

APPENDIX 4

BREFING NOTE ON HYDROGEN CODES & STANDARDS EU and ISO

for

The European Integrated Hydrogen Project

by

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November, 2002

Executive Summary

At the June 14, and 15, 2002 **International Standards Organization TC 197** meeting in Montreal, Canada , two new work item proposals (NWIP) were unanimously approved. The first new work item proposal is for an International Standard for “Hydrogen generators using fuel processing technologies” (ISO/TC 197 N238, 2002-07-31) and the second work item is the “Transportable gas storage devices – Hydrogen absorbed in reversible metal hydride” (ISO/TC 197 N239, 2002-07-31). ISO will circulate the two NWIPs to the member countries of ISO TC 197 for a three month vote (7-31 to 11-13). If the NWIPs are approved the new work items will be assigned to an existing working group, or a new working group may be formed.

ISO TC 197 has formally asked the SAE for approval to adopt the SAE J2600 connector standard as the working draft for the Working Group (WG). A copyrighted version of the SAE standard has been circulated to the WG members. Comments from the WG will be reviewed at the WG meeting September 19/20, 2002 in Las Vegas. Assuming all comments are resolved at the Las Vegas meeting, the draft will be circulated as a Draft International Standard (DIS)

The **European Integrated Hydrogen Project (EIHP)** was conceived in the late 1990's to fulfill the need for harmonized legal requirements within Europe to assist the development and introduction of hydrogen powered vehicles

Two proposals were developed in EIHP1, “Draft Regulation Document for Compressed Onboard Storage System for Liquid Hydrogen” (on 8th revision, 9th revision to be issued shortly) and “Draft Regulation for Liquid Hydrogen” (11th revision complete, 12th revision to be issued shortly). The draft regulation for compressed hydrogen consists of:

- Specific Components of Motor Vehicles Using Compressed Gaseous Hydrogen
- Vehicles with regard to the Installation of Specific Components for the Use of Compressed Gaseous Hydrogen

The draft regulation for liquid hydrogen consists of:

- Specific Components of Motor Vehicles Using Liquid Hydrogen
- Vehicles with Regard to the Installation of Specific Components for the Use of Liquid Hydrogen

EIHP2 has also developed a “Draft on Gaseous Hydrogen Installations and Vehicle Refuelling Stations”. This draft has useful summaries on offsets and design issues.

Finally, US DOE will provide a link to EIHP to the US DOE comprehensive **Codes & Standards Matrix**. The matrix is being refined, i.e., significant input from API, and will be sorted by the different applications. This new layout will improve the understanding of what Codes & Standards are necessary to build a hydrogen service station.

1 Introduction

This briefing note focuses on activities in Codes and Standard development in ISO and EIHP. It was compiled by Jim McGetrick of BP.

Development of Codes and Standards has grown dramatically over the last year. This briefing note summarizes the activities of ISO and EIHP. Reiner Wurster of the European Integrated Hydrogen Project (EIHP), Bob Mauro of the National Hydrogen Association (NHA), and Jim Uhi of the National Renewable Energy Lab (NREL), graciously supplied input to the briefing note.

2 International Organization for Standards (ISO) Technical Committee 197

At the June 14, and 15, 2002 ISO TC 197 meeting in Montreal two New Work Item Proposals (NWIP) were unanimously approved. The first new work item proposal is for an International Standard for “Hydrogen generators using fuel processing technologies” (ISO/TC 197 N238, 2002-07-31) and the second work item is the “Transportable gas storage devices – Hydrogen absorbed in reversible metal hydride” (ISO/TC 197 N239, 2002-07-31). The scope of proposed project on Hydrogen generators using fuel processing technologies follows:

- 1.1 The document is to be a product safety and performance standard suitable for conformity assessment as stated in IEC Guide 104:1997, ISO/IEC Guide 51:1999 and ISO/IEC Guide 7:1994.
- 1.2 The standard is to apply to packaged, self-contained or factory matched hydrogen generation appliances, herein referred as hydrogen generators, that convert a hydrocarbon fuel to a hydrogen rich stream of composition and conditions suitable for the type of device (e.g. fuel cells) using the hydrogen.
- 1.3 For the purposed of the standard, a hydrogen generator shall be a configuration of the following assemblies: Fuel Processing System, Fluid Management System, Thermal Management System, Automatics Control System Electrical System, and Enclosure.
- 1.4 Hydrogen generation appliance that use water electrolysis processes are to be excluded from the scope of the standard (dealt with by WG 8).
- 1.5 Hydrogen generators examined for compliance with the standard shall be for use with: Natural gas; liquefied petroleum gases; kerosene, diesel, gasoline (or other petroleum-derived liquids) and/or methanol, ethanol, biodiesel (or other liquid organic fuels).
- 1.6 The standard is to be applicable to stationary hydrogen generators intended for indoor and outdoor commercial, industrial and residential use.
- 1.7 The standard shall contemplate all significant hazards, hazardous situations and events, with the exception of those associated with environmental compatibility (installation conditions) and disposability, relevant to hydrogen generators, when they are used as intended and under the conditions foreseen by the manufacturer

The scope of the “Transportable gas storage devices - Hydrogen absorbed in reversible metal hydride” is:

“This project will develop standards for the safe design and use of transportable gas storage devices, valves and pressure relief devices, intend for use with a metal hydride, gaseous hydrogen storage system. This standard shall apply to refillable devices only.”

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3 European Integrated Hydrogen Project (EIHP)

EIHP was conceived in the late 1990's to fulfill the need for harmonized legal requirements within Europe to assist the development and introduction of hydrogen powered vehicles. Legal requirements are different to standards in that they are legally binding and often have a much slower amendment process that take place through different bodies. Within Europe, legal requirements are known as **regulations** or **directives** depending on their source. European and some non-European countries, require an authority together with a technical service undertaking approval testing, to assess compliance of components and the vehicle with legal requirements. This process is known as **type approval**. In contrast North America use the **self-certification process**.

In 1998 partial EU funding was secured for a 10-partner project involving many major multi-national organizations. The follow up 3 year EIHP2 project (to be completed in early 2004), has an expanded partnership of 20, including major North American based companies and 5 major vehicle manufacturers. The project now extends to refueling infrastructure and the vehicle interface.

Proposals for legal requirements will be developed based on the framework of the United Nations Economic Commission for Europe Working Party 29 (ECE WP29) as it is recognized as the World Forum for the Harmonization of Vehicle Regulations. Initially EIHP proposals were developed under the “1958 Agreement” which is based on the **type approval** process, and therefore could not be applied within North America, which was not a member of the 1958 agreement. To develop truly **Global Technical Regulations**, (GTR) a new framework has been developed by ECE WP 29 based on the 1998 agreement, which includes North America. This new concept called **Global Technical**

Regulations (GTR) are technical requirements that allow the use of different approval processes and eliminates the major obstacles to global harmonization of legal requirements for vehicles. Legal requirements will be based on GTR and where standards are necessary they should be focused through the International Organization for Standards (ISO).

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