

## **NTRD Program Disclaimers**

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

Contract Number: \_\_\_\_\_582-5-70807-0007\_\_\_\_\_

Grantee: \_\_\_\_\_Lamar University\_\_\_\_\_

Date Submitted: \_\_\_\_\_June 15, 2006\_\_\_\_\_

Report for the Monthly period:

Starting Date \_\_\_May 15, 2006\_\_\_      Ending Date \_\_\_June 14, 2006\_\_\_

**Section I. Accomplishments** *(Please provide a bulleted list of project accomplishments as well as a description of their importance to the project.)*

- **DPF Regeneration Facility Modified and New Tests Conducted** – The significant accomplishments include the following:
  1. An exhaust flow control valve and an on-line controller have been installed and tuned. This flow control system is designed to maintain a constant flow of the exhaust gas to the DPF (diesel particulate filter) for long-term tests of DPM (diesel particulate matter) filtration and the on-line regeneration of the DPF.
  2. Two series of long-term experiments involving the modified facility were carried out to characterize DPM filtration efficiency. In the experiments, PM samples were taken before and after the DPF and the efficiencies were found to be greater than 95%. In the sampling process, electric heating tape was put on the sampling line and the sample holder to prevent moisture condensation on the filter paper.
  3. Two on-line regeneration modes are currently being tested involving the modified facility, namely periodic and continuous regeneration. The objective is to determine the effect of the regeneration mode on the performance of the developed DeNOX and VOC/CO catalysts.
  
- **NOx Reduction Tests Conducted and Catalysts Modified** – They are reported below:
  1. Four NOx reduction tests were carried out to characterize the effects of flow rate, hydrocarbon injection rate and bed temperature on NOx reduction and CO oxidation efficiencies. A typical set of data is shown in Table 1 in page 3.
  2. The developed VOC/CO catalyst was modified to reflect an optimum condition suggested from the observed experimental results. A by-pass line was also installed to improve the performance of the VOC/CO catalyst.

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

The above accomplishments are related to Tasks 1, 2, 3, and 4 described in the Scope of Work of the project.

## Section II: Problems/Solutions

<p><b>Problem(s) Identified</b></p> <p><i>(Please report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project)</i></p>	None
<p><b>Proposed Solution(s)</b></p> <p><i>(Please report any possible solution(s) to the problem(s) that were considered/encountered)</i></p>	N.A.
<p><b>Action(s) Conducted and Results</b></p> <p><i>(Please describe the action(s) taken to resolve the problem(s) and its effect)</i></p>	N.A.

**Section III. Goals and Issues for Succeeding Period** *(Please 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)*

The goals for the next month are to:

1. perform on-line DPF regeneration experiments involving both periodic and continuous regeneration schemes;
2. perform long-term experiments to establish optimal NO<sub>x</sub> reduction conditions; and
3. design and construct an improved prototype involving the developed DeNO<sub>x</sub>-VOC/CO catalyst pack.

The next Monthly Progress Report will be submitted to TCEQ on July 15, 2006.

Table 1. Engine Exhaust DeNO <sub>x</sub> Test								
Exhaust Flow (cc/min)	HC <sup>(1)</sup> (cc/min)	Analysis						
		O <sub>2</sub> %	CO ppm	NO ppm	NO <sub>2</sub> ppm	NO <sub>x</sub> ppm	SO <sub>2</sub> ppm	
Engine Exhaust		9.2	624	427	362	789	263	
100	0	2.5	8375	144	28	172	-	
100	10	0.9	28322	19	0	19	-	
100	15	1.1	40309	22	0	22	-	
100	20	1.7	-	52	0	52	-	

Note: (1). HC is hexane vapor  
 (2) Temperature of DeNO<sub>x</sub> catalyst bed is ~1000 °C  
 (3) VOC/CO catalyst appears inactive compared with the previous test.

Date: 6/15/06

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.