



# NRC NEWS

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## A VISION OF TOMORROW, A PLAN FOR TODAY

By

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Commissioner  
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### Introduction

This is a very interesting and challenging time to be a nuclear regulator. Over the last year, there has been an increasingly louder drumbeat among both members of Congress and key industry leaders about the possibility of building new nuclear power plants in the United States. Of course, we at the NRC must remain agnostic about the merits of building new plants, but we cannot be caught unprepared. The NRC will have an enormous responsibility not only to ensure that tomorrow's technology is safe, but also to effectively communicate the results of our work to stakeholders on both sides of the nuclear debate.

Dean Rusk, the former Secretary of State, once said that "unless we can find some way to keep our sights on tomorrow, we cannot expect to be in touch with today." For the NRC, our health and safety mission is too important to risk being "out of touch" on any nuclear matter. If legislative proposals and industry discussions are any indication, the next year or two may well bring an application for a new nuclear power plant using new technology, which the NRC may presently be unprepared to review. The possibility that the NRC may not be ready today is understandable given the fact that we have not received a new plant order for decades. Nonetheless, it would be utterly irresponsible for us to remain unprepared. Therefore, we are taking steps to understand our weaknesses and future needs to ensure that we are ready for the challenges of any future plant order.

## Changing Political Climate on Energy

Let me begin with some recent legislative proposals that I believe demonstrate a changing political environment for nuclear energy in the United States. Currently in Congress, there are many new or continuing initiatives aimed at enhancing the possibility that nuclear power can be a competitive, viable source of energy production in the United States. While no individual proposal provides direct funding for building a new nuclear power plant, in combination they illustrate a significant attempt to ensure that nuclear power is given serious consideration in the near future. The fact that such sweeping proposals are being considered may signal that a Rip Van Winkle-like awakening of the United States to the prospect of new nuclear power plants may be imminent.

Leading the movement for energy reform, President George W. Bush has stated that it is essential for America to have in place an energy policy that keeps power prices affordable, reduces our dependence on foreign oil, and does so in an environmentally responsible manner. Similarly, leaders in Congress are insisting that the national energy policy include prospects for new nuclear generation. Most notably, on February 26<sup>th</sup>, the Chairman of the Senate Energy and Natural Resources Committee, Senator Frank Murkowski (R-Alaska) along with Senator John Breaux (D-LA.), introduced broad-based legislation aimed at increasing domestic nuclear, oil, and natural gas generation to decrease America's dependence on foreign oil.

As for nuclear power, the Murkowski-Breaux bill, which is referred to as the National Energy Security Act of 2001, S. 388, provides for "nuclear energy production incentives" that encourage increased nuclear generation by providing up to \$2 million per year for up to 15 years, to those nuclear operators that increase their generation over the previous year's output. This legislation also contains \$25 million in funding for a "nuclear technology development program," to create "a roadmap to design and develop a new nuclear energy facility in the United States" and \$60 million to fund nuclear research initiatives. While it is unclear what portion of this legislation will become law, it seems certain that the bill will spark serious debate in Congress about the future of nuclear energy in the United States.

Senator Pete Domenici (R-N.M.), Chairman of the Senate Appropriations Energy and Water Development Subcommittee, introduced his own energy proposal on March 9<sup>th</sup>. Unlike the Murkowski-Breaux legislation, which focuses on a wide-range of power generation issues, Senator Domenici's bill, referred to as the Nuclear Energy Electricity Assurance Act of 2001, S.472, focuses exclusively on nuclear energy.

Senator Domenici asserts that his bill is "squarely aimed" at avoiding the risk of inadequate future energy supplies. In a statement accompanying the bill, Senator Domenici stated that the United States cannot afford to lose its supply of nuclear energy unless it is confident that it has a replacement energy technology that, as he puts it, offers "comparable safety, reliability, low cost, and environmental attributes." For these reasons, Senator Domenici believes his legislation will help ensure that nuclear power remains a viable energy source. Among many initiatives, the bill specifically "encourages construction of new plants." It also supports research and development of new technologies and supports the development of a regulatory framework within the NRC to ensure that new plants can be licensed.

Finally, Senator Jeff Bingaman (D-N.M.), in February introduced legislation that also focuses exclusively on nuclear energy issues. His bill, referred to as the Department of Energy University Nuclear Science and Engineering Act, S.242, is aimed at remedying an issue that impacts the NRC and industry alike; the declining trend of college graduates in the nuclear science and engineering fields.

