NRC NEWS

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Perspectives and Challenges of the Nuclear Renaissance

Remarks Prepared for NRC Chairman Dale E. Klein

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Good evening. It is a pleasure for me to be with you. Let me extend a special thanks to John Caves for setting all this up on very short notice. Earlier today I visited the campus of NC State, led a seminar with some students, and toured the research reactor there.

I should mention that this is my third speech to an ANS audience since August. Over the summer I addressed the ANS Utility Working Conference in Florida, and then in September I participated in a conference on Advanced Fuel Cycles and Systems in Boise. These ANS events are always intellectually stimulating, but I also go into them with a little trepidation, because I know that an ANS audience will ask me the toughest possible questions. I hope that you might take it easy on me tonight, considering that this a dinner speech, and that I already delivered a lecture earlier today.

When I spoke to the students a few hours ago, I basically gave them a recruiting pitch. I think most of you know very well that workforce development is shaping up to be one of the key challenges that both regulators and the industry will have to deal with over the next decade or two. Many of the people that are needed—including skilled craft workers such as electricians, welders, pipe-fitters, mechanics, electronics technicians, and others—require specialized training, but not advanced degrees. But we also need those advanced degrees, especially if the United States pursues fuel recycling and develops advanced and innovative fuel cycle facilities.

I have often said that universities, community colleges, business groups, government agencies, and utilities need to work together to meet the needs of the nuclear workforce across all levels of training and education. I genuinely believe in the need for this broad, cooperative effort—although I admit that it didn't prevent me from trying to entice some of your most promising local talent while I was here!

In order to explain to the students what the NRC does, I had to put the current global interest in nuclear power in a larger context. I discussed both the worldwide increase in electricity demand, as well as the environmental implications of our various energy sources. Of course, all of you already know that electricity demand is rising rapidly all over the world. You also know that while energy conservation and further improvements in renewable sources like wind and solar will be important, these simply won't be enough to meet future demand in the U.S.—let alone the major developing nations such as China and India.

Coal and nuclear are going to have to carry the load for the foreseeable future. But as I told the students this morning, just for nuclear power to maintain its current 20 % share of the electricity supply in the U.S., the industry would need to add 50 new power plants, with an average of 1,000 megawatts each. And not even the most enthusiastic pro-nuclear people think that there will be 50 new plants generating electricity any time soon. In fact, in my capacity as a regulator, let me take this occasion to assure you that there will not be 50 new plants generating electricity in the next five years! Nuclear power plants are extraordinarily complex… they are engineered to a very high level of precision… and they are built to last for forty years, or more. You can't just decide you want one and start construction the next day.

So to repeat one of my favorite warnings—against an "excessive exuberance" for new nuclear power plants—I would reinforce a point that Sam Bodman, the Secretary of Energy, often makes. The expansion of nuclear power should be seen as part of a larger goal of enhancing the nation's energy security and energy diversity, which depend on a variety of different energy sources.

With that understanding in mind, how do we ensure that an expansion in commercial global nuclear power is done correctly? Let me mention a few of the most critical areas where cooperation, guided by intelligent leadership, will be essential. The first is in the area of nuclear components and manufacturing.

The U.S. was once the primary supplier of nuclear components. Three-quarters of the world's reactors operating today are of U.S. origin, either in construction or design. So when the current fleet of U.S. reactors was built, parts and components could be purchased almost entirely from domestic vendors. Today, of course, nearly the opposite is true. When reactor orders in the U.S. ground to a halt about 30 years ago, technological progress and manufacturing innovation moved abroad—and along with them, most of the links in the global supply chain. On top of this, there has been a great deal of international consolidation, so that there are now fewer N-stamp firms worldwide.

Some of you may know Dr. Tom Sanders, one of the senior nuclear scientists at Sandia National Lab, who I understand is running for President of ANS. He told me recently about some interesting things he found by comparing the current ANS Membership Directory with the one from thirty years ago. If you don't happen to have a copy of the 1977 Directory laying around, I will summarize Tom's findings.

In 1977 there were 1,350 American companies listed as ANS members, and another 430 outside the US, for a total of about 1,800. In 2007, however, there were only 875 companies listed worldwide—less than half the total from 30 years ago. Of those, about 700 are listed in the US, about half of the 1977 number, and many of these are foreign-owned.

This dramatic decline in the domestic supply chain is clearly having an effect. Some of you may have seen the stories in the trade press about utilities that are rethinking their plans to file a license application for a new plant, for the simple reason that their vendors cannot give them definite price quotes. The global supply chain is stretched, if not to the breaking point, at least to the tipping point for what some utilities consider commercially viable.

The adequacy of domestic facilities for the various stages of the fuel cycle is another area of potential concern. There is a great deal of interest in uranium these days, and the NRC is experiencing a lot of licensing activity for new or expanded facilities in uranium mining and recovery, enrichment, and processing. We have devoted considerable staff to these applications, however, and everything appears to be on track. It is the middle and back end of the fuel cycle where some attention may be warranted.

Many of the world's nuclear nations are moving toward recycling, if they have not already done so. Whether the United States also takes this route is not for the NRC to determine. But while this choice in not within our control, we nevertheless need to be prepared for that eventuality.

The U.S. Nuclear Regulatory Commission was primarily a light-water reactor agency when it was formed; and we continue to be focused mainly on light-water technology today. But we know that we need to develop new capabilities to license and oversee the nuclear technologies of the future. Certainly, we must engage actively with regulators in other advanced nuclear nations, as well as international organizations, to develop these capabilities. NRC would benefit greatly from drawing on the regulatory experiences of facilities in Britain, France, and Japan. In turn, if we were an active participant in the development of recycling technologies, we would be in a position to promote high standards of safety and security around the world.

Whatever happens with respect to recycling, there are still other regulatory challenges we must confront. With regard to high-level waste, the NRC has been preparing to receive a license application for a potential Yucca Mountain waste repository. I think most people who understand the issues involved in commercial nuclear power agree that completing the fuel cycle is important. The recycling

technology I mentioned earlier has the possibility to reduce the volume of high-level waste needing underground disposal. This had led some people to conclude that recycling can eliminate the need for a permanent waste repository. That is simply not correct. Recycling can reduce the volume and radiotoxicity of high-level waste, but not eliminate it. Significant amounts of high level waste and spent fuel exist today, and will continue to exist—and we must pursue a safe, secure, and timely solution to disposal.

Congress determined what the solution would be in the Nuclear Waste Policy Act of 1982, and the amendments of 1987. I remember clearly the debates, then and subsequently, over the specific provisions of that Act, as well as the eventual focus on Yucca Mountain. But in all the debates over the years, Congress never altered the statutory obligations that were created for DOE and NRC under the original Act.

Congress has not re-opened the debate over the statutory waste disposal solution it established over 20 years ago; and the federal government remains on the path set by Congress. But there have been delays and DOE program funding issues that emphasize the need to remain focused on high-level waste management matters.

One question, therefore, is whether industry is prepared to continue to address the waste management challenge through interim fuel storage. For our part, I can tell you that, if needed, the NRC is prepared to address the issue of interim storage; and we have confidence that we can ensure the safety and security of interim storage for the foreseeable future.

There are a number of other issues I could address, but in anticipation of the typically incisive ANS questions I think I should stop here. I believe I have already presented a large enough target!

Let me conclude by thanking you again for your hospitality and for your thoughtful attention.

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