

## IX.6 Evaluation of Integrated Hydrogen Systems

*Susan M. Schoenung*

*Longitude 122 West, Inc.*

*1010 Doyle Street, Suite 10*

*Menlo Park, CA 94025*

*Phone: (650) 329-0845; Fax: (650) 329-9951; E-mail: schoenung@aol.com*

*DOE Technology Development Manager: Pat Davis*

*Phone: (202) 586-8061; Fax: (202) 586-9811; E-mail: Patrick.Davis@ee.doe.gov*

*Technical Advisor: Jay Keller*

*Phone: (925) 294-3316; Fax: (925) 294-2276; E-mail: jokelle@sandia.gov*

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*Projected End Date: December 31, 2006*

### Objectives

- Organize international working group to address hydrogen technology integration
- Establish database of international hydrogen development activities
- Evaluate integrated hydrogen systems for performance, safety and codes and standards permitting policies

### Technical Barriers

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

- C. Hydrogen Refueling Infrastructure (3.5.4.2.)
- H. Hydrogen From Renewable Resources (3.5.4.2.)
- I. Hydrogen and Electricity Co-production (3.5.4.2.)
- A. Limited Historical Database for Components (3.6.4.2.)
- B. Access to Industry Proprietary Data (3.6.4.2.)
- D. Technical and Scientific Understanding of Systems Limits to the Value of Protocols (3.6.4.2.)
- I. Strategic Conflicts between Domestic and International Standards Objectives (3.6.4.2.)

### Approach

- Organize working groups for International Energy Agency (IEA) Hydrogen Task 18, and plan tasks and meetings
- Collaborate on the identification of information sets and collect data for assessment
- Contribute to the Hydrogen Resources Study: Where will the hydrogen come from?
- Provide liaison in modeling and analysis of hydrogen systems between national and international efforts
- Evaluate integrated demonstration systems for performance and application of codes and standards
- Manage preparation of case studies authorized by the Hydrogen Implementing Agreement Executive Committee
- Summarize and document lessons learned
- Maintain public website for IEA Hydrogen Task 18

**Accomplishments for the Period June 2004 – June 2005**

- Led international experts meeting in Madrid, Spain in September 2004
- Organized industry workshop in conjunction with experts meeting in Madrid
- Led international experts meeting in Tokyo, Japan in March 2005
- Established structure for international database task, including participation in collaborative Hydrogen Resources Study
- Identified nine projects for evaluation and began data collection and modeling efforts
- Began dialog on modeling participation with Sandia personnel
- Supervised completion of three case studies: Madrid PV-Fuel Cell Project for Telecommunications; California Fuel Cell Partnership; and Canadian High Pressure Infrastructure project
- Established two websites for working group members, including secure site for data analysis
- Established public website for dissemination of information from Task 18
- Participated in executive committee meetings in October 2004 and May 2005, including presentation of annual report and incorporation of new activities
- Outlined report documents from working groups

**Future Directions**

- Task 18 is scheduled to continue through December 2006. Meetings will be held semi-annually – fall and spring. The fall 2005 meeting will be held in Iceland in conjunction with evaluation of the Ecological City Transport System (ECTOS) (Iceland) bus project. The spring 2006 meeting will be held in Vancouver, in conjunction with the Natural Resources Canada bus project.
- Update information database by fall 2005 and determine public access
- Participate in collaborative international Hydrogen Resources Study
- Continue case studies of demonstration systems, with emphasis on application of codes and standards
- Complete analysis of ECTOS project and Malmo bus systems
- Draft reports on Subtasks A&B
- Plan modeling workshop for spring 2006
- Participate in IEA Executive Committee activities, including annual and semi-annual reporting. Fall 2005 meeting is planned for Singapore and the spring 2006 meeting is planned in conjunction with the 16<sup>th</sup> World Hydrogen Energy Conference in Lyon, France.