

Researcher urges nuclear waste options

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The Bush administration is eagerly pushing nuclear power as a way to help solve the U.S. energy crisis. But in its new plan for nuclear waste management, the administration is taking the wrong approach, says an MIT professor who studies the nuclear energy industry.

"My hope is that over time, the administration will rethink its priorities in this area," says Richard Lester, professor of nuclear engineering and director of the Industrial Performance Center.

In a recent article published in *Issues in Science and Technology*, Lester argued that the Bush administration's plan, known as GNEP (Global Nuclear Energy Partnership), is not the best way to encourage further development of nuclear energy.

GNEP, which President Bush announced earlier this year, is meant to stimulate the nuclear industry by coming up with better ways to manage spent nuclear fuel. The plan focuses on reprocessing spent fuel, but Lester believes the administration should focus on finding regional storage facilities for the nuclear waste.

Right now, uncertainty over how to deal with spent fuel, which remains radioactive for hundreds of thousands of years, is one of the major obstacles to the construction of new plants. Thousands of spent fuel rods are now stored in secure pools or concrete casks located near nuclear plants, which is not considered a long-term solution.

The administration has been pushing a plan to move all of the nation's

spent fuel to a repository at Yucca Mountain, Nevada, but that facility is not scheduled to open until at least 2017. Many years and billions of dollars have gone into planning for the repository there, over the protests of Nevada residents, and success is still not assured. If the project fails, an alternative will be needed. And even if it succeeds, spent fuel will remain at nuclear power plants for decades before it can be removed.

Several nuclear energy companies have sued the federal government for failing to fulfill its contractual obligation to remove spent nuclear fuel from their plants. That failure does not bode well for construction of new plants, Lester said.

"If electric power companies can't believe the government is going to fulfill its obligations, it's going to be a real deterrent for them to go ahead with new power plants," he said.

In the meantime, the Bush plan calls for developing new technology to reprocess spent fuel to recover usable plutonium and uranium and eliminate other long-lived radioactive elements known as actinides. But according to Lester, the government's efforts would be better focused on other solutions, such as establishing a small number of regional facilities, where nuclear plants could send their spent fuel to be stored safely for several decades.

GNEP does not address the utilities' spent fuel storage problem. Instead, it "is being sold as a technical fix for three other problems," Lester said, but "each of these problems is either not as serious as the administration suggests or could be solved in a different way that is less costly and less risky."

Those perceived problems are lack of space at Yucca Mountain; the long life of radioactive material; and a potential shortage of uranium.

Yucca Mountain, a ridgeline geological formation about 100 miles northwest of Las Vegas, has already been tunneled in preparation for waste storage. When Congress approved the Yucca Mountain site, it put a 70,000-metric-ton limit on the amount of waste that could be stored there, but there is room for much more if Congress wants to raise the limit, Lester said.

Any effort to remove the long-lived radioactivity from the waste would require construction of reprocessing plants, special "burner" reactors and other nuclear facilities, which would be costly and difficult to site. And even if these plants were successfully built, it would be nearly impossible to eliminate all of the long-lived radioisotopes in the waste, Lester says.

"When you really look at the technical feasibility of reducing the toxic lifetime of waste, it has less potential than the administration is claiming, and the costs and shorter-term risks of doing it are significant," he said. Moreover, according to Lester, there are other, less costly ways to reduce the long-term risks of nuclear waste disposal that the administration has ignored.

Supporters of GNEP also say that reprocessing spent fuel could be necessary in the future if uranium becomes scarce, but according to the 2003 MIT report, "The Future of Nuclear Power," there is enough uranium to last for several decades, even if many new nuclear plants are built.

Lester said he is not opposed to research on new fuel cycle technologies, but he argues that reprocessing will not be needed for several decades, if then, and that to spend billions of dollars over the next few years on demonstrating reprocessing and related technologies, as the administration is proposing, would not be a wise use of resources.

Source: MIT

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