

**Texas Commission on Environmental Quality
New Technology Research & Development (NTRD) Program
Monthly Project Status Report**

Contract

Number: 582-11-11144-3264

Grantee: Engine, Fuel, and Emissions Engineering, Inc.

**Report for the
Monthly period:** September 2010 to April 30, 2011

**Date
Submitted:** May 13, 2011

Section I. Accomplishments

Provide a bulleted list of project accomplishments as well as a description of their importance to the project.

- Continued ongoing durability demonstration of locomotive SCR system.
 - Monitored urea usage and reminded SCRRA to refill tank when needed
 - Rebuilt urea metering pump assembly using higher-capacity valves and improved layout. Increases SCR control efficiency at high load, where the previous design was unable to accommodate the required flow rates.
 - Modified NO_x sensor installation to provide a representative sample of the complete exhaust. Enables us to monitor NO_x control effectiveness remotely, in real time, and to log NO_x emission rates vs. time.
 - Added automatic “self-tuning” capability to SCR control software, using the outlet NO_x sensor for feedback. This will help ensure that the SCR control system maintains its effectiveness despite possible drift in engine-out NO_x and metering pump calibration.
- Selected Motive Power Industries, Boise, Idaho, as the emission test facility
- Designed and had built the exhaust collector hood to combine both outlet stacks from the SCR catalyst into a single exhaust stream for emissions measurements.
- Reviewed Code of Federal Regulations and consulted with the US Environmental Protection Agency (EPA) on requirements for locomotive emission measurements. Initiated preparation of emission test plan, including modifications to existing RAVEM hardware and software to perform locomotive emission measurements according to EPA requirements.
- Modified existing RAVEM hardware to allow simultaneous sampling of raw exhaust (for gaseous emissions) and dilute exhaust for particulate matter, as required for LEMS. Tested the new configuration in steady-state emission measurements on a generator.

Indicate which part of the Grant Activities as defined in the grant agreement, the above accomplishments are related to:

- The bullet and its sub-bullets pertain to section 2.2.1. of the Grant Activities: “The PERFORMING PARTY will ensure that the test locomotive, SCAX #865, completes its current demonstration project in service at the Southern California Regional Rail Authority (SCRRA) and accumulates the required demonstration hours in preparation for certification testing.
- The remaining bullets pertain to Task 1, Section 2.1, “The PERFORMING PARTY will select an emission test facility and prepare a certification plan in consultation with EPA”

Section II: Problems/Solutions

Problem(s) Identified: Report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project

- a) In November 2010, SCRRA reported that some of the shock absorbers supporting the catalyst had broken.

Proposed Solution(s): Report any possible solution(s) to the problem(s) that were considered/encountered

- a) We determined that the damage to the shock absorbers occurred because the mounting allowed excessive fore-and-aft motion of the catalyst, trapping the shock absorber against the frame. The solution was to restrain the fore-and-aft motion of the catalyst.

Action(s) Conducted and Results: Describe the action(s) taken to resolve the problem(s) and its effect

- a) The problem was solved by installing stainless steel cables to restrain the fore-and-aft motion of the catalyst. This solution was implemented in January, and no shock absorber problems have been observed.

Section III. Goals and Issues for Succeeding Period:

Provide a brief description of the goal(s) you hope to realize in the coming period and identify any notable challenges that can be foreseen

During May, we plan to complete the draft emission test plan in consultation with the Motive Power Industries test laboratory. The plan will be submitted to EPA for approval.

Date: May 13, 2011

Authorized Project Representative's Signature

NOTE: *Please attach any additional information that you feel should be a part of your report or that may be required to meet the deliverable requirements for tasks completed during this reporting period.*