NRC NEWS

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"The Future Ain't What It Used To Be"

by

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U.S. Nuclear Regulatory Commission

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on Structural Mechanics in Reactor Technology
SMiRT 16

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INTRODUCTION

Good morning everyone.

I am delighted to be here, with you, today.

I would like to thank and congratulate the organizers of this conference. I think you have done a wonderful job providing an informative and interesting agenda. I hope that everyone will take the time to see and experience the Nation's Capital. I see that on Wednesday you will have an opportunity to see the Baltimore Orioles play the Kansas Royals. You might get to see future Hall of Famer, the "Ironman", Cal Ripken play in his final season.

Many of you may also be familiar with another great philosopher who happened to be a baseball player-- Yogi Berra. His one liners are famous and often amusing and sprinkled throughout my discussion today. Some of you might even recognize the title of this speech, "The Future Ain't What it Used To Be" as one his quotes. For the commercial nuclear power industry and the Nuclear Regulatory Commission truer words could not be spoken.

Much has changed since the SMiRT Conference was held in Lyon four years ago. Much has even changed since the SMiRT Conference was held in Korea just two years ago. Four years ago, how many of you would have predicted that NRC might expect to get renewal applications from almost every commercial nuclear power plant or that new nuclear power construction in the United States would be under serious consideration. It was just five or six years ago that the NRC was building resources and planning to meet an expected demand for decommissioning reviews. The future does not appear to be what it used to be!!!

So this is an important conference that is held at an important time --a time when commercial nuclear power appears to be on the verge of a significant resurgence in the United States and other parts of the world; a time when aging of existing reactors and license renewal presents new challenges; and a time when the nuclear workforce is in transition and investing in people is perhaps never more important.

MAKING THIS DAY NECESSARY

In the United States, the threat of rolling blackouts and brownouts is no longer just a threat. Indeed, the energy crisis in California has perhaps had some influence in the way the nation thinks about nuclear power. The National Energy Policy published in May of this year calls for nuclear power to be a component in the mix of technologies that shape the national energy strategy. Congress has a strong interest in energy legislation, as reflected in several bills that are already pending. A resurgence in commercial nuclear power appears more and more a reality. But the increased likelihood of a resurgence in nuclear power results from more than just a need for more capacity. There are always electrical power generating alternatives.

On Yogi Berra Appreciation Day in St. Louis in 1947, Yogi said, “I want to thank you for making this day necessary.” While that may not make complete sense given the context, a convergence of several influencing factors has, arguably made it necessary for the United States to consider increased reliance on nuclear power. But I believe that it is many of you that have made this day possible. Nuclear power remains a viable option because of the impressive operating safety record of nuclear power plants over the past 15 years. The current nuclear safety record worldwide is a result, in part, of the efforts of the people in this room. You should be proud of your accomplishments. But there are many challenges ahead.

DÉJÀ VU ALL OVER AGAIN

We must never compromise safety as we continue to demonstrate creativity, openness, resolve and resilience in meeting each and every new challenge. You will play a vital role. The NRC will also play a key role, not because we are advocates, but because we provide a stable and predicable process and the public remains confident that we are a strong and effective regulator.

In a recent speech, Chairman Meserve indicated that viability of the nuclear option is absolutely dependent on the maintenance of safe operations, the NRC's -- and the industry's -- highest priority must be the protection of public health and safety. If we fail in ensuring safety, the emerging optimism about nuclear energy will quickly disappear. I agree.

Licencing 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.

The Commissioners are considering resource impacts associated with potential licensing of a new plant in preparing our Fiscal Year 2003 Budget submittal and the staff is exploring scenarios for distributing resources to support potential increased activity in the next year. Both the Office of Nuclear Reactor Regulation and the Office of Regulatory Research have announced organizational changes designed 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 interest in new plant construction involves not only additional light water reactors such as the AP-1000 and the International Reactor Innovative and Secure (IRIS) designs, but also other types of designs including the gas-cooled pebble bed modular reactor (PBMR) and the Gas Turbine-Modular Helium Reactor (GT-MHR).

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.

YOU CAN OBSERVE A LOT JUST BY WATCHING

Our initial experience with our license renewal process, by almost all measures, appears to have been successful. We have established a stable and efficient license renewal process and. to date, have completed the reviews for Calvert Cliffs Units 1 and 2; Oconee Units 1,2 and 3; and Arkansas Nuclear One Unit 1. Several additional reviews are underway, including the first boiling water reactor, Southern Company's Hatch Plant. Most recently, at the beginning of July, Exelon submitted a renewal application for the Peach Bottom facility.

The license renewal reviews completed to date have emphasized safety and been completed ahead of schedule. We believe that this is noteworthy accomplishment and recognize that potential challenges lie ahead with the simultaneous review of many renewal applications. We continue to work to improve the effectiveness and efficiency of our license renewal process.

