

## VII.11 Performance Evaluation of Delivered Hydrogen Fueling Stations

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Contract Number: DE-EE0005886

Subcontractor:

Linde LLC, Hayward, CA

Project Start Date: March 1, 2013

Project End Date: August 31, 2016

Technologies Office Multi-Year Research, Development and Demonstration Plan:

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

### 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 2.3: Validate fuel cell electric vehicles achieving 5,000 hr. durability (service life of vehicle) and a driving range of 300 miles between fuelings. (4Q, 2019)
- 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 for motive applications. (4Q, 2014)
- Milestone 3.4: Validate station compression technology provided by delivery team. (4Q, 2018)
- Milestone 4.4: Complete evaluation of 700 bar fast fill fueling stations and compare to SAE J2601 specifications and DOE fueling targets. (3Q, 2016)

### Overall Objectives

- Confirm performance of systems in real world applications through data collection
- Provide the public with aggregated data presented in composite data products, and secure confidential data in the National Renewable Energy Laboratory Hydrogen Secure Data Center
- Benchmark station capacity utilization, maintenance, and safety

### Fiscal Year (FY) 2013 Objectives

- Perform station assessments—an evaluation of stations' adequacy to ensure deliverables are achievable and development of associated data acquisition plan
- Data acquisition engineering design and packaging—station design packages to be reviewed for data acquisition integration
- System fabrication and installation (initial three sites)—specification of project materials, execution of hazards and operability analysis, and fabrication and installation of equipment

### Technical Barriers

This project addresses the following technical barriers from the Technology Validation section of the Fuel Cell

### FY 2013 Accomplishments

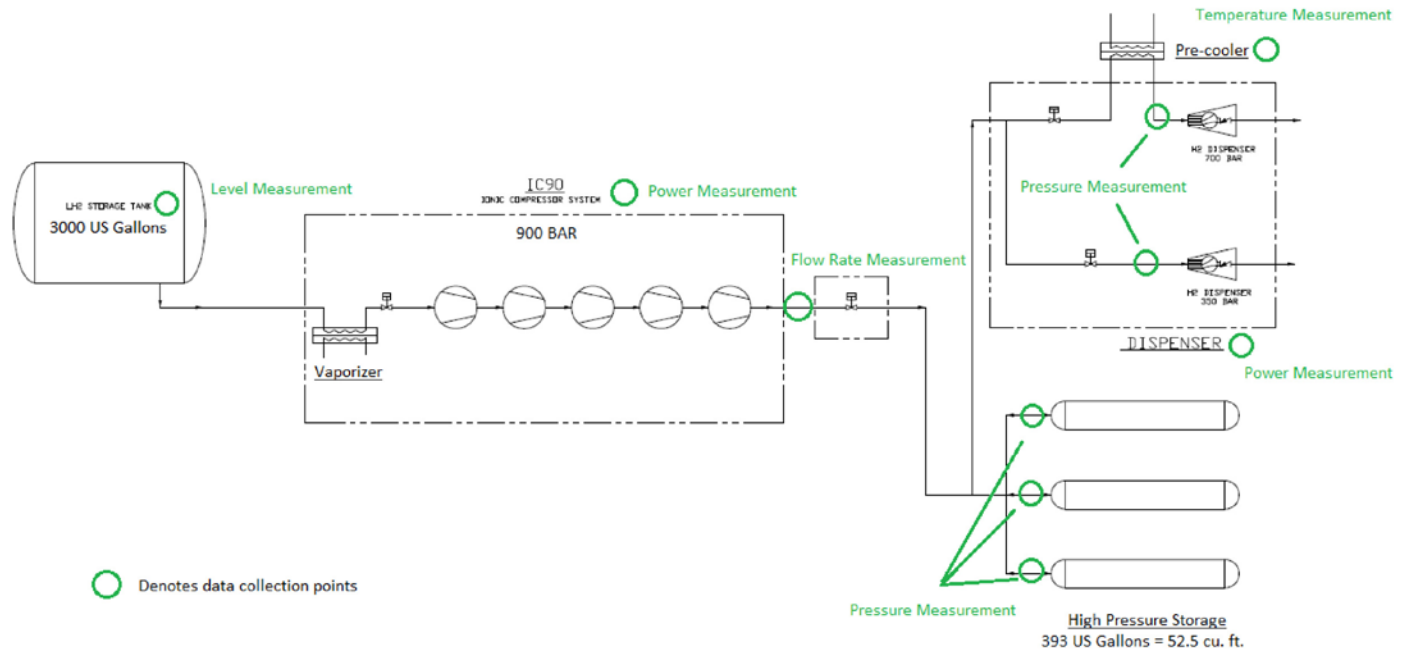
- Secured funding for all five project locations in California
- Agreed to terms with project partner and subcontractor
- Obtained station technical specifications and commenced review
- General project approach and software was selected providing the project the data format requirements
- Completed a preliminary design and approach for integration of data collection systems in station design in order to meet project objectives and deliverables set forth by the National Renewable Energy Laboratory (Figure 1)



### FUTURE DIRECTIONS

- Complete station site reviews and finalize data acquisition plan
- Obtain station engineering drawings for specific stations and complete detailed integration approach

### Hydrogen Fueling Station Data Collection Approach



**FIGURE 1.** Hydrogen Fueling Station Data Collection Approach

- Develop LabVIEW® data acquisition software and data storage/handling process
- Create site-specific engineering drawings for hardware installation and data collection system integration to station equipment
- Identify, specify, and procure materials required for data acquisition system fabrication
- Complete hazards and operability analysis of each of the preliminary locations identified in the statement of project objectives
- Fabrication of electrical panels and onsite installation/start-up/commissioning of units

### FY 2013 PUBLICATIONS/PRESENTATIONS

1. tv025\_tieu\_2013\_p.pptx – Poster Presentation 2013 AMR.