

NTRD Program Disclaimers

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

Contract Number: 582-5-70807-0006

Grantee: Railroad Commission of Texas

Date Submitted: December 8, 2006

Report for the **Monthly** period:

Starting Date: November 1, 2006

Ending Date: November 30, 2006

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

1. CARB has approved the test plan that Engine Control Systems, Ltd. (ECS, formerly Lubrizol) submitted for testing of the TermiNOx system on the GM 4.3-liter V6 engine. A copy of the test plan without confidential data has been submitted to TCEQ.
2. TCEQ has also received a copy of the contract for testing that is in force between ECS and the Railroad Commission.
3. With TCEQ's approval, a purchase order was issued to Carnot Emissions Services to procure an engine, prepare it for testing, and conduct initial tests of the ECS system.
4. ECS was asked to ship the conversion hardware so it can be fitted to the testing engine. ECS has asked that the make and model of forklift from which the engine is taken be identified so that the interconnections can be exact. We will try to accommodate them but may not be able to because of time constraints.
5. We have again requested from NETT Technologies a copy of their test plan and CARB approval. We have not received this yet. We have also sent them a draft contract for review and approval. CARB has told us that have approved NETT's test plan in concept but have requested a few minor changes.
6. TCEQ and the Railroad Commission have extended the term of this NTRD contract until December 31, 2006.
7. Carnot Emissions Services has obtained a GM 4.3L V6 engine for testing.
8. The engine was installed in a test cell at Carnot Emission Services and tested for performance. The engine was found to be mistuned and only generating 80 hp. The engine has been reworked to get the power up to 90 hp before testing started.
9. On September 8, testing started on the ECS system and continued for one week.
10. The tests for the NETT fuel system were scheduled to start right after the ECS test. NETT has reported problems in shipping an aged catalyst. If they can't ship the catalyst, their tests may be delayed.

11. The emission tests for the ECS system have been completed. Carnot Emission Services has turned in a draft report, which has been transmitted to TCEQ.
12. NETT is trying to collect their aged catalyst and reschedule the test.
13. In reviewing the September tests of the ECS system it was discovered that the aged catalyst was not tested. Also, CARB has requested two additional C2 tests for the de-greened catalyst. Accordingly, the engine was reinstalled in the test cell on October 30, and both C2 and transient emissions tests were conducted with the GM 4.3 liter V6. Carnot Emissions Services is preparing these test results for Railroad Commission review and CARB review.
14. NETT has advised us that they have forwarded equipment to Carnot Emissions Services for testing. We don't know yet if all necessary equipment has been sent.
15. The additional C2 emission tests were started but were delayed due to a family emergency with the testing engineer. The testing is to be completed by December 13, 2006. (NOTE, Dec. 14: The testing was completed by this date). Carnot will produce a report on the testing in December that will be submitted to CARB for their approval.
16. NETT says they have three systems in development and they are most interested in testing the latest system, which has yet to accumulate durability hours. They have been asked when they can present a system with an aged catalyst (2,500 hours of operation) for testing.

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

Task 1. Select partners

- 2.1.1 Select retrofit fuel systems
- 2.1.2 Enter into written agreements with selected partners
- 2.1.3 Select specific forklift retrofit kits and engine groups to verify
- 2.1.4 Complete task
- 2.1.5 Submit names of verification partners and copies of the agreements

Task 2. Initiate CARB verification process

- 2.2.1 Submit [through partners] proposed testing protocol to CARB
- 2.2.2 Secure written approval from CARB
- 2.2.3 Complete task

Task 3. Conduct verification testing

- 2.3.1 Select testing laboratory (subtasks: reserve dynamometer time, secure engine and kit(s) for testing, observe preparations and testing.
- 2.3.2 Test ECS system on a GM 4.3L V6 engine.
- 2.3.3 Submit preliminary test result to CARB

2.3.4 CARB has requested some retesting on the system which was started about 11/1/06

Section II: Problems/Solutions

<p>Problem(s) Identified</p> <p><i>(Please report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project)</i></p>	<p><i>The NETT system that was shipped was unacceptable for testing due to the lack of an aged catalyst. NETT has later versions of its retrofit fuel system that are ready for testing once an aged catalyst can be provided.</i></p>
<p>Proposed Solution(s)</p> <p><i>(Please report any possible solution(s) to the problem(s) that were considered/encountered)</i></p>	<p><i>The contract needs to be extended to May 31, 2007, to allow NETT time to submit an aged catalyst for their Version 1 system and to properly age catalysts for their Version 2 and 3 systems. NETT has agreed to resubmit their equipment, but it is not expected to arrive until approximately February 2007.</i></p>
<p>Action(s) Conducted and Results</p> <p><i>(Please describe the action(s) taken to resolve the problem(s) and its effect)</i></p>	<p><i>A no-cost grant contract amendment through December 31, 2006, has been executed.</i></p> <p><i>A testing contract with ECS has been executed.</i></p> <p><i>A purchase order has been issued to Carnot Emissions Systems.</i></p> <p><i>A draft testing contract has been sent to NETT for review.</i></p> <p><i>NETT has sent equipment but have not sent the contract. They will be contacted to clarify the contract terms and equipment status. Testing on the ECS system is complete. We expect test results by January 1.</i></p>

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)*

1. *ECS will resubmit the complete test results to CARB in support of their application for verification.*
2. *ECS will secure verification from CARB, which will be transmitted to the Railroad Commission and on to TCEQ.*
3. *Extend contract to 5/31/07. Develop a new contract with NETT for the proposed system.*



Date: December 14, 2006

 Authorized Project Representative's Signature