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

Contract Number:	582-11-11145-3264		
Grantee:	The University of Texas at Austin (UT-CEM)		
Report for the Monthly period:	November 2012	**Date Submitted:**	December 10, 2012

Section I. Accomplishments

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

- Continued to operate the hydrogen refueling station. For the month the reformer was operated for about 87 hours and produced 50 kilograms of hydrogen.
- Two minor issues arose with the station during November 2012 as outlined in Section II. Both issues corrected themselves upon restarting the system and have not reoccurred since.
- Gas Technology Institute (GTI) and UT-CEM are still awaiting lab test results for the hydrogen gas samples taken at the end of October 2012.
- The Proterra fuel cell bus continued passenger service and operation by Capital Metro throughout November 2012. The bus ran for 11 out of 20 days of scheduled service.
- The bus experience and fuel cell shutdown issues early in the month which took it out of service for about nine days. The issue was corrected by re-plumbing the exhaust lines of the fuel cell which had previously been allowing water to build up at the outlet of the fuel cell stack.

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

> *Task 2.5: The PERFORMING PARTY will operate the hydrogen fuel cell hybrid-electric bus in a realistic working environment over a twelve month period, including using the hydrogen generation and fueling station as the bus's primary fuel source.*

Section II: Problems/Solutions

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

a) On November 9, 2012, the fuel processor was starting up and shutting down due to high inlet temperature of gas feeding the pressure swing adsorption (PSA).
b) On November 27, 2012, the fuel processor shut down due to a spike in the flow rate of secondary air to the burner.
c) On October 29, 2012, the bus experienced a loss of one of the two fuel cell modules while in operation. The loss occurred on the dead head portion of the route on its return trip to the depot and did not affect passenger service.

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

a) A malfunctioning coolant chiller would be the cause of this high temperature. UT-CEM checked the refrigeration loop on the chiller to confirm chiller operation.
b) Cycle the secondary air supply for several different flow rates and monitor secondary air flow for its ability to hold the desired set point flow.
c) Proterra traced the problem to poorly routed fuel cell exhaust plumbing which was allowing water to build up at the outlet of the fuel cell.

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

a) The chiller was inspected by UT-CEM personnel. Under no load conditions the chiller appeared to be operational. It was decided to run the chiller under the station's normal load conditions to see if over temperature issue re-occurred. System ran for 53 hours without showing the over temperature error.
b) The flow control valve was able to maintain several set points during manual operation. The station was restarted and the flow was able to be maintained at the desired level for 53 hours of operation.
c) The plumbing issue was corrected and the bus returned to service on November 12, 2012.

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 operating the hydrogen station and refueling the bus.
- Continue collecting data on fueling and bus operation.

Date: 12/10/2012

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.*