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:	January 2013	**Date Submitted:**	February 5, 2013

Section I. Accomplishments

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

- In January 2013, the hydrogen reformer was operated for about 22 hours and produced 16 kilograms of hydrogen.
- Gas Technology Institute (GTI) made a trip to the site to add a coolant reservoir to the chiller and perform station maintenance. After reservoir was in place, the station did not experience any more chiller coolant flow rate errors during this period.
- The National Renewable Energy Laboratory (NREL) requested energy consumption tracking of the station to determine the "cost" of hydrogen produced. Theoretical values have been calculated, and GTI can determine the flow of water and natural gas to the station. The missing data is electrical energy consumption. The team is investigating adding power metering acquisition capability to the station to track electrical energy consumption. If determined feasible and within budget, GTI and UT-CEM will add this capability.
- NREL also requested automatic tracking of refueling times. Currently the station is setup to monitor the time from when the operator switches the dispenser handle to “on” to the time when it is turned back to ”off”. This presents error in the refueling time since the refueling process is automatic and the operator may not necessarily turn the handle to “off” right after the refueling procedure is complete. GTI modified the station's data acquisition code to capture the true time when refueling was completed based on the dispenser's control algorithm.
- The Proterra bus transmission was rebuilt and reinstalled. Testing of the bus was concluded on January 31, 2013, and the bus will be ready for service beginning in February 2013.

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 January 9, 2013, the control system registered an error in the measurement of the secondary air flow to the burner.
b) On January 23, 2013, the computer needed to be rebooted. A ”memory allocation error” was observed upon reboot.
c) On January 30, 2013, the station experienced a failure of three solenoid priority valves controlling flow of hydrogen to the dispenser. The valves failed close, so no danger was presented, but the bus was unable to refuel without manual override.
d) The back-up hydrogen tube trailer registration has expired, and the trailer cannot be refueled without proper testing and inspection. This requires removal of the trailer from the site.

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

a) UT-CEM cycled the flow control valve that adjusts the secondary air supply from 0 to 100% open to make sure it was not binding.
b) The computer has shown signs of age, as evidenced by this error message and should be replaced before it fails to reboot.
c) UT-CEM inspected the valves, removed debris, and greased their o-rings.
d) UT-CEM has worked with AirGas to identify an alternative hydrogen tube trailer in San Antonio, Texas, that can be used for the remainder of the demonstration.

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

a) After the cycle was performed, the station operated for 10 hours without a reoccurrence of the error.
b) GTI has begun specifying a new computer for the station. The new computer should correct the memory allocation problems and prevent an unexpected loss of the entire computer system.
c) The solenoid valves are operational after the repair.
d) The replacement trailer will be swapped out when the current trailer is emptied.

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

- The hydrogen generation system will be operated to replenish hydrogen consumed by the bus throughout the period.
- Specify a new computer and identify any issues with software license transferring and version conflicts.
- Restart passenger with the bus and continue data collection and reporting efforts.

Date: 02/05/2013

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.*