



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. S-04-018

Chairman Nils J. Diaz
U.S. Nuclear Regulatory Commission

at the

Institute of Nuclear Power Operations (INPO)
25th Annual CEO Conference

November 3-4, 2004
Atlanta, Georgia

EXCELLENCE IN SAFETY MANAGEMENT
(Ensuring the Assurance of Adequate Protection
and Enhancing Public Confidence)

It is my distinct pleasure to address the 25th INPO CEO Conference. The Nuclear Regulatory Commission recognizes the important role INPO plays in helping the nuclear industry strengthen and sustain the focus on nuclear safety and improved plant performance. I will be presenting my individual views, which do not necessarily represent the views of the Commission, unless I state otherwise.

I have considered several good topics to discuss with you today. For example, I could talk about security: nuclear power plants in the USA are as secure as they should be, and the NRC continues to work with the industry to add further assurance to the safety strategies for event mitigation. I could also talk about safety and security, or new reactor licensing, or cross-border design certification, or regulatory predictability, or implementation of risk-informed and performance-based practices, or the new NRC Strategic Plan, or materials degradation.

In fact, I could go on and on, use up my time and never get beyond a very solid laundry list of issues. That would be nice. However, realizing it is late in the afternoon and it is November 3, 2004, I am going to pass by those issues. You may have guessed right: I am not going to miss the opportunity to add something to your plate. And INPO, unknowingly, gave me the solution, with their emphasis on excellence; excellence is a word normally outside the regulatory lexicon.

I am going to talk to you about excellence in safety management, its importance to ensuring the assurance of adequate protection and to increasing public confidence. Furthermore, I am going to focus on a very specific area of utmost concern for the NRC and for the industry: the management of events, of shutdowns and of extended shutdowns.

The discussion that preceded my talk certainly laid out the foundation for the issues I will be addressing. I cannot imagine a better introduction for my talk than what you experienced this afternoon (a discussion of the TMI-2 accident and its aftermath).

Let me begin with the regulator's role and the industry's role in continuing to "provide adequate protection" of public health and safety, a phrase you surely recognize comes from the Atomic Energy Act, enacted in 1954. The regulatory structure for commercial nuclear power was then established, and the Atomic Energy Commission was charged in part with regulating the civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety and to promote the common defense and security. Since the early days of commercial nuclear power, there have been many discussions on what constitutes "adequate protection." The framework for adequate protection is provided by the body of NRC regulations and requirements. Of course, the actual implementation of these requirements is primarily the job of the industry, with NRC oversight.

The protection of public health and safety is obviously a priority for the NRC; I believe it is a priority for the industry as well. In a sense, both the industry and the NRC have the mission to provide the oversight and management to ensure the assurance of adequate protection. I am not creating a tongue twister. I am trying to peel away any ambiguity about the ultimate responsibility and accountability for the assurance of adequate protection: it belongs to the nuclear industry management and the NRC management. The daily activities of the workers at nuclear plants should be conducted in a manner that assures adequate protection in the operation of facilities and the use of nuclear materials; the daily activities of the NRC staff should also assure adequate protection by implementing the licensing and regulatory functions of the agency. Yet, the best assurance of safety clearly requires excellence in management by both NRC and the industry managers, from top to bottom. They remain key in ensuring the assurance of adequate protection.

I mentioned earlier the NRC's new Strategic Plan. It is based on five goals: safety, security, openness, effectiveness and management. Two weeks ago at the Fall NRC's Senior Manager's Meeting, I only focused on one goal: excellence in management of the agency's activities across the board, with enhanced accountability, connectivity, communications and timeliness. In reviewing the NRC's and the industry's management performance, I became convinced that events, shutdowns and extended shutdowns, need additional management attention; a better, more effective, more risk-informed and performance-based management. I am going to be very specific.

I see the need for improved safety management and overall management of shutdowns, and especially of events and extended shutdowns. I see the need for effectively managing the regulator/licensee interface during events and extended shutdowns. I see the need for better informing the public and stakeholders of what is happening in the safety management of events and/or extended shutdowns. I see the need to converge on the resolution of safety issues, first and foremost, in a manner that demonstrates the NRC's and the licensee's full cognition of regulatory requirements, expectations, and timely solutions. And I see the need to communicate the resolution in each of these areas in clear and unambiguous terms, so people and stakeholders know what the situation is and what to expect.

Excellence in management is key to early convergence on safety issue resolution and the implementation of the solutions.

At this point, I will take a few minutes to discuss with you one perspective on the existing data on nuclear power plant events, shutdowns and extended shutdowns by reviewing the distribution of extended shutdowns during the last 25 years, beginning after TMI and therefore not including the shutdown of TMI-2. Figure 1 shows Unplanned Shutdowns that lasted for more than six (6) months. You may be a bit surprised by the fact that there have been at least 140 unplanned shutdowns lasting six months or longer since 1979. Excluded are some plants that permanently shutdown for economic or political reasons, in our judgment. Also excluded are routine shutdowns for planned maintenance or modifications, regardless of the length of the shutdown. Figure 1 correlates with the well-known data showing the increase in the capacity factor of the nuclear fleet that began in the mid-eighties, as well as with improvements in the safety performance indicators.

