

Foreword

Selected papers from the 20th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-20)

Guest Editors

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This issue is part of a combined set of special issues of *Nuclear Technology* and *Nuclear Science and Engineering* that contain full-length, peer-reviewed papers presented at the 20th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-20), held August 20–25, 2023, in Washington, D.C. Meetings in the NURETH series are held every two years and allow experts from all over the world the opportunity to discuss and explore the state of the art in nuclear reactor thermal hydraulics. Held since 1980, NURETH is widely recognized as the leading meeting for the worldwide nuclear thermal hydraulics community. It is also the flagship of the Thermal Hydraulics Division of the American Nuclear Society (ANS).

The 20th edition of NURETH marked a return to the meeting's traditional in-person format following the COVID-19 pandemic, which forced the postponement and a virtual format for NURETH-19. NURETH-20 included a wide range of topics in the field of thermal hydraulics associated with conventional and advanced nuclear reactor designs. More than 800 abstracts and 500 draft papers were submitted to the meeting. Ultimately, 510 papers were accepted and presented over the five days of the conference.

NURETH-20 was organized with eight technical tracks spread over eleven concurrent technical sessions. The eight technical tracks included fundamental thermal hydraulics; computational thermal hydraulics; experimental thermal hydraulics; verification, validation, and uncertainty quantification; water-cooled reactor operation and accident analysis;

severe accidents; new and advanced reactors; and a special topics track. Special topics considered topical areas of interest including thermal hydraulics of fusion reactors, liquid metal heat transfer, international thermal hydraulics programs, and artificial intelligence. The conference also hosted nine panel sessions involving experts on a range of current topics.

The opening plenary revolved around the conference's theme, "Innovations in Nuclear Thermal Hydraulics." Eleven keynote speakers highlighted state-of-the-art developments. The conference also hosted presentations to colleagues receiving the Bal-Raj Sehgal Memorial Award and the ANS Thermal Hydraulics Division's Technical Achievement Award. Our opening plenary celebrated 40 years of NURETH conferences with remarks by several distinguished industry representatives and thermal hydraulics researchers.

Following NURETH-20, the technical program committee had the challenging yet rewarding task of down-selecting the list of papers for these special issues. The committee combined the recommendations of reviewers and session chairs. The result was the selection of the articles appearing across these two special issues, representing a collection of cutting-edge research in thermal hydraulics. Topics in these issues include experimental, computational, and analytical evaluations of various aspects of thermal-hydraulic phenomena related to the practical application of nuclear science and technology. Papers have been revised from their original form and

expanded to include additional content. Readers will find these topics of great interest and derive significant value from this compilation.

Finally, we would like to thank the reviewers who volunteered their time and expertise to review the papers for these special issues of *Nuclear Technology* and *Nuclear Science and Engineering*. We would also like

to thank Dr. Yassin Hassan and Dr. Farzad Rahnema for their support and providing their leadership in producing these special issues. We also thank Mr. David Strutz, who has been instrumental in getting these issues published on a timely basis. Finally, we would like to thank the attendees and authors of NURETH-20, who made this outstanding conference a success.