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Statement of Jeffrey S. Merrifield  
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Good Morning. Thank you very much for the opportunity to speak to you this morning. It is a pleasure and honor to be here.

Over the next few days, you will hear several presentations regarding risk including ones on the NRC's efforts to risk-inform Part 50 and our efforts to develop a risk-informed reactor oversight program. Do me a favor. If during the presentations you don't hear the word **communication**, I urge you to challenge the presenter. Ask the presenter what their plans are for communicating about risk to the lawyer on the Commission or in Congress, or to the concerned mechanic or parent who lives near a nuclear plant. Let me make one thing perfectly clear, we can have the most advanced risk insights, the best science, the leading experts in the field, but if we do not have an effective communication plan, we will fail. The only way the NRC and the nuclear industry will succeed in their efforts to risk-inform our regulations and use risk insights to reduce unnecessary burden is by learning to effectively communicate with the public and our other stakeholders about risk. For most of our stakeholders and even some of our staff, risk is an unknown, a black box. Uncertainty brings with it apprehension, fear. Other stakeholders in public interest groups and even in Congress view our efforts to risk-inform our regulations with skepticism. They see these risk initiatives as just another ploy by the industry and a capitulating NRC to reduce regulatory requirements. It is imperative that we discuss risk in a manner that brings greater understanding and confidence to our community of stakeholders. We must demonstrate that risk-informed regulation in no way represents less of a commitment to safety, in fact, it represents an even greater commitment to safety because it allows the NRC and our licensees to focus our limited resources on aspects of plant operation that are truly risk-significant. The ball is in our court. If we are to reap the tremendous benefits of our improved risk expertise, we cannot take shortcuts in the area of communication.

### **State of the Nuclear Industry**

What I thought I'd do today is discuss the rapidly changing state of the nuclear industry in the U.S., the equally rapid changes ongoing within the NRC, and some of the challenges facing the NRC's research and international programs.

These are truly eventful times for the electric industry in the United States. Deregulation is rapidly changing the business landscape of the electric industry and the transition to a competitive market has begun to take shape in many States. Utilities are restructuring, mergers are taking place, many nuclear and non-nuclear assets are changing hands, and the economics of the market are demanding that plant owners work very hard to control and reduce costs. The speed of change is unprecedented.

As for the state of the U.S. nuclear power industry, just a couple of years has made a tremendous difference. Just 2 years ago, the outlook for nuclear power in the U.S. appeared bleak. There were ominous predictions by both the electric industry as well as the financial community that the unpredictable regulatory and economic challenges brought on by deregulation would force many nuclear plants to shut down well before the expiration of their licenses. Today, many economic factors and the NRC's regulatory reform efforts have contributed to a resurgence for nuclear power. As I have stated on many occasions, I believe the outlook for nuclear power in the U.S. is the brightest its been since the Three Mile Island accident. Deregulation of the electric industry, once thought to be final nail in nuclear power's coffin, is instead serving as the catalyst for dramatic improvements in the manner in which nuclear plants are managed. Licensees have improved operator training, made significant process improvements, streamlined operations, shortened refueling outages, and reduced costs. Today, plants are operating better than ever before with forced outage rates at an all time low and capacity factors at an all time high. Utilities are recognizing that nuclear plants that are well-maintained and effectively operated can be money-makers even in a competitive deregulated electric industry.

The resurgence of nuclear power in the U.S. has catapulted two issues to the forefront of the nuclear industry: license renewal and license transfers.

### **License Renewal**

As many of you know, more than half of the operating nuclear reactors in the U.S. will reach the end of their currently licensed lives by 2018. Both the NRC and the nuclear power industry have devoted extensive resources to understanding the technical issues associated with allowing a nuclear plant to operate for 20 years beyond the original 40-year license term. Also, establishing a disciplined, predictable, and timely license renewal process that ensures the protection of public health and safety, has been, and continues to be, a top priority of the Commission. In this regard, the Commission has issued a policy statement outlining its expectations for a focused review of license renewal applications. Using case specific Orders, the Commission has established an aggressive adjudicatory schedule for reviewing the first two license renewal applications - those for the Calvert Cliffs and Oconee nuclear power plants. Significant management oversight of the review process and the resources dedicated to that process has been institutionalized. As I have told the staff and a number of industry leaders, ultimately the decision on whether to seek license renewal rests with the licensee. This decision should not be tainted by concern over the uncertainty and unpredictability of the NRC's regulatory processes.