The peaks are reasonably correlated with identifiable events or regulatory initiatives. The increases from 1980 to 1985 were mainly the result of material degradation problems and the post-TMI action plans. It is well documented that materials degradation has always been an issue; some are old mechanisms of degradation and some are new. Shutdowns from 1986 to 1995 were mainly due to material degradation problems and design issues. The increase in the number of shutdowns in 1996 and 1997 corresponds to the issue of design basis and licensing basis resolution and documentation, as shown by the problems at Millstone and D.C. Cook, as well as management issues such as deficiencies in the corrective action program. I will dare to say that in the mid-nineties the regulatory interface was not well managed. Please keep in mind that there are other causal factors, which I am not addressing, that contributed to the length of the extended shutdowns. However, I still believe that pertinent conclusions can be drawn from the data.

Figure 2 shows those shutdowns that lasted for more than a year, a subset of Figure 1. There are 52 extended shutdown cases on Figure 2. Figures 1 and 2 confirm that both sets of extended shutdowns (longer than six and 12 months) have occurred in recent times with reduced frequency. Since 1998 there has only been one plant shutdown lasting longer than 12 months, and that was the 2002 Davis-Besse shutdown, which started as a serious materials degradation problem, and was compounded by the ECCS, sump and High Pressure Injection problems, and by management issues.

There is, of course, much good news here, especially since 1998, and there is no doubt that most of you should be congratulated for the very significant improvement made in your overall safety and management performance. I also believe the NRC made sound improvements in its regulatory approach to assure effective safety oversight. But there is more to discuss.

Figure 3 shows that the "over 6 months" and the "over 12 months" shutdowns are well correlated; the "over 6 months" data includes the "over 12 months" shutdowns. One fact is that the shutdowns of longer than 12 months dominate the 1993 and 1996 peaks. The 1979-1998 twenty-year average of shutdowns was about seven for longer than six months and about 2.5 for longer than 12 months. Since then, the number went down significantly, and stayed down.

Figure 4 presents a more complete picture; it shows the duration of each extended shutdown since 1996. For example, in 1999 there were five plants in extended unplanned outages, although no plant entered an extended outage in that year. Another way to look at this aspect of the issue is seen on

Figure 5, which shows total months of extended unplanned shutdowns per year. There were approximately 418 unplanned shutdown months (or 35 reactor shutdown years) from 1996 through 2004. It is not until 1999, or even 2001, that a very significant reduction was maintained.

A brief analysis of the 52 unplanned shutdowns since 1979 lasting longer than a year reveals a set of reappearing causes. One could group the causal factors as shown in Table 1:

TABLE 1

APPARENT CAUSE	No. of Shutdowns Longer than One yr	Shutdowns Avg. length (months)
Design basis or licensing basis	18	38
Material degradation	15	16.5
Management issues	12	25
Equipment failures	7	19

I would like to point out that, based on the numbers in Table 1, issues relating to “design basis or licensing basis” contributed to about 50 percent of the total industry-wide shutdown time (for shutdowns since 1979 lasting longer than a year). If you add “management issues” to these, the combination contributed almost three quarters of the total industry-wide shutdown time.

I believe I should at this point highlight some of the reasons why I decided to bring this issue out into the limelight again. Of course, it is TMI’s and INPO’s 25th Anniversary. But that is not it. First, I am convinced that the NRC and the industry have the know-how and opportunity today to deal with this now. A good time to do this is while there is no crisis. Also, the new security regime has been established, and license renewals are proceeding to extend plant life. Second, excellent management will support license renewal, power uprates, and other regulatory activities. Excellence in management is also needed to accommodate the fact that plants are now running longer between outages. Furthermore, we know that extended shutdowns are not necessarily related to the original reason for the shutdown and that excellent management could have, and should have, contributed to earlier resolution. Third, I am concerned that many of the good senior managers who have experienced extended shutdowns, have faded, or are about to fade, from the action. I am talking about both the industry and the NRC. While you and we have great talent in our respective pipelines, many do not have the scars. We owe new managers a good program to define better how to manage a potential crisis, including dealing effectively with the regulatory interface. Pipes, tubes, and equipment will weaken, and some will break, and there will be human failures. Management is about being ready.

Furthermore, at the beginning of my remarks, I mentioned the importance of safety management for increasing public confidence. I have often been asked why so many people are concerned with the safety of nuclear power plants when no member of the public has been injured by an event or accident. Well, I believe that unplanned shutdowns, especially extended shutdowns, contribute to these concerns.

They raise questions among members of the public about safety management and management practices. Excellence in management is strongly coupled with public confidence.

It has been said that the NRC has unnecessarily contributed to the number and length of extended shutdowns. I will neither dispute it nor confirm it. I am sure that we can all do better at fulfilling expectations for the management of the safety issues. It is fair to say that the NRC concentrates significant efforts on what we perceive as poor performance. The tools and policies we had in the past were not as effective as those we have today in discriminating between the truly significant safety issues and other conditions. Under our current policy, we keep safety issues as the focus of our attention, and the ROP is a prime example of a good tool. For some of the extended shutdowns, I believe that licensee management did not fully appreciate the regulatory implications of the situation. That made the NRC's job harder and demanded much more attention.

For the oversