The official newsletter of the CTFCA Codes and Standards Working Group

SPRING 2005

directions

Welcome

to the inaugural edition of *directions*, the official newsletter of the CTFCA Codes and Standards Working Group. As many of you know, our working group was initiated in 2001 to help address regulatory challenges associated with installing hydrogen equipment in Canada. Our focus remains on the elimination of market access barriers in support of CTFCA demonstration projects and broader commercialization of fuel cells and hydrogen in this country.

In this newsletter, you'll learn about some of our recent progress, including revisions to the Canadian Electrical Code and the development of a new Canadian Hydrogen Installation Code.

We also discuss our involvement in scientific initiatives that support changes to national codes and standards. One example is our work to determine safe distances between stored hydrogen and the general public. We are also quantifying distances for flammable areas around hydrogen installations and identifying types of electrical equipment that can be safely used in their proximity.

On the international front, we're leveraging resources by co-operating with stakeholders such as the U.S. Department of Energy, Europe's HySafe Program and the California Fuel Cell Partnership to produce harmonized tools, such as the Vehicle Emergency Response Guides now being used in Canadian demonstrations.

We are also supporting the work of ISO TC/197 to develop international standards addressing critical components in the hydrogen infrastructure such as pressure vessels and hydrogen-generating appliances, and promoting the use of these standards within Canada. By ensuring a consistent approach across markets, we are to lay the groundwork for all Canadian companies participating in the fuel cell and hydrogen sector.

Jeff Grant, Chair, Codes and Standards Working Group

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Virtual fuelling stations and emergency response guides take shape

The development of a web-based system to help industrial designers create hydrogen refuelling stations, and another project producing emergency response materials, are ways that the C&S Working Group is helping expand communications of hydrogen-sector related information.

TISEC, a Montreal-based engineering firm, is part of a working group that has developed a hydrogen fuelling station design tool. The 3D model includes embedded links to an extensive codes and standards database. TISEC President Robert Hay said the 3D model enables users to design fuelling stations and their components with the benefit of interactive access to important regulatory information.

"The people we have demonstrated it to have been enthusiastic," added Dr. Hay.

The model, available at www.hydrogensociety.net/VFS, is undergoing continuous improvement. The recent additions of components to enhance fuelling station scenarios are now under review to ensure that the database information for various jurisdictional standards is accurate.

Gary Howard, formerly of Stuart Energy Systems (now with Hydrogenics), contributed to the C&S Working Group's development of emergency response guides for light-duty and heavy-duty fuel cell vehicle and hydrogen fuelling stations. These projects are in collaboration with the California Fuel Cell Partnership (CaFCP).

The guides provide emergency procedures for operators of hydrogen fuel cell vehicles and fuelling stations. These materials are expected to serve as templates for regional authorities to develop site-specific guides.

Guides covering light duty and heavy-duty vehicles are now available on the CTFCA member website. A hydrogen fuelling station guide is also complete and will be posted soon. □

Revisions to Canadian codes are key to H_2 introduction

Ongoing work to review and revise the Canadian Hydrogen Installation Code (CHIC) is helping facilitate the approval of CTFCA hydrogen demonstration projects in Canada and building a pathway to commercialization.

Randy Dey, President of The CCS Global Group Inc., said a technical committee of the Bureau de normalisation du Québec (BNQ) is currently developing the CHIC.

Mr. Dey, Chair of the BNQ Technical Committee, said the CHIC will cover installation requirements for new hydrogen technologies, such as hydrogen generation and dispensing equipment, storage containers, piping systems and related accessories.

A second draft of the CHIC was circulated to BNQ technical committee members on December 29, 2004 and is scheduled for completion in the fourth quarter of 2005. While the draft is not yet available to the public, Mr. Dey is enthusiastic about its development.

"This brings us a step closer to the publication of a code that will be an important tool for industry and regulators regarding the introduction of hydrogen in energy applications for home and office heating, generation of electricity and transportation in Canada," noted Mr. Dey. □

the road ahead

CTFCA C&S Working Group members are attending the following gatherings:

SAE World Congress, Detroit, MI, April 11-14
The SAE World Congress provides the foremost technical program on advanced technology and relevant engineering techniques for the automotive industry.

H_2 a part of the mix: Integrating with existing fuelling stations

C&S Working Group projects answering fundamental questions about hydrogen fuel risks are bringing industry closer to installing hydrogen technologies in existing fuelling stations.

