

No. S-95-15  
Tel. 301-415-8200  
Internet: opa@nrc.gov

"Entering the 21st Century  
on the  
Technical Information Highway"  
by  
Shirley Ann Jackson, Chairman  
U.S. Nuclear Regulatory Commission  
to the  
Nuclear Information and Records  
Management Association  
'95 Symposium

August 28, 1995

I. INTRODUCTION

Good morning ladies and gentlemen. It is indeed a pleasure to have this opportunity to address the 1995 Nuclear Information and Records Management Association (NIRMA) Symposium. The theme of your 19th Annual Symposium - "Managing Our Information Capital...New Strategies for the 21st Century" is both appropriate and timely in this era of shrinking budgets and constrained resources. As we enter the 21st century, managing our capital-- whether it be human, monetary, or information capital-- is clearly a theme that must be considered in almost every aspect of how we do business. In my first few months as the Chairman of the Nuclear Regulatory Commission, I have spent a great deal of time assessing how we can more efficiently manage the NRC's "capital", and examining various strategies for the operation of the NRC in the 21st century. So I find the theme of your conference-- managing capital and examining new strategies-- to fit squarely with my view of what needs to be evaluated for the efficient and effective operation of the NRC as we go forward.

When I was invited to address this symposium, I was asked to discuss the vital issues facing the nuclear industry. As you are well aware, the nuclear industry is confronted with many issues and I have both a long list and a short list of those issues. You will be relieved to know that for today's talk I have chosen the short list. I would like to address three broad areas.

First, I would like to describe to you a strategic assessment and rebaselining that I have initiated within the NRC; second, I would like to address a few of the major technical issues that confront the nuclear industry; and finally, I will mention some activities within the NRC that directly relate to information technology.

## II. NRC STRATEGIC ASSESSMENT AND REBASELINING

Let me describe the effort that I have recently initiated at the NRC. I am sure that you are well aware of the many regulatory initiatives that are being introduced in various government agencies as well as in Congress. All one needs to do is to scan the Washington Post, New York Times, or any other major newspaper to see much about regulatory reform, the National Performance Review, or other initiatives being undertaken or considered by government. I view the ideal thrust of all these initiatives to be summed up, for the NRC, by what I like to refer to as "regulatory effectiveness." What do I mean by "regulatory effectiveness"? It goes to the heart of how we do business: It means looking not only at whether a particular old or new regulation or set of regulations is unnecessary, but also considering the ease of its implementation, its internal consistency (unitary view), its consistency with other applicable statutes and regulations (contextual view), its fairness, and how well the regulation fits into the entire existing integrated program of regulation. It also relates to the professionalism with which we do our jobs. Regulatory effectiveness also means not losing sight of the agency's overall goal -- protecting public health and safety.

What the concept of "regulatory effectiveness" provides is a broader picture of the impacts of regulatory reform, and not just reform for reform sake.

I believe that such an approach would be useful at the NRC. The time is ripe for a critical assessment of NRC's regulatory requirements and the programs built on those requirements, and for appropriate rebaselining in these areas from a bottom-up perspective.

I, with the support of Commissioner Rogers, have directed the NRC staff to initiate a strategic assessment and rebaselining of the NRC'S regulatory activities. I expect that this effort will be of great value in helping the agency to define its direction and to respond to a changing environment. It will help us to be more clear about our statutory responsibilities as well as enhancements to our core programs. This activity will result in clearly defined agency goals, core elements, and strategies to achieve those goals. I expect the strategic assessment and rebaselining to provide a broad review of the statutory and other

bases of our work, and an evaluation of all of NRC's regulatory programs. In short, properly done, it will result in a strategic vision, and flowing from it, a strategic plan to guide our activities, our use of resources, our planning, and our overall decision-making.

I personally intend to take an active role in this effort. And I expect this process to lead the NRC into the 21st century. So you can see that the theme of your conference, "Managing Our Information Capital...New Strategies for the 21st Century," and one of my principal goals as Chairman of the NRC are closely aligned.

