



NRC NEWS

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**“Not Your Father’s Nuclear Regulator”
The Role of the Licensing Process in the Future of Nuclear Energy**

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U.S. Nuclear Regulatory Commission**

at

**Nuclear Energy Conference:
Opportunities for Growth and Investment in North America
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Good morning ladies and gentlemen. It is a pleasure to be here this morning. Given the dynamic state of the nuclear industry today, it seems quite clear why this conference is focusing on the opportunity for growth. As a Commissioner of the Nuclear Regulatory Commission (NRC), I cannot be an advocate of nuclear power. Nonetheless, neither can I ignore the direction this industry is going. To meet our mission of protecting public health, safety and the environment, our agency must be prepared for this changing future. Today, I would like to discuss my personal views on how the NRC’s licensing process will play a critical role in the development of a growing nuclear industry. The process is more predictable than it was in years past, and it has been improved to recognize technological breakthroughs in reactor design and lessons learned from years of operating experience. I would also like to share with you a brief summary of the challenges we have yet to resolve in the licensing of new power reactors.

In the past, the NRC has shouldered much of the criticism for the fact that no new power reactors have been constructed in the United States in the last twenty years. Truth be told, the uncertainty of the NRC’s regulatory and hearing processes was a major contributor to the industry’s decision not to venture in this direction. Regulatory instability, however, is no longer the convenient excuse for the failure of nuclear power plants to be built. Twenty years ago, ten years ago, or maybe even five years ago, that view may have been justified, but today, it is not.

Like those in the military who are faulted for always preparing to fight their last war, individuals who are stuck in the past, but who fail to learn and evolve from those lessons will not be able to accurately understand where they are going in the future. Some of you who have heard me

speak before will recognize that I like to weave lessons from the past with my own views of where we are going. More so than any other technology, it is critically important that both the regulator and the leaders of the nuclear sector understand and learn from past successes and mistakes.

From a regulatory perspective, I think it is useful to compare where the nuclear sector is today with where it was twenty years ago. Looking back at 1985, a number of factors combined to portend a very dark outlook for the future of nuclear power. At that time, the nuclear fleet consisted of 89 units, 16 of which had been in an extended shutdown for six months or more. As a whole, the fleet was operating at a capacity factor of 63%. Consumer prices, although lower than the late 70's, were still high by today's levels with inflation running at 3.55% percent and a prime interest rate of 10% percent. The price of nuclear fuel had skyrocketed to costs averaging 1.28 cents per kilowatt-hour and there was no relief in sight.

This grim financial outlook was only partially responsible for the decline in nuclear power that occurred in the mid-eighties. In 1985, public support for nuclear power was running barely over 50%. A seemingly low percentage, which would be further degraded a year later with the accident at Chernobyl. Construction of new plants, which had previously been predicted to explode during this time period, was coming to a dramatic halt. Costs for those plants still under construction were growing exponentially due to post-Three Mile Island changes imposed by the Nuclear Regulatory Commission and the failure of utility managers to hold down costs. The NRC's Atomic Safety and Licensing Board had challenges opposing operating licenses for 14 different reactors on its docket in 1985. By that year, the Shoreham operating license proceeding had already been on the docket for eight years and the Seabrook proceeding had been under review for over three years. The bankruptcy of Public Service of New Hampshire was just a mere three years away. Given these statistics, it is no wonder that utilities decided to pull the plug on the construction of 38 units between 1980 and 1985. Finishing off this bleak picture, Wall Street, which is an enormous player in deciding whether plants will be built, had no stomach and no interest for this technology.

What has changed? Well, for one thing, the NRC has made dramatic changes to the way we conduct business. License renewals and power uprates are two clear examples that demonstrate how the NRC has honed its licensing process to be significantly more efficient and effective. I doubt that anyone would have been willing to place a bet in 1985, or even 1995, that the NRC would be able to renew the licenses of one third of our 103 unit fleet in a period of just over six years, with a review time averaging approximately 22 months for most applications. Nor would it have been anticipated that the agency would have approved over 100 power uprates totaling over 4,000 megawatts electric. Similar efficiencies in licensing spent fuel storage casks, and on-site spent fuel storage facilities demonstrate the agency's commitment to holistic improvement to our regulatory review processes. While we have had some operational miscues, including the core offloading and safety culture issues at Millstone in the mid 90s and more recently the vessel head degradation at Davis-Besse, I think I can confidently say that the NRC knows much more about regulating these reactors than we did 20 years ago, and the safety of these plants has been significantly enhanced since that time.

All of the examples I just mentioned, however, relate to operations at currently licensed facilities, so I imagine you are asking yourselves "but what about the licensing of new reactors?"

As you know, the two-step process by which we historically licensed power reactors was considered cumbersome and unpredictable. First, licensees were required to navigate the NRC's technical review and hearing processes to obtain a construction permit. Once granted, licensees would sink millions of dollars into constructing the facility. After construction was substantially completed, the licensee was again required to submit to an NRC review process, as well as run the gauntlet of the operating license hearing. This left many of the most controversial issues to the end of the licensing process, often resulting in considerable delay to completion, and in some cases, like the Seabrook and Shoreham facilities, a complete halt to the project.

The NRC recognized the need for a simpler, more predictable licensing process and it had already taken steps to revise its regulations when Congress modified the Atomic Energy Act to provide the statutory authority for a new, progressive one-step licensing process. The NRC implemented this legislation through promulgation of Part 52, which as you well know, can be credited with a significant role in the growing desire in the industry to explore new construction possibilities. The Part 52 licensing process is designed to resolve the more controversial issues earlier in the process, prior to undertaking a huge investment in construction. This change will allow licensees, as well as their investors, to have more financial certainty in making a multi-billion dollar investment.

Licensing Becomes More Efficient

Part 52 established three new pieces of our licensing structure. First, we developed an early site permit process, which allows licensees to seek pre-approval of sites for new reactor units. By obtaining an early site permit, applicants can significantly reduce licensing uncertainty because site-related issues are resolved and presumed final for purposes of litigation. We have already received three applications for early site permits from existing licensees and are currently in the middle of the two-year review and adjudication process for these licenses. Barring any unforeseen circumstances, these reviews should be completed by early next year.

Next, we created standard design certifications. Here, the NRC extensively reviews a reactor design and then approves the design for general use through notice and comment rulemaking. Use of a pre-approved design in a combined license application removes consideration of design aspects from the staff's licensing review. We have already approved three designs, and the NRC staff has recommended that a fourth design be published for public comment in the next month. The NRC is also engaged in conducting pre-design review or preliminary review discussions with six different companies (GE, AECL, Framatome, PBMR Ltd., Toshiba, General Atomics and Westinghouse), so we could potentially see several more design applications emerge from these efforts in the near future.

Finally, we created the combined license which grants an applicant both a construction permit and operating license. This reduces regulatory risk for applicants by limiting adjudication of licensing issues to one hearing, instead of the two required under the previous licensing process. Applicants can further reduce regulatory uncertainty by utilizing an early site permit and design certification in their combined license applications. Three different consortiums of utilities have announced that they want to explore this new licensing process, with even more companies that may choose to go forward on their own.

NRC Safety Reviews Improved By Technology

I am proud to say that it is not only our licensing process that has been improved. Significant changes have been made over the last 10 years to refine the effectiveness and efficiency of our safety reviews. The Commission, on which I have now served for six and a half years, has demanded constant improvement on the part of our staff, while remaining ever vigilant of our safety mission. Virtually every schedule provided by our staff is continually met with one question from the Commission: “Is this the best we can do?”

