

**Statement of Work
For
Biosensor Calibrator
13 September 2022**

1.0 INTRODUCTION

US Army Product Director – Test, Measurement, and Diagnostic Equipment (PD-TMDE) is responsible for providing calibration standards for US Army personnel performing maintenance on US Army weapon systems. PD-TMDE has a requirement to develop automated test equipment (ATE) and calibration instrumentation (standards) in the biological agent defense parameter to the fullest extent possible. PD-TMDE requires the development, test, evaluation, and training of engineering prototypes to support emerging gaps in calibration capability with high stability and accuracy.

1.1 Purpose development

The PD-TMDE has a requirement to develop biological detection calibration capability to work with the modernized calibration sets and meet current and future biological detection calibration and repair requirements. The PD-TMDE has an urgent need to develop an engineering prototype of a Biosensor Calibrator capable of producing positive identification of aerosolized, surface, and human surrogate pathogen contamination samples. The prototype must be capable of passing all performance parameters with accuracy traceable to the National Institute of Standards and Technology (NIST) and to transfer those accuracies to the Joint Force field biodetectors.

1.2 Scope

The Contractor shall design, acquire, implement, test, deliver, and support the integration of the Biosensor Calibrator Prototype and the associated documentation as specified in the following paragraphs.

1.3 Technical Requirements

1.3.1 The Contractor shall develop a bioaerosol detection method with Localized Surface Plasmon Resonance (LSPR) technology to sense airborne biological and non-biological material.

1.3.2 The Contractor shall manufacture plasmonic sensor chips with specific surface functionalization for sensitive bioaerosol detection and an integrated air sampling device that can be used to collect the bioaerosols into a detection solution.

1.3.3 The Contractor shall construct an intermediate system with an automated bioaerosol sampling unit, liquid sample transfer unit, and LSPR detection unit.

1.3.5 The Contractor shall validate the intermediate system performance and provide a calibration certificate with system response to concentrations of E. coli, B. Subtilis, and influenza A.

1.3.3 The Contractor shall construct an automated Biosensor Calibrator system that shall be capable of automatically completing air sampling, LSPR sensing, data acquisition, and calculation. The automated system shall calculate and report bioaerosol concentrations.

1.3.6 The Contractor shall provide general project oversight, prepare quarterly reports, briefings, project technical reviews, and prepare and maintain a project schedule.

2.0 DELIVERABLES

2.1 Hardware Deliverables

2.1.1 The Contractor shall deliver an intermediate Biosensor Calibrator as described in the technical requirements.

2.1.1 The Contractor shall deliver a fully automated Biosensor Calibrator as described in the technical requirements.

2.2 Documentation Deliverables

2.2.1 The Contractor shall deliver written operating procedures with the fully automated Biosensor Calibrator in Contractor format that provides instruction on using the product (i.e. SW graphical user interface, hardware controls, and basic operations).

2.2.2 The Contractor shall deliver a calibration report for the intermediate system and the fully automated system. The calibration report shall contain a multi-point curve fit of system response to concentrations of E. coli, B. Subtilis, and influenza A.

2.3 Delivery Requirements

2.3.1 Document Marking: All documents containing technical information shall be marked as follows unless approved for public release:

Distribution Statement D:

Distribution authorized to the Department of Defense and U.S. DoD Contractors only due to the need to protect technical or operational data and/or export limitations as determined on 2 October 2017.
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2.3.2 Delivery Instructions: The Contractor shall deliver to U.S. Army TMDE Activity (USATA) Army Primary Standards Laboratory (APSL), Building 5435 Fowler Road, Redstone Arsenal, Alabama 35898-5000. DoDAAC W80RA6.

2.3.3 The period of performance for this effort is not to exceed 24 months after receipt of order (ARO).