Like Senator Bingaman, I believe this is an extremely important issue that deserves the attention of Congress. The NRC cannot maintain its current regulatory programs, let alone deal with the possible review of a new plant order, if it cannot maintain its nuclear expertise. Senator Bingaman's proposal, which would authorize funding for the Department of Energy to institute programs to attract undergraduates and faculty into the nuclear field by supporting training and research in nuclear science, could assist in arresting the recent decline in new graduates.

To me, the tone and number of bills that have been introduced in such a short time demonstrate that the political landscape has shifted with respect to nuclear power. Although many members of Congress will undoubtedly remain skeptical about the increased use of nuclear energy, it seems likely that the national energy debate that will occur this year will most certainly include some of the most active discussions about the potential future use of nuclear power since the TMI accident. Because funding for any new nuclear initiatives will serve to encourage licensing requests, we at the NRC are keeping a close eye on these developments. It will be up to the President and Congress to make the ultimate policy choices about whether to encourage the use of nuclear power to meet future energy needs. Our task will be to ensure that we are prepared to review the safety issues raised by new licensing requests, should any of the bills pass and should industry move ahead and order new nuclear plants.

### Industry Plans for A New U.S. Reactor

Turning to the issue of industry initiatives, it seems clear to me that the changing political climate will undoubtedly influence industry plans that were already underway for a new reactor in the United States. The NRC has been aware for months that a handful of utilities are seriously exploring the option of building new nuclear plants in the United States. In August 2000, Joe Colvin, the President and CEO of the Nuclear Energy Institute (NEI), told a gathering in London that a new plant may be ordered in the United States within five years, but that conditions for doing so may be ready in as little as two years.

As you know, the NRC has already certified three new reactor designs pursuant to Part 52. These designs include General Electric's advanced boiling water reactor, Westinghouse's AP-600 and Combustion Engineering's System 80+. Because the NRC has certified these designs, I believe it is likely that a new plant order would use one of these approved designs. However, the staff is also conducting a preliminary review associated with the Westinghouse AP-1000.

Exelon Corporation has also kept the Commission informed about its investment in a project for a new gas-cooled Pebble Bed Modular Reactor in South Africa. Clearly, the Pebble Bed reactor raises a variety of technical questions. Its use in this country will depend on resolving a range of technical and policy issues, and of course, the results of the South-African initiative. If the Pebble Bed reactor proves successful in South Africa, there is little doubt in my mind that Corbin McNeil, the CEO of Exelon, will attempt to utilize this technology in the United States. Likewise, Paul Miskin, CEO of BNFL, a co-investor in the Pebble Bed reactor, recently speculated at a nuclear waste conference in Tucson, Arizona, that construction of a Pebble Bed reactor in South Africa could begin within a year and that several could be under construction in the United States within five years.

While even Joe Colvin viewed his prediction in August as optimistic, the recent changes in the political climate combined with the factors that originally led NEI and others to predict the new plant orders in the first place, signal that new plant orders may indeed be on the horizon. Among these factors are the following: first, the cost of natural gas and oil has soared in recent years, making nuclear power more cost competitive. NEI, relying on data compiled by the Utility Data Institute, asserts that nuclear energy was the least expensive generating source in the year 1999. Second, interest rates are

considerably lower today than they were in the late 1970's and 1980's when utilities were financing the present fleet of nuclear reactors and when double digit inflation led to many plant orders being canceled. Third, more strenuous emission restrictions under the Clean Air Act have significantly impacted non-nuclear generating sources, such as coal. Fourth, the NRC has demonstrated a strong commitment to providing regulatory predictability and has significantly improved its timeliness over the last five years. Fifth and finally, there is an increasing demand for baseload power in the U.S., and in many parts of the country, supply simply cannot keep up with demand.

Obviously, the energy crisis in California has raised public awareness about energy supply issues. While it is fortunate that power shortages and unaffordable energy prices are not a problem for most Americans, the extensive news coverage of California's deep deficit of supply, which led to rolling black-outs and soaring energy prices, has awakened America to the reality that new generating capacity of whatever source must be built expeditiously, not just in California, but in many areas around the country.

This is not to suggest that I am aware of, or that I am encouraging any concrete plans for a new plant order. However, given the increasingly stronger indicators that a new plant order may be imminent, I believe the NRC must give very serious consideration to the possibility that new nuclear plant orders may become a reality in the near future.

