FY 2022 Broad Agency Announcement: Topic B8 **January 7, 2021**

Environmental Security Technology Certification Program (ESTCP)

MOISTURE CONTROL IN DOD BUILDINGS

OBJECTIVE

The Department of Defense (DoD) Installation Energy Test Bed seeks solutions to improve the management of buildings with respect to moisture control and the negative impacts of moisture infiltration. The DoD owns and operates thousands of buildings in hot-humid climates with a variety of building vintages, designs and installed heating, ventilation and air-conditioning (HVAC) systems. When issues associated with moisture infiltration are identified, root cause analysis can be conducted and solutions developed to mitigate the problem. However, this reactionary approach can result in higher maintenance costs for the building, damage to sensitive materials and poor indoor air quality for occupants. ESTCP seeks proposals for studies and/or demonstration projects that help identify and prioritize investment in preventative and corrective interventions to reduce the negative health and economic impacts of moisture infiltration in DoD buildings.

Of particular interest are studies and demonstrations that address the following issues:

- Understanding of the scale of the moisture control problem within DoD owned and operated buildings and actions taken to date. Include DoD and other organizations (e.g., ASHRAE) as relevant in the analysis.
- Efficient approaches to identifying, prioritizing and implementing mitigation measures that align with and leverage current facility investment mechanisms and auditing and retrocommissioning processes.
- Innovative solutions to monitor relative humidity and prevent moisture infiltration.
- Technologies and solutions that can be implemented through performance contracts.

Analyses and technologies focused on privatized housing are not of interest and will be considered non-responsive to the solicitation.

BACKGROUND

The DoD owns and operates over 50,000 buildings, totaling nearly 1 billion square feet, in climates that require dehumidification to deliver conditioned air to occupied spaces or storage facilities. Various offices within DoD issue and update guidance on building and HVAC design and control system configuration that is intended to result in buildings and systems that deliver indoor air that falls within the temperature and relative humidity comfort zone recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and specified in the DoD Unified Facilities Criteria[1] (UFC). In order for new buildings to operate as designed, all systems (building envelope, mechanical systems and control systems) need to operate as designed. Over time, systems degrade, buildings are retrofitted, loads change and control systems can drift. The building portfolio ranges in vintage from 1940 to 2020 with a variety of HVAC systems, construction materials and designs.

[1] https://www.wbdg.org/FFC/DOD/UFC/ufc_3_410_01_2013_c6.pdf

When severe cases of moisture infiltration are encountered, either through the discovery of mold or damage to sensitive materials, the DoD can and does develop and implement solutions to mitigate the issues based on known engineering best practices. The Military Services issue and update guidance[2][3][4] on addressing moisture issues once they are discovered; however, this reactionary approach can be expensive. Energy Savings Performance Contracts (ESPC) and Utility Energy Services Contracts (UESCs) are common mechanisms for the DoD to leverage third-party financing to upgrade under-performing buildings. In order for an ESPC or UESC to work, the energy and water use baseline is measured and provides the basis from which the proposed upgrades are measured to ensure there are sufficient energy/water cost savings to pay for the upgrades. In some circumstances where outdated or controlled HVAC systems are a source of poorly controlled humidity, the energy baseline can be lower than that of a new system that is designed and operated to meet the indoor air quality standards. This can make it difficult to include solutions to address moisture control issues alone in ESPCs or UESCs.

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For pre-proposal submission due dates, instructions, and additional solicitation information, visit the ESTCP website.

[2] https://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/Indoor-Air-Quality-Mold.aspx
[3] https://phc.amedd.army.mil/PHC%20Resource%20Library/TG277FINAL28Feb2019.pdf
[4] https://www.ellsworth.af.mil/Portals/146/documents/190822%20AF%20Mold%20Policy.pdf?ver=2019-08-22-142254-760