

Foreword

Special issue on the 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics

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This special issue of *Nuclear Science and Engineering* features selected papers from the 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-16), which was held in Chicago, Illinois, from August 30 to September 4, 2015. In addition to this special issue, two more special issues are being published in *Nuclear Technology* and *Nuclear Engineering and Design* for other selected NURETH-16 papers.

The International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH) provides a forum for scientific and engineering advancement in the fields of fluid flow, heat transfer, and safety assessment for nuclear energy system applications. The history of the highly successful NURETH series goes back more than 35 years. The inaugural meeting of the NURETH series was held in 1980 in Saratoga Springs, New York, and hosted 14 technical sessions with 108 papers, 9 keynote addresses, and 5 “state of the art” addresses. Since then, the NURETH meetings have carried forward many traditions, such as daily keynote addresses that present the leading-edge developments in the field and recognizing the authors of the best papers of the conference. Most importantly, the NURETH tradition continues to emphasize the publication and discussion of high-quality scientific and engineering papers that provide direction for nuclear research and industry. Proceedings of NURETH and special issues consisting of a collection of selected papers in technical journals, such as this one, continue to serve as a guidepost marking the evolution of the field of nuclear reactor thermal hydraulics from engineering prototyping to new phenomenological understanding.

Currently, nuclear energy is faced with a number of challenges including continued efficient operation and safety enhancement of the existing fleet with lessons learned from the 2011 Fukushima Daiichi accidents. The industry itself recognizes the ultimate importance of ensuring the overall safe and reliable operation of nuclear power plants. Thermal hydraulics research and development play an important role in support of this objective. Bearing in mind the global nature of these nuclear technology issues, it is essential that professional forums, such as NURETH, continue to provide an international setting to foster the exchange of ideas and critical information and to enhance cross-fertilization of research and development activities through our professional community.

In 2015, NURETH-16, sponsored by the American Nuclear Society’s Thermal Hydraulics Division and co-sponsored by a number of international nuclear societies, brought nearly 700 thermal hydraulics experts from around the globe to Chicago, to discuss the developments of today and look to the needs and opportunities of the future. A total of 984 abstracts were submitted, over 750 draft papers were reviewed, and finally, 677 papers were accepted as either oral or poster presentations at this 16th edition of the NURETH tradition.

One of the key challenges that faced the NURETH-16 Technical Program Committee (TPC) after the meeting was to revisit all of the presented papers and to make recommendations of outstanding papers of archival value for publication in leading scientific journals in nuclear science and engineering. The TPC and guest editors coordinated the selection of a limited number of NURETH-16 papers for consideration in

these technical journals, based on both the reviewer comments and session chair recommendations. The authors were then invited to update their papers before submitting them for additional peer review for these special issues.

This special issue of *Nuclear Science and Engineering* is one of the most comprehensive compilations of the state of the art in nuclear reactor thermal hydraulics today. This topic will continue to draw the attention of industry and academia to further ongoing research activities worldwide. In achieving this, sincere appreciation is expressed to the contributing authors and reviewers for their time and effort to make

this special issue possible as well as the members of the Organizing Committee and the TPC for their contribution to the NURETH-16 conference and to this issue. Professor Dan Cacuci, editor of *Nuclear Science and Engineering*, has been enormously supportive and helpful in the production of this special issue. The time and effort that Mary Edsey and John Fabian devoted to this project were invaluable. The suggestions and support from all involved in this exciting publication endeavor are greatly appreciated.

On behalf of the NURETH-16 TPC, enjoy this NURETH-16 special issue of *Nuclear Science and Engineering*!