



# NRC NEWS

**U.S. NUCLEAR REGULATORY COMMISSION**

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**Securing the Future of Nuclear Power:  
More Than A New Year's Resolution**

**The Honorable Greta Joy Dicus  
Commissioner  
U.S. Nuclear Regulatory Commission**

**American Nuclear Society Pittsburgh Section  
Monroeville, Pennsylvania**

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## **INTRODUCTION**

Dr. Itkin - Ivan - Thank you for that kind introduction. Good afternoon everyone, thank you for being here, and Happy New Year.

How many of you make "New Year's Resolutions?" Most of us probably, at least, reflect as the new year begins about what we can do to improve our lives or better support our families and communities. Some of that reflection migrates into resolve, and usually even less of that resolve winds up as results. And by about now, two weeks into the new year, we can tell whether our "resolutions" have taken root or whether we are destined to begin the cycle over next year.

Someone once said a fool is someone who keeps doing the same thing over and over again and expects a different result. A key, then, to turning resolution into result is to do something different.

Another useful insight regarding resolutions is captured by William Ralph Inge who wrote: "It is useless for the sheep to pass resolutions in favour of vegetarianism while the wolf remains of a different opinion."

It seems doing something different is not always enough and we must understand those things we can control, those things we can influence, those things which require divine intervention.

And finally, if you are one of those folks who likes instant gratification - - resolutions are probably not for you. Change does not happen overnight. Most successful resolutions are systemic in nature and results must be monitored over time.

By now you are probably asking what resolutions have in common with the future of nuclear power -- the answer is everything. The future of nuclear power, like the success of a New Year's resolution, requires us to embrace change, understand those things we can influence and those we can control, and seek systemic and meaningful reforms. The absence of change does not necessarily imply stability. In my opinion, the absence of change may, in fact, imply complacency. We must resolve to avoid complacency.

Again, thank you for coming this afternoon. I am delighted to be in Pittsburgh in January. It's cold up here, but I guess Steelers' football kinda warms your soul. When considering contributions to nuclear power, the Pittsburgh area can be justifiably proud. There is history here that resonates and Westinghouse has been at the center. This morning I toured the Beaver Valley nuclear power station and just came from a visit with Steve Tritch and other senior executives. David Squarer has been extraordinarily helpful in coordinating my visit and everyone has been so gracious. I appreciate all your hospitality.

I have been asked to touch on two subjects. First, NRC's reassessment of nuclear plants' safety and security post September 11, and second NRC's readiness to support resurgence in nuclear energy demand. At the end of my remarks, I will of course be delighted to answer your questions.

September 11, 2001 was the beginning of a new era. For operating reactors, emphasis on security was now clearly tantamount to operational safety. The events of September 11<sup>th</sup> so vividly and tragically illustrated that we were vulnerable - as a society and as an industry.

On a relative scale, the nuclear power industry was and remains one of the most well protected civilian infrastructures - -supported by a highly capable security force. But, could the nuclear industry defend against an intentional attack from a commercial aircraft or other well-organized terrorist attack? Perhaps a more important question is: Should they be required to defend against such threats? We did not and still do not have the answers to all the questions, but the NRC and the industry realized one thing - - there had to change.

Our security resolutions took three forms - those items that needed to be done immediately, those items that needed to be done soon, and those items that needed to get done - but not immediately. Change was needed to bolster already strong industry security, to internalize the developing lessons learned from September 11<sup>th</sup>, and to help reassure the public - - not to mention Congress.

The challenges in a post-September 11<sup>th</sup> environment for the NRC and the nuclear industry have been daunting. The nuclear industry appears to be the relentless focus of political and public scrutiny. When one reflects on this, it is completely understandable, although perhaps not completely justified. But one thing is a certainty, the focus will always be there.

Nuclear power plants are among the most hardened potential targets of terrorist attacks. As you probably know, each nuclear plant has a well-trained and well-armed security force, a robust security

plan, and design features which would make a successful terrorist attack unlikely. Nonetheless, in the light of September 11<sup>th</sup>, the NRC and the industry realized that vulnerabilities need be further reduced.

