

NUCLEAR ENERGY FUTURES

Research Project Publication

GNEP Watch: Developments in the Global Nuclear Energy Partnership

A monthly report prepared by Miles Pomper in Washington DC for the CIGI Nuclear Energy Futures Project

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US Panel Urges Brake on GNEP as US-Russia Technology Deal Moves Ahead

After a sharply critical report from a high-level independent panel, the Bush administration appears to be scaling back its ambitions for the domestic leg of its controversial Global Nuclear Energy Partnership (GNEP). The program continues to gain some ground overseas, however.

Administration officials have claimed that the initiative, which seeks to develop new nuclear technologies and new international nuclear fuel arrangements, will reduce nuclear waste and decrease the risk that anticipated growth in the use of nuclear energy worldwide could spur nuclear proliferation. Critics assert that the administration's course would exacerbate the proliferation risks posed by the spread of reprocessing technology, be prohibitively expensive, and fail to significantly ease waste disposal challenges without any certainty that the claimed technologies will ever be developed.

A 29 October 2007 report by a National Research Council (NRC) panel, commissioned by the US Department of Energy, sided strongly with the critics, concluding that the department should "not move forward" with GNEP, particularly efforts to develop new commercial-scale facilities for reprocessing and for burning a new type of nuclear fuel. Citing a lack of urgency and appropriate technical knowledge, the NRC panel said the department should return to an earlier course in which it conducted a "less aggressive research program."

The panel's judgment echoes criticism from the US Congress, where House and Senate committees have approved legislation that would substantially cut funds for the Advanced Fuel Cycle Initiative, which underpins GNEP, and limit spending to research.

Indeed, Dennis Spurgeon, assistant secretary of energy for nuclear energy, told the Senate Energy and National Resources Committee on 14 November 2007 that rather than annually confront such budget battles, he would personally favor funding GNEP in the future with a portion of a fee on electricity generation that Congress has imposed on nuclear power plant operators to pay for disposing of spent fuel. He said that the US government has accumulated close to US\$20 billion from this fee, which has yet to be spent because of continued political wrangling over a planned permanent repository for nuclear waste at Yucca Mountain in Nevada.

The GNEP program calls for research on new reprocessing technologies that administration officials say will not yield pure separated plutonium but a mixture, including plutonium that is less applicable to making bombs. GNEP further calls for construction of new advanced burner reactors to make use of the reprocessed fuel. The administration also claims that this action will reduce the volume of spent nuclear fuel currently stored at nuclear reactors so that the United States will not have to build another permanent repository.

The proposal has drawn criticism, in part because facilities that reprocess spent fuel for plutonium-based fuels might also be used to harvest plutonium for nuclear bombs. By establishing such facilities, critics say, the

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United States might be encouraging other countries to do so as well, perhaps leading to nuclear weapons proliferation. Because of such concerns, the United States had shied away from spent fuel reprocessing for nearly three decades until GNEP was launched in 2006.

Department officials had indicated that, by the summer of 2008, Secretary of Energy Samuel Bodman would decide whether to build new commercial-scale fuel facilities and fast reactors that could produce and burn such new fuels. By that time, four industry groups are slated to provide studies examining financial, technical, and other issues. (See GNEP Watch, No. 2.)

The NRC panel said making such a decision next year would be unnecessarily hasty. "Domestic waste management, security, and fuel supply needs are not adequate to justify early deployment of commercial-scale reprocessing and fast-reactor facilities," the panel wrote.

In particular, the panel said it was not clear if a second waste repository would be needed. It also argued that the knowledge of appropriate technologies was not sufficient to move to commercial-scale facilities. It said the cost of the program would be far more expensive than proceeding with the current "once-through" system that stores rather than reprocesses spent fuel, a conclusion backed by the Congressional Budget Office in testimony before the Senate panel.

The NRC panel also said that "qualifying" the new fuel — ensuring it could be used appropriately in the reactor — would take many years. Instead, the panel advocated returning to a lower-level research program to provide more basic information before choosing any particular path forward.

In his testimony before the Senate committee, Spurgeon acknowledged that the department would not be ready to move forward with commercial deployment of any new reprocessing technologies in the near future.

After the hearing, he told reporters that he did not expect Secretary of Energy Bodman next summer to call for any immediate construction of commercial-scale facilities using existing technologies employed by France and Japan that separate pure plutonium, an approach championed by Sen. Pete Domenici of New Mexico, the panel's top Republican. "We need the fastest method to proceed with the construction of a recycling facility in the US," Domenici said.