The recent circumferential cracking around control rod drive penetrations found at Oconee and Arkansas Nuclear One nuclear plants should serve to remind us that age-related degradation is an issue that can affect all operating reactors. It should also help emphasize the importance and strength of our current processes to deal effectively with emergent safety concerns. Ongoing efforts to further our understanding of age-related degradation are important and we should continue to vigorously explore new techniques that help us better detect, characterize, and assess the impact of these degradations. Analytical tools for assessing the risk significance of degradation help ensure the actions we take are appropriate, coherent and timely.

IF YOU DON'T KNOW WHERE YOU ARE GOING YOU WILL WIND-UP SOMEWHERE ELSE

Some of you may know that an NRC Working Group was formed last year to help assess and report to the Commission the policy implications of industry consolidation and the need to consider policy changes to NRC oversight of industry activities. The staff has completed its initial assessment and has published it's assessment for comment.

The nuclear power industry is changing. Whether it is through consolidation or acquisition, the number of companies operating nuclear facilities seems to be declining. Essentially, we have the same number of facilities with fewer licensees. Economics drives industry decisions. NRC decisions will be driven by our desire to maintain safety, improve our effectiveness and efficiency, reduce unnecessary burden, and improve public confidence. The Commission and the staff are taking reasonable and necessary steps to help determine if there are things we can do better or do differently as a result of industry consolidation.

The desire to produce electricity in a safe, economical manner, results in nuclear power plant operators looking at innovative methods to make the design, operation, and maintenance of the plant more efficient. For example, several licensees have pursued or will be pursuing power uprates. In seeking to operate more efficiently utilities may operate closer to some margins, or as a result of improved technology be able to better understand and eliminate unnecessary conservatism. I understand that many of the folks here today may be involved in some of these efforts. Another issue that I think deserves further consideration is whether there is a cumulative impact or a potential unintended result that these efforts may have in combination - - a so called synergistic effect.

Many facility design changes have occurred over the past several years including the use of high burnup fuel, longer fuel cycles, higher peaking factors, increased power levels, use of mixed core, new fuel design, and life extension. Although we have deterministic methods for looking at each one of these issues, and we have done research to deal with each one of these issues, we may need to look at them in a more synergistic fashion to ensure that we understand how changes, when considered together, have affected plant operation. I do not believe there are significant safety issues, but I believe the question is worth asking. The challenge is to ensure we take an integrated look at the overall effect of our changes.

It is also worthwhile to consider whether some of our long established analytical tools require updating. Several of our thermal-hydraulic codes have been used for decades and most of these codes have included deliberate conservatism or bounding assumptions to address uncertainties in the models. The codes have proven to be adequate to satisfy regulatory requirements, when used with appropriate conservatism and judgment. Industry efforts to improve plant and NRC and industry efforts to reduce unnecessary burden may pose new challenges to the use of these codes. There is an increasing need for "realistic" predictions and, for some applications, it may no longer be sufficient for a code to make conservative predictions.

NOBODY GOES THERE ANYMORE: IT'S TOO CROWDED

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.

At the NRC, the ratio of NRC employees who are over 60 years of age to those under 30 is between 5 and 6 to1. The same ratio at NASA, for comparison, is approximately 2:1. Moreover, approximately seventeen 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. Twenty-five percent of the employees in the Office of Nuclear Regulatory Research and twenty percent of the employees in the Office of Nuclear Reactor Regulation are eligible for retirement today.

Despite our efforts to hire new engineers, we have experienced a net loss of engineers over the past five years. That loss is equivalent to roughly eight percent of our engineering workforce. The bottom line is that we are losing expertise and, along with it, valuable institutional knowledge.

Human capital in the nuclear area is also a key concern for Congress and the international community. For example, legislation had been introduced in the US Congress known as the Department of Energy University Nuclear Science and Engineering Act, designed to help stem the declining trend of college graduates in the nuclear science and engineering fields. NRC recently highlighted the importance of maintaining a highly skilled and talented workforce in recent correspondence and in agency Congressional testimony. And some recent correspondence from Congress to the agency indicates support for using maximum flexibility within existing law to attract and retain qualified people until appropriate reforms can be considered.

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 we must be pro-active and aggressive is 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 hinges on maintaining a strong technical expertise.

IF YOU COME TO A FORK IN THE ROAD, TAKE IT

So I hope you can see that the NRC and nuclear industry are at an exciting time. Excitement brings new challenges. Your work will continue to be important in helping us meet these challenges and helping to maintain and improve our understanding of safety. A potential resurgence in the nuclear-industry will bring new technical challenges while we still must focus on the safety of currently operating plants. We must be sensitive to the potential loss of experience and expertise as our workforce ages and retires and ensure we are taking steps to pro-actively address the issue.

I am confident that we will meet the challenges ahead of us. It will take innovative ideas and a workforce that is technically agile to deal with the challenges of the future.

So, with apologizes to Yogi, I will conclude by saying “Thank you for making this day necessary” and I would be pleased to answer any questions.