### III. TECHNICAL ISSUES

Although the NRC assessment and rebaselining initiative are intended to reevaluate all of our assumptions about NRC programs, one important element will not change. That is to ensure the continued safe operation of U.S. nuclear facilities. It is particularly important to maintain our vigilance in this area as reactors, in particular, age, and, in light of resource constraints for all of our licensees and for the NRC itself. In addition, the trend toward deregulation and restructuring of the electric utility industry will pose unique challenges. When we look at where an industry or technology might be in the 21st century, it is important, and this particularly applies to the nuclear power industry, that we recognize that where we end up in the future depends in large measure on how we solve problems in the present.

Therefore, with regard to the second broad area of my remarks this morning, two technical issues are of particular importance to me -- (1) the aging of nuclear power plants; and (2) nuclear waste management. In my confirmation hearings before the U.S. Senate, I emphasized the importance of both these issues. I want to discuss them with you today because they are of concern to the public, Congress, and the NRC, and are vital to the nuclear power industry.

#### 1. Power Plant Aging

The problem of aging of nuclear power plants embraces a host of intertwined technical, policy, and legal considerations. The first priority, of course, is to see that the nuclear plants continue to operate safely. From the standpoint of national energy policy, it is not the role of the NRC to promote the use of nuclear power, but it clearly makes sense that, nationally, we make the most efficient use of our energy resources. In the case of nuclear power plants, this means not shutting plants down prematurely if they are still capable of years of safe operation.

The NRC has developed a sound and sensible licensing process to handle plant life extension -- 10 CFR Part 54.

What are some of the technical problems with aging? There are many, but two that are of great importance are (1) Reactor Pressure Vessel embrittlement and (2) Steam Generator Tube Integrity.

Let me address reactor pressure vessel embrittlement first. The integrity of the reactor pressure vessel is essential in assuring long term safe operation of nuclear power plants. Reactor pressure vessels become embrittled with increased time of operation due to neutron irradiation. Those constructed of materials with high traces of copper and nickel are especially susceptible to this phenomena. This combination of susceptible materials and the accumulated effect of neutron fluence can lead the vessels to reach, or exceed, embrittlement screening criteria set forth in our regulations.

Thermal annealing has the potential for restoring the ductility and toughness of the vessel steel to very near the original, unirradiated condition. This would effectively enable licensees to "reset the clock" on vessel irradiation embrittlement, and potentially to increase the safe operating life of the reactor vessel. However, thermal annealing of a reactor vessel is a complex process which has not been previously attempted at a commercial nuclear power plant in the U.S., and involves significant engineering issues and financial risk to utilities. Just last week I was briefed by the NRC staff on this issue. The Commission is currently evaluating the regulatory framework within which the NRC could eventually assess reactor pressure vessel integrity. It is important that this framework not be unduly burdensome to licensees, but it is equally important that the public is aware and gains comfort that public health and safety is protected. Last Friday, I visited the Palisades Nuclear Plant, in Michigan, which is giving serious consideration to implementing this annealing process for its pressure vessel. This would follow the performance of two annealing tests by the DOE, in conjunction with a coalition which includes EPRI. The NRC will carefully observe and evaluate these tests as part of and to provide input to our regulatory process in this area.

A second aging issue is steam generator tube degradation. The thin-walled tubing of steam generator tubes comprise more than one-half of the primary coolant system boundary, and as a result, steam generator tube failures represent a failure of one of the principal fission product boundaries in a nuclear power plant. In the past, steam generator tube problems had been handled on a plant-specific basis. The Commission is now considering a generic approach for dealing with steam generator tube degradation that will ensure defense in depth through a balance

of protective, inspection, and mitigative measures. This continues to be a major problem for the industry and it is one that needs to be given increased attention as nuclear plants age.

## 2. Nuclear Waste Management

The next issue that I will discuss is perhaps one of the most important matters facing the nuclear industry -- nuclear waste storage and disposal. Without satisfactory resolution of this issue, the role of nuclear energy in the nation's overall energy mix in the future will be constrained.

Earlier this month, I toured the Yucca Mountain site in Nevada. At the DOE Exploratory Studies Facility there, I had the opportunity to go more than three quarters of a mile into the mountain, and to observe first-hand the tunnel-boring machine that moves ahead at a rate of about 30 feet per day, depending on geologic conditions. I visited alcoves within the tunnel that are, and will be, used to conduct experiments and to collect site-related data. I saw thermal, hydrologic, and mechanical experiments, and field laboratories, that are being used to characterize the site. DOE still confronts many scientific and technical challenges before site characterization is complete, but ensuring that the NRC is prepared to review a DOE license application for a mined geologic repository is one of my priorities. NRC has its own regulatory research center, the Center for Nuclear Waste Regulatory Analysis in San Antonio, Texas, which is conducting research in areas important for developing our technical abilities, and refining our regulatory approach for licensing a repository. I visited that center before my trip to Yucca Mountain.