Rather, Spurgeon said the department would be charting a "technology path" forward for research, though his remarks did not close out the possibility of using COEX, a process nearly ready for commercial deployment that extracts and precipitates uranium and plutonium (and possibly neptunium) together so that plutonium is never separated on its own.

Still, Spurgeon pointed to some progress in the program's international dimension when Italy on 13 November 2007 became the 17th country to join GNEP. Sixteen countries had signed GNEP's statement of principles in September, although the list did not include such important nuclear energy consumers and producers as Canada, Germany, and the United Kingdom. (See GNEP Watch, No.1.) Also, it is not clear how much weight Rome's participation carries. Italy at one time had five power reactors and two under construction; but it shut down all of its nuclear power plants after a 1987 referendum in the wake of the 1986 Chernobyl disaster.

About GNEP Watch

GNEP Watch reports on current developments in the Global Nuclear Energy Partnership (GNEP). GNEP is a US government-led international initiative aimed at encouraging the expansion of domestic and international nuclear energy production while working toward the reduction of proliferation and environmental risks.

CIGI Nuclear Energy Futures Project

The Nuclear Energy Futures project investigates the implications of the purported nuclear energy revival for nuclear safety, security and nonproliferation over the coming two decades and will propose recommendations for consideration by the international community, particularly in the area of global governance.

US-Russia Deal Advances GNEP Technology

In a related move, the United States also has agreed to recast a 2000 US-Russia accord to each dispose of 34 metric tons of weapons-grade plutonium in a way that corresponds more closely to GNEP's goal and Russian preferences.

Russia has long viewed plutonium as an untapped energy resource and sought to find means to use it as part of the fuel for its planned fast nuclear reactors. These reactors when operating in "breeder" mode are capable of producing more plutonium than they burn. Russia has an estimated stockpile of 120-170 metric tons of weapons-grade plutonium, including the 34 tons set for disposal.

The United States had resisted this approach until the advent of GNEP. But in a joint statement announced on 19 November 2007, Bodman and Russian Federal Atomic Energy Agency Director Sergey Kiriyenko generally endorsed the Russian approach. Under the plan, the United States will cooperate with Russia to convert the Russian weapons-grade plutonium into MOX fuel, made of plutonium and depleted uranium. Starting in 2012, Russia would irradiate this fuel, eventually employing at least two reactors, a BN-600 fast reactor currently operating at the Beloyarsk nuclear power plant and a more advanced BN-800 fast reactor under construction at the same site.

The statement said the two countries also intend to continue working together on development of an advanced gas-cooled, high-temperature reactor, another potential means to dispose of Russia's plutonium. That reactor is initially intended to burn weapons-grade plutonium at Seversk where the United States is also supporting an effort to replace two plutonium-production reactors that are used to generate electricity. Such high-temperature reactors are viewed as more proliferation resistant because their fuels have a high burn-up rate and their wastes are difficult to reprocess.

Under the plan, Russia agreed to dispose of the surplus weapons-grade plutonium "without creating new stocks of separated weapon[s]-grade plutonium." Moscow will operate the fast reactors in a "burner" mode rather than a breeder mode, by removing the breeding blanket of depleted uranium around the reactor core. Officials from the National Nuclear Security Administration, a semi-autonomous part of the U.S. Department of Energy, said that under such a scheme the reactors will still produce

plutonium as part of the reaction but consume far more plutonium fuel, thereby reducing the stockpile. Together the reactors would run through about 1.5 tons of plutonium per year.

The initial 2000 Plutonium Management and Disposition Agreement prohibited Russia from reprocessing any additional plutonium from the spent fuel used in the fast reactors until all of the original 34 tons of weapons-grade plutonium had been irradiated.

The new plan would amend that agreement to state that no fuel from the BN-600 reactor could be reprocessed. But it would permit 30 percent of the spent fuel from the BN-800 reactor to be reprocessed if this were done as part of the kind of advanced reprocessing program that is backed by GNEP. Other details need to be worked out in the coming months by negotiators.

For more information on CIGI's
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CIGI was founded in 2002 by Jim Balsillie, co-CEO of RIM (Research In Motion), and collaborates with and gratefully acknowledges support from a number of strategic partners, in particular the Government of Canada and the Government of Ontario. / Le CIGI a été fondé en 2002 par Jim Balsillie, co-chef de la direction de RIM (Research In Motion). Il collabore avec de nombreux partenaires stratégiques et exprime sa reconnaissance du soutien reçu de ceux-ci, notamment de l'appui reçu du gouvernement du Canada et de celui du gouvernement de l'Ontario.

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