While our goal for completing the license renewal process for the Calvert Cliffs and Oconee applications was originally 30-36 months, it is now likely these reviews will be completed well ahead of schedule - most likely within 25 months. While I am personally pleased with our progress on these two applications, I think we can do better in the future. The staff has gained a great deal of experience during the initial reviews and is in the process of compiling an impressive list of lessons learned that can be applied to future renewal reviews. The staff is also developing a streamlined, yet thorough, process for addressing generic issues. I sincerely believe that with additional process improvements, we will be able to complete our review of future renewal applications within 18 months.

In some ways the NRC is a victim of its own success. The Calvert Cliffs and Oconee reviews have demonstrated that the NRC's renewal process is disciplined and timely, and as a result, interest in license renewal within the nuclear industry has dramatically risen. Entergy's Arkansas Nuclear One plant and Southern Company's Hatch plant are poised to submit their renewal applications in the coming months. Many more applications are certain to follow. Sam Collins, the NRC's Director of Nuclear Reactor Regulation was recently quoted in an industry journal as saying that about 85 of the 103 operating units have expressed some interest in license renewal. I don't know what the right number is, but I feel confident that the vast majority of the existing fleet of nuclear reactors will seek license renewal. This, of course, represents a major resource challenge for the NRC. In order to meet this challenge, we will have to

capitalize on our experience, get our arms around our process for dispositioning generic issues, and simply dedicate additional resources to our review effort. There is little doubt in my mind that the NRC is up to the challenge and no doubt in my mind that the Commission will provide whatever resources necessary to get the job done.

## **License Transfers**

Now let me discuss license transfers.

As the electric industry proceeded down the road toward deregulation over the last few years, it was clear that the NRC would have to gain a greater understanding of the effects of the changing business environment on plant operations and safety. It was also clear that the corporate restructuring and asset transfers brought on by deregulation would result in an increase in license transfer applications. To ensure that license transfer reviews were conducted in an effective and timely manner, the Commission promulgated regulations establishing an informal and streamlined Subpart M hearing process. In addition, we began work on developing guidance documents to determine whether a proposed transferee is technically and financially qualified, as well as to evaluate foreign ownership and control issues. The overall effect of our efforts has been to improve the preparedness of the NRC, our licensees, and the public for dealing with issues associated with electric utility restructuring.

While the NRC was prepared for an increase in license transfer applications, few of us were prepared for the onslaught of activity witnessed in 1999. We began 1999 confident that the NRC's license transfer process was predictable, disciplined, and prompt. In April, the NRC approved the transfer of the operating license for Three Mile Island Unit 1 from GPU Nuclear to Amergen Energy Company, a company jointly owned by PECO Energy and British Energy. We felt very good because our process proved itself to be sound as the staff was able to address the many foreign ownership issues raised, and still complete its review in less than 4 months. In May, we approved the transfer of the operating license for the Pilgrim Plant from Boston Energy Company to Entergy in about the same period of time.

What was to follow was unprecedented. Announcements were made that ownership of Clinton, Nine Mile Point, Oyster Creek, and Vermont Yankee would change hands. Millstone and Seabrook would be put up for auction. Carolina Power & Light, the licensee for the Brunswick, Shearon Harris, and Robinson nuclear plants would merge with Florida Power Corporation, the licensee for the Crystal River nuclear plant. Then, several weeks ago, two giants in the U.S. nuclear industry, Commonwealth Edison and PECO Energy, announced merger plans. 14 operating nuclear units are involved in this merger. And to think - this is just the beginning.

Clearly, we are in the midst of a truly dramatic shift in ownership of nuclear generating assets in the U.S. Given the current market forces, I believe that this shift will continue to accelerate in the next year or two. As I have said on several occasions, I view the consolidation in the nuclear industry as a tremendous opportunity to further improve the operational performance and safety of these plants. In most of the transactions, I expect that the buyers will be large nuclear generating companies that own and operate a substantial number of nuclear units. These buyers have economies of scale and resources that are simply not available to companies that own and operate only one nuclear unit. I am also truly encouraged by the fact that most of the license transfers will likely involve buyers with excellent performance records. However, as I have cautioned many executives in this industry, these transfers must be managed effectively. License transfers, if not managed properly, can distract management from their primary plant oversight responsibilities and dilute management talent. Since there are typically resource and staffing implications associated with these transfers, they can also distract plant workers from their primary responsibilities. To date, licensees involved in license transfers have done a terrific job managing them. As long as this continues, the Commission is prepared to commit whatever level of resources necessary to ensure future license transfers are handled in an expeditious manner.

