

*Written Statement of  
Nils J. Diaz, PhD  
Florida*

*Before the Committee on Appropriations  
Subcommittee on Energy and Water Development  
U.S. House of Representatives*

*Hearing on the Future of Nuclear Energy  
September 13, 2006*

*Introduction*

Mr. Chairman, members of the Subcommittee, I am pleased to join you to testify on the future of nuclear energy in this country, and on its fuel cycle. On a personal note, Mr. Chairman, I want to thank you for the privilege of working with you and candidly discussing many important issues during my years in government service, and for your confidence in asking for my participation today.

I would like to preface my comments by establishing my position on the main theme of this hearing. I am convinced that nuclear energy can and should play a more significant role in our energy, economic and environmental portfolio, for the well-being and the security of our nation.

Mr. Chairman, you know I am primarily a technical person, with over 40 years of experience in many important areas of nuclear energy and technology. Nevertheless, I believe that the challenge ahead for nuclear energy is mostly not technical. For the most part, I think that the future growth of nuclear energy depends on providing credible and practical solutions to the governing socio-political issues and to the financial uncertainty they create.

I will, therefore, first use a technical argument to support my statement. Simplistically, there are three necessary components of a functional nuclear program: the fuel supply, the nuclear power plant and the radioactive waste/spent fuel management program. The fuel supply and the nuclear power plant have to be there from the beginning and thereafter, as well as key elements of radioactivity management and on-site storage of spent fuel. The safe and secure permanent disposal of high level wastes is eventually necessary, yet it is not strongly coupled with the operability or the economics of the power plant. In fact, there are no permanent fuel disposal facilities fully established after 50 years of commercial nuclear power operation. Some will argue that the fuel is so

compact and so easily stored and monitored that delays were inevitable for a variety of reasons, including economics and political considerations. The energy value of the recoverable fissile fuel was also one of the factors for delay, with the recovery cost too high when compared to the cheap uranium in the marketplace. Of course, this situation has changed today.

Commercial nuclear fuel has been and is safely and securely stored on-site or off-site in wet pools or dry storage casks, and safely transported when needed. The socio-political issues have dominated the policy and public debate on high level wastes, arguably distorted its relevance in time, and contributed to the uncertainty of nuclear power growth. A viable, practical and credible permanent solution to the end of the fuel cycle is sorely needed here and abroad, but it is not needed immediately and it must not be a prerequisite for the growth of nuclear power. Regardless of technical, economical, fuel supply or other factors, we have been confronted with the desire for a credible solution, sealed and delivered, for high level radioactive waste, sooner rather than later. That alone is good enough for me, Mr. Chairman, to make it a very important issue. Consequently, and fully cognizant that I am preaching to the choir, Mr. Chairman and members of the Committee, this great country of ours needs to forge a comprehensive solution to the closing of the nuclear fuel cycle, in appropriate stages, deliberately, knowing that it is required, that it is doable and that we are obligated to frame it carefully for present and future generations.

### ***Future of Nuclear Power***

The future growth of nuclear energy in this country is dependent, for about the next 25 years, on the establishment of a sustainable industrial and financial infrastructure capable of deploying advanced Light Water Reactors (LWRs) on cost and on schedule. Safe and secure advanced LWRs can and should contribute to the nation's strategic interests, and to our energy, economic and environmental security. In other words, the new nuclear enterprise must be comprehensive and disciplined, economically competitive, well-rated financially, carefully planned and executed from beginning to end, supported by a reliable fuel and component supply chain, and with a credible spent fuel utilization and disposition program that can be taken to the bank. Of all these, I believe that establishing sound financing and credible spent fuel programs are the most challenging.

The requirements I have just mentioned are well known and everyone realizes they demand a new level of excellence in management, worldwide coordination and communications. In fact, I have been asked often, here and abroad, if the nuclear renaissance is real and doable. I am convinced, Mr. Chairman, that it is real and it is doable.

The United States of America can build a new fleet of LWRs on cost and schedule, with the requisite regulatory oversight, when the design, engineering, supply chain and financing are secured. I am not making light of the difficulties of implementing a new nuclear construction program on cost and schedule, with the requisite federal and state licensing. Once the nuclear industry makes up its mind to do it, I am convinced it can be

done right. I personally believe that the financial risk attached to the current nuclear ventures is over-estimated by being over-dependent on the poor history of nuclear power plant construction and licensing in the seventies and eighties. Even then, this country built over 100 nuclear power plants in about 20 years; at that time, it seems that many of the players did not know how to do it right; cost and schedule were figments of someone's imagination; there was no 3-Dimensional Computer-Aided-Design; and management and fully qualified craftsmen were wanting. The Vendor, the Architect/Engineer/Constructor, and the utility were often overwhelmed with the variations in the plant, the lack of a qualified and timely supply and manpower chain, and the start/stop project schedules. The licensing and regulatory structure was not adequate to the task, and to cap it all, the financial uncertainty was a dominant factor, with double-digit inflation and interest rates, declining electrical growth and the utilities/ investors facing costs that might not be recoverable. The utility industry was often caught between the proverbial rock and a very hard place.

