

VII.2 Supporting the Consensus-Based Process for Hydrogen Codes and Standards

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Subcontractors:

- American National Standards Institute (ANSI), New York, NY
- American Society of Mechanical Engineers (ASME), New York, NY
- Compressed Gas Association, Inc., Chantilly, VA
- CSA America, Cleveland, OH
- GWS Solutions of Tolland, Tolland, CT
- U.S. Fuel Cell Council, Washington, D.C.
- International Code Council, Inc., Country Club Hills, IL
- Kelvin Hecht, Avon, CT
- National Hydrogen Association, Washington, D.C.
- National Fire Protection Association (NFPA), Quincy, MA
- Society of Automotive Engineers (SAE) International, Warrendale, PA

Project Start Date: December 5, 2007

Project End Date: September 30, 2011

Objectives

- Develop a robust supporting research and development program to provide critical hydrogen behavior data and a detailed understanding of hydrogen combustion and safety across a range of scenarios, needed to establish setback distances in building codes and minimize the overall data gaps in code development.
- Support and facilitate the completion of technical specifications by the International Organization for Standardization (ISO) for gaseous hydrogen refueling (TS 20012) and standards for on-board liquid (ISO 13985) and gaseous or gaseous blend (ISO 15869) hydrogen storage by 2007.
- Support and facilitate the effort, led by the NFPA, to complete the draft Hydrogen Technologies Code (NFPA 2) by 2008.
- With experimental data and input from Technology Validation Program element activities, support and facilitate the completion of standards for bulk hydrogen storage (e.g., NFPA 55) by 2008.
- Facilitate the adoption of the most recently available model codes (e.g., from the International Code Council [ICC]) in key regions.
- Complete preliminary research and development on hydrogen release scenarios to support the establishment of setback distances in building codes and provide a sound basis for model code development and adoption.
- Support and facilitate the development of Global Technical Regulations (GTRs) by 2010 for hydrogen vehicle systems under the United Nations Economic Commission for Europe, World Forum for Harmonization of Vehicle Regulations and Working Party on Pollution and Energy Program (ECE-WP29/GRPE).
- Support and facilitate the completion by 2012 of necessary codes and standards needed for the early commercialization and market entry of hydrogen energy technologies.

Technical Barriers

This project addresses the following technical barriers from the Hydrogen Codes and Standards section of the Hydrogen, Fuel Cells and Infrastructure Technologies Program Multi-Year Research, Development and Demonstration Plan:

- (A) Limited Government Influence on Model Codes
- (B) Competition among SDOs and CDOs
- (C) Limited State Funds for New Codes
- (D) Large Number of Local Government Jurisdictions (approximately 44,000)
- (E) Lack of Consistency in Training of Officials
- (F) Limited DOE Role in the Development of International Standards
- (G) Inadequate Representation at International Forums
- (H) International Competitiveness
- (I) Conflicts between Domestic and International Standards

- (J) Lack of National Consensus on Codes and Standards
- (K) Lack of Sustained Domestic Industry Support at International Technical Committees
- (L) Competition in Sales of Published Standards
- (M) Jurisdictional Legacy Issues
- (N) Insufficient Technical Data to Revise Standards
- (O) Affordable Insurance is Not Available
- (P) Large Footprint Requirements for Hydrogen Refueling Stations
- (Q) Parking and Other Access Restrictions

- Continued support of cooperation between ICC and NFPA continued through Hydrogen Industry Panel on Codes (HIPOC) activities.



Safety Contributions

This project will contribute to achievement of the following DOE Hydrogen Codes and Standards milestones from the Hydrogen Codes and Standards section of the Hydrogen, Fuel Cells and Infrastructure Technologies Program Multi-Year Research, Development and Demonstration Plan:

- C1 Input from Codes and Standards: Completed hydrogen fuel quality standard as ISO Technical Specification.
- C2 Input from Codes and Standards: Technical assessment of standards requirements for metallic and composite bulk storage tanks.
- C3 Input from Codes and Standards: Final standards (balloting) for fuel dispensing systems (CSA America).
- C4 Input from Codes and Standards: Draft standards (balloting) for refueling stations (NFPA).
- C8 Input from Codes and Standards: Final Hydrogen fuel quality standard as ISO Standard.

Accomplishments In 2007

- Completed transition to the cost share model of funding the Code Development and Standard Development Organizations (SDOs and CDOs) as codes and standards sub-awardees, in close collaboration with DOE.
- Ensured requested funding provided for critical participation in international forums by U.S. industry and association representatives.
- Continued development of increased user-friendliness of ANSI web portal for hydrogen standards available at <http://hcsp.ansi.org/> and the additional hydrogen information provided at the hydrogen matrix web site available at <http://www.fuelcellstandards.com/Matrix.htm>.
- Initiated electronic payment system allowing quicker reimbursement of sub-awardee code and standard developers.

Introduction

As suggested by the list of barriers, the codes and standards area is unusual for a DOE program in that the ultimate goals and objectives cannot be achieved directly by DOE or its contractors, but rather, must be met indirectly, as the necessary process of consensus-based codes and standards development is carried out. Virtually all relevant hydrogen-related codes and standards work rests on a voluntary, consensus-based process, in contrast to the direct development of government-based rules and regulations.

Thus, in addressing the barriers, this project relies on the strategic value of targeted resources and support aimed at identified “log jams” in the process, and the provision of supported manpower where the voluntary process would otherwise succumb to the delays inherent in such processes. This approach is thus able to ensure or enhance the free flow of important and credible information, including supporting necessary research to develop or adapt new codes and standards, and always supporting the optimum participation by U.S. industry and related industry associations.

Approach

This project utilizes close collaboration between DOE program leadership, national laboratory technical experts, and the individual and SDO and CDO sub-awardees to identify the highest value contributions that are available for improving the timeliness of the consensus-based standard process for the successful commercialization of hydrogen in stationary and mobile applications.

Results

Because of the relatively late beginning of the Regulatory Logic LLC contract, initial results for this year are primarily focused on the initiation of the new contractual relationships with the 11 designated sub-awardees, the identification of one to five year tasks in the relevant statements of work (SOW). The transition process, including the challenge of moving to a cost-shared model of funding, has largely been completed.

Conclusions and Future Directions

With the completion of the remaining sub-award contracts, Regulatory Logic LLC will be able to

increasingly participate in outreach efforts regarding the dissemination of the program's codes and standards work whenever deemed appropriate by DOE leadership. The close collaboration with DOE, and the technical experts of the national laboratories, continues the funding announcement prescription of the awardee's working in close collaboration with DOE in fulfilling the objectives of the project.

FY 2007 Publications/Presentations

1. Regulatory Logic LLC presented a poster at the 2007 Annual Merit Review, held May 15–18, 2007 in Arlington, VA.