FOREWORD

SPECIAL ISSUE ON NUCLEAR HYDROGEN PRODUCTION, CONTROL, AND MANAGEMENT

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This issue of *Nuclear Technology* features selected papers from the First International Topical Meeting on the Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH_2), an embedded topical meeting held during the annual meeting of the American Nuclear Society (ANS) in Boston, Massachusetts, in June 2007. The ST-NH_2 topical meeting was sponsored by the Nuclear Installations Safety Division and the Environmental Sciences Division's Working Group on the Nuclear Production of Hydrogen. Fuel Cycle and Waste Management and Thermal Hydraulics were cosponsoring divisions. Mr. Carl Sink, Program Manager of the U.S. Department of Energy's (DOE's) Nuclear Hydrogen Initiative within the DOE Office of Nuclear Energy, was the General Chair, and Dr. Paul Kruger, Professor Emeritus of Stanford University, was the Honorary Chair. The opening keynote speaker, Mr. Jeff Serfass, President of the National Hydrogen Association, gave an insightful discussion from a broad hydrogen industry perspective entitled, "Hydrogen, For All the Right Reasons."

The ST-NH_2 topical meeting provided a forum for nuclear hydrogen safety and technology professionals to exchange information, present results from new work, review the state of the art, and discuss future directions and needs for development of the hydrogen options. Over sixty papers and presentations were given in thirteen panel and paper sessions over a three-and-a-half-day span.

The meeting covered major initiatives globally in nuclear hydrogen research and development, and safety work, featuring the following:

1. Hydrogen production through nuclear energy (sulfur-iodine cycle, hybrid sulfur-electrolysis cycle, high-temperature steam electrolysis, and alternate thermochemical cycles), nuclear hydrogen safety, reactor–hydrogen plant interface, incorporation of nuclear hydrogen into synthetic fuel production, and environmental aspects

2. Major international participation, especially highlighted in the session, "An International Overview of Nuclear Hydrogen Programs," which was developed and chaired by Dr. Gail Marcus. Dr. Marcus' summary paper captures key information presented by representatives from the International Atomic Energy Agency, China, France, Japan, Republic of Korea, Russia, and South Africa.

3. Eight national laboratories, sixteen universities, and ten consulting companies provided leadership on the Technical Program Committee, chaired sessions, authored papers, and otherwise contributed to the success of the meeting. Experimental and analytical activities from the primary U.S. programs are discussed in a series of papers

beginning with "The High-Temperature Electrolysis Integrated Laboratory-Scale Experiment" by Stoots et al.

The papers included in this special issue were selected by ST-NH_2 session chairs and the technical program committee to capture the most noteworthy advances and new information in nuclear hydrogen work from around the world. The authors were then invited to update their embedded topical papers and submit them for additional peer review for this special issue.

We believe that these selected papers provide the nuclear hydrogen community a timely overview of progress on the nuclear and chemical technology, plant integration, and safety and environment fronts. We trust that you will find the papers in this issue both interesting and stimulating, and a fitting preface to the second ANS embedded topical meeting in this series (2IST-NH_2), which is scheduled for San Diego, California, in June of 2010.