Dr. Andrei V. Tchouvelev, formely Vice President Codes and Standards, Stuart Energy Systems, and now President & CEO of A.V. Tchouvelev & Associates, Inc., led a project developing scientific and engineering guidelines for clearance distances and hazardous locations classification for hydrogen releases. He said these projects were completed in third quarter 2004.

The complete project report, including these recommendations, has been issued to the BNQ CHIC Technical Committee for its review. The report represents the first time that model codes development has been based on both hydrogen volume and pressure.

Dr. Tchouvelev is also leading the Canadian contribution to the International Energy Agency (IEA) Task 19 Hydrogen Safety program. Among their contributions, Canadians are looking at the Task 19 risk management program, including a risk assessment methodologies survey, probability and consequence analysis; CFD modelling; hydrogen component test program and failure database development; stakeholder outreach; and comparative quantitative risk assessment of hydrogen and CNG fuelling stations.

Joe Wong, Manager, Infrastructure Programs at BC Hydro's Powertech Labs, said the results of risk analysis obtained for CNG could probably be extended to hydrogen. "CNG and hydrogen have similar properties in a sense that they are both buoyant (lighter than air) flammable gases that require compression to high pressure in order to store them," he said.

Dr. Tchouvelev will present project developments at an upcoming CTFCA meeting in Vancouver. "Any discovery we make, whether positive or negative, is very useful," he said. "There is a lot of uncharted water, but we are making good progress."

An IEA expert workshop will be held in Paris in March to finalize the Task 19 three-year work plan. □

Strong collaboration accelerates hydrogen sensor standards

An international team of hydrogen technology experts is developing requirements that will set a standard for fuel cell vehicle sensors worldwide.

The Fuel Cell Vehicle Oxidant Outlet H_2 Sensor Project is a collaborative effort involving Ballard Power, Hydrogenics, Greenlight Power, NRC, AECL and hydrogen sensor suppliers from around the world. The project is developing a document that outlines testing specifications and other requirements for a sensor that monitors fuel cell system compliance with safety and certification guidelines.

Leading the oxidant outlet hydrogen sensor project is Ballard Power Senior Reliability Engineer Robert Holland. He reports that, while the project is in its early stages, it is moving forward on schedule.

"Parts for the test station are being purchased and the station is being built. We should have the test station delivered to NRC at the end of April and ready to start testing in June 2005," he said. "By June 2006, all of the reporting and testing should be complete."

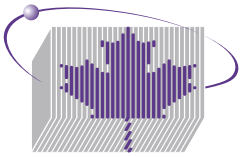
General test results will available to CFTCA members and international standards organizations when completed. Sensor test results will be available to each supplier confidentially. □

C&S Annual Conference, Kelowna, BC, June 19-24
This important conference will explore current issues and workable solutions for climate change and infrastructure.

CTFCA C&S Working Group meeting, Toronto, ON, May 26
This meeting coincides with the H_2 Village Workshop on May 25 and the EECO conference also taking place in the Toronto area that week.

Scope

The CTFCA C&S Working Group is focused on three primary tasks:



Codes and Standards Development

The C&S Working Group is focusing its efforts on the adoption and implementation of national and international standards related to fuel cell and hydrogen systems including storage, fuelling station configurations and locations, and fuelling interfaces with vehicles. As a guideline, this work will exploit to the extent possible the adoption, adaptation and development of international standards while maintaining compatibility with NAFTA and WTO considerations. The goal is to ensure seamless integration of hydrogen and fuel cell technologies into the federal and provincial regulatory systems to facilitate electrical, gas, building and fire inspections by the local authorities and thereby expedite the implementation of technology demonstration projects.

Information Dissemination

The objective of this task is to produce comprehensive materials documenting the work of C&S and organize and distribute this information to the stakeholder community including regulatory officials, project developers, the general public and advisory bodies working with C&S in the adaptation of model codes to accommodate hydrogen. The CTFCA Communications Working Group is responsible for external communications.

Fundamental Safety Analysis

The objective of this task is to create the fundamental scientific data that supports safe and practical standards and regulations. This work, some of which is being done in conjunction with international bodies such as the International Energy Agency (IEA), will be presented to both national and international standards development organizations where relevant.

Mission

To facilitate the development and market implementation of practical and safe codes and standards in support of:

1) CTFCA demonstration projects

2) broader utilization of hydrogen as an energy carrier within Canada, for transportation applications.

www.ctfca.nrcan.gc.ca

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