As a result, individual nuclear power plant operators took actions which they deemed prudent. The NRC imposed, by Order, additional requirements to further improve the security of these facilities. The specific actions are sensitive, but generally include requirements for increased patrols, augmentation of the number and capabilities of security guards, additional security posts, installation of additional barriers, enhanced coordination with law enforcement and military authorities, and restrictive site access controls for personnel. We continue to evaluate appropriate enhanced security measures for our licensees based on our prioritized efforts. Enhanced force-on-force exercises at commercial nuclear power plants will be piloted shortly.

The NRC has also re-organized to better meet the needs in a post-September 11<sup>th</sup> world. We established a new Office of Nuclear Security and Incident Response to provide a single focused organization for security, safeguards, and emergency response. The new office of Nuclear Security and Incident Response also provides a central interface between the NRC and the newly established Department of Homeland Security, other Executive Branch agencies and Congress.

In August 2002, NRC implemented a new Threat Advisory and Protective Measures System. The system corresponds to the color-coded national Homeland Security Advisory System and provides the NRC with the flexibility to advise protective measures for each threat level. Our first experience with the new system came on the first anniversary of September 11, 2001, when the national threat level was raised from "Yellow" to "Orange." The new system worked well.

With immediate and short term actions nearly complete, our attention has keenly focused on revising the Design Basis Threat or DBT - - the threat to which nuclear power plants are required to defend against. After a thorough consideration of a revised DBT, we will answer many of the questions regarding what is a reasonable threat for a private industry to defend against. The shape of a revised DBT is of great interest to the industry and members of Congress. The NRC staff continues to work with other government agencies, the intelligence community and the industry to consider appropriate revisions to the Design Basis Threat for commercial power reactors.

As some of you may be aware, interest in security is not limited to those associated with current operating reactors. Design certification applicants, prospective design certification applicants, and potential early site permit applicants are expressing interest in obtaining security-related information that may be useful in considering the design or location of a new plant. Most of this information is, of course, sensitive and before it is provided we will need to ensure that it will be properly handled and safeguarded.

Many of you might also be aware of a recent industry-sponsored study regarding the survivability of containment should it be impacted by a commercial aircraft. I am not sure that I take too much comfort in the report even if careful peer scrutiny of the report validates its findings. I suspect that a commercial aircraft crashing into a nuclear plant can create many unanalyzed plant and human conditions, challenge defense-in-depth, and, in general, wreak your whole day.

As I thought further about where we are today, and reflected on the recent report on containment strength, I found subtle irony. Within a few days of the containment report, an article in the Washington Post described the massive engineered 20,000 ton steel structure that is to be constructed over

Chernobyl. It is a healthy irony that cautions us against hubris and ensures that we never become overconfident or complacent. We can never think that it cannot happen to us, because it just might.

Even today we make mistakes and sometimes we still think we are better than we are. The reactor vessel head degradation that was discovered at Davis Besse is an important example. I will not dwell on the seriousness of this event only to say that it is watershed issue, a wake-up call so to speak, that has caused NRC and industry to look critically into the process and circumstances that lead up to this discovery.

The NRC has completed a lessons learned report associated with the Davis Besse event. We have drawn important conclusions from the event at Davis Besse. I have concluded, no - - reaffirmed, that defense-in-depth must always remain the foundation of safety. The event at Davis Besse also affirms that our regulatory process is sufficiently robust, albeit not perfect, to handle emergent safety issues quickly and effectively. But, we must learn from Davis Besse and continue to look at ways to make our processes better. We are good at reacting. But I believe we must strive to make our processes even more predictive.

## **THE FUTURE OF NUCLEAR POWER**

I mentioned the massive 20,000 ton steel enclosure that is, by media accounts, planned to be placed over the Chernobyl reactors. About three years ago, in September 1999, I toured the Chernobyl site and the Chernobyl Shelter project. More irony - - because the trip coincided with what was the worst nuclear accident, a criticality accident, to occur in the country of Japan.

We must all understand the importance of our principal duty - to maintain safety. The use of nuclear technology has a global impact and whether we are operating the technology, handling or safeguarding nuclear material, designing new plants, or providing independent oversight, we engender a responsibility that has implications beyond corporate boardrooms and Commission tables. As the nuclear power industry moves forward and as the NRC moves toward improved regulatory processes, we must all be ever mindful of our most important responsibility and principal duty - safety.