Evolutions in technology are one of the reasons the staff has been able to reduce the time for safety reviews while increasing staff confidence in our quality assurance findings. Take the example of reactor design reviews. Twenty years ago, one of the complications the NRC faced in reviewing designs for nuclear power plants was the unique nature of the designs provided by our licensees. Faced with designs that were constantly changing and that often had to be modified during the course of construction, the NRC was confronted with significant complications in conducting effective and timely reviews. Such late hour changes also provided yet another opportunity for opponents of these plants to claim that the designs were unsafe and not subject to sufficient NRC review.

Today, the picture is much different. The widespread use of computer-aided design has significantly advanced the quality of the design materials that are reviewed by the NRC staff. This technological advance, coupled with a more advanced nexus between the design and how the construction will actually be carried out, has resulted in the staff feeling more confident in making quality assurance findings. This also reduces the likelihood that a design will need to be changed during construction, thereby reducing licensee costs and workload for the NRC staff. Given the fact that most combined license applicants will reference a pre-certified design that has already been extensively reviewed by the staff, safety reviews for new licenses should be much more effective, predictable, and timely.

Adjudication of License Applications

Another highly significant, but not so obvious process improvement at the Commission is the manner in which we conduct legal proceedings. Without fanfare, last year the Commission issued a change to Part 2 of our regulations, which governs the rules of practice for our adjudicatory process. The amended regulations tailor hearing procedures to the different types of licensing activities in order to better focus the limited resources of involved parties and the NRC. One of the more noteworthy changes was establishment of specific timelines for our judges on how long a legal proceeding should take. This will allow the judges to take a more active role in case management and conduct a more efficient review of contentions brought before the Commission. Another significant change established the use of more informal procedures for the conduct of most proceedings. Now, rather than endless debates between competing experts, and unfocused and unending hearings, our judges will be able to concentrate on the facts and reach common sense, safety-focused decisions in a timely way.

As an attorney, I recognized the inherent weaknesses in our former process, and I am convinced that these changes will improve the efficiency of our legal proceedings. I must mention, however, that shortly after the final rule was published, it was challenged in Federal court by several public interest groups. The crux of the petitioners’ challenge was that the rule violated the Atomic Energy Act and the Administrative Procedure Act by abolishing formal hearings in reactor licensing cases. In

December, however, the 1st Circuit Court of Appeals struck down this challenge and upheld the view of the Commission.

Our changes to the adjudicatory process did not stop with revision of our procedures for the conduct of hearings. We are also working to bring in new, highly qualified judges to conduct the proceedings. The Atomic Safety and Licensing Board Panel (Board) is blessed with an excellent Chief Judge, Paul Bollwerk, who has worked tirelessly to replace vacancies on the Board created by the aging workforce issues facing the nuclear industry as a whole. His efforts have also been aimed at ensuring adequate staffing for potential Yucca Mountain proceedings.

The Commission, recognizing the need for outstanding judges, has recently assumed a role where we personally interview the finalists for open Board positions. Within the last year, we have hired three new legal judges and three new technical judges, whom I believe will significantly enhance our capabilities to conduct effective safety reviews. This influx of highly qualified judges, combined with the enhancements to our regulations under Part 2, will hopefully erase some of the lingering concerns about regulatory instability within our agency and establish improvements to our legal proceedings that will endure well beyond my tenure on the Commission.

Construction of New Plants

Improved NRC licensing and legal processes are not the only reasons I see the industry heading into an era of growth. Evolutions in technology will change the way in which new plants will be manufactured and constructed. Computer aided manufacturing allows for an even greater ability to meet customer requirements, and also brings with it a greater confidence that the NRC's quality assurance requirements will be met. With no existing domestic capabilities to manufacture large components such as steam generators, pressure vessels, or pressurizers, our licensees, as well as our staff, will need to spend time in Europe and Asia assuring that these components meet our requirements. CAD/CAM design and manufacturing, when effectively tied to an excellent quality assurance program, will assure that far distant markets make no difference in producing safe, high caliber components.