## NRC Reactor Oversight Program

At the same time that economic challenges in the electric industry are driving the licensees of our nuclear plants to reinvent themselves, government reform efforts and stakeholder dissatisfaction are driving the NRC to reinvent itself. The NRC is now in the midst of one of the most aggressive regulatory reform efforts ever undertaken within the federal government. We are successfully making the transition from big government to good government. In terms of real dollars, our FY 2000 budget has decreased by over 25% and our staffing level is down almost 600 individuals from agency highs in 1993. We are also successfully making our processes more timely and predictable, we are eliminating unnecessary regulatory burden, we are becoming more risk-informed, and we are holding our managers and staff more accountable. Some see these challenges as threats. I see them as tremendous opportunities that I am confident will result in a more effective and efficient NRC.

Never has the NRC had a greater opportunity to reinvent itself as that presented by the new **reactor oversight program**. By almost any standard, the safety performance of the nuclear industry has significantly improved during the 90s and is better now than at any time in the past. The number of initiating events resulting in scrams has declined significantly over the past 10 years, and this is reflected in fewer and less complicated transients. While the NRC's current reactor oversight program has served us well and, I believe, has enhanced reactor safety in the U.S., it has failed to evolve sufficiently as the industry matured and reactor performance significantly improved. Some of our inspection efforts were misdirected on non-risk-significant matters and excessive subjectivity had entered into our plant assessment processes. Quite frankly, our assessment processes lacked the predictability and consistency necessary to run an effective and efficient oversight program.

In response to these shortcomings, the staff is well along its way to developing a new reactor oversight program. The new program will utilize a combination of risk-informed, objective performance indicators and a risk-informed baseline inspection process to measure plant performance. It is designed to focus more of the agency's resources on the relatively small number of plants which experience performance problems, while reducing the regulatory impact on plants that perform well. I'm not going to go into detail about the new program; however, I want to give you a sense for how significant the changes are.

The use of objective and measurable indicators of licensee safety performance should substantially reduce the amount of subjectivity in our reactor oversight process. Initially, there will be 19 performance indicators built around seven safety cornerstones. These cornerstones include such things as initiating events, mitigating systems, and emergency preparedness. I am certain that these indicators and their thresholds for regulatory response will evolve as we become smarter with their use.

In combination with our performance indicators, our new baseline inspection program will be our standard inspection effort that focuses on activities and systems that are truly risk-significant. Additional inspections beyond the baseline will be performed at those plants at which performance is below a specified threshold, based on performance indicators and inspection findings. I am pleased to note that we are capitalizing on our risk research in the development of our baseline inspection program by extracting risk insights from the Individual Plant Examinations to help our inspectors improve the new risk-informed framework. Since these insights focus on areas that drive risk, the inspectors will be able to make more realistic assessments of safety findings, and be better prepared to present their assessments to our licensees and the public.

The NRC is testing the new reactor oversight process with a pilot program at nine nuclear plants. The plants represent a cross-section of the nuclear industry, different plant designs and varying levels of performance. From my perspective, the response to the pilot program has been nothing short of remarkable. The apprehension and resistance to change that is common with most new ideas are diminishing as our

inspectors, our licensees, and our stakeholders gain greater confidence in the new oversight program. That is not to say that problems are not being identified. Some believe that our performance indicator thresholds for taking regulatory action are set too high and thus not adequately sensitive to detect performance declines. Others believe the new program could hinder our ability to provide valuable feedback to licensees regarding plant performance. I believe that if the pilot program is effective, more problems will surface. Initially, the pilot program was scheduled to be completed by January 2000. However, given the scope and depth of the changes, the Commission extended the pilots until at least April of 2000 to ensure the new oversight process is adequately put through its paces. I believe this is time well spent.