Some of you may be aware of proposed legislation that would place greater emphasis on the development of a centralized interim storage facility. The Commission has provided testimony on this legislation (H.R.1020). It has been the Commission's position that it agrees with the fundamental approach of the proposed legislation which contains the basic elements of an integrated high-level waste management plan. The three fundamental elements of an integrated plan are, first, interim on-site storage; second, centralized interim off-site storage; and, third, deep geologic disposal of high level nuclear waste, primarily spent fuel. The Commission holds to the view that the overall, long-term success of this nation's program to manage spent fuel and other high-level radioactive waste is dependent on developing a permanent repository for this material.

The Commission continues to believe that deep geologic disposal is a sound and technically feasible solution to the problem of permanently disposing of spent fuel and other high-level radioactive waste. We are also confident that the Commission will be able to determine, with reasonable assurance, that spent

fuel and other high-level waste can be disposed of safely in a geologic repository provided (1) that NRC receives a high quality application from DOE; (2) that NRC requirements are met; and (3) that NRC can maintain its technical capabilities for licensing a deep geologic repository in the face of budget constraints.

The disposal of low-level radioactive waste also presents an important issue. As many of you are probably aware, the responsibility for identifying sites and developing the disposal facilities rests with the States and Compacts. And most, if not all, low-level radioactive waste disposal sites will be licensed by Agreement States. NRC continues to provide technical support and guidance to these Agreement States.

The premature shutdown and decommissioning of nuclear facilities could add, in a compressed time frame, to the already projected quantities of low-level radioactive waste requiring disposal in this country. However, within the last couple of months, there have been signs that some of the concerns with having adequate low-level radioactive waste disposal capacity have subsided. Of course, the Hanford disposal site has been available for low-level waste disposal to the Rocky Mountain Compact and the Northwest Compact for some time now. And, as of July 1, 1995, the disposal facility in Barnwell, South Carolina, has re-opened and is accepting waste from all states except North Carolina. The National Academy of Sciences recently issued a report on the Ward Valley site in California. The report reviewed seven technical issues related to the site, and did not identify any reasons for not proceeding with the site licensing process.

#### IV. INFORMATION TECHNOLOGY

Next I will turn to some specifics on information technology. In May of this year, President Clinton signed into law the Paperwork Reduction Act of 1995. This act supplants the previous Paperwork Reduction Act and gives very specific direction to Federal Agencies (1) to reduce government paperwork burdens imposed on the private sector and to increase opportunities for public comment on the merits of each new and extended information collection proposal, and (2) to initiate a concerted effort, using information technology, to improve government management of information collection. NIRMA has been at the forefront of the nuclear industry efforts in this area.

Last December NIRMA and the NRC co-sponsored a workshop on Electronic Information Exchange. The NRC is dedicated to continuing the process of exploring new ways of doing business using new information technologies. Projects, such as the development of an agency wide document management system, establishment of Electronic Information Exchange processes, development of World Wide Web and Internet connections, and

REGNET to name a few, demonstrate the NRC's intention to improve its customer service by redesigning much of the way we do business. In this age of dwindling resources we, that is the NRC and its customers, must work separately and together so that we may each become more effective and efficient.

We at the NRC know that issues involving plant relicensing, decommissioning and waste disposal are going to generate huge amounts of information that will be flowing into and out of the agency. The projects I have mentioned are testing new ways to handle the increased information flow and will lead us to new processes that will benefit all aspects of the nuclear industry. Projects such as the Regnet/Rulenet pilot, if successful, will develop a way, not only to enhance public participation in the rulemaking process, but also to shorten the lead time necessary to move from the proposed to final rule stages. The NRC's Office of Information Resources Management is committed to improving the flow and use of information through the uses of new technology and the redesign of our business processes to take better advantage of the new technology.

Let me discuss a technical information retrieval system that should provide the NRC with valuable assistance when we conduct the licensing review of a geologic repository for high-level radioactive waste.

