

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

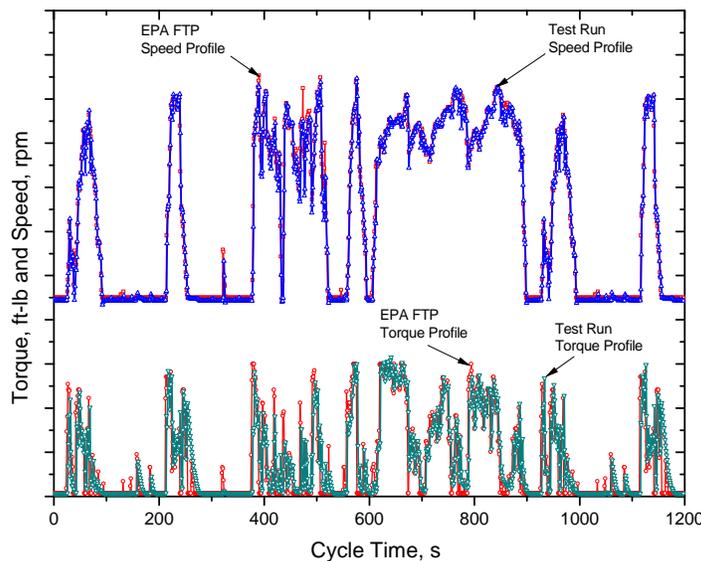
**Contract Number:** 582-11-13469-2019  
**Grantee:** QuantLogic Corporation (Quantlogic)  
**Report for the Monthly period:** February 1, 2013, to March 8, 2013  
**Date Submitted:** March 8, 2013

**Section I. Accomplishments**

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

**Task 5: Transient Emissions Tuning and Testing**

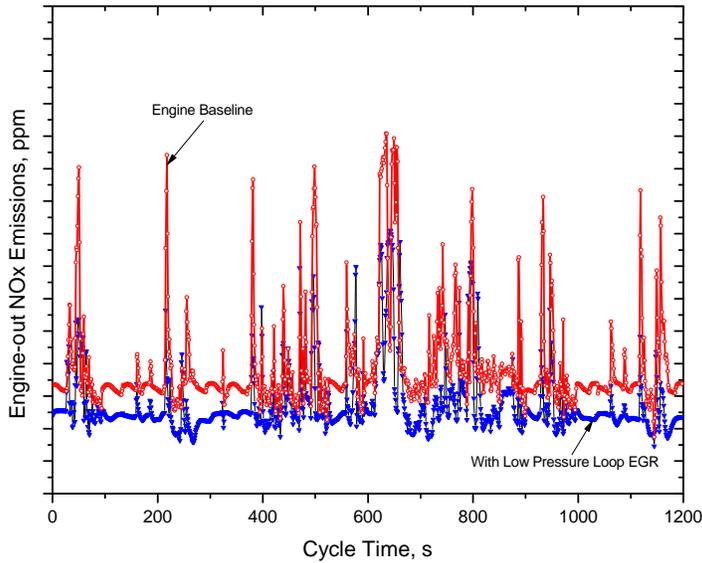
- Task 5 is 35% completed.
- Tested and tuned dynamometer controller and engine pedal controller for the United States Environmental Protection Agency (EPA) Federal Test Procedures (FTP) test cycle for the test engine's speed and torque ratings. **Error! Reference source not found.** Figure 1 shows that the tuned dynamometer controller is able to control the dynamometer and engine pedal to meet the EPA FTP test cycle profiles.