I am optimistic about the new reactor oversight program. I believe that it has the potential to enhance safety by focusing NRC and licensee resources on the most risk significant aspects of plant operation. It should also bring greater consistency, discipline, and predictability to our inspection, assessment, and enforcement processes. As we proceed along the course we have set for ourselves, we must be vigilant in our efforts to ensure that our new program is able to detect performance declines before they challenge safety. I am confident that the new oversight program will ultimately meet this challenge and I am equally confident that it will increase the level of safety at the plants we oversee.

## **Research**

I'd like to now turn my discussion to a subject that is near and dear to my heart - funding for research projects within the NRC.

As many of you know, the NRC's research program has historically provided a significant part of the Commission's independent technical capability. Congress in the Energy Reorganization Act of 1974 mandated the formation of the Office of Nuclear Regulatory Research to ensure that the Commission would have "an independent capability for developing and analyzing technical information related to reactor safety, safeguards, and environmental protection in support of the licensing and regulatory process."

The scope and emphasis of our research programs have changed over the years as nuclear technology has changed and matured. In recent years, the NRC's regulatory reform initiatives and the nuclear industry's enhanced interest in license renewal, have brought research to the forefront of the agency's efforts. For example, the Office of Research is at the forefront of our efforts to risk-inform Part 50. They are instrumental in developing a new risk-informed inspection program and objective performance indicators. The resurgence of interest in license renewal has highlighted the need for additional research on plant aging, particularly as it affects the integrity of reactor pressure boundary components, vessel internals, electrical components, steam generator tubes, the containment structure, and other passive structures and components. In addition, emerging technologies such as the Framatome electro sleeving technique, bring with them their own unique research challenges.

One would think that with these many challenges, this would be a heyday for the agency's research program. In many ways, it is. However, our research program has never been under greater scrutiny and has never before faced the budgetary pressures it faces today. The days of the open checkbook are over. In fact, the reactor safety research portion of the NRC's budget has declined from over \$100M in the early 1990s to around \$40M in FY 2000. There are two primary reasons for the increasing budgetary pressures facing not only our research program, but our entire agency - the Omnibus Budget Reconciliation Act of 1990, commonly referred to as OBRA-90 and the Government Performance and Results Act of 1996, or GPRA.

Briefly, OBRA-90 requires the NRC to recover almost 100 percent of its budget by assessing fees to NRC licensees. This has been a highly controversial issue for many years, and one in which the NRC has been actively seeking legislative remedy. With a budget of about \$470 million, a declining number of licensees, and increased competition in a deregulated electric industry, our fees represent a significant economic

burden to many licensees. It's not surprising that this burden has resulted in greater scrutiny of our budget by our licensees and ultimately Congress. GPRA requires agencies to set long-term strategic goals as well as annual performance goals and to clearly demonstrate how each and every one of the activities they perform is linked to these goals.

Simply put, if you can't demonstrate that what you are doing is linked to your overall strategic goals, you shouldn't be doing it.

The NRC's Office of Research has made progress in reinventing itself to meet the many challenges of OBRA-90 and GPRA. However, one challenge that remains unanswered involves their inability to defend the research program budget to the extent necessary in today's environment. The NRC's FY 2001 research budget proposal, which the Commission recently voted on, focused on describing **what** research projects were necessary. However, one key piece was missing. What was missing was a clear and defensible articulation of **why** these projects were necessary. Missing were the clear links between proposed research activities and the NRC's strategic and performance goals. As a result, I and some of my Commission colleagues aggressively challenged the proposed research budget and quite frankly recommended even further cuts. I can assure you, I will scrutinize the FY 2002 research budget even more vigorously.

I am a fiscal conservative. However, I am not fiscally irresponsible. I understand the meaning of false economics and understand that in order for the NRC to be successful in dealing with such important matters as risk-informed regulation, license renewal, and emerging technologies, our research program must be strong. I also understand the importance of both anticipatory and confirmatory research. Given a sound basis, I will vehemently defend our research budget before Congress, our licensees, and other stakeholders. Without such a basis, I will be research's toughest critic.

I'd like to share with you my perspective on what the budget realities of the new millennium will mean for the future of the NRC's research program. I'm sure many of you who are not from the NRC face similar realities.

