

REQUEST FOR EXPRESSION OF INTEREST Radiation Mapping Solution for Hanford Pits

Introduction

Washington River Protection Solutions (WRPS) is the Tank Operating Contractor (TOC) for the U.S. Department of Energy Hanford site. The Hanford Site Tank Farms store mixed radioactive and chemically hazardous waste in large underground tanks. Hanford Tank Farms includes many underground pits that house crucial process equipment. Access to these locations is very limited. Typically, only small penetrations (4" to 12" diameter) are available to inspect and interact with in-pit equipment in a non-invasive fashion. More significant interaction requires the removal of 2ft thick concrete shielding blocks and connected equipment. This is a time and resource intensive activity. A solution is requested that allows Tank Farms to perform radiation mapping prior to in-pit work without coverblock removal. Figure 1 depicts a typical Double Shell Tank (DST) pit and shows the types of equipment systems that are encountered. Figure 2 depicts a typical Single Shell Tank (SST) and shows the types of equipment, debris, and pit conditions that are encountered.



Figure 1. Image of a typical DST pit (with shield blocks removed)



Figure 2. Image of a typical SST pit (with shield blocks removed)

Current Technology

For more historical Hanford tank information please visit <http://www.hanford.gov/page.cfm/hab>.

Technology Need

Initial deployment of the radiation mapping solution will be to scan and create a detailed visual radiation dose map of underground valve and pump pits without removing the coverblocks using access ports 6 inches in diameter or less. The solution should be designed for ease of decontamination. Ideally the solution will include video, positional data, and beta and gamma radiation detection and mapping capability. Modular radiation detectors may be used to switch between various radiation range/sensitivity/radiation type but should be interchangeable in the field. The components entering the pit should be sealed to prevent intrusion by moisture and airborne particulates. Submittals should include a description of routine operability checks, calibration requirements and radioactive sources necessary. Radiation range should be capable of 0.05 mGy/hr (5 mRad/hr) to 0.5 Gy/hr (50 Rad/hr).

QUALITY ASSURANCE

This work is classified as QL-3, General Service. The subcontractor shall have a Quality Program that meets or is equivalent to the requirements outlined in the attached Quality Assurance Requirements (QAR) document dated 11/29/2022 and provide a copy of your uncontrolled QA Manual for review by WRPS.

EOI SUBMITTALS:

Interested parties are invited to submit an expression of interest letter to include the following:

- Provide a description of similar projects where your technology was used, if possible
- Rough Order of Magnitude (ROM) cost estimate
- Include a response to the following 19 items:
 1. Does the scanner fit down a diameter of 5.5” or less?
 2. Is there a robotic solution that pairs with this technology for deployment? Can the robotic deployment traverse and acquire line of sight access to 100% of pit?
 3. Can the scanner report results in real time?
 4. As an example, approximately how long does a complete scan of a 10 x 10 x 10 foot space take to scan?
 5. Specify the optical quality that the device provides (frame rate, display resolution, etc.).
 6. Does the gamma detector have a 360-degree horizontal field of view and approximately 160-degrees of pan/tilt in the vertical axis?
 7. Can the system map the surroundings up to a distance of 16 feet?
 8. When scanning does the system have an angular resolution less than or equal to 5 degrees?
 9. Can the gamma detector detect hot spots as low as 5 milliRem/hr?
 10. What is the weight of the device?
 11. Does the equipment use industry standard tools and connections?
 12. What are software requirements for video and image storage?
 13. Can the scanner be sleeved to reduce potential contamination?
 14. Is the deployed hardware water proof or water resistant?
 15. What are the temperature ranges that the equipment can handle?
 16. Can the system operate in up to 90% relative humidity?
 17. How durable are the instruments (i.e. jarring, dropping, vibration, etc.)?
 18. Please provide specific requirements for any interfaces (power, air, internet connection?)
 19. Is the electrical equipment listed or labeled by an organization currently recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL)?

This is not a Request for Proposal, but a request for an expression of interest. WRPS will not award a contract(s) based on this expression of interest nor pay for information solicited.

Responses with details on the recommended technology must be received by WRPS no later than close of business on February 6, 2023 by 4:00 pm (PST) via email to: Marisa Struwe – marisa_m_struwe@rl.gov