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at the

Aging Research Information Conference

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Good morning, ladies and gentlemen. It is a pleasure to be here this morning to open this third day of what I consider to be a most important and timely conference on the topic of nuclear power plant aging and aging research. I should say at the outset that in reviewing the list of attendees, it is particularly gratifying to see the extensive participation in this conference, both from the United States as well as from other countries. I join my colleagues on the Commission in extending all of you a warm welcome.

The agency's role in sponsoring this conference, as well the presence here of so many distinguished speakers and participants, are a testament to the widely-acknowledged significance of the plant aging issue and the increasing importance that activities in this arena will have on the safe operation of the world's population of nuclear power plants -- a population that, of course, grows older with the passage of time.

Indeed, in this regard, one need only look at the activities of this past year for evidence of the growing importance that the aging issue will play in our future actions as regulators, as plant operators, as scientists and engineers, and as members of the larger global community interested in ensuring the continued safe operation of the existing generation of nuclear power plants.

Notably, this past year has seen heightened interest in age-related issues brought about as a result of several important

developments, three of which I would like to touch on just briefly.

First and perhaps most significantly, the promulgation of a comprehensive framework by the Commission in December of last year for considering requests to extend the licenses of existing nuclear power plants beyond their current 40-year term culminates several years of effort by the agency directed at laying out a sensible and balanced set of procedures and requirements for plant life extension. Indeed, with the promulgation of these procedures and requirements in 10 CFR Part 54, we now have in place the requisite procedures to permit us to entertain such applications from those who may wish to move forward with license renewal.

Closely related to the issue of license renewal, the promulgation in July of last year of a rule addressing the maintenance of nuclear power plants represents an extremely important initiative, noteworthy not only because of the direct and obvious link that maintenance has to the aging issue, but also because the approach taken by the Commission in this rule, with the focus on results rather than process, constitutes an important milestone in the agency's regulatory philosophy -- a subject that I will come back to shortly.

Third, of course, this past year we faced the question of how to proceed in addressing important age-related questions that arose in the context of the Yankee-Rowe case -- many of which involved issues of first impression, both for us as an agency as well as for the licensee. In particular, we faced the challenge of applying our regulations and regulatory guidance on the issue of reactor vessel embrittlement in a context where the technical uncertainties about the condition of the Yankee-Rowe vessel, as well as the questions that arose about the clarity of our regulatory guidance, proved to complicate our efforts to address the underlying technical issues in this case.

These initiatives -- the license renewal rule, the maintenance rule, and the Yankee-Rowe case -- are but a few of the more notable activities of the past year that highlight the growing importance of the aging issue, and the increasing importance that we as an agency place on the activities and products that are produced through the aging research program.

As we look forward to the remainder of this decade, with the population of power plants continuing to age and with significant challenges in this arena still before us, the most immediate challenge that we face, in my judgment, is to take the significant insights that have been gained, and that are continuing to emerge, from the aging research program and apply those insights in a way that will serve to realize the maximum

benefit of this significant body of work for the safe operation of the existing plants -- to take the results of this research program and ensure that those results are being translated into useful and usable information for those who are operating nuclear power plants.

In this regard, let me say parenthetically that I commend to those of you who have not yet reviewed it, NUREG/CR-5643, a document entitled "Insights Gained from Aging Research." This document is perhaps the most persuasive, organized, and comprehensive review of the benefits of the aging research program that I have seen to date. Indeed, every maintenance manager around the country would benefit from the insights presented in this document and, I would suggest, find those insights quite valuable in day-to-day plant operations.

With the balance of the time remaining this morning, I'd like to shift gears to discuss in more detail a topic that I touched on just briefly at the outset of my remarks -- the issue of maintenance and the recently promulgated maintenance regulation - - focusing on the important role that, in my judgment, this initiative can play in the management of aging at nuclear power plants and the linkage between this initiative and the issue of plant life extension.

As I indicated at the outset, 1991 saw the promulgation of two significant age-related regulatory initiatives: the maintenance rule, codified at 10 CFR Part 50.65, and the license renewal rule, codified at 10 CFR Part 54.

At a rather simplistic level, both regulations have, as their common denominator, the effective management of aging. But going beyond this simple observation, I submit to you that there is much more that these two regulatory initiatives have in common. One, the maintenance rule, requires licensees to monitor the performance of important structures, systems, and components (or, alternatively, to have an effective preventive maintenance program) so as to ensure that such SSCs will be available, when called upon, to perform their intended function.

The other, the license renewal rule, requires, among other things, that any licensee applying for license renewal must have what is referred to in the rule as an "effective program" for key structures and components, with the definition of an "effective program", again, focused on ensuring that key SSCs will be capable of performing their intended function.

