provide an overview engineer character traits useful in deployment environments, to summarize of the different engineering disciplines and to provide examples of technical deployment and support roles CC engineers could fill to senior leaders within the Commissioned Corps and Department of Health and Human Service.

## **ENGINEER CHARACTER TRAITS**

Engineers apply the theories and principles of science and mathematics to research and apply designs. All engineers possess many common characteristics that are desirable in most deployment scenarios:

- **Engineers are problem solvers**
- **Engineers are detail oriented**
- **Engineers are comfortable with technology/computers**
- **Engineers have technical skills**
- **Engineers are adaptable**

## ENGINEERING SPECIALTIES

The majority of USPHS Commissioned Corps Engineers are registered professional engineers<sup>1</sup> and are highly trained in their technical discipline. The disciplines listed below represent the majority of USPHS Commissioned Corp engineers. Each of these disciplines bring unique skills which can contribute to the overall mission

1. **Civil Engineering/Environmental:** Ability to plan, design oversee construction and/or maintenance of structures and facilities that provide shelter, support transportation systems, and supply drinking water and treatment and disposal of waste.
2. **Biomedical Engineering:** Understands the basic principles of many engineering disciplines along with the sciences of anatomy and physiology. Possess knowledge and skill in understanding the functionality and interoperability of various medical equipments to ensure its safe and effective use.
3. **Chemical Engineering:** Understands the basic principles of chemical processes. Possess knowledge and skill in control of pollutants and hazardous materials in chemical and related industries.
4. **Electrical Engineering:** Designs, commissions, or manages the design and construction of power generation systems, power distribution systems, building systems (main wiring, physical plant and control systems) for utilities, hospitals, laboratory's, and other public and private structures. Electrical Engineers also perform research and analysis of current and future electrical products and provide safety and troubleshooting analysis of existing systems.
5. **Mechanical Engineering:** Understands the general principles of designing, constructing, and operating machines. Making equipment do its required functions within the bounds of various safety and performance standards. Understands the environmental conditions under which equipment must function.

---

<sup>1</sup> Professional Engineers (PE) have the authority to sign and seal engineering plans and offer their services to the public. PE licensure is the engineering profession's highest standard of competence (defined by National Society of Professional Engineers, <https://www.nspe.org/resources/licensure>)

## ENGINEER DEPLOYMENT ROLES: TECHNICAL MISSION

1. **Water / Wastewater System Assessments:** CC engineers are highly trained and knowledgeable about drinking water system (public water systems and private wells) and wastewater system design and operation. CC Engineers can conduct detailed assessments of these systems, provide recommendations on needed improvements. Additionally, they can develop procedures, complete site assessment and oversee the installation, set up, and operation of temporary water and/or wastewater treatment units.
2. **Exposure/Damage Assessments:** CC engineers can assess hazardous exposures to chemical and biological agents and identify opportunities to reduce exposures for both the public health responders and the general public by providing recommendations on personal protective gear, containment, sampling, and testing and clean-up actions.
3. **Facility Occupancy Inspections:** CC engineers can lead a facility inspection for the purpose of identifying life/safety issues and development of a corrective action plan to address the identified needs

## ENGINEER DEPLOYMENT ROLES: MEDICAL MISSION

CC engineers have been and will continue to be engaged in the medical mission deployments in following roles<sup>2</sup>:

1. **Administration role:** keeping track of deployment team roster, and ensuring accountability among team members.
2. **Logistic role:** Receiving & distributing supplies, setting up communications & IT equipment, and ensuring constant supply of food/water is provided.
3. **Preventative medicine role:** serving as members that work closely with safety officer to proactively prevent disease outbreaks and contaminations.
4. **Leadership role:** combines analytical and management skills with vision and decision-making to lead units or whole teams.
5. **Disaster response engineers** are trained to provide initial assessments, complete site surveys and need assessments, identify other engineering disciplines that are required to address the specific needs identified in the survey and needs assessment, interface with deployment site facility management and local organizations, and work closely with the safety officer on the deployment teams to ensure safe operation of deployment sites

---

<sup>2</sup> The list is not intended to be exhaustive.