

Editors' Note

This issue of the journal includes three articles that deal with Russia's nuclear power complex. Russia is a key player in the global nuclear power industry, with the fourth largest nuclear capacity in the world at about 25GWe. Rosatom, the state-owned corporation in charge of the Russian nuclear program has ambitious expansion plans that include the development of prototype commercial-scale plutonium-fueled fast-neutron-reactors. It is planning expanded reprocessing of nuclear spent fuel to recover both uranium and plutonium for use as fuel. Russia also has the most highly enriched uranium (HEU) fueled research reactors of any country, with a total of 58 research and production reactors, pulsed reactors and critical assemblies.

The first article in the issue, "Status and Prospects for Russia's Fuel Cycle" by Anatoli Diakov, provides a critical overview of current Russian plans for its nuclear power industry. It documents that despite full support of the Russian government for Rosatom, including political backing and generous subsidies, Rosatom is experiencing problems that are common to the nuclear industry worldwide—very high capital cost of new nuclear power plants, concerns about safety, and the lack of proven and economically viable technologies that could support a closed nuclear fuel cycle. These cost overruns, delays, and technical problems may challenge the long term viability of Russian plans to increase reliance on nuclear energy through a move to plutonium-fueled fast-reactors.

As part of its nuclear plans, Russia has been exploring the recycling of uranium recovered from spent fuel during reprocessing. In their article "Radiation Safety Issues of Using Regenerated Uranium in Nuclear Fuel Manufacturing at the Electrostal Plant" Andrei Kislov, Aleksandr Titov, Aleksandr Dmitriev, Andrei Sintsov, and Aleksandr Romanov assess the experience of a pilot project at one of Russia's leading fuel production facilities, the Electrostal Plant, with limited use of regenerated uranium in the production of new fuel for power reactors. The project demonstrated that while regenerated uranium could be used in fuel, the fuel production facilities would need additional radiation protection measures and limits on the concentration of regenerated uranium in the fuel to ensure that it could be safely handled during production and storage.

Although Russia has been participating in global efforts at reducing the use of HEU in civilian research reactors by assisting in conversion of Russian-supplied reactors abroad, it has only recently launched an effort to reduce the use of HEU at such facilities in Russia. Institute of Physics

and Power Engineering (IPPE) in Obninsk is one of the research centers that maintain a large stock of HEU and plutonium. Two critical assemblies located at IPPE, BFS-1 and BFS-2, together use almost ten tons of HEU and plutonium. The article "Decreasing HEU Stocks and Use at the Institute of Physics and Power Engineering" by Igor Matveenko, Valery Poplavko, and Gennady Pshakin provides an overview of the current situation with fissile material stocks at IPPE and discusses various approaches to minimizing the amount of HEU and plutonium used in IPPE research programs. It offers an important example of openness that can help inform the international efforts to make progress on HEU minimization.

The final article of the issue, "A Revised Assessment of the North Korean KN-08 ICBM" by John Schilling, provides an analysis of the North Korean effort to build a mobile intercontinental ballistic missile. Since the secretive nature of the North Korean missile program makes this analysis extremely difficult, Schilling provides a range of estimates that are based on various assumptions about the level of technology that might be available to North Korea. At this point, this range is fairly broad, but it will be narrowed once North Korea begins flight tests of the missile. However, as Schilling concludes, even after a successful test program, the North Korean missile is likely to be unreliable and limited in performance.