

IX.4 International Standards and Regulations

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Projected End Date: Project continuation and direction determined annually by DOE

Objectives

- Support and facilitate development of Global Technical Regulations (GTR) 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)
- Work with U.S. Department of Transportation/National Highway Traffic Safety Administration (DOT/NHTSA) and U.S. Environmental Protection Agency (EPA) to coordinate the U.S. position on the development of international hydrogen/fuel cell codes, standards, and regulations that are performance-based

Technical Barriers

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

- 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

Technical Targets

Since the development of the model codes and domestic and international standards is a voluntary industry-led process, the federal government can influence, but cannot direct this process. The Codes and Standards program element activities focus on assisting the commercial acceptance of hydrogen and fuel cell technologies.

Approach

Coordinate the harmonization of international standards

- Facilitate the development of U.S. consensus for international standards
- Facilitate a unified approach to standards development

Accomplishments

- U.S DOT/NHSTA representative to the Informal Group officially announced U.S. co-sponsorship of the GTR proposal
- Sub-working Group on Environment and Emissions formed (European Commission/Joint Research Centre [EC/JRC] is lead) and first meeting held (April 28-29, 2005)

Future Directions

- Provide technical expertise to the development of international regulations for hydrogen and fuel cell vehicles

Introduction

The development of performance-based and harmonized international codes, standards and regulations is critical to fair and open competition in worldwide markets for hydrogen and fuel cell vehicles. Teaming with DOT, DOE has played a key role in redirecting efforts that could have resulted in design-specific regulations for on-board hydrogen storage. Through active participation in the United Nations/Economic Commission for Europe (UN/ECE) World Harmonization of Vehicle Regulations (referred to as WP.29) and its efforts on hydrogen and fuel cell vehicle regulations, further

consideration of two draft design-specific regulations on liquid and compressed hydrogen storage was suspended. The U.S., in collaboration with representatives from Europe (primarily Germany) and Japan, led an effort to develop a roadmap to a GTR. This roadmap effort is strongly supported by the leadership of WP.29 as a path forward to a promising hydrogen future, wherein we will "not sacrifice the long-term for short-term political issues." The GTR process (the 1998 agreement) is significantly different from the ECE regulation/directive process (the 1958 agreement), as described in Table 1.

Table 1. Comparison of the UN/ECE 1958 and 1998 Agreements

Issue	1958 Agreement (ECE Regs)	1998 Agreement (GTRs)
Contracting Parties	European countries (33) European Community Japan (signed in 1998) Australia (2000), South Africa (2001) New Zealand (2002)	US Japan European Community Canada, European countries Russia, China, Korea...
Principal Elements	Conditions for granting type approvals and their reciprocal recognition by Contracting Parties Does not preclude membership by countries who use the self-certification process ("alternate to type approval")	Does not contain provision for mutual recognition of approvals Allows authorities to adopt and maintain technical regulations that are more stringent Two pathways: harmonization of existing (recognized) standards or regulations, or establishment of new GTR where there are no existing standards or regulations
Voting	2/3 majority of Contracting Parties who are present and voting	Quorum = at least half of all Contracting Parties Have to be present to vote Existing regulation is added to the Compendium of Candidate Global Regulations if supported by 1/3 of the present and voting Parties, including the vote of Japan, EC, or US New GTR: consensus vote (unanimous) of Contracting Parties present and voting – if voting against, must provide an explanation within 60 days. If the Contracting Party fails to provide the explanation, vote is changed to affirmative
New/revision enters into force	If (within 6 months) fewer than 1/3 of all Contracting Parties object	A contracting Party can decide not to adopt the established GTR into its own laws or regulations. Has to notify The Secretary-General in writing and has to give a reason (within 60 days of making decision) A Contracting Party that has not adopted the GTR or made a decision not to adopt within one year has to report to the Secretary-Ge (yearly)

Approach

In 2004, the U.S. led an effort, in collaboration with representatives from Europe (primarily Germany) and Japan, to develop a roadmap to GTRs. This effort was strongly supported by the leadership of WP.29 as a path forward to a hydrogen future. Four possible routes were proposed:

- Direct to a single GTR (no intermediary GTRs or regulations)
- Layered single GTR
- Modules, where multiple parts of a GTR are developed in parallel and combined into one GTR
- Modules, where multiple parts of a GTR are developed in parallel and are approved as GTRs (unknown number)

Results

DOT strongly favors the first approach and considers the others as just variations on a (component) theme. The Europeans are very concerned about the first approach (Direct to a Single GTR), since they see no pathway to approve fuel cell vehicles until the GTR is approved, and that is not likely before 2010. In Europe, vehicles must currently conform to more than 100 ECE directives or regulations, and many of the existing regulations will apply to hydrogen fuel cell vehicles. Therefore, they believe that only a few additional regulations are needed for hydrogen and fuel cells, if one follows a component approach.

In March 2005, the Japanese government issued a comprehensive regulation for hydrogen vehicles and refueling infrastructure. Since Japan uses a type-approval process (as do the Europeans) and they used a systems approach (favored by the U.S.) in developing the regulation, this comprehensive regulation is expected to be proposed as the basis for a one-step GTR.

Conclusions

Careful study of the Japanese regulation and evaluation of the supporting data, will be essential to the rapid and appropriate development of a GTR for hydrogen and fuel cell vehicles.

FY 2005 Publications/Presentations

1. Hydrogen Energy, Chapter in 2005 Kirk-Othmer Encyclopedia of Chemical Technology.
2. The Shape of the Hydrogen Economy, 2005 New Mexico Youth Conference on the Environment, April 2005.
3. Domestic Hydrogen and Fuel Cell Codes and Standards - Status of US Activities, 13th meeting of the GRPE Informal Group on Hydrogen/Fuel Cell Vehicles, Ispra, Italy, April 2005.
4. The Shape of the Hydrogen Economy, Los Alamos Education Group, April 2005.
5. A System Perspective for the Hydrogen Economy, Institute for Hydrogen and Fuel Cell Research Seminar Series, March 2005.
6. Hydrogen Basics, Technical Seminar, New Mexico Hydrogen Business Council Meeting, February 2005.
7. Global Technical Regulation, Codes & Standards Tech Team, February 2005.
8. The DOE Hydrogen Program: Overview of Technology Roadmap and Implementation, China Hydrogen Roadmap Workshop, Beijing, China, January 2005.
9. China Hydrogen Roadmap: Hydrogen Production and Delivery, China Hydrogen Roadmap Workshop, Beijing, China, January 2005.
10. Assessing Leaks in a Global Hydrogen Infrastructure: Can it Perturb the Natural Hydrogen Cycle? American Geophysical Union, San Francisco, December 2004.
11. Global Technical Regulations, USFCC, Troy, Michigan, December 2004.
12. Hydrogen Demonstration, Fuel Cells, and Transportation, 3rd Joint Working Group Meeting, Chicago, November 2004.
13. Energy Secretary's Hydrogen Learning Workshop, Annapolis, Maryland, September 2004.

References

1. "World Forum for Harmonization of Vehicle Regulations (WP.29): How it works, How to join it," United Nations Publication, UCE/TRANS/NONE/2002/12 (2002).