Let me expand on the similarity between the two rules. A first step common to the implementation of both rules is a review of a very similar set of plant structures and equipment to determine which are included within the scope of each rule and are

necessary for vital plant functions. Indeed, while the definition of what is considered an important SSC differs in minor respects if one compares the two rules, I would submit that when all is said and done, there will be a great deal of overlap between those SSCs that are considered important for purposes of license renewal and those SSCs that are considered important for purposes of the maintenance rule. Indeed, we have every incentive to bring the two as close together as possible.

Accordingly, the first challenge that I would leave you with is to endeavor to ensure that those SSCs that are important for license renewal are included in your maintenance program.

Beyond this, I see tremendous value in the information that will be generated pursuant to the maintenance rule when it comes to satisfying the requirement of the license renewal rule that a licensee have a program in place to manage age-related degradation unique to license renewal for key SSCs important to license renewal. Indeed, when it comes to demonstrating that you have an effective program in place to manage age-related degradation, I would submit that you will be ahead of the curve if you come in armed with data generated through your maintenance programs.

That suggests the second challenge that I would leave you with: take advantage of the framework of the maintenance rule to begin documenting the performance of key SSCs important to license renewal, including a focus on age-related degradation unique to license renewal.

There is a third and final point that I'd like to discuss, having to do with the scope and extent of monitoring envisioned under the maintenance rule. At the time that the maintenance rule was promulgated, the Commission recognized that there is a subset of plant equipment for which failure should not be tolerated. To amplify on this point, the Commission took the position in the Statements of Consideration accompanying the maintenance rule that "where failures are likely to cause loss of an intended function, monitoring should be predictive in nature, providing early warning of degradation." Expanding on this point, the Commission went on to say that "[s]ome parameter trending, beyond that already required by NRC requirements to provide early warning of degradation, may also be necessary for critical components whose unavailability causes a system train to be unavailable or whose failure is otherwise unacceptable".

I will say that I am quite aware that there has been considerable concern in the industry that the rule could be read -- and might be interpreted -- to require monitoring of an unmanageable number of components. And frankly, I share your concern that we not

head down the path of monitoring simply for the sake of monitoring, with no relationship whatsoever to the underlying importance, from a risk standpoint, of that which is being monitored. Indeed, as the Commission declared when it promulgated this rule, "[i]t is not the intent of the Commission to require a monitoring program so extensive that it detracts from licensees' ability to otherwise maintain equipment."

At the same time, you have heard at this meeting -- in a most fascinating and insightful presentation by Bill Vesely of SAIC on Tuesday -- that it is in fact possible to identify that subset of components that are risk significant, and that the total number of these risk-significant components for any given plant is indeed manageable. Moreover, a relatively small percentage of the total components at a plant may, in fact, be the dominant contributors to overall plant risk.

This suggests, and I would submit for your consideration, that it is this subset of risk-significant components -- a subset that, of course, will vary from plant to plant -- that we should concern ourselves with, and that should therefore be subject to individual monitoring under the maintenance rule.

I will say that I am less concerned with whether licensees choose to control degradation for these risk-significant components through a monitoring regime -- pursuant to the so-called paragraph (a)(1) approach -- or through a preventive maintenance program that has been demonstrated effective by failure-free performance histories -- the so-called (a)(2) approach.

It seems to me that what is important is that licensees take the initiative to identify those key risk-significant components through careful review of your PRAs, as well as through relevant plant experience, determine the degradation effects of concern for each of those components, establish specific mechanisms to monitor and control those effects, and put in place a feedback mechanism to verify that the controls are working.

Indeed, as you move forward with the formulation of the guidance that the industry will be proposing later this month to the NRC for how the maintenance rule should be implemented, I would leave you with yet a third challenge: I urge you to give careful thought to the value of a monitoring effort that would include monitoring for those individual components that dominate your risk profile.

Conclusion

Let me close my remarks with a fourth and final challenge. The maintenance rule was specifically designed to give licensees

broad latitude in the mechanics of how this rule would be implemented, but with the Commission having very clear objectives in mind. As you consider this question, I urge you to keep two thoughts in mind: first, this rule presents an exciting opportunity to incorporate the concept of risk-based maintenance in both your thinking as well as ours; second, I urge you to approach implementation of the maintenance rule with license renewal squarely in mind.

While individual licensees may or may not have license renewal in mind at this point, those that view the maintenance rule narrowly -- those that would monitor only the minimum structures and components necessary for compliance with the rule and those that would monitor only for failure and not for the purpose of trending age-related degradation effects -- will deprive themselves of a potential win-win situation. NRC and the licensees would win in terms of added safety assurance. Licensees would win in terms of reduced duplication of effort, potential cost savings in equipment replacement due to early identification and mitigation of adverse aging effects, increased flexibility in managing your aging activities, increased predictability in the license renewal process, and increased confidence among the financial community that aging can be successfully and economically controlled.

Thank you for your attention.