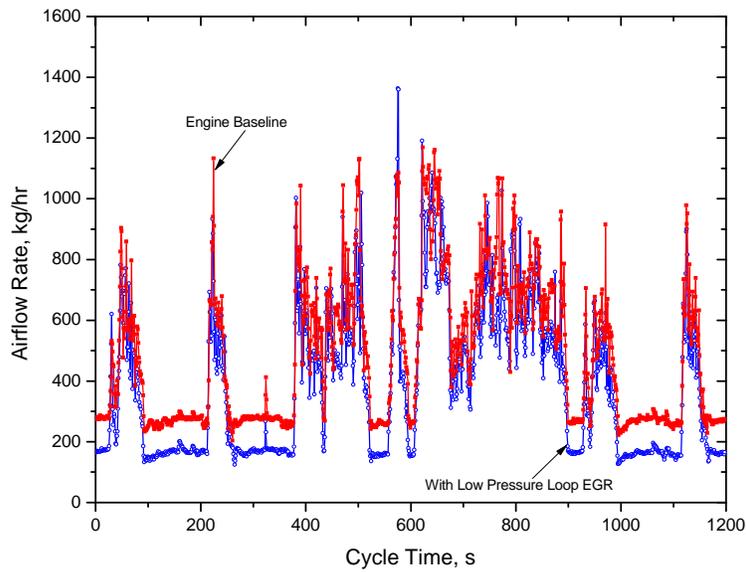
**Figure 1. Comparison of EPA FTP test cycle speed/torque profiles and tuned dynamometer/engine speed/torque profiles**

- Cleared all error codes by Navistar diagnosis software "ServiceMaxx" after replacing engine environmental sensors. This is necessary to make sure the baseline and low pressure exhaust gas recirculation (EGR) retrofitted engine run at normal conditions.
- Emissions tested the baseline engine and tuned the low pressure loop EGR control parameters. The initial test results showed over 40% NO<sub>x</sub> emissions reduction without any fuel penalty over the FTP cycle. Figure 2 shows the engine out NO<sub>x</sub> emissions reduction with low pressure loop EGR and Figure 3 shows the intake fresh air flow rate reduction by introduced the low pressure loop EGR. Figure 4 shows that the fuel flow rates from the

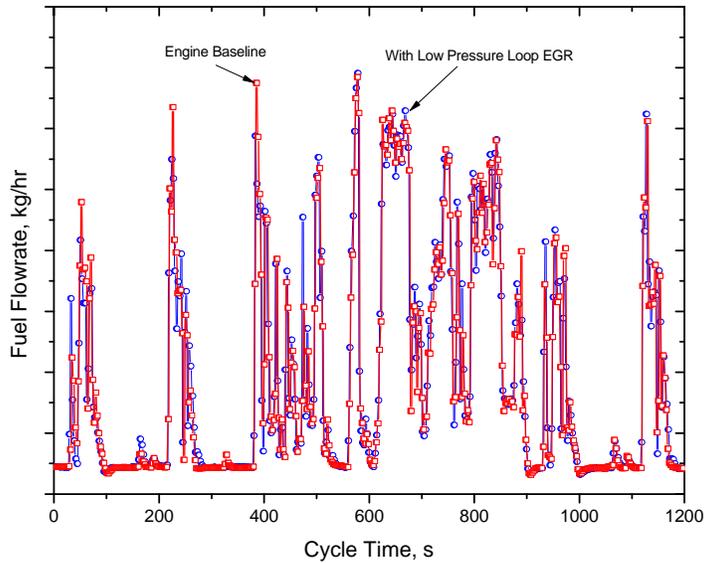
baseline and with low pressure loop EGR were very similar which explained the no fuel penalty result.



**Figure 2. Engine-out NO<sub>x</sub> emissions reduction with low pressure loop EGR over EPA FTP test cycle**



**Figure 3. Intake fresh air reduction by low pressure loop EGR over EPA FTP test cycle**



**Figure 4. Fuel flow rate comparison between baseline engine and with low pressure loop EGR over EPA FTP test cycle**

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

*Task 5: Transient Emissions Tuning and Testing*

2.5.2 Task Statement: The PERFORMING PARTY will finalize the engine control parameters to achieve targeted emissions goal and emissions test the retrofitted engine.

*2.5.3 Transient Emissions Testing*

*2.5.2.1. The PERFORMING PARTY will emissions test the dual loop EGR retrofitted engine on an engine dynamometer at the Houston Advanced Research Center's engine lab over the EPA Heavy-duty FTP test cycle.*

## **Section II: Problems/Solutions**

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

- a) The schedule for Task 5 was compressed due to delays in the completion Task 4.

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

- a) Currently we are allocating more resources to speed up the progress in Task 5.

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

- a) Increase effort to meet the new timeline.

## **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.*

Continue on Task 5.

Date: 3/8/2013

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*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.*