First, I believe that the economic pressures facing the NRC and our licensees will manifest themselves into even greater scrutiny of each and every research dollar in the future. If anyone thinks these economic pressures are going away, I urge them to consider the speed at which deregulation is proceeding in the electric industry and the extent to which fiscal conservatism is sweeping our federal government. There should be little doubt that these economic pressures are here to stay. It is imperative that our research staff adapt to this higher standard of fiscal accountability and demonstrate to our stakeholders that our research activities represent an effective use of agency resources.

I also believe that our research staff will have to reinvent the manner in which they defend research activities. Contrary to popular belief, **good research does not speak for itself**. We as an agency have to do a better job articulating why each of our research activities is important to the mission of the agency and demonstrate strong links between each activity and the agency's strategic and performance goals. If the research is defensible, our research staff must learn to market it, sell it, and clearly make the case for why it should be funded. If it is not defensible, the staff should sunset it and move on to higher agency priorities.

I strongly support having a research program that is visionary in its approach and capable of providing independent thought on important agency matters. However, independence has to be carefully managed so that it does not lead to isolation. I believe our research staff must work closely with our program offices and our stakeholders - the primary end users of the research - to ensure that these parties share similar priorities and a consistent, or at the very least a compatible, vision of the future.

I believe that our research staff should adopt a budgeting process that better integrates both micro and macro budgetary components. Too many people inside and outside of the agency are fixated on the bottom line. They point to the bottom line of the research budget and express alarm that it is either too big or too small for the job at hand. I would argue that the bottom line is an almost secondary component of the budget equation. Today's budget realities dictate that we approach our research budget line item by line item. If we are true to our strategic goals and disciplined in our approach, a sound and defensible bottom line will naturally fall out of this process. For those that argue that our research budget is too big or too small, I challenge you to move beyond the bottom line and identify research initiatives that should be done but are not, or research initiatives that are being done but should not.

Finally, while I believe it is prudent for the NRC to maintain a vibrant research program and to assume a leadership role in areas that are critical to reactor safety in the U.S., I believe it is foolish to aspire to be the premier nuclear research agency in all disciplines. The issues are simply too broad and complex for any country to assume such a role. As the regulator of the world's largest civil nuclear program, the NRC has broad capabilities to contribute to international safety and regulatory programs. Also, through cooperation, the NRC often participates in research programs of other countries and obtains valuable information often at a comparatively small cost. For example, International research has already benefitted the NRC in such areas as high burn-up fuel performance and materials issues associated with steam generators and reactor vessel internals. As economic pressures drive greater fiscal restraint, it is going to be imperative that the NRC seek ways to expand on its efforts to capitalize on research work being done by the international nuclear community.

### **International**

While I'm on the subject of international activities, I want to welcome our international colleagues in the audience. It is a pleasure and honor to have you with us.

Your presence here today illustrates how very small and closely knit the world of nuclear power has become. With this closeness comes opportunities. Opportunities to share technical insights and operating experience. Opportunities to exchange views on broad policy and safety matters. Opportunities to capitalize on the tremendous economies of scale of the international nuclear community.

Our closeness also brings with it many challenges. As I have discussed with many executives in the U.S. nuclear power industry, this industry will always be judged by its weakest link. Thus, nation's with mature nuclear programs should recognize the vested interest they have in sharing technical insights, operating experience, and best practices with those nations with struggling programs. We must face the fact that a core damage accident anywhere in the world is like having one in our own backyard. As the accidents at Three Mile Island, Chernobyl, and most recently at the Tokaimura (To-ki-mura) facility in Japan have highlighted, a serious nuclear accident anywhere in the world could have a significant impact on public confidence and could ultimately derail the future of the nuclear option in many countries.

In my opening remarks, I stated that the outlook for nuclear power in the U.S. is brighter today than it has been in a very long time. However, it is not lost on me that the continued safe operation of the existing fleet of nuclear plants around the world remains the foundation upon which the future of this industry will be built. I commit to you today that as the NRC pursues regulatory reform initiatives and faces the challenges presented by electric industry deregulation and government budget cuts, we will not lose sight

of our mission to protect public health, safety, and the environment. To do so would simply be irresponsible.

Thank you very much. I would be pleased to use my remaining time this morning to answer any questions you may have.