

Guest Editorial

Guest Editorial by Gilles Rodriguez



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It is an honor and a pleasure to wish to all actors of the ASME *Journal of Nuclear Engineering and Radiation Science* (Chair, Editors, Authors, Readers, and Reviewers) my New Year's greetings. This 2022 year must be seen toward an exit of the COVID-19 pandemic situation, looking for better perspectives. We must capitalize on the best of this period and on the way out of the health crisis. Even in this extremely difficult context, the links still

existed. They were even been strengthened by showing more solidarity, support, and mutual aid. We must keep these qualities within our scientific community because we must now face a new decisive challenge: responding to a very strong increase in carbon-free energy demand. In order to meet this challenge, nuclear energy has a major role to play among all other non-CO₂ emitting sources of energy. Its great flexibility and massive production capacity make it a perfect complement to renewable production systems.

At the Generation IV International Forum (GIF¹) we firmly believe that the six selected systems² (GFR, LFR, MSR, SCWR, SFR, and VHTR) will have a central position in the topology of the world nuclear reactors fleet—as well as in the new global energy paradigm—in the coming decades. The nuclear industry of tomorrow will have to offer a wide range of power supplies from the microreactor up to power reactors, without forgetting of course the promising various small modular reactors (SMRs). The next generation of reactors will have to give more diversified services beyond the production of electricity: delivery of industrial heat, production of massively hydrogen and organic molecules, contribution to a rapid transition of industrials toward decarbonization of their primary energy consumption. In this regard, the Generation IV International Forum has undertaken to adjust its organization internally to better address all of these challenges.



Moreover, GIF redesigned its logo to reaffirm and display outside its values: expertise—collaboration—excellence.

The New GIF Logo Since January 2021

The Gen-IV International Forum pays particular attention to all initiatives that contribute to the capitalization and dissemination of knowledge and scientific progress. Nuclear power is full of challenges (scientific, technical, and technological), all exciting for the younger generations. It is our role to disseminate this message. Therefore, the ASME *Journal of Nuclear Engineering and Radiation Science* holds a key position, as a benchmark scientific journal, but also as an aggregator of knowledge and nuclear future innovations.

This special session describes in detail the ESRF-SMART project. I take the opportunity of this editorial to salute the remarkable work of this project-team. ESRF-SMART is the perfect example that even in the most mature Gen-IV systems, there is room for innovation and improvement. R&D is a virtuous process that allows our Gen-IV systems to be continuously adjusted to the requirements of safety and the evolution of the economy and tomorrow markets.

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¹<https://www.gen-4.org/gif/>

²Gas Fast Reactor, Lead Fast Reactor, Molten Salt Reactor, SuperCritical Water-cooled Reactor, Sodium Fast Reactor, and Very High Temperature Reactor.