There is an uncertainty in the future of nuclear power. An uncertainty that varies often by things we cannot control. For those things we can control, we are obliged to always do what is right. For but we can influence, we are similarly obligated to do what we can to foster an underlying responsibility to nuclear safety.

Whether it is September 1999 or September 2001, the nuclear industry is in some ways already globalized. A nuclear accident in another country is a catalyst for profound, worldwide introspection and scrutiny. The NRC is typically inundated with requests for information from other government organizations, the media, and concerned members of the public. Even if we escape the tragic effects associated with a nuclear accident in another country, in a very real sense, a nuclear accident anywhere in the world has an impact on nuclear programs everywhere. We should not underestimate these potential and profound effects on our regulatory environment or future of the nuclear industry in the United States.

I concluded that we must always remain open to new ideas, understand international challenges, and be supportive of international initiatives designed to improve nuclear safety. I believe that we have the best regulatory framework in the world, although, we can still improve. I believe that the US nuclear industry is the best in the world and continues to maintain the proper emphasis on safety.

However, even today, I am reminded of the performance history of some of the US nuclear power plants - where good performing plants turned inward and did not keep pace with improving industry practices or lessons learned. In a short period of time they converted from good performers to not so good performers. On a similar and broader scale, the NRC and the US nuclear industry cannot turn inward. We must remain open-minded, realize that we can learn, and consider how to participate more effectively and efficiently in the international arena.

The future of nuclear power depends on maintaining safety. Again, I am reminded of Three Mile Island and Chernobyl and cannot overstate the adverse impact that a significant reactor or accident would have on the United States' nuclear industry. We must never compromise safety as we continue to demonstrate creativity, openness, resolve and resilience in meeting each and every new challenge. The NRC and the industry will play a key role. The NRC's role is to provide stable and predictable processes, provide independent and vigorous oversight, and thus ensure that the public remains confident that we are a strong and effective regulator. The industry' role is to operate safely by setting and maintaining high standards, even above those required by regulation.

It is fair to suggest that rising optimism about nuclear energy paused after the events of September 11<sup>th</sup>. The "breath" was needed because of the additional uncertainty and the diversion of resources. Most concerns have been placed in context and efforts to flush out issues for licensing and siting a new reactor are again on the upswing.

I must be clear. Licensing of a new plant, whether under 10 CFR Part 50 or Part 52, will be a significant challenge to the NRC. While we currently do not anticipate a return to the feverish pace of licensing for new plants that occurred in the mid-1970's, we are taking prudent steps to ensure that NRC is prepared to meet a potential new plant licensing submittal.

Both the Office of Nuclear Reactor Regulation and the Office of Regulatory Research have re-organized to support increased interaction with the industry and stakeholders, establish a new plant licensing infrastructure, support timely identification and resolution of technical and policy issues, and prepare for an effective transfer of technology.

The staff continues its Westinghouse AP-1000 design certification review and has interacted with Exelon and the Department of Energy (DOE) to identify key issues related to the pebble bed modular reactor (PBMR) and an approach for their resolution. The security review appears to be an important item for the AP1000 design certification and the staff is scheduled to issue a draft safety evaluation report for the AP1000 design certification in the middle of this year.

But, as many of you may know, the US industry support for pebble-bed technology has stepped back. Changes in industry leadership and some difficult technical issues have resulted in a slower pace of activity on the pebble-bed. NRC has adjusted its resources accordingly and has closed out the Exelon pebble bed modular reactor pre-application review.

Overall the interest in future reactors designs has increased. The NRC staff has met with representatives from Atomic Energy of Canada, Limited to discuss pre-application review activities for the ACR-700 design and also met with representatives from Framatome to discuss the SWR-1000 design. In addition, the staff has initiated pre-application review for the General Atomics (GA) gas turbine modular helium reactor (GT-MHR) and General Electric ESBWR. The Department of Energy is considering licensing issues in their Generation IV reactor development program and DOE's 2010 initiative foresees a possible application for a combined license as early as 2005.

The companion element of building new nuclear power plants is the siting process - - finding a place. Much effort is underway to “exercise” our early site permit process, work out some of the issues, and within the next few years, possibly have an approved site for construction of a new reactor.

