

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

**Contract Number:** 582-11-13473-2019

**Grantee:** Robert Bosch LLC

**Report for the Monthly period:** October 2011      **Date Submitted:** November, 10, 2011

**Section I. Accomplishments**

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

- Two on-site meetings with Buffalo Marine Service Inc. (Houston, TX) to coordinate emission baseline measurement on the marine engine on selected vessel (positioning thermocouples/sensors, data acquisition systems, etc.)
- Delivery of weld-on-sockets for sensors and measurement devices to Buffalo Marine and logistics coordination for measurement equipment shipping to Buffalo Marine
- Emission measurement system dry runs for software and control unit are in progress and mostly completed.
- First meeting with tank supplier fixed for mid December 2011
- Engine fuel consideration completed. Engine currently runs on ultra low sulfur diesel (ULSD) fuel. Not necessary to switch fuel.
- Benchmark of dynamometer testing services from outside contractors completed.
- First round of design and evaluation of marine aftertreatment systems completed. Concepts (blue print) ready. Further investigation of back-pressure, efficiency, and regeneration strategy on-going

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

- Phase 1 -Task 1: Baseline Measurement
  - 1.2 Measurement of baseline emissions
- Phase 1 – Task 2: System Design
  - 2.1 First design of aftertreatment concepts
  - 2.2 Tank layout
  - 2.3 Wiring harness

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

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

- a) EPA-regulated marine and locomotive fuel switch to ULSD (15 ppm sulfur) will take place June 1, 2012. Some marine engines have shown performance degradation after switching to ULSD fuel (e.g. UT study on the Port of Galveston marine engines switching to ULSD fuel, 2007.)
- b) Due to Thanksgiving week (limited availability of Buffalo Marine staff) it seemed necessary to delay the timeline for the deliverable report by approximately 1 week.

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

- a) To synchronize our aftertreatment technology development with this upcoming EPA regulation, all our tests on the marine engine will be conducted exclusively using ULSD fuel. We took great care therefore to make sure the targeted marine engine on the vessel can indeed use ULSD fuel without inducing any potential damage to the engine. Several discussions were pursued including with Cummins, EPA, experienced marine engine experts and marine fuel suppliers focusing on this fuel transition.
- b) On-site emission measurement timeline was postponed by about 1 week.

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

- a) It has been confirmed that the engine has been using ULSD for at least the last 6 months.
- b) None.

### **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*

- Finishing baseline measurement and analysis of collected data
- Initial computer-aided design (CAD) layout for exhaust gas aftertreatment system and computational fluid design (CFD) simulation
- Definition of tank size and layout
- Catalyst layout and coating based on collected measurement data from the marine boat *San Patricio*
- Subcontractor approval for dynamometer testing.
- Procurement and preparation of dyno engine Cummins KTA19-M3
- Layout hydraulic urea lines for deNOx system and modification of backflow valve for supply module

Date: 11/10/11

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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.*