#### Is NRC's Infrastructure Prepared to Handle a New Reactor License?

A new plant license application will obviously place a significant responsibility on the NRC. To be prepared for a new reactor application, the agency must have a strong infrastructure to continue to regulate the safety of existing reactors, while at the same time meeting the health and safety challenges that a new reactor application would bring. Having read the news reports of significant industry interest in new plant construction, I issued a memorandum to my fellow Commissioners (COMJSM-00-0003) this past October. In it, I expressed my view that in light of the magnitude of the technical, licensing, and inspection challenges that would be associated with these initiatives, it would be prudent for us to take steps to ensure that our staff is prepared to carry out our duty to evaluate proposed plant applications should they materialize. This proposal was not intended to promote new plant orders. Instead, it recognizes that the NRC would be irresponsible if it stuck its head in the sand and ignored reality.

My memorandum recommended that the Executive Director of Operations (EDO) take several actions to aid the Commission in understanding the steps necessary to ensure that we would be ready to meet the challenge of any new license application. These included assessing our staff's technical capabilities, inspection resources and expertise, the infrastructure supporting our construction permit and operating license regulations, and our understanding of new reactor technology. I am pleased that the entire Commission took the proposal and our responsibilities in this area very seriously. With all five Commissioners in agreement, we directed the staff to examine our readiness for a new reactor application.

In its Staff Requirements Memorandum dated February 9, 2001, the Commission directed the staff to assess the technical, licensing and inspection capabilities that would be necessary to review an application for an early site permit, a license application, or construction permit. This effort includes designs for generation 3+ or generation 4 light water reactors including the AP-1000, the Pebble Bed Modular Reactor, and the International Reactor Innovative and Secure (IRIS) designs. The Staff was also directed to examine our regulations relating to license applications, 10 C.F.R. Parts 50 and 52, and to identify whether any enhancements are necessary. The Commission recognized the need to prepare

for early public and other stakeholder interaction to identify policy issues associated with using new technology and building new facilities and directed staff to thoroughly examine these issues. As for timing on the completion of these tasks, the Commission expects the staff later this Spring to establish specific milestones for completing these assessments.

In sum, I believe that when the staff finishes its assessment, the Commission will have a better understanding of whether our regulations are adequate to support review of new licensing initiatives, whether our staff is technically qualified to conduct adequate reviews of the applications, and the number of staff and resources that would be necessary to effectively and efficiently review a new reactor application, should one land on our doorstep.

## Impacts on the NRC from a New License

The Staff has just begun to assess the impacts of a new plant order on our agency and our readiness to address them. Obviously, I do not have the benefit of that analysis. I can, however, identify many areas that I will be using to evaluate our readiness for a new plant order.

At this point, many questions remain unanswered. For example, from a programmatic perspective, I would want to know:

- Does the NRC have the inspection capabilities necessary to oversee the construction of a new plant, given that it has been many years since we have been called upon to do so?
- Does the NRC have sufficient expertise to review a construction permit and operating license application?
- Is our research program strong enough to address the many technical challenges that could arise from using new technology or new plant designs?

In the area of policy and regulatory impacts, I would want to know:

- Can the Commission accept a reactor design that has no containment, such as the Pebble Bed?
- Will there be unique ownership and management arrangements that will have to be considered?
- Are the quality assurance regulations sufficient to assure that new parts and fuel are protective of health and safety?
- What changes to our regulations are necessary to license non-light water reactor designs such as the Pebble Bed?
- If an increasing number of non-domestic vendors are used, are our regulations applicable to import/export licensing adequate?
- How many licensed operators and how large a security force should we require at plants with new designs?

From a technical perspective, I would want to know:

- Do we have the technical capability to review advanced reactor designs and new technology?
- Do we have the expertise to review new fuel designs and technology?
- Do we have the expertise to review the numerous materials issues we will face, including those associated with the ceramics used in the Pebble Bed reactor?
- What expertise is necessary to address spent fuel disposition issues for new reactor designs?
- Do we have the codes and expertise necessary to evaluate issues related to thermal hydraulics?

- Do we have sufficient capability to evaluate an expanded use of digital instrumentation and controls?

Even if the staff has appropriate answers to these questions, I would also question whether the NRC's programs for interacting with the public are prepared for future challenges. The Commission has a significant responsibility to provide fair and meaningful opportunities for public involvement in our licensing proceedings. The Atomic Energy Act requires the Commission to offer an opportunity for a hearing to any interested person, and the National Environmental Policy Act requires significant public interaction. A new license application will likely spark a lively public debate, and our program offices will have to be adequately staffed and trained to handle these issues fairly, effectively, and meaningfully. Similarly, we must have a sound communications initiative. Most importantly, we must clearly articulate the basis for our technical conclusions. We must provide adequate forums for the public to communicate with us so that their concerns are well understood and raised as early as possible in the licensing process, and we need to have a reliable and user friendly electronic database of NRC documents.

