

**International Energy Agency
Hydrogen Implementing Agreement
Semi-Annual Progress Report – May 2009**

Task 19 – Hydrogen Safety

Task Background

The purpose of this task is to develop a better capability of predicting risks and hazards in the absence of actual operating experience. Without such experience or a well-developed infrastructure for the use of hydrogen fuels in consumer environments, evolving codes, standards or local regulations could become unnecessarily restrictive or burdensome to early adopters. Therefore, better predictive techniques and experimental data are needed to facilitate the acceptance and approval of these new technologies until such operating experience is obtained.

Task Description

This task is aimed at reducing the safety related barriers to widespread adoption of hydrogen energy systems. It is being accomplished within three subtasks:

- **Subtask A. Risk Management:** the conduct of quantitative risk analyses (QRA) and development of testing methodologies around which collaborative testing programs can be conducted.
- **Subtask B. Experimental Testing:** to close knowledge gaps on consequences of equipment or system failures and effects of mitigation measures through a collaborative testing program.
- **Subtask C. Information Dissemination:** A program to develop targeted information packages for stakeholder groups.

Activities during the previous six months

Activities conducted since the last semi-annual report for the ExCo meeting in Athens were the planning, conduct and documentation of the experts meeting in San Francisco, March 21-23, and contributing to the End of Term report. We also began a major revision of the Task 19 web site to put all task information not yet published behind a password protected area.

Major Accomplishments

We began detailed planning to conduct the task according to the approved work plan for the follow-on period 2007 – 2010, however discussion are underway to revised the work plan to be consistent with the level of effort committed to the task. Several countries have continued to support the task, but National Participation Letter have not bee received. A key question remains as to what level of effort would be made to the task for the completion of the work through October 2010. Individual participating experts were asked to discuss what their respective contributions and if a sufficient commitment could be made. The task work plan lays out a plan of work which will accomplish the Task Objectives and help establish the technical basis for the

required codes and standards for the commercial application of hydrogen systems (See Attachment 2). After the National Participation Letters are received, the work plan will be modified, as necessary, based on the actual resources committed by participating countries in the National Participation Letters. A template for the National Participation Letter for this task was attached to the last semi-annual progress report submitted in October 2007 and that report also indicated that a template was also available for download on the task 19 web site (www.ieah2safety.com). However all of the required commitment letters have not been received by the operating agent, and a separate request will be sent out prior to the ExCo meeting in San Francisco. Until recently this has not created a problem getting most of the work done. However two subtask leader have had to resign, because they did not receive sufficient support to fulfill the duties of subtask leaders. This is primarily an issue of knowing that we will have the needed resources to complete the products anticipated at the end of the follow-on period (October 2010).

A meeting Task 19 experts was held April 21-23, 2009 in San Francisco, California. This was the ninth meeting and was extremely successful. The meeting was hosted by the U. S. Department of Energy and Sandia National Laboratories. We had several guest presentations from the National Institute of Standards and Technology, Stanford Research Institute and by Susan Shoenung, Operating Agent for Task 18.

Everyone agreed that this was an exceptionally productive meeting and showed that the task 19 experts have formed an effective group for exchanging information and addressing the international issues of hydrogen safety. Several commented that this was the best meeting to date for the task.

One of the purposes of the meeting was to plan activities for the remaining 18 months of the task. Achieving that purpose of the meeting was made difficult by the fact that National Participation Letters have still not been received from all participating countries. Several experts indicated that they had not yet been funded for their participation in the collaborative efforts of Task 19. The minutes of the meeting will be posted to the Task web site in May.

Status of Milestones

All milestones for the first three years have been completed. Specific milestones for the follow-on three year period will be set upon receipt of NPL's.

Products completed during Phase I of the collaboration.

- **Risk Assessment Methodologies Survey**

The Risk Assessment Methodologies Survey has been completed and has been submitted to the Secretariat and posted on the Task 19 web site. As stated in the previous SAP, the report will be updated during the follow-on period to include additional information on:

- Ignition probabilities;
- Risk criteria; and
- Consequence tools

- **Review and Analysis of Risk Assessment Studies**

This document has been completed and has been submitted to the Secretariat and posted on the Task 19 web site.

- **Knowledge Gaps White Paper**

This document has been completed and has been submitted to the Secretariat and posted on the Task 19 web site.

Activities and Milestones for Next Six Months

As has been reported in the last two semi-annual reports the task still needed to determine the level of participation committed to the task through National Participation Letters. This has been reported as an issue since September 2007. The issue has been brought to the Executive Committee's attention in the previous three ExCo meetings. Sadly, insufficient commitment letters have been received to allow the operating agent and the subtask leaders to plan the final two years of the task.

The task has developed a very detailed work plan that depends on contributions from all experts, but failing full participation, the work plan and planned products will have to be adjusted to accommodate the available resources. We will continue to try to get that information and set the scope and schedule of task products during the next few months.

Effectiveness of Task Participation

The Task 19 experts have had the benefit of the last three years of collaboration, have gotten to know each other and have now formed a cohesive collaborative effort. The only other effort that addressed this subject is the HySAFE activity, a European collaboration that will end in March 2009. Efforts are underway to form an international version of HySAFE (*The International Association of HySAFE*), but it has not yet been fully funded or become operational. This has left the IEA Task 19 on Hydrogen Safety as the most significant international collaboration on hydrogen safety. We believe that this collaboration is creating knowledge and products that will be crucial to the increased adoption of hydrogen energy technologies as the price of oil continues to increase. Hoagland is continuing to discuss with Thomas Jordan the organizer and director of IA Hysafe about the possibility of the IEA/HIA Providing support to the International Conference on Hydrogen Safety and they are sending a proposal to the Executive Committee for consideration at this meeting. Hoagland will discuss this at the ExCo meeting.

Schedule of future experts meetings

- September 2009, Corsica, France, in conjunction with the Third International Conference on Hydrogen Safety (location to be determined).
- Spring 2010, tentatively in Germany in conjunction with World Hydrogen Energy Conference.

Open Items

1. Receipt of National Participation Letters.
2. Consensus on support of ICHS3.

Matters Requiring Executive Committee Attention