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United States House of Representatives

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Chairman Gordon, Congressman Hall, Members of the Committee:

Thank you for the opportunity to appear before you today to discuss opportunities and challenges for nuclear power and to highlight NuStart Energy Development's activities to spur new reactor development in the United States. I am Marilyn Kray, Vice President of Project Development for Exelon Nuclear and President of NuStart Energy Development.

Exelon Nuclear is the largest owner and operator of commercial nuclear power plants in the United States. We have 17 reactors at 10 sites in Illinois, Pennsylvania and New Jersey, and we are developing a Combined Construction and Operating License (COL) application for two reactors in Victoria County, Texas.

NuStart is a consortium of 10 power companies and two reactor vendors[1] that was formed in 2004 with two purposes: first, to demonstrate the Nuclear Regulatory Commission's never-before-used licensing process to obtain a Combined Construction and Operating License (COL) for an advanced nuclear power plant; and second, to complete the design engineering for two advanced reactor technologies, General Electric's Economic Simplified Boiling Water Reactor (ESBWR) and Westinghouse's Advanced Passive AP-1000. NuStart activities are being funded by the Department of Energy on a 50/50 cost sharing arrangement under the Nuclear Power 2010 Program.

America's 104 nuclear power plants generate about 20 percent of our electricity. In 2007, the nuclear industry generated more electricity than ever before, and we did it more safely than ever before as evidenced by data on unplanned reactor shutdowns and the industrial safety rate. Bureau of Labor Statistics data show that it is safer to work in a nuclear plant than to work in the real estate or financial sectors.

Demonstrating the NRC licensing process and completing the engineering for new reactor designs are critical first steps toward the construction of a new generation of reactors in the United States. To date, individual NuStart member companies have submitted six COL applications to the NRC for their review and another four are planned for submittal by the end of 2008. We anticipate that the Commission will complete its review of certain applications as early as 2011, allowing a company or consortium of companies to begin construction of a new reactor with the hope of having a plant begin operation by 2017.

[1] Power companies include: DTE Energy, Duke Energy, EDF International North America, Entergy Nuclear, Exelon Generation, Florida Power and Light, Progress Energy , SCANA, Southern Company and Tennessee Valley Authority. Reactor vendors include General Electric-Hitachi and Westinghouse.

Opportunities

As power producers strike to maintain a reliable supply of clean, safe and economic electricity to sustain our economy, there are three primary trends that create opportunities for nuclear power to play an increasing role in meeting our nation's energy needs: first, increasing demand for baseload electric generation; second, increasing fuel costs for conventional sources of electricity; and third, the likelihood of limits on greenhouse gas emissions from power plants.

Increased Demand for Electricity

Even with aggressive efforts to increase energy efficiency and conservation, demand for baseload electricity both in the United States and around the world is expected to increase significantly over the next two decades.

The Energy Information Administration's Annual Energy Outlook for 2008 projects that electricity demand will increase by 30 percent by 2030. EIA's International Energy Outlook for 2007 predicts even higher growth worldwide. Much of the increased demand in the U.S. will be for base load power and will occur in regions of the country currently served by companies with nuclear experience.

To help meet this anticipated demand, nine companies, including the six NuStart members mentioned earlier, have submitted applications for combined operating licenses with the Nuclear Regulatory Commission for 15 units. As many as 10 additional applications for 16 or more new units are possible at the NRC this year.

Increasing Fuel Prices

Increased worldwide demand has led to steep rises in fuel costs for power plants since 2000, with coal prices increasing over 250 percent; natural gas prices rising over 300 percent; oil prices growing over 400 percent; and uranium prices up nearly 1000 percent from their all-time low. Although nuclear fuel prices have risen more than other fuels, the price of uranium remains relatively low, and nuclear fuel accounts for a small portion of operating and maintenance costs compared to fossil-fired plants. As a result, these fuel price increased have made nuclear more attractive.

The volatility of fuel prices also makes nuclear energy more attractive than fossil-fired plants. In approving FPL's recent proposal for two nuclear reactors at the Turkey Point site, the Florida Public Service Commission found that building nuclear plants instead of natural gas plants would save Florida utility customers over $94 billion in fuel costs alone over the life of the plants.

Limits on Greenhouse Gas Emissions

While some may disagree about the science of climate change, we at Exelon are convinced that there is a need to take action now to slow, stop and then reduce human-caused greenhouse gas emissions to address climate change. If policymakers take action to reduce greenhouse gas emissions, nuclear power will play a critical role in helping meet that policy objective.

Nuclear power has played a vital role in reducing greenhouse gas emissions. Nationally, nuclear power plants account for 73 percent of all carbon-free generation. In 2006, the volume of greenhouse gas emissions prevented by nuclear plants was the equivalent of taking 96 percent of all passenger cars off the road. During the last year alone, Exelon Nuclear prevented 121 million metric tons of carbon dioxide by eliminating the need for an equivalent amount of coal-based generation.

