

# Foreword

## Selected papers from the NPIC&HMIT 2019 and 2021 Topical Meetings

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We are pleased to present this special issue of *Nuclear Technology*, which includes 17 papers based on work presented at the 11th and 12th International Topical Meetings on Nuclear Plant Instrumentation, Control & Human-Machine Interface Technologies (NPIC&HMIT 2019 and 2021, respectively).

The NPIC&HMIT topical meeting series, hosted by the American Nuclear Society Human Factors, Instrumentation & Controls Division, serves as the pre-eminent forum to present and discuss advances in research and practical applications in the parallel fields of nuclear power plant instrumentation and control and human factors engineering. Over 350 technical papers were presented across NPIC&HMIT 2019 in Orlando, Florida, and the virtual NPIC&HMIT 2021 meeting. Proceedings of the NPIC&HMIT topical meetings and published collections of selected papers, such as this special issue, document the evolution and major advances in instrumentation and control and human factors engineering for nuclear applications.

Over the past 12 instances of the NPIC&HMIT meeting series, the focus of technical content has expanded to include the current fleet of light water reactors, plus small modular reactors, advanced reactors, microreactors, and nonterrestrial reactors including for nuclear thermal propulsion and space applications. In all these application areas, NPIC&HMIT meetings attract the latest in research and development, practical applications, and licensing and regulation to provide a holistic view of instrumentation and control and human factors engineering issues facing the nuclear industry.

The nuclear industry is currently presented with interesting challenges and opportunities to expand the standard concepts of operation to establish nuclear power as an integral contributor to worldwide energy production. The fields of nuclear plant instrumentation and control and human factors engineering continue to develop and change as the nuclear industry evolves to meet current energy needs and climate goals. Advances in instrumentation, control, and human factors engineering are necessary to move beyond the current state of the operating nuclear fleet and regulatory basis in order to meet the vision of future nuclear power applications.

From the breadth of high-quality papers, presentations, and panel discussions presented at NPIC&HMIT 2019 and 2021, this special issue provides a small peek at the research, development, and demonstration work conducted by some of the world's foremost specialists in instrumentation and control and human factors engineering for nuclear applications. Our sincere appreciation is extended to the contributing authors and the technical reviewers for their time and effort to support this special issue.

We hope that you enjoy this special issue of *Nuclear Technology*, and we look forward to welcoming you to NPIC&HMIT 2023 in Knoxville, Tennessee, held July 15–21, 2023.

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