Clearly articulating a message in a manner that avoids criticism is likely to be illusory for a regulatory agency. Yet, I am convinced that we absolutely cannot succeed as an effective regulator if we underestimate the importance of good communication. Failures in communication often cause misperceptions and cost the agency time and money to remedy. With expectations shifting in the nuclear field, and new challenges likely to come our way, we cannot afford to make such costly mistakes. Though we will never be able to please everyone, and some say the mark of a good regulator is one that is equally criticized by public interest groups and industry alike, at least we should ensure that our message is clear. To accomplish this task we need a well qualified, dynamic staff that is capable of communicating with varied and diverse communities.

#### Planning and Budgeting for A New Reactor Application

We need to plan and budget for the impacts on the NRC from a new plant order. Certainly, it is possible that a new plant order may not come, or may not come for many years in the future. But, we at the NRC do not have the luxury of waiting around to see whether the plans for a new plant come to fruition, before we start preparing for the possibility. While we will play no role in whether a plant will be ordered, we have to be prepared to request funding to lessen the impacts on important and demanding ongoing agency initiatives. Frankly, our most important stakeholders, the public, will demand no less than a nuclear regulatory agency that they believe is capable of understanding and judging whether new plant orders are safe.

To meet this expectation, we will need additional funding for adequate staffing levels, sufficient salaries to recruit and retain qualified staff and resources to support advanced training programs and research projects. Yet, we are already in the 2003 budget planning stage and have only just begun to assess the needs of the agency if a new license application were received. Like it or not, the NRC may very well need supplemental resources to meet those demands, if plant orders do materialize.

The issue concerning staffing is not just a budget issue. While I believe our expertise is excellent for today's licensing issues, we are facing significant staffing challenges in the near future, especially if the number of licensing issues significantly increases or the type of issues significantly changes. Just as the NRC mirrored downsizing of the industry in the last decade, the universities mirrored the same trend. Universities are experiencing declining enrollment in nuclear studies, and universities in turn, are

offering fewer nuclear courses and downsizing their on-campus nuclear technology. It is unclear what effect a new plant order will have on the job market. It is possible that the optimistic attitudes of Congress and industry toward new nuclear generation may spark new interest in the nuclear field and create a larger pipeline of graduates to fill future employment needs. It is also possible that it may not.

Ensuring that we have a sufficient number of qualified experts cannot wait until the last minute. At this time our goal is to retain as many of our technically qualified staff as possible and to use creative, innovative hiring techniques to attract new, qualified employees. Our first task is to continue to identify the areas of expertise that are needed and to target universities that include studies in these fields. I know that all of the members of the Commission are maintaining an active interest in this issue. For my part, I recently undertook a recruitment effort at the University of Maryland to encourage students to join our agency. I was heartened by the excitement shown by these college students, but I was also awakened to the doubts shown by the University administrators as to the future of nuclear power. We need to continue to examine ways to convince students that oversight of nuclear reactors is exciting and challenging work. A lot will also depend on the commitment that NEI and its members make in ensuring that our nation's nuclear engineering programs remain financially viable. As you can see, there is much work to be done in the area of staffing and any successful regulatory program will require adequate planning and resources to address these issues.

### Important Ongoing NRC Initiatives

Undoubtedly, it will be a significant challenge for this agency to ensure that our review of any new plant application does not interfere with important ongoing initiatives. As we prepare for the potential next generation of reactors, we must not lose our focus on the critical demands of the existing fleet and activities that we have initiated to improve our regulation of them. The dual challenge of regulating both the existing fleet as well as any new plant is one that I believe we can meet, if we take appropriate steps now to prepare our regulatory infrastructure and our staff for the challenge. To put this effort into perspective, let me describe a few ongoing agency initiatives that I believe are extremely important and which I believe cannot be compromised.