It is a testament to the men and women that operate and manage nuclear power plants that they eventually prospered to the present level of safety, reliability and economics. No one should venture into nuclear construction without the lessons-learned from the past in one hand, and the new tools and capabilities now available on the other hand. Today, we know, can and should do much better, in every single key aspect of the construction, licensing and operation of new advanced LWRs. Uncertainty, and specifically financial uncertainty, needs to be reduced to enable the growth of nuclear power in this country. Again, Mr. Chairman, we know what to do.

The reduction of financial uncertainty is one task that the Congress already addressed by the enactment of the 2005 EPact. It certainly was an excellent beginning. Yet, the Congress should continue to look for additional means to enable those committed to new nuclear power plant construction to overcome the ghosts of the past and write a new chapter from which its performance is established and rated by decision-makers. There may be more you can do to strengthen the infrastructure needed to bring these plants on line more quickly, and safely.

### ***The Closing of the Fuel Cycle***

Mr. Chairman, members of the Committee: nothing is easy in nuclear power, and certainly there is nothing easy, politically or otherwise, regarding policy-making for the utilization and disposition of nuclear spent fuel. I used the term "utilization and disposition" very deliberately. Today, I believe the U.S. realizes that the solution to the accumulated and accumulating commercial spent fuel is not just a burial problem; it is not just a hole in a mountain. We have the information needed for policy-making on a mature subject and the technical capability to provide the solutions that will best benefit our country and stand the test of time.

The closing of the fuel cycle should be achieved by multiple and parallel solutions working holistically to support the acceptability, stability and growth of nuclear power, and assure our people that there are no undue risks to the public safety. It can be done by

integrating a program for spent fuel storage and transportation, preparation and reprocessing, recycling of fissile materials, reduction of the average radiotoxicity of wastes, and their eventual disposal in underground geological repositories. I recognize that this is precisely what many have toiled for long to achieve, only to find an obstacle and wait for next year. And the more the nation waits, the more difficult it seems to get. Nothing is easy in nuclear power and the closing of the fuel cycle appears to be the most challenging issue. I believe that the seriousness of the energy situation, the immediacy of new nuclear construction, the present serious and urgent debate to achieve a national policy and to make the investments it requires provides a good opportunity to forge what is needed for our generation and generations to come. The debate needs to focus on the fact that this is truly a policy issue for the benefit of the American people, and not just a nuclear issue that can again be postponed.

Recognizing that the timetables are changing, that decision-makers are weighing new and good options, I would like to provide a summary addressing the other main issues of this hearing:

- The principles underlying GNEP and the stated objectives are sound and would work in the best interests of the U.S. GNEP could serve as a driving force to integrate the different paths and stages of a complete solution to closing the fuel cycle, storing, transporting, utilizing and disposing of the spent fuel materials for recycling and disposal, as appropriate. I understand that significant efforts are on-going to discriminate between short term and long term preparation and processing technologies and their relative priority, as well as to optimize the staging of the different flow paths.
- Interim Storage has two distinct considerations, which I would like to address separately. One is an equity and financial liability issue, arising from the DOE responsibility to take ownership of the spent fuel. I leave this issue to those closer to it, while realizing it has impact on the entire spent fuel program. The second consideration is more technical: the need for away-from-reactor Interim Storage facilities. From the viewpoint of safety, security and operability, I believe there is not a present need for multiple interim storage facilities. Again, I am not addressing the equity and financial liability issue, only the actual operational need. Interim Storage makes a lot of sense for the storage of spent fuel from decommissioned reactors and for spent fuel staging related to GNEP, especially if there are one or two willing and suitable sites. Presently, it could also add multiple technical, licensing and legal variations to an already complex problem.
- Yucca Mountain should be expanded, changed and completed, fitting the new timetables and the nation's needs, after assuring that the licensing requirements are fulfilled. The distinct role that Yucca Mountain should play in the overall national policy to close the fuel cycle should be well established.

In summary, Mr. Chairman, I see capabilities that need to be exercised and a lot of hard work to spur the growth of nuclear energy in this country. I see no showstoppers, yet there is a need for continued political support by the Congress and the Administration, as well as the financial commitment of the nuclear utilities. I believe that the present policy debate on the closing of the fuel cycle is converging on solutions that focus on the

protection of public health and safety as strongly as on the well-being of the nation. I encourage you and the members of the Committee to take additional steps to assure the confidence of our people on legislated solutions to the spent fuel recycling and waste disposal issues.

Thank you, Mr. Chairman., members of the Committee; I will be pleased to answer your questions.