NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. S-00-24 October 24, 2000

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Commissioner
U.S. Nuclear Regulatory Commission

"Perspectives on Research's Role in Regulation"

Water Reactor Safety
Information Meeting

28th Annual Meeting
Bethesda, Maryland

October 24, 2000

Good morning ladies and gentlemen. I am very pleased to have the opportunity to speak to you at this conference. Today I intend to provide my perspectives on some of the activities within Research which I believe are a very important part of the NRC mission. In particular, my remarks will be focused on the following: (1) how important I perceive the office of Research's role to be; (2) current initiatives which benefit from Research's support; and (3) challenges which provide opportunities to shape Research's future, But first I would like to recall what Congress had in mind when it formed the office of Research.

The Energy Reorganization Act of 1974 stipulated that the Director of Nuclear Regulatory Research shall perform such functions as the Commission shall delegate including: (1) developing recommendations for research deemed necessary for performance by the Commission of its licensing and related regulatory functions, and (2) engaging in or contracting for research which the Commission deems necessary for the performance of its licensing and related regulatory functions.

Of note as stipulated in the Act, was that the head of every other Federal Agency shall cooperate with respect to the establishment of priorities for the furnishing of such research services as requested by the Commission for the conduct of its functions. This is a mandate that we should continue to exploit to the maximum benefit for our research activities. As I'm sure many of you have heard from those within the NRC the research budget has decreased from a high of over 200 million in

the past to about 42 million in the last fiscal year. This is due in part to the fact that the nuclear industry has matured. This has provided challenges for the NRC to get the most from each research dollar to support both short term and longer term activities that support the Agency's mission.

As I hope that most of you know by now, in meeting this challenge the NRC has adopted a strategic plan that articulates four primary objectives: (1) to maintain safety; (2) to improve public confidence; (3) to make our regulatory processes more effective, efficient, and (4) to reduce unnecessary regulatory burden. In the process of meeting these objectives I believe we are benefitting in that we are focusing our research efforts to gain the maximum benefit for the stakeholders we serve.

Over our recent history the NRC has been challenged to redefine or at least re-examine Research's role and future direction. It pretty much began with an issue paper, Direction Setting Issue 22 written in 1996, which posed fundamental questions about what role research should play in meeting the Agency's mission and it also provided several recommendations. Since then there have been several status reports to the Commission and one of the outcomes of NRC's efforts to increase its efficiency and effectiveness has been to fold many of the responsibilities previously charged to the NRC Office of Analysis and Evaluation of Operational Data into the Office of Research.

I'm sure some of you may have heard that recently a panel was convened to review what role research should have in our current and future regulatory environment in an effort to gain input from stakeholders. And I will do a little advertising and mention that tomorrow, my fellow Commissioners Merrifield and McGaffigan will be part of a discussion on this subject. I'm pleased by the diversity that has been brought to the panel which is chaired by former Commissioner Kenneth Rogers and includes membership from academia, public interest, industry, other federal agencies, former NRC executive managers, as well as, congressional and senate staff representation. I have studied some of their preliminary recommendations and I understand that they are only about half way through their study; but I am intrigued by the scope of their individual recommendations. And while the focus of the panel so far has not specifically identified the role of research with respect to materials issues, I am sure this panel will give appropriate consideration to those research activities because there are many materials challenges that go hand in hand with the future of nuclear power in the U.S. Also, I noted a question posed by several members of the panel was whether the Offices of Nuclear Reactor Regulation and Nuclear Materials Safety and Safeguards should also be solicited to provide input. However, even if these offices do not participate as part of this panel, I am confident that any future changes to the direction of our research programs would surely be weighted in on by all NRC stakeholders at the appropriate juncture.

One particular aspect I would hope to see as an outcome of this effort would be recommendations regarding what minimum staffing level or minimum core areas of research might be necessary to maintain research's ability to respond to future challenges. Recently, I read where the technology boom in the Silicon Valley and other similar technology centers is taking the best and brightest from government research laboratories. It can only stand to reason that the same might hold true for our University expertise base. Because the chance to become an internet millionaire is very alluring, I think we might need to start looking at ways to ensure our current base of technical expertise which we frequently draw upon, the national laboratories, does not become too watered down. One thing I am very mindful of every time I review the NRC's budget is, what level of funding will ensure that RES can efficiently and effectively function to support the NRC mission while maintaining highly qualified respected technical staff who produce high quality products.

CHALLENGES THAT TRANSLATE TO OPPORTUNITIES

Regulatory Initiatives

One of NRC's management challenges is to develop and implement a risk-informed, performance based regulatory oversight program. We are answering this challenge by working with industry on risk-informing 10 CFR Part 50 through several initiatives focusing on what has been referred to as "special treatment" requirement and piloting risk-informing regulations such as 10 CFR Part 50.44. Years ago when research for much of today's regulatory framework was conducted using experience, testing programs, defense-in-depth philosophy and engineering margins incorporated to account for areas of uncertainty, we didn't have the benefit of quantitative estimates of risk. This framework has served our nation quite well for many years, and we don't expect to throw it out and start over. Rather, given that the margin of safety is a recurring issue in the implementation of risk-informed regulation we must not lose sight of the benefits of research to identify which margins do -- and which do not -- contribute to safety. As we move into the 21st century, continued research directed at quantifying margins should NOT be confused with the perception that while reducing regulatory burden, to support risk-informed regulation we are also improving safety. Remember we now have much commercial operating experience and research to consider as a result of the ensuing years of inquiry and challenges the nuclear industry has brought us all -- and we should try and benefit from this knowledge in every way possible.

We must also be mindful of the impact of industry deregulation and license transfers on those we regulate. While we will always conduct our activities so as to be true to our mission to regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment -- that does not mean that we cannot support industry initiatives such as the development of technical basis to support license renewal, or risk inform our current regulatory requirements and appropriately reconcile these requirements to allow licensee's to more efficiently and effectively focus their resources in those areas where their impact on improving safety will have the greatest result.

I believe the NRC has been responding to the changing environment well, but I'll be the first to agree we can continue to do more. And I believe that the staff is up to this challenge. For example, earlier this year we launched implementation of the new power reactor oversight program for all plants. If you will recall, last year we piloted the new program with a few plants, made adjustments and subsequently initiated the program for all reactor licensees in April of this year. A key part of this initiative is that risk insights were used and we are making every aspect of it transparent as possible -- one just needs to visit the revised reactor oversight program webpage accessible through the NRC's homepage to see what I mean. And while there is agreement that lessons learned since its recent wide scale implementation suggest that more changes to the program will probably be necessary, I think we all can agree that overall the effort has been a success to a large part because of stakeholder input. And I think experience gained through research has contributed to this effort and we are currently looking to Research in conducting studies aimed at developing data and methods to risk-inform the various performance measures.

Decommissioning is another area where we have been working with stakeholders to remedy inefficiencies in our current regulatory framework which was largely established from the perspective of operating reactors. As a result, in the power reactor area, the NRC is taking a formal look at our whole approach to decommissioning to see if we need to create a new regulatory framework, and to see

if we can focus on the areas of greatest risk. This year the staff proposed an integrated rulemaking plan and has been discussing its recommendations with stakeholders. Research is contributing by examining various analytical tools and studying the viability of possible approaches to decommissioning, such as entombment.

Participation & Communication

Closer involvement and improved dialog with the industry and all stakeholders is required in order to better define and focus NRC research efforts. Only through such interactions will it be possible to obtain broader support for research programs. And meetings like this one are just one of the many ways we can actively achieve education of and input from all of our stakeholders. Looking at the various topics that will be discussed I see there are papers from both the staff and industry experts which give me the impression that we are making progress toward working together on challenging technical issues. Another way to raise consciousness for the value of research is to ensure that our research products provide relevant recommendations toward improving our regulatory structure.

I think if we are going to be successful in making the case for maintaining the current funding levels or perhaps even increasing funding we will have to get better at communicating and demonstrating how research dollars have benefitted safety and are providing products to support concerns such as license renewal, power up-rates, increased fuel burnup, and mixed oxide fuels. To quote Mr. Thadani "we would have had a difficult time moving as rapidly as we did on license renewal without anticipatory research." Much of which contributed significantly to the beginnings of the first Generic Aging Lessons Learned report. Obviously, explaining to stakeholders the costs of such efforts in terms of anticipatory research dollars should increase confidence in what we consider to be forward thinking research activities.

Timeliness of Our Activities

However, there is one aspect with respect to our research activities that I am very sensitive to, which is timeliness of outcomes. Frequently, we find real world uses for our anticipatory research, but we end up taking many years to see the results to fruition. Our research programs must be timely and responsive to both internal and external stakeholders. I suppose resources could be part of this mix, but I would also argue that management oversight might also be a contributing factor. I believe one way to ensure we can improve performance in this area is to get input early on from all stakeholders. I can assure you that while I am on the Commission I will be very critical of research activities that lend themselves to improving our regulatory infrastructure but do not have an aggressive schedule for seeing their contribution through to improving our regulatory framework.

Cooperation with Independence

As resources for research become more subject to challenge, I think we can really benefit by maintaining our existing relationships and looking to develop new relationships and cooperative agreements with our Federal colleagues, private sector stakeholders, and international colleagues. For example, I noted that with respect to one of the topics that will be discussed, digital instrumentation and control, the research staff have identified that digital failure assessment methods are currently used by defense and aerospace industries to determine types of failures and their impact on overall safety. Also, the railroad industry has experience with systems which we foresee as being potentially viable for

the nuclear industry. Obviously the practical experience and research results from these parties could serve as a minimum -- as a starting point as the NRC begins to determine and gather information on digital instrumentation and control failure rates to better assess the risk from the increased use of this type of equipment. Another example that has already yielded significant results is the successful collaboration between the NRC and industry in the 1980's on research projects under the auspices of the Nuclear Plant Aging Research Program which lead to development of much of the basis for our conclusions that license renewal was viable. And just recently at the conference of the International Atomic Energy Agency the U.S. and France signed an agreement on scientific and technological cooperation for developing an advanced type of nuclear reactor. Under the agreement, the two countries will cooperate in developing an advance type of nuclear reactor, establishing research programs in materials and combustibles for future reactors and in developing medical and industrial uses for radio-isotopes. Another very good example of working to achieve unique solutions as the nuclear industry moves to a deregulated environment is the Research-Energy Power Research Institute memorandum of understanding which advocates sharing available data and sharing costs of generating new data, when required. I would hope this would go a long way towards ending disagreements over data which has traditionally been one area where contentions arise between the staff and industry when facing new challenges. This is especially useful as those facilities which the NRC has traditionally relied upon are scaling down or closing down as the need for research in new areas has dwindled as the industry has matured and also in the face of declining budgets. In the area of cooperation aimed at risk-informing regulations, I noted that last month the NRC's PRA Steering Committee and the NEI Risk-Informed Regulation Working Group held their second meeting to discuss the various initiatives which could be used to support the framework for risk-informing 10 CFR Part 50.

While working with the industry is becoming more of a reality in our current environment we must also remain vigilant to insure that the public's confidence in the NRC's independence is not eroded by blindly accepting results from others. Confirmatory research or anticipatory research for industry initiatives has been, is, and will always be necessary to insure we maintain our charge as an independent regulator. I think upon reflection of the lessons we have learned from Millstone and those we are still learning from Indian Point Unit 2, I am convinced that communicating what we do and how we do it in a way that is open to all stakeholders is very important to maintaining public confidence.

Research's overall budget has decreased. However, as I just stated the NRC has a management challenge to redefine the role of research in a mature industry I think we can't be too short sighted as we implement this challenge. If you look at the currnet challenges facing Ford and Firestone I think you will agree that the consequence of not aggressively investigating suspicious safety problems has resulted in a significant loss of credibility for both these companies. We cannot allow that to happen to the NRC. There are many past and recent examples which demonstrated the benefits of being a forward thinking organization and I will use remarks made by the Chairman which I whole heartedly agree with, to illustrate my point. " . . . Virtually every major new initiative that the agency has undertaken over the past few years, license renewal, risk-informed regulation, design certification of advanced reactor designs, assessment of digital instrumentation and control systems, steam generator tube integrity programs, and the new source term, have required technical guidance derived from our research programs. I do not believe that the NRC would have either the reputation that it enjoys as a world leader in nuclear regulation, or the credibility and the technical wherewithal to proceed with the implementation of a risk-informed regulatory structure, were it not for the contributions of the Office of Research."

We are hearing rumblings today that utilities are beginning to explore the possibility of building a new reactor in the United States. I can't see how the NRC can wait until we see an application at the door to begin exploring what new regulatory requirements might be necessary if an application was received. At some point, as soon as the picture focuses a little more on this issue, we might need to embark on what some might perceive to be anticipatory research. Performing the research now to better understand where the uncertainties lie with possible new technologies will not only provide short term benefits but long term benefits if and when we see future power plant applications.

CONCLUSIONS

In closing, I would just like to add that my vision of the NRC Office of Research would be a center of excellence and source of expertise. This center would maintain a cadre of reactor and materials safety specialists in various key areas, with independent and unbiased expertise across a broad spectrum of advanced nuclear technology, to provide the technical basis for robust and transparent regulatory decisions. Experimental facilities and resources would be maintained to ensure our ability to respond in a timely manner to new or emerging issues. The office would complement the front-line regulatory activities of the agency and independently examine evolving technology and anticipated issues. While I am pleased to see that we are soliciting stakeholders more in what we do, I would expect we do more and focus on making what we produce more timely and more useful.

One final thought that I would like to leave with you regards the issue of funding. The current funding process of NRC research through users fees has the unintended impact of discouraging user support in the face of economic pressures. As a result, some are starting to pose the question as to where the NRC's research activities, if not the anticipatory activities, should be funded from the general fund rather than from those we regulate, since the public at large benefits from activities such as establishment of new regulatory requirements to support new reactor designs for example. I find this proposition very interesting and must study it more before I reach my final conclusion, but nevertheless I appreciate new ideas from our stakeholders as we continue to explore the future role of research and what mix of anticipatory and confirmatory research is optimum.

Thank you for your attention, I would be pleased to answer any questions you might have at this time.