1. I feel very strongly that fundamental reforms are necessary in the area of plant security oversight. I do not know of any stakeholder that is satisfied with the NRC's current approach to this matter. In particular, there needs to be more precise guidance on the knowledge and attributes possessed by adversaries, and the difference between our regulations' reference to "enemies of the United States" and other adversaries that licensees are required to protect against. The Commission needs to bring discipline to the process of modifying security requirements in response to new information about adversary characteristics. Finally, we must bring greater clarity to the enforcement provisions associated with security. I am simply not willing to allow ongoing initiatives aimed at these reforms to fall victim to competing demands.
2. I am not satisfied with the NRC's current approach to fire protection at nuclear power plants. The staff, the industry, the National Fire Protection Association (NFPA), and other stakeholders have spent significant time and resources developing a risk informed fire protection standard; NFPA 805. What do we have to show for it - very little. We have a new alternative standard that NEI informs us no licensee is willing to adopt. I am not willing to let NFPA 805 die on the vine, and neither should our stakeholders.
3. We must not lose our momentum to fine tune our new reactor oversight process. The new oversight process is a measurable improvement over our previous regulatory approach - it is a



success story. However, further improvement is necessary. For example, we have repeatedly been informed about possible unintended consequences of certain performance indicators that could be adverse to safety. It would be utterly irresponsible to ignore these matters and lose possible insights by failing to examine the consequences in a timely manner or by failing to make prudent changes to the process.

4. I believe we have already lost momentum in risk informing 10 C.F.R. Part 50. Progress on Option 2 initiatives has been very slow and the gulf between the industry's and NRC's positions appears to be growing. NEI recently told the NRC staff to "fish or cut bait," when it comes to Option 2. It is time for the Commission to show more leadership in this important area. We cannot allow this initiative, which is aimed at enhancing safety by encouraging licensees to focus on the most risk significant issues, to stagnate.
5. Finally, we cannot rest on the successes that we have had reviewing license renewal applications up to now. License renewals are not, and should never become, routine. The challenges in this area are becoming increasingly rigorous as Surry, North Anna, McGuire, Catawba and Peach Bottom are on the horizon. It would be irresponsible at this point for the Commission to shortchange the resources devoted to license renewals or dilute the leadership and management dedicated to it. I assure you, I will oppose any initiative which I believe undermines our efforts in this area.

As we shift our attention to the possibility of new plant orders, we cannot neglect the growing demands of the existing fleet. I am not willing to let any of these initiatives die on the vine. I am absolutely committed to doing my part to ensure that the agency creates an infrastructure that is able to handle both important ongoing agency initiatives and the challenges that any new plant application would bring.

### Industry Preparations

The industry, for its part, must recognize the enormity of the task for this agency to review a new plant order, and the advanced planning and budgeting that will be necessary. To this end, in the Staff Requirements Memorandum issued in February, the Commission directed the staff to encourage industry to be as specific as possible about its plans and schedules to enable the Commission to plan and budget for advanced reactor reviews without disrupting current initiatives. While the industry is increasingly relying on the NRC to make "just in time" regulatory decisions, our ability to handle this higher level of expectation will be significantly impacted by new plant orders.

The NRC must have adequate time and receive adequate funding to maintain its current regulatory programs and to handle the responsibilities of a new reactor license application. Otherwise, current regulatory initiatives may be compromised, milestones for licensing actions such as license renewals will have to be revisited and potentially lengthened, and review of any new reactor license will necessarily take longer. The NRC has taken significant initiatives to improve its regulatory process in the last few years, which will undoubtedly make us better prepared to review any new plant license application. But, any organization that is understaffed or underfunded, cannot accomplish monumental tasks. Consider also that the public will never accept a review that seems rushed simply to meet industry needs. The schedule must be sufficient to allow the public to be confident that our review was thorough and complete. Therefore, if industry is serious about pursuing a new plant order, it is imperative that it provide the NRC with ample time to plan for and review an application.

## Conclusion

I began my discussions today talking about Congressional and industry interest in new plant construction because unlike accusations leveled against the NRC in the past, this Commissioner and this Commission do not have our heads in the sand. This is not to suggest that we are meeting the possibility of new plant construction with boundless enthusiasm. That is not our job. We are instead approaching the possibility with prudent caution. Any new plant license application will create significant challenges for our agency, and at this time we may well be unprepared for such a challenge. We will have tremendous need for scientific, technical, legal, and public policy expertise. We are facing a wave of retirements of our most seasoned and qualified personnel, yet, fewer students are entering the nuclear field to fill this void. Our communication efforts will have to support a public that is unfamiliar with the details of a new age of nuclear power plant design and construction. In the midst of any new licensing request, we will continue to be responsible for the safety of the present fleet of nuclear plants and materials licensees and the regulatory demands that they will place on the agency. Significantly, despite the expenditure of billions of dollars, the issue of permanent high level waste disposal is in no way settled.

There is no doubt that a new plant application would have a profound impact on our agency and our country. We are not and cannot remain isolated in this effort.

Thanks for joining me today. I left a few minutes remaining to open the floor for questions.