

VII.9 Data Collection and Validation of Newport Beach Hydrogen Station Performance

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Contract Number: DE-EE0005889

Subcontractor:
Hydrogenics, Mississauga, ON, Canada

Project Start Date: October 2012
Project End Date: March 2015

Overall Objectives

- Specify and install correct instrumentation to increase the amount of data collected
- Validate new data and conduct initial analysis
- Increase overall station/equipment up time
- Reduce non-scheduled maintenance visits
- Make component optimization recommendations
- Check/validate station optimization

Fiscal Year (FY) 2013 Objectives

- Specify and install correct instrumentation to increase the amount of data collected
- Validate new data and conduct initial analysis

Technical Barriers

This project addresses the following technical barriers from the Technology Validation section of the Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration Plan:

- (D) Lack of Hydrogen Refueling Infrastructure Performance and Availability Data

- (F) Centralized Hydrogen Production from Fossil Resources

Contribution to Achievement of DOE Technology Validation Milestones

This project will contribute to achievement of the following DOE milestones from the Technology Validation section of the Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration Plan:

- Milestone 3.2: Validate novel hydrogen compression technologies or systems capable of >200 kg/day that could lead to more cost-effective and scalable (up to 500 kg/day fueling station solutions for motive applications. (4Q, 2014)

FY 2013 Accomplishments

Specified 16 pieces of instrumentation to effectively increase data collection.



INTRODUCTION

The hydrogen fueling station located at 1600 Jamboree Boulevard in Newport Beach, CA, was designed and built to refuel light-duty fuel cell electric vehicles (FCEVs). The station features the on-site generation of hydrogen through a small-scale natural gas steam methane reformer. All the hydrogen-related equipment was added to an existing retail gasoline/diesel station. The station is an early demonstration of what the footprint and equipment arrangement of a retail on-site steam methane reformer facility might look like.

Only a few hundred FCEVs are on the road in California. As a result, hydrogen throughput is relatively low at the few early pre-commercial hydrogen stations that are currently open. As a result, the stations are underutilized. This project aims to collect additional data to allow the operator to potentially adjust various station component and operational parameters in order to improve the overall efficiency of the station and lower operation and maintenance costs and to help improve air quality and reduce greenhouse gas emissions.

APPROACH

The first phase of the project involves specifying and installing the correct instrumentation to increase the amount of data collected. This involves installing (3) mass flow

meters, (2) hour meters, (9) power meters, and (2) water flow meters. The new data collected will be validated and the initial analysis will be conducted.

The second phase of the project aims to improve the efficiency of the station. The intent is to increase the overall station and equipment up time and reduce non-scheduled maintenance visits. The data collected will be used to make recommendations on how to optimize discrete station components. The recommendations will be acted upon, and continually monitored to validate the optimization of the station.

RESULTS

The results of this project have yet to be derived. Final contract/grant agreement negotiation between subcontractor, station owner, real estate owner, and hydrogen station operator has taken much longer than anticipated.

CONCLUSIONS AND FUTURE DIRECTIONS

Data collection at the station is in progress. Research is expected to continue as planned until 2015.