NRC NEWS

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"Address to the Big 12 Engineering Summit"
Prepared Remarks of William D. Magwood, IV, Commissioner
U.S. Nuclear Regulatory Commission

Summit Sponsored by the Big 12 Engineering Consortium
Kansas City, Missouri
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Thank you very much for the invitation to participate in this week's Big 12 Engineering Conference. It is a special pleasure for me to be here because this conference represents the continuation of a vision of cooperation among universities that many of my colleagues and I had a decade ago during my time at the Department of Energy.

In that spirit, let me begin by loudly and clearly offering my congratulations on the ongoing success of the Big 12 Engineering Consortium. You have made incredible progress by developing a lasting infrastructure that will sustain your collaboration into the future by establishing by-laws, policies, procedure, and memoranda of agreement. This is hard and often unheralded work, but once completed, it provides a framework for many great things. Due to your efforts, students enrolled at any Big 12 school may now receive a minor in nuclear engineering from Texas A & M University, Kansas State University, University of Missouri-Columbia, or the University of Texas. Moreover, nuclear engineering courses are offered to all students in the consortium without the need for them to leave their home campuses.

These accomplishments are yours, but to the degree that we in Washington were able to support your efforts, I am both proud and gratified. I am also quite impressed with the fact that your work has outgrown the original focus on nuclear engineering to include discussions about renewable energy and water resources.

As you know, my focus during my years at DOE was to revive nuclear engineering programs at colleges and universities in the United States. When I took over as the head of Nuclear Energy, many people thought nuclear energy to be a dying field. In fact, in the late 1990s, one prominent Senate staffer told me he likened the study of nuclear engineering to the efforts to preserve the skill of manufacturing wheels for horse-drawn carriages in the 1920s. At that time, only about 600 students were enrolled in nuclear engineering programs at U.S. schools. Now, the situation has improved considerably. Today, with a lot of effort by many, targeted funding from the

government, and revived interest in commercial nuclear energy, there are more than 4700 nuclear engineering students at U.S. schools, with many more students receiving some course work in nuclear technology. Hundreds of these students are in the Big 12.

Now that I am with the Nuclear Regulatory Commission, I am very pleased to be in a position to continue supporting nuclear education programs in America's universities. The NRC awards grants to universities for nuclear safety-related research, curriculum development, faculty development, and scholarships and fellowships, as well as grants to trade schools and community colleges, in 33 states, the District of Columbia, and Puerto Rico. I congratulate the institutions in the Big 12 that have been awarded NRC faculty development and NRC curriculum development grants in 2010. As these programs proceed, we would very much appreciate your feedback on how the grant award process is working and whether these programs continue to meet the most pressing needs. As I am sure you know, we have recently posted the funding opportunity announcement for Fiscal Year 2011 research grants on www.grants.gov. We look forward to hearing your ideas and proposals for new research.

In the 1990s, many of us believed that a strong base in nuclear technology education was necessary because nuclear power was likely to make a comeback in this country. Today, it appears that we were prescient. The NRC expects a total of 31 applications and early site permits from companies interested in building new nuclear power plants.

However many of these plans are ultimately brought to fruition, responding to this surge in interest has required NRC to increase its staff significantly – by about 1000 individuals over the last six years. Many of these new employees are young engineers and recent graduates from Big 12 schools – thank you! Given the retirements we face, we anticipate more hires in the coming years; about 25% of these will be entry-level technical staff. By the way, the NRC looks forward to bringing about approximately 50 students for internships next summer.

The nuclear industry faces similar challenges in staffing. The Nuclear Energy Institute is anticipating a massive wave of retirements over the next five years. NEI estimates that 38% of workers in the nuclear industry are eligible for retirement over the next five years with a total potential loss of 48% of all workers due to retirement and attrition. If new plants are to be built and effectively staffed, it is essential that a new generation of engineers, craftspeople, and other vital staff be trained and hired very soon.

Even as we look forward to assuring a pipeline for new nuclear technologists in the next few years, I continue to worry about the pipeline of U.S. students entering university science and technology programs. While there has been some improvement in recent years, we are not keeping pace with many other countries in terms of training new engineers and scientists. A study performed by the National Science Foundation a few years ago found that only 5% of American 24-year-olds with a bachelor's degree were engineers, compared with 39% in China and 19% or more in South Korea, Taiwan, and Japan.

In addition, many American high schools continue to fail the children we send to them. I remember when I was in public school in the 1970s. They browbeat us on what seemed to be a daily basis about how important it was to stay in school. I remember television commercial hammering

the message home – "drop out and ruin your life." Back then, graduation rates around 80% were considered a major problem. Today, with a full third of students not completing high school, no one talks about it. Today, with only 58% of students in the 50 largest urban school districts graduating, no one talks about it. The overall U.S. average public high school graduation rate is about 68%. That's a scary number – nearly a third of all U.S. children don't even get a high school diploma. And look at the graduation rates in a few cities: my home town Pittsburgh, 65%; Washington, D.C., 58%; our host city Kansas City, 46%; and Baltimore, 35%.

When I departed government service in 2005, I remember speaking to a colleague. We both had regular access to classified information about terrorist threats against the U.S. He asked if knowing all that would keep me up at night. I told him that I wasn't as worried about terrorists as I was about our education system – that really scares me.

But as the Big 12 comes together to celebrate its success, it is a wise time to think about the longer-term future. Maybe a future summit will devote time to discuss how to deal with the problems of public schools – a challenge that is even more difficult than the odd problems in *LaMarsh and Baratta*!

Thank you, and, once again – congratulations!