

# Fuel Cell Codes and Standards Summit IV

## May 10-11, 2000

### **Summary**

The Office of Power Technologies' Fuel Cells for Buildings Program<sup>[1]</sup> held the fourth annual Fuel Cells Summit for Codes and Standards on May 10-11, 2000. Nearly 90 representatives of fuel cells manufacturers, building code authorities, codes and standards organizations and others attended the Summit, bringing the cumulative total of individual participants (i.e., excluding those attending multiple Summits) to more than 200. Attachment 1 provides a listing of Summit IV attendees.

The plenary session was kicked off by David Leiter, PDAS EE/RE, who underscored the importance of this activity in the current context of the recently formed Distributed Energy Resources task force and in the Administration's ongoing multifaceted concerns on grid system reliability, global warming and energy security. Manufacturers next presented on the status of technology development and their respective field experiences; and finally, representatives of industry organizations and federal programs spoke to codes and standards development. A roundtable discussion addressed issues of fuel cell technology installation from the various perspectives of the building inspector, the utility, the manufacturer, and other relevant parties. Attachment 2 contains the Summit agenda. Attachment 3 provides an unofficial transcript of the panel discussion.

### **Goal**

The goal of the Summits, and the overall DOE Office of Power Technologies efforts in support of the Summit and its ongoing work can be stated as follows:

"To develop an institutional, regulatory and technical environment that supports the commercialization and deployment of fuel cell power-generation technologies for stationary, portable, and vehicular applications"

### **Update: Technology Development and Deployment**

As the attached agenda shows there were a number of manufacturers who outlined the status of their activities. Highlights included:

- **Siemens/Westinghouse** is demonstrating a first-of-a-kind, 220 kWe combined SOFC/microturbine system that operates on natural gas with a projected system efficiency of 49%.
- **Fuel Cell Energy** presented their Direct Fuel Cell design, which targets stationary applications, uses no noble metal catalyst, offers internal reforming and operation at atmospheric pressures.
- **Plug Power** explained that although recent design changes in their 7 kW unit relieved General Electric of their previous purchase obligation, Plug expects that GE will purchase a large number of these units regardless. Plug still intends to release their first commercial product in 2001.
- **Avista Labs** showed their modular PEM cell design, individual units of which can reportedly be changed without taking the system down due to an embedded control system. The individual cells are also self-hydrating and constructed of low cost materials.
- **International Fuel Cells** noted that, even with 81 units installed in the United States and more than 3 million hours of operation logged internationally, siting

new installations continues to present challenges due to the time and associated costs required for site regulatory approval.

### ***Update: Codes and Standards Activity***

- **NFPA 853** covers the installation of stationary fuel cells of at least 50 kW output. Following extensive public review, the NFPA membership voted on the draft document May 17, 2000. The final standard is scheduled for issuance in July 2000 and publication in August 2000.
- The **International Code Council** described various codes under development related to fuel cells, including the International Mechanical Code (Section 924), the International Fuel Gas Code (FG 22-00), and others. ICC also reported on the recently formed Ad Hoc Committee on Hydrogen, which will evaluate the impact of hydrogen on supporting infrastructures, develop code language, and provide education and outreach on hydrogen use for portable and vehicular fuel cells.
- The first major revision to **ANSI Z21.83** is underway, and proposed changes include expanding fuel gases to methanol and hydrogen, referencing UL 50 (Enclosure for Electrical Equipment) for construction materials, and allowing plastic piping for conveying reformat to fuel cell stacks, among others.
- The new **UL 1741** standard covers stand-alone or utility interactive systems, inverters, converters, and controllers, and is intended to harmonize with IEEE-929, IEEE-C62.41 and IEEE-1547.
- **IEEE** is focusing on interconnection issues through SCC 21, which is responsible for standards development in distributed generation and energy storage technologies. The draft interconnection standard P1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, is scheduled for completion by Spring 2001.
- **NES** reported on development of the National Evaluation Report for fuel cells, which is intended to serve as an interim reference and information source for building code officials and other authorities having jurisdiction until the national codebooks are updated to reflect fuel cell technologies. The draft report is currently undergoing a review and comment period and will be released in final form sometime this summer.
- **IEC TC105** is to prepare international standards regarding fuel cell technologies for all fuel cell applications, covering general terms and definitions, safety, performance tests, interfaces, installation, and markings. The first meeting of this committee was held February 2000, with delegates from Canada, China, France, Germany, Italy, Japan, the Netherlands, Switzerland, Great Britain and the United States.
- **SAE** presented on its history, mission, and extensive membership and standards development system to serve industry, government, and the public in developing standards for design, manufacture, testing, quality control and procurement for transportation applications. The primary scope of SAE's current focus related to fuel cells is in performance testing of PEM systems and components.

## ***Expert Panel – Field Experiences in Codes and Standards***

The panel addressed questions of: codes and standards from the perspectives of manufacturers and testing and listing agencies; one-of-a-kind design; code official/multi-manufacturer cooperation; electrical connection to the distribution system; training; insurance coverage; and, device labeling. See Attachment 3 for details.

## ***Trade and Industry Associations***

- **Fuel Cells 2000** presented their role as an advocacy group and information clearinghouse for the fuel cells industry, citing several examples of where they have helped the industry advance their causes in the past.
- The **Hydrogen Fuels Association** works to identify needs for codes and standards, and develops draft new standards when the work is not being accomplished elsewhere. The HFA has working groups in various areas of interest, including connectors, containers, refueling stations, electrolyzers, self-service refueling, SAE coordination and maritime applications.
- The **Distributed Power Coalition of America** discussed its position as an advocacy organization committed to advancing the use of distributed power. One goal is to remove regulatory and legislative impediments to the use of distributed power technologies, including fuel cells.
- The **U.S. Fuel Cells Council** presented its role as helping foster commercialization of fuel cell technologies in the United States. This organization is involved in the development of several codes and standards for fuel cells, ranging across transportation, portable, and stationary power generation applications.

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[1] Formerly located in the Office of Building Technologies, State and Community Programs.