Construction of new plants may be approached in a modernized fashion as well. For the first time, detailed engineering of the entire plant will essentially be complete by the start of construction. Additionally, using techniques developed in Japan and elsewhere, the plants of the future will likely employ extensive modular construction techniques, with modules barged in from distant ports to be assembled with massive cranes. This modular construction provides licensees with the opportunity to increase quality and reduce costs. At the same time it presents our agency with opportunities to improve inspection techniques since modules for each plant will contain similar technology. Once the staff verifies the quality assurance and safety of a particular module, it can more easily effectuate safety enhancements for all modules to follow. There will be challenges associated with this verification, however, given that the staff may need to inspect modules during their construction overseas since there may be limited access to components once a module is installed at the facility. As we prepare for the possibility of new plant orders, we are actively working to prepare our staff and modify our procedures to meet these new demands. While unforeseen challenges will invariably arise, we can and shall meet them consistent with our safety mission.

Future Challenges

Earlier, I spoke about regulatory instability no longer being a convenient excuse. So as not to appear entirely sanguine about the work our agency has to do, I would focus briefly on two areas that I believe will require the continued attention of the Commission.

The first, which affects both currently operating reactors and new reactors alike, is security. Quite obviously in a post-9/11 environment, our agency has expended considerable time and resources in meeting this challenge. The nation's nuclear power plants, which were highly secured prior to September 11th, have been required to beef up security by adding a significant number of guards, increased weaponry, improved training requirements, and other numerous and costly security enhancements. According to industry figures, almost a billion dollars have been spent in improving the security at the plants. Despite having handed down a series of orders mandating these changes, the Commission and its staff recognize the progress that has been made, and realize that we need to achieve a new normalcy. In my view, 2005 will be the year where we change our focus from requiring new security enhancements for licensees, to stabilizing our current security requirements for the new world we face. For me, the enhanced, robust security programs of our licensees have achieved just about everything we can reasonably demand of a civilian security force.

The second issue, which could potentially have considerable impact on the construction of new reactors, is management of agency resources. As I mentioned previously, the NRC has several early site permit applications and one design certification under review, several other reactor designs are nearing submission for certification, and three different consortia have expressed interest in testing our combined license process. These submittals, coupled with the regular business of license renewals, power uprate requests, rulemakings, and security issues, have stretched our existing agency resources further than I would have imagined. Add in the possibility of a Yucca Mountain high level waste repository application and we could be facing a significant resource crisis. My fellow Commissioners and I are aware of the potential resource challenges and have tried to address them through the agency's Strategic Plan and our senior agency management. Nonetheless, this will remain a significant challenge.

Conclusion

Referring back to my earlier comments, it is easy to see how far the nuclear sector has come if you look at today's statistics. We now have a nuclear fleet of 103 units that is operating at a capacity of approximately 88% with no units in regulatory shutdown. Safety factors at these plants continue to be at very high levels. Inflation is running at 2.68% with the current prime interest rate at 5.5%, which is just over half its level in 1985. The price of nuclear fuel, although higher than the recent past, is 0.44 cents per kilowatt-hour, which is one third of the price in 1985. Today, 65% of the American public is supportive of building new nuclear power plants, which is significantly larger than times past. And as I have said at length, the NRC of today is a far more efficient, effective, timely regulator of the safety of our nation's nuclear fleet.

Today, you may hear some speakers express concerns as to whether the NRC licensing process will work as promised. And I am sure that some of these people will remain concerned about this issue no matter what information I share with you today. Albert Einstein once said that "Anyone who has never made a mistake has never tried something new." We are working through a new licensing

process and the complications posed by new plant designs. I can't promise that we won't make mistakes, but we are committed to meeting these challenges head on. It is my personal belief that the NRC is prepared to review and resolve potential regulatory problems and safety concerns in a timely manner. Compared with where this industry was in 1985, things are far different, and while there may be a myriad of reasons why Wall Street and the nuclear utilities have hesitated to build new nuclear power plants, blaming the NRC should no longer be the principal reason.

Thank you very much.