While nuclear power will not serve as a "silver bullet" solution to the climate issue, policymakers are increasingly recognizing that it will be exceedingly difficult – if not impossible – to reduce emissions without nuclear power. New York Mayor Michael Bloomberg's PlaNYC, the Regional Greenhouse Gas Initiative, and most recently the State of New Jersey's Energy Master Plan have all recognized that nuclear plants must continue to operate if their environmental objectives are to be met.

Challenges

In addition to a demonstrated need for new base load power, the nuclear industry has identified six preconditions to the construction of new nuclear plants:

- a demonstrated regulatory process
- completion of reactor designs for passive technologies
- confidence in a long-term solution for used fuel disposal
- public confidence in nuclear power
- a sound nuclear power infrastructure
- acceptable financial returns

I would like to touch briefly on each of these issues.

Demonstration of Regulatory Process

As noted above, one of NuStart's primary objectives is to demonstrate the Nuclear Regulatory Commission's never-before-used licensing process to obtain a Combined Construction and Operating License (COL) for an advanced nuclear power plant.

Obtaining a COL is a critical step in a potential renaissance of the nuclear power industry in the United States. By achieving this, NuStart hopes to demonstrate that the COL can be obtained on schedule and within budget, and that advanced plant designs can be approved.

Further, NuStart's efforts will provide a realistic time and cost estimate for building and operating a new nuclear plant in today's environment.

During the 1980s, nuclear plants were plagued with significant cost overruns due in large part to the regulatory uncertainty inherent in the NRC licensing process. Many major issues were argued and litigated only after plants had been constructed, in some cases delaying plant operations for years.

Congress took an important step to reform the licensing process as part of the Energy Policy Act of 1992 with the codification of the NRC's combined Construction and Operating License regulations under 10 CFR Part 52. The COL process is designed to provide all parties with an opportunity to raise issues related to siting and plant design before a license is granted. Once a plant is built, the only question before the Commission is whether the licensee has constructed the plant in conformance with its license. On paper the process appears to be sound; however, investor confidence will not be established until the process is demonstrated, as proposed under the NuStart project.

The new licensing process also gives potential licensees an opportunity to have sites pre-approved by the Commission. The Early Site Permit (ESP) process allows a potential licensee to apply to the Commission for approval of a site for a new nuclear plant. Companies provide the NRC with extensive data on the proposed site, as well as information about the reactor design that could be built on the site. If a site is approved, a company can "bank" the site for as long as 20 years.

Also under the Department of Energy's Nuclear Power 2010 program, three companies received matching funds to develop and submit Early Site Permit applications to the NRC: Dominion's North Anna site in Virginia, Entergy's Grand Gulf site in Mississippi, and Exelon's Clinton Power Station in Illinois.

NuStart's experience with the licensing process has been positive to date. Much of the success to date is attributable to the communication between the NRC staff and the industry. The communication examples include the numerous workshops conducted by the staff to convey their expectations regarding COLA content, the frequent pre-application visits and meetings and the frequent interaction during the sufficiency reviews of the applications. Also of note is the implementation of the design-centered working group concept whereby each applicant consistently presents the standard design for a particular technology in their respective COLA allowing for efficiency in the NRC review process. The NuStart consortium serves as an optimum forum for such industry coordination, both before and during the NRC review process.

Completion of Reactor Designs for Passive Technologies

Another aspect of the revised NRC licensing regulations allows reactor vendors to submit designs to the NRC for Design Certification. This process allows the NRC to evaluate potential designs and allows for public participation in the certification process. Once a

design is certified by the Commission, it can be paired with an Early Site Permit and used in the submission of a Construction and Operating License.

NuStart plans to complete the design engineering for two advanced reactor technologies, General Electric's ESBWR and Westinghouse's AP1000. NuStart selected these technologies because they represent the optimization of operational confidence and innovation. They are natural evolutions of the designs currently in operation, yet both of these technologies adopt simplified design features and technology improvements that rely on inherent, passive safety systems. In this context, "passive" refers to design principles wherein laws of nature such as gravity feed, convective heat transfer and natural circulation are used in place of complex systems comprised of numerous pumps, valves and actuation devices. The result is an enhancement to safety because there is less reliance on equipment performance and operator action, and a reduction in cost because there is less equipment to construct and maintain.

NuStart's work with the reactor vendors to complete the one-time generic engineering work necessary for the standardized plant designs will position these technologies for deployment when needed, thereby significantly reducing the time to market for a new nuclear plant.

A Long-Term Solution for Used Fuel Disposal

While nuclear energy has a proven track record in the United States as a clean, economic and reliable source of energy, used fuel from nuclear plants must be managed to permanently isolate it from the environment.

Before new plants can be built, energy companies, investors and the public must be confident that there is a long-term solution for the disposal of used nuclear fuel. While individual companies may have different views on what constitutes an acceptable solution, it is essential that the Federal government continue to make progress on meeting its statutory and contractual obligation to begin removing used fuel from reactor sites.

In 1982, the Federal government codified its obligation to assure for the permanent disposal of high-level radioactive waste and used nuclear fuel. In 2002, Congress upheld President George W. Bush's designation of Yucca Mountain, Nevada, as the site for the nation's permanent, deep geologic repository. While the Yucca Mountain project faces a number of challenges, the industry, policymakers and regulators have recognized that used fuel can be safely stored on-site for 100 years or more.