The sites that are the primary focus of these reviews are existing reactor sites that can accommodate an additional facility. Dominion’s North Anna site, Entergy’s Grand Gulf site and Exelon’s Clinton site are in the mix of possible early site permit review candidates.

Of course, associated with some of the newer designs will likely be a host of technical and policy challenges. Some of these challenges include high-temperature materials performance, qualification of accident analysis codes and methods, qualification of coated particle fuel, and need for “containment or confinement”. To meet these challenges, we must continue to have a strong nuclear research. I am, and I believe that the Commission is, committed to strengthening our research program.

## **HUMAN CAPITAL INITIATIVES**

Whether there is resurgence of nuclear power or not, the changing nuclear workforce provides enormous management challenges that must be addressed today. The current inflow of new talent does not equal the outflow of experienced workers. Even when we are able to attract talented young men and women, the lack of upward mobility or lack of variety in career paths may result in segments of the workforce moving outside the nuclear area. Maintaining and cultivating core competencies in nuclear-related areas is a key concern for the industry and the NRC.

Two years ago, at the NRC, the ratio of NRC employees who are over 60 years of age to those under 30 was between 5 and 6 to 1. The same ratio at NASA, for comparison, was approximately 2:1. Moreover, approximately fifteen percent of NRC's engineers are already eligible for retirement and another four percent of the current workforce of engineers will become eligible for retirement each year for the next few years.

Today, a focus on entry-level hiring and our two-year Nuclear Safety Intern Program have served to shift the age ratio of the workforce from 6:1 to 2:1, with a total of 121 intern program participants. Twenty-three percent of the employees in the Office of Nuclear Regulatory Research and twenty-one percent of the employees in the Office of Nuclear Reactor Regulation are eligible for retirement today. While the number of employees eligible to retire remains proportionally high, the percent of those employees who decide to retire is down slightly. In 2001, actual retirements at NRC were 15 percent of those eligible.

In addition,, we appear to be stemming the adverse trend of engineering capability loss by exercising a number of human capital strategies to recruit, hire, develop, and retain a talented, diverse workforce. NRC uses targeted recruitment, "signing bonuses" for applicants with critical skills, student loan repayment benefits, fellowships, technical training, and leadership development programs. The downturn in other segments of the economy and the excitement about the future of nuclear power appears to contribute to an improved outlook at NRC. But, the human capital crisis is not over. Demand still outnumbers supply.

Should the resurgence of new nuclear power plant flourish, I think the Agency will be faced with at least two competing forces that will affect NRC resources. One force will be good for the agency and would involve establishing new positions, reviewing cutting-edge technology, and

increasing upward mobility. The other force would be from outside the agency resulting from government and industry competing, under different rules, for the same resources.

It is clear that both the NRC and the industry must be pro-active and aggressive in seeking out talent early, training them and planning smartly for what the future may bring. We need to be able to respond to emerging technology, deal with emerging issues, and deal effectively in the international environment. Our credibility as an effective competent regulator and the industry's credibility as effective and competent designers and operators hinges on maintaining a strong technical expertise.

## **CONCLUSION**

In summary, a year ago, our focus shifted to security of nuclear facilities and materials. Major changes occurred at the NRC and within the nuclear industry and some ongoing initiatives slowed to support the surge in effort toward security. More security-related changes will likely be necessary and our focus remains high in the security area - - as it should.

However, our safety focus never changed. It cannot. We cannot turn inward. A successful terrorist attack or a reactor accident carry similar devastating effects on public confidence and potential public health and safety issues. In the aftermath of September 11<sup>th</sup>, we continued to move forward to improve our regulatory processes and focus resources on safety.

The future of nuclear power is bright - - as long as we continue to learn and focus on safe and secure operations. The trade-off between safety and security is not a zero-sum game. We cannot rob Peter to pay Paul.

Oscar Wilde once wrote, "Good resolutions are useless attempts to interfere with scientific laws." I disagree with Mr. Wilde, and if we adopt one resolution this New Year, I encourage you to consider one simple, easy to remember, yet powerful resolution: "Do better."

Best wishes for a happy, healthy and successful New Year. Again, thank you and I would be pleased to answer any questions that you may have.

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