

THREAT AGENT DEFEAT MODELING AND TESTING USING WMD SIMULANTS

Portable Testbed For Bioaerosol Detector Performance Evaluation

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An integrated standalone platform was developed to evaluate the performance of biological aerosol (bioaerosol) detection systems. It was deployed in a maritime bioaerosol test to measure over-the-water simulant releases of *Bacillus atrophaeus* (BG) and *Bacillus thuringiensis* subsp. *kurstaki* (Btk). The testbed platform was configured to evaluate four commercial bioaerosol sensors and included two industry-standard referee systems: the Wideband Integrated Bioaerosol Sensor (WIBS) and the Aerodynamic Particle Sizer (APS). The on-board reference systems were used to quantify the response of the commercial sensors to the bioaerosol simulant challenges. This test case was used to propose a method to evaluate performance limits of sensors in outdoor trials, which is a challenging task. Data from 28 trials was analyzed and performance results for two of the four systems is reported using laser induced fluorescence (LIF) and particle counting metrics. The results compare the signal-to-noise ratio (SNR) of the systems under test to the SNR of the referee instruments. Resulting performance curves can be used to predict potential performance gains if analysts have access to raw data from the sensors.