# Proceedings of 2021 28th International Conference on Nuclear Engineering

(ICONE28)

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#### ASME 28<sup>TH</sup> INTERNATIONAL CONFERENCE ON NUCLEAR ENGINEERING (ICONE28)

Dear Colleagues,

Greetings and Salutations to All! On behalf of the organizers of ICONE 28, I would like to extend to you my heartfelt welcome to the 28<sup>th</sup> International Conference on Nuclear Engineering. The year 2020 will forever be remembered for the COVID-19 pandemic and its resultant impact on our social and economic lives. Large in person social gatherings, including engineering conferences, are by necessity transitioning to virtual events. Following a very successful virtual ICONE 2020, Nuclear Engineering Conference powered by ICONE, we are sure that ICONE 28 will provide each of you a wonderful opportunity to have an energetic, shared, and comprehensive virtual conference.

As has been a long ICONE tradition, the ASME Nuclear Engineering Division is delighted to continue our collaboration with long-time partners; The Japan Society of Mechanical Engineers (JSME), and the Chinese Nuclear Society (CNS). We are all working together to promote a global nuclear resurgence. Together we continue to be a strong global voice for the nuclear community.

The conference will unfold in the virtual space, while being mindful of different time zones and preparations necessary for online participation including video recorded sessions. We hope that the virtual space will also create a rhythm and a platform for a continued scholarly exchange after the official conference dates, encouraging research and exchange of ideas on an ongoing basis. The virtual conference will feature both synchronous and asynchronous events, and discussion forums on an online platform, all of which will be pre- recorded and broadcast to ensure as wide participation as possible, given the international nature of the conference participants with different time zones.

As the premier nuclear engineering technical conference, ICONE is for nuclear professionals who want to stay technically current and on top of industry trends and developments. As always, the success of ICONE is due to the contribution of numerous professionals from industry, government, academia, and technical societies from around the globe. We at the ASME Nuclear Engineering Division would like to thank the Track and Session leaders who helped organize this conference. This conference will cover a wide range of topics in multiple tracks including: Operating Plant Challenges, Successes, and Lessons Learned; Nuclear Plant Engineering; Advanced Reactors and Fusion; Small Modular and Micro-Reactors Technologies and Applications; Nuclear Fuels, Research, and Fuel Cycle; Nuclear Codes & Standards; Thermal-Hydraulics; Computational Fluid Dynamics (CFD); Verification and Validation; Advanced Methods of Manufacturing (AMM) for Nuclear Reactors and Components; Decontamination, Decommissioning, and Radioactive Waste Management; Beyond Design Basis and Nuclear Safety; Risk Informed Management and Regulation; and supporting the future of our Industry, the Student Paper Competition. In addition to over three hundred technical presentations, ICONE 28 will present multiple plenary and panel sessions. The plenary and panel sessions will address key technical challenges and business issues facing the nuclear industry, featuring discussions with leaders from industry, academia, and government.

We will also hold a number of technical seminars/workshops, as well as the Nuclear Codes and Standards Seminar to expand the knowledge base of our profession. Lectures and discussions in those seminars will target a wide range of practitioners and young engineers to provide the basic principles, requirements, codes, standards, and best industry practices. Our thanks to our Conference Sponsor, Westinghouse, for their continued support of the Nuclear Industry in general and ICONE in particular. Special thanks go to the ASME staff and the reviewers for assuring the excellence of the technical papers. Finally, we recognize, honor, and say thank you to all the authors, keynote and plenary speakers, and panel participants who are the major contributors to the success of the conference. I cordially invite all of you to participate and support ICONE 28 activities. Together, we will make the conference a triumph and continue the success of our great industry as well as the Nuclear Community as a whole.

Clayton T Smith

Chairman, ASME Nuclear Engineering Division Conference Chair, ICONE 28

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