



Technologies for Testing Fuel-Quality Approaches of the Petroleum Quality Analysis System (PQAS)

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Problems and Objectives: The Petroleum Quality Analysis System (PQAS) was demonstrated in a recently completed PDRR (Program Definition and Risk Reduction) phase. The PDRR phase demonstrated several new technologies for testing fuel quality. Over 20 fuel-quality properties were analyzed using these technologies. Since that time, CASCOM (Combined Arms Support Command) has shortened the list of required tests. This shift in attitude toward performance requirements signals a new responsibility for TARDEC to further refine the list of required tests and consider future requirements.

Importance of Project: The U.S. Army CASCOM and Quarter Master School placed one primary requirement on the PQAS; it must meet the testing protocols specified in MIL-HDBK-200G. This is necessary because the U.S. Army must be able to support operations by its allies, and all test data must be recognizable by all parties involved. Nonstandard test methods may produce results that are of little or no value to U.S. troops or allies. In short, this means that test methods must be ASTM standard methods or their equivalent. Any correlative or estimated methods must produce results that are equivalent to the standard method.

Technical Approach: Under this program Southwest Research Institute identified the essential fuel properties necessary to determine fuel quality in the field and investigated solutions to poor correlation between standard and nonstandard test method results for a number of the identified properties.

Specific tasks included the following:

- Identify those kerosene fuel properties deemed essential or highly beneficial in indicating fuel quality and usability in military ground vehicle engines.



Petroleum Quality Analysis System Mobile Laboratory

- Evaluate whether infrared techniques, particularly FT-IR, can be used as a measuring tool to determine any or all of the fuel-quality properties identified in the above task.
- Identify and recommend a combination of instruments capable of adequately characterizing fuel performance, quality, or usability, and determine which best satisfies the PQAS requirements.

Accomplishments: A list of recommended test methods was compiled and justified.

Military Impact: The use of the test methods identified in this report will allow Army personnel to more quickly measure the quality of fuel and reduce the chance of using contaminated or unacceptable fuel.

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