The importance of safe, secure and sustainable spent fuel management

By Yukiya Amano, Director General, IAEA

Nuclear power can help to address the twin challenges of ensuring reliable energy supplies and curbing greenhouse gas emissions. The 451 nuclear power reactors in operation in 30 countries today supply over 10% of the world's total electricity and a third of all low-carbon power. Nuclear power will continue to play a key role in the world's low-carbon energy mix for decades to come.

The safe, secure and sustainable management of spent fuel from nuclear power reactors is key to the future of nuclear energy.

This challenge is as much for policymakers as for engineers. In fact, technical solutions for the management of spent fuel exist, ranging from reprocessing and recycling, to conditioning spent fuel for disposal in deep underground repositories. Furthermore, research has established the feasibility of advanced processes, such as partitioning and transmutation, which have the potential to further reduce the impact of nuclear waste. The implementation of any selected strategy can take decades. Allocating the necessary resources to implement the strategy is often difficult.

The management of spent fuel involves a long-term commitment, and national strategies must be flexible enough to make it possible to integrate new technologies that will enhance and improve the efficiency, safety, security and sustainability of nuclear power.

In this edition of the *IAEA Bulletin*, we examine solutions from around the world. We explain Russia's integrated strategy to handle, at a single location, wet and dry storage, reprocessing, fuel fabrication and – eventually – high level waste disposal (p. 6). French experts tell us what makes their spent fuel management efficient (p. 8), while safe and secure transport is the focus of our article on spent fuel management in the United Kingdom (p. 12).

We profile joint research by Sweden and Finland into the development of underground repositories (p. 14). We consider how safeguards considerations can play a part in the design of spent fuel management facilities (p. 20), making life easier for both the operator and IAEA safeguards inspectors. We look into the future by discussing the approach countries new to nuclear power could take to spent fuel management (p. 10) and explore how the planned introduction of Small and Modular Reactors in some countries could affect spent fuel management (p. 11).

This year's IAEA International Conference on the Management of Spent Fuel from Nuclear Power Reactors: Learning from the Past, Enabling the Future is a follow-up to our previous conference on this subject in 2015. Back then, delegates emphasized the need for a more integrated approach to the fuel cycle, with more coordination between major players and decision-makers. This year, participants will focus, among other topics, on how the management of spent fuel can be affected by decisions taken at the front end of the nuclear fuel cycle and on sharing best practices and lessons learned in this area.

The IAEA will continue to assist Member States in the important field of spent fuel management by providing technical expertise and a platform for international exchange. I wish delegates a very successful conference.

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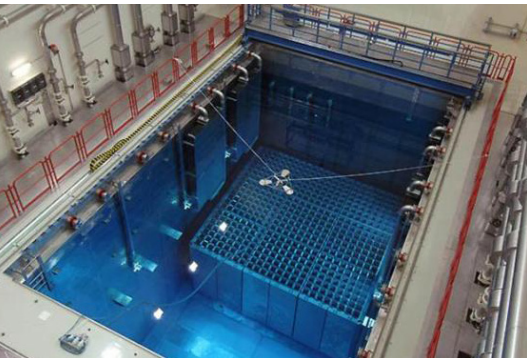
—Yukiya Amano, Director General, IAEA



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