Given the uncertainties surrounding the Yucca Mountain program and the fact that used fuel can be safely stored at reactors sites for several decades, policymakers are examining the possibility of recycling the fuel to harvest the vast quantities of usable material that remain in the fuel and to minimize the volume of the waste product that must be permanently isolated from the environment.

Public Confidence in Nuclear Power

New nuclear power plants cannot be built without a high degree of public confidence in the safety of the technology, the competence and commitment of reactor operators, and the dedication of regulators. The industry recognizes that public confidence is based on the performance of our current fleet of plants. We must remain ever vigilant to the safety responsibility entrusted to us.

Public awareness of nuclear energy's positive contribution to energy independence, clean air, and a reliable, low-cost energy supply, has led to greater support in recent years. The nuclear industry's commitment to safe operations and its proven track record over the last 25 years have also reinforced public support for nuclear technology.

The nuclear industry's continued strong operating record has led to increased public confidence. In 2007, the industry's median unit capability factor was 91.5 percent, the eighth consecutive year that capability factors have exceeded 90 percent. A related metric, capacity factor, a measure of total power generated as a percentage of design production, was a record high 91.8 percent in 2007. The Nuclear Energy Institute reported that this record capacity factor, along with other sector-leading nuclear industry indicators, led to U.S. nuclear power plants producing a record-high 806 billion kilowatt-hours (kwh) of electricity in 2007.

A nationwide poll conducted earlier this month for the Nuclear Energy Institute found 63 percent of those surveyed favor nuclear energy. While 59 percent agreed that the country should definitely build new plants, 71 percent believe that plants are safe and secure.

Nuclear Power Infrastructure

A critical challenge for the nuclear industry is the continued presence of a strong nuclear power infrastructure. This infrastructure includes the engineering expertise and skilled labor to design, construct, and operate plants; the existence of a strong educational network at the nation's colleges and universities; and the presence of knowledgeable and dedicated personnel to staff the Nuclear Regulatory Commission.

The lull in the construction of new nuclear power plants in the 1990s led to a decrease in the number of nuclear engineering students in American universities. As with many other businesses, the nuclear industry faces an aging workforce. If the commercial nuclear power industry in the United States is to expand, it is imperative that the nation has a skilled workforce that is ready to construct, operate, and support new plants.

The limited availability of a skilled workforce is not unique to the nuclear industry. It affects the entire energy sector as well as the manufacturing sector. The commercial nuclear industry is taking aggressive action to develop its future work force. The industry has been pursuing a variety of initiatives to increase career awareness through direct outreach efforts with professional societies and through the internet and other media.

The industry has also developed training programs and partnerships through high schools, union apprenticeship programs, skills centers, community colleges and universities, and we provide financial support and scholarships to students and is actively developing and engaging regional and state-based work force development partnerships.

To help American workers prepare for careers in the nuclear industry, we are taking steps to raise awareness of the impending skilled craft labor shortage and its impact on the energy sector; elevate the image, status and prestige of skilled craft careers; attract, recruit and train workers, particularly from untapped and under-represented labor pools; align investments and work force development initiatives to ensure collaboration and coordination of government, industry and labor efforts in the develop the energy skilled trades work force; build partnerships between industry, government, organized labor and the education community that promote talent and economic development; and implement performance-based education and training programs for skilled craft workers through vocational and technical education programs in secondary and post-secondary educational environments (including high schools, pre-apprentice, apprenticeship, and community college programs).

Acceptable Financial Returns

As a final prerequisite for new plant construction, companies will have to be confident that they can provide their shareholders with an acceptable financial return on their investment and that they can provide to their customers affordable and reliable electricity. Any investment in nuclear power must look attractive not only on an absolute basis, but superior to other fuel alternatives.

While the industry is optimistic that nuclear generation can be competitive to the other alternatives, it does expect that the "first mover" investors will face significant hurdles unique to a nuclear investment. Accordingly, financial incentives such as those provided for in the Energy Policy Act of 2005 are both necessary and appreciated.

The Energy Policy Act established three incentives for new nuclear plant deployment: a production tax credit for up to 6000 MW of new plant capacity, standby insurance in the event of regulatory delay for the first 6 units, and the Title XVII loan guarantee that allows support for any advanced energy technology that "avoid, reduce, or sequester" greenhouse gas emissions.

These incentives are necessary for the first series of plants built employing advanced technologies under a never-before used licensing process. The new regulatory process must be proven before investors will have the confidence necessary to invest in these new technologies. Such a cooperative industry/government financing program for the first plants is a necessary and appropriate investment in U.S. energy security.

Conclusion

Trends in worldwide energy use, increases in fossil fuel costs, and the need to limit greenhouse gas emissions present the nuclear industry with the opportunity to play an increasing role in meeting our increasing need for electricity. While there are a number of challenges to realizing the full potential of nuclear power, I am confident that those challenges can be successfully managed.

Thank you for the opportunity to appear before you today.