



# NRC NEWS

**U.S. NUCLEAR REGULATORY COMMISSION**

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## **“Achieving Excellence in Human Performance - Nuclear Training and Education”**

**Prepared Remarks for**

**The Honorable Gregory B. Jaczko  
Commissioner  
U.S. Nuclear Regulatory Commission**

**at the**

**American Nuclear Society’s  
Conference on Nuclear Training and Education  
Jacksonville, Florida**

**February 5, 2007**

Good Morning. It is a pleasure to be here today, and share with you how the NRC achieves excellence through our training and human resources programs.

The NRC has long been concerned with attracting and retaining a highly qualified and educated workforce. The agency expects to receive the first new nuclear reactor license applications in decades later this year. These potential new applications would not be conceivable without the high quality training of nuclear plant operators, technicians, engineers, and the NRC staff as well, to ensure that we all keep the focus on the safety of the existing fleet.

Because the average age of the NRC workforce is approximately 48 years old, each year we lose experienced staff through attrition. To offset this attrition and add staff to be able to review new license applications, the NRC plans to hire about 300 - 400 new technical staff through 2008, with net gain of 200 this year. We are even looking at the possibility that the total NRC workforce could eventually approach approximately 4,000 people, and are addressing the management and space challenges which would accompany such an expansion.

The NRC has several programs to address these issues.

The first involves Strategic Workforce Planning. This program helps us figure out what the agency's gaps and needs are. The purpose of strategic workforce planning is to support human resources allocation decisions. We identify core competency requirements and strategies, conduct an annual assessment of current technical capacity, and then address the gaps between current capacity and projected needs.

We also have a robust recruitment effort. This includes a Nuclear Safety Professional Development Program that involves recent graduates with bachelor's, master's, or doctoral degrees and strong academic records in health physics, earth sciences, or engineering. New employees in this program participate in on-the-job training, formal classroom training, and rotational assignments.

To ensure we have the legal expertise we need, we take advantage of the Honor Law Graduate Program to recruit graduating law students or judicial law clerks with strong academic records; excellent writing, research, and advocacy skills; and an interest in the interplay between law, science, energy policy, environmental concerns, and public policy.

For candidates still in school we manage a Student Career Experience Program, designed to provide experience directly related to the student's educational program and career goals. College or university students pursuing undergraduate and graduate degrees in science, engineering, and other disciplines related to the NRC mission can participate in this program. They have the opportunity to alternate periods of academic study and work experience, or parallel periods of academic study and work experience. There is also a less formal Student Temporary Employment Program for high school or college students who wish to work during the summer or during school vacations.

The NRC also reaches out to Historically Black Colleges and Universities through a program to provide grants to students and faculty, and the agency manages a Graduate Fellowship Program to attract and retain qualified individuals who aspire to work in areas requiring highly specialized technical knowledge and skills. This developmental program combines an initial period of work at the NRC and subsequent graduate education, followed by a return to a position at the agency that utilizes the knowledge gained through graduate study.

Once we have hired qualified staff, we have a myriad of training programs for our workforce. They include technical, engineering, and inspector qualification programs including courses in professional development and knowledge management, reactor technology training, technical training support and specialized technical training, human resources policy and programs, team organization, and labor relations workforce planning.

The idea of "knowledge management" has also been a focus at the NRC. The agency needs good technical staff to help achieve its mission of making sound public policy decisions. While things are now changing as I noted above, the agency has traditionally enjoyed a stable workforce and a climate of slowly evolving technologies that has allowed it to meet its performance goals by using an informal approach to knowledge management. To quote a now-

retired NRC senior manager, knowledge management is really about teaching, and every level of NRC management has made teaching and mentoring a high priority.

We also have unique collaborative efforts with universities. I would like to close my formal remarks with an example from the fire protection world of how being open to creative thinking and collaboration across agencies and sectors can lead to better human performance. The NRC Research Division's Fire Research Program brought the University of Maryland into the electrical performance and fire induced failure cable testing effort known as Cable Response to Live Fire Project (CAROLFIRE). CAROLFIRE testing included a series of 78 small-scale tests, and a second series of 18 intermediate-scale open burn tests. The tests were designed to complement previous testing and to address two needs; namely, to provide data supporting (1) resolution of items identified in Regulatory Issue Summary 2004-03 Revision 1 - *Risk-informed Approach for Post-Fire Safe-Shutdown Circuit Inspections*, and (2) improvements to fire modeling in the area of cable response to fires.

Our Research office prepared the initial CAROLFIRE program to use fire models to better predict multiple spurious fire induced shorts, in this case. A project team was formed with Sandia National Labs performing the bulk of the testing, and the National Institute of Standards and Technology developing the cable damage sub-model. As this project was taking shape, Professor Mohammad Modarres from the University of Maryland visited the NRC looking for technical challenges for some of his PhD students. He identified two students who could assist the CAROLFIRE team and use some of the data for their PhD thesis projects.

The CAROLFIRE team therefore came to include students in all phases of the project as full team members. They participated in the weekly status calls, visited Sandia to witness some of the testing, and provided their comments and feedback to the team. University of Maryland peer reviews are even included with the full program peer review and both students will be acknowledged in the final guidance. By taking the opportunity and expanding the CAROLFIRE team to include the PhD students, the core CAROLFIRE program gained another dimension and the students were exposed to real world safety research. This was clearly a "win-win" for both the NRC and Maryland.

As we move forward to whatever the next phase of nuclear power in this country may be, we must ensure that our primary focus remains on safety. We must not just say these words, but live by them. That is why focusing on the elements necessary to strengthen human performance: workforce planning, training, teaching, and providing a good sound safety culture for employees is so crucial to the NRC and its licensees. I look forward to continuing to exchange ideas with you on these subjects, and would welcome any questions you may have for me this morning.

Thank you.