#### 1. Consolidated Document Management System ("CDOCS")

The Nuclear Waste Policy Act of 1982 charges the NRC with completing licensing actions for a high-level radioactive waste repository within three years of receipt of an application from the Department of Energy. It is anticipated that the license application and supporting documentation for this first-of-a-kind project will be both technically complex and voluminous. Recognizing this, NRC and DOE engaged in a negotiated rulemaking to establish criteria and a process for development of a Licensing Support System (LSS). While discussions continue regarding the LSS, NRC and its contractor staff are developing a document management system appropriate to meet its immediate needs during the pre-licensing period as well as the long-term need to interface with the LSS.

Known as the Consolidated Document Management System, or "CDOCS", this system combines regulatory program and technical document management databases previously developed by NRC. CDOCS, which was developed for the NRC by the Center for Nuclear Waste Regulatory Analyses, provides the NRC with four broad capabilities:

- 1) Full text search and retrieval

- 2) The ability to document and manage program open items, such as comments on DOE prelicensing and license application submittals
- 3) Support to the periodic publication of NRC program documents such as the License Application Review Plan
- 4) A configuration controlled archive to serve as the "program corporate memory" regarding the evolution of regulations, regulatory guidance documents, staff positions, and policies, together with their underlying rationales and strategies for implementation.

Effective implementation of CDOCS will provide the NRC with early access to the automated environment needed to enhance staff productivity, facilitate thoroughness and integration of licensing reviews, and collect internal documentation of licensing decisions. We are already seeing benefits in these areas. It will be one of many document collection systems feeding NRC's document contribution to the LSS.

## 2. Business Process Reengineering

A second very interesting project that is ongoing within NRC is the NMSS Materials Licensing Business Process Reengineering (BPR) project. It is now moving into the prototype phase. The BPR Team, a cross-functional group of NRC headquarters and regional staff, was chartered to examine the NRC's current materials licensing process and develop a new materials licensing process design. This design is to:

- 1) Maintain or raise the level of public safety achieved by the current process;
- 2) Perform at a rate that is an order of magnitude faster than the current process;
- 3) Exploit modern information technology as a fundamental part of the new process; and
- 4) Reduce resources to meet 1998-1999 staffing levels.

The 10-fold improvement in speed is an ambitious goal that requires looking at the existing process from the bottom up with "no holds barred" on the final solution.

It was clear from the beginning that to achieve this goal, it would be necessary to look at modern technology to fundamentally change the current licensing process.

Analysis began with interviews of over 70 NRC staff and managers to find out what was wrong -- and I might add what was right -- with the current process. Some of the problems identified are familiar, ones that almost every large agency faces today:

- Supporting information technology applications, are antiquated, disjointed, redundant, and management-focused.
- Modern information technology is mismatched with personnel skills.

Other findings are specific to the NRC operation:

- Standard materials licensing processes are undefined at any organizational level and unsynchronized with Agreement States.
- Guidance is outdated, too general, and unconsolidated.
- Regulatory product development takes too long.

The entire materials licensing process has been examined in detail. One startling finding is that it takes 84 days to process an average materials license, but the actual work time is only about 2 days. The rest is administration and coordination.

At this time, NRC staff believes that modern information technology will make possible several improvements in our current materials licensing program. Some of these improvements include:

- A licensee will have multiple choices for submission of a license application -- paper, fax, or internet.
- The simplest licenses will be reviewed via an automated system; more complex cases will be reviewed by human reviewers, assisted by expert systems.
- NRC will use an agency-wide groupware capability to develop new regulatory products--and reach concurrence on them--in parallel rather than serially.
- The NRC staff, licensees, and the public will be able to remotely access a single, up-to-date, consistent electronic repository of (materials licensing regulatory) products.

This is an interesting project, one with major implications for NRC and for other agencies as well. The enabling technology is readily available and is used worldwide. It does not need to be developed. What will make the difference between success and failure for many organizations will be the use they make of this technology. You will be a major part of that difference.

V. CONCLUSION

I hope my remarks have provided you with some insights into my views of the many issues that confront the NRC and the nuclear industry today. I am sure you appreciate that how we solve today's problems can, and will, affect the role that nuclear energy will play in the 21st century. Information technology is playing a major role at the NRC in helping us resolve many of these critical issues. Thank you for your attention. I wish you all a very enjoyable and successful conference. I would be pleased to answer any questions that you might have at this time.