

Field Testing Of Propellant/HE Stability Using Thin-Layer Chromatography (TLC) Technology

PROJECT HIGHLIGHTS

- *Application of Innovative Technologies*
- *Developed a Training and Certification Program*
- *Used Performance Measurements to Identify Weaknesses to Develop Recommendation for System Improvements*
- *Project Information Stored on PIKA's Client Portal*

U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT

The Forensic Science Center (FSC) at Lawrence Livermore National Laboratory (LLNL) has completed development and testing of a prototype, field-portable, quantitative thin-layer chromatography (TLC) system for the Army. This technology system analyzes the percent remaining effective stabilizer (%RES) in any Diphenylamine (DPA), 2-Nitrodiphenylamine (2NDPA), Ethyl Centralite (EC) and Akardite II (AKII) stabilized propellant formulation. It accurately characterizes all propellant stabilizer compounds and nitrate decomposition products. The system has been validated by the U.S. Army Defense Ammunition Center (DAC), endorsed by the ARDEC Army Propellant Surveillance Laboratory (APSL), and is pending the endorsement of the Joint Propellant Safety Surveillance Board, for use in screening solid propellants not in the active stockpile (e.g. third party assets and demil assets). The system is ready for fielding.

PIKA International, Inc. (PIKA) was contracted by the U.S. Army Corps of Engineers, Honolulu District to further upgrade the (TLC) technology to meet current U.S. military demands, to include the capability to identify and analyze various high explosive materials, and initiate transition to an issuable, logistically supportable, fielded technology.

SPECIFIC TASKS INCLUDED

- Development of a training and certification (T&C) program for operators of the Propellant Stabilizer TLC (PS-TLC) kit.
- Implementation of the T&C program at two facilities.
- After implementation, identification and incorporation of improvements into a T&C program that can be expanded for a larger operator base.
- Development of requirements and establishment of procedures to stand-up a PS-TLC Mobile Analysis Team that can provide a rapid response capability to determine propellant stability at locations worldwide.
- Development of a PS-TLC supply chain that will effectively meet the needs of authorized users.
- Consult and coordinate with technical representatives of the Government offices and the other Contractors who had been involved in the development of the PS-TLC kits.
- Utilization of existing kits and re-supplying packages for training and fielding purposes.
- Development of a QC/QA system capable of measuring the performance of both the kits and individual operators.
- Provide post-fielding consulting for one year after project completion.

