

Greetings From JSME PESD



**Professor
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It is my pleasure to say New Year's greeting to readers, reviewers, and editors of the ASME *Journal of Nuclear Engineering and Radiation Science* (NERS) as a chair of the Power Energy Systems Division (PESD) of the Japan Society of Mechanical Engineers (JSME). The ASME Journal of NERS is a very important scientific journal to share the latest research developments in the field of nuclear engineering and radiation science within the specialists in the nuclear/power engineering areas of industry, academia, and government. It is believed that this journal continues to contribute to the enhanced safety of nuclear power.

Japan's current energy situation is as follows. Ministry of Economy, Trade and Industry reported that Japan's self-sufficiency ratio was 9.6%, lower than other OECD countries in 2017. Of course, Japan is largely dependent on oil, coal, natural gas, and other fossil fuels that are imported from overseas. Following the Great East Japan Earthquake, dependence on fossil fuel in Japan increased and was 87.4% in 2017. In order to accomplish a "decarbonized society," Japan will explore every possible change to the energy supply structure and promote innovations. To accomplish a "decarbonized society" as early as possible in the second half of this century, we must gather wisdom of the world and move forward while exploring all possible options such as hydrogen, carbon recycling, renewable energy, batteries, and nuclear power.

The percentage of renewable energy power in Japan was 16% in 2017. Japan is ranked No. 6 in the world in terms of capacity of renewable energy generation capacity, and No. 3 in the world for solar power generation. Renewable energy excluding hydro-electric is 8.1% and hydro-electric power is 7.9%. The amount of electricity generated by renewable energy varies significantly depending on the weather and season. In order to ensure a stable supply, it is necessary to secure a means of energy storage by using renewable energy in combination with flexible output power sources such as not only thermal power generation and storage batteries but also nuclear power generation. It is necessary to maintain a balance between electricity generation and consumption so that consumers can have stable access to electric power. To this end, flexible power sources such as thermal and pumping-up hydraulic power generation are used to compensate for fluctuations in renewable energy output.

As of September 2020, reactors in operation is 9, reactors approved for installment license amendment is 6, reactors under assessment for new regulatory requirements is 12, and reactors that have not applied for assessment is 9. Reactors to be decommissioned is 24. For a country that lacks natural resources, nuclear power generation is essential in order to achieve the following three objectives: the first is securing a stable supply of power, the second is reducing electric power costs, and the third is reducing greenhouse gas emissions. In order for nuclear power plants to be restarted, conformance with new regulatory requirements that prioritize safety is required. The JSME PESD will continuously support the research and development activities of the nuclear energy and will send the significant information to the nuclear industry.

Finally, the research and development activities were much affected by the pandemic of COVID-19 in not only thermal and nuclear power but also renewable energy in 2020. Although the original ICONE-28 were postponed to 2021, the ASME's nuclear engineering conference powered by ICONE was held successfully by the virtual conference organized by the ASME, CNS, and JSME. The students and young researchers lost a chance to meet to overseas researchers and to discuss their research activities with them. They also have lost a chance to experience overseas culture. We found that we can well hold a national conference by the web meeting, but it is difficult to handle an international virtual conference, because there is a large time difference. Though such a severe situation, I hope students and young researchers will submit their latest research activities and results to the ASME Journal of NERS.

I wish the ASME *Journal of Nuclear Engineering and Radiation Science* continuous contribution to further development of nuclear engineering as a top world nuclear engineering journal. The JSME PESD will continuously support the development of nuclear engineering and radiation science areas for a sustainable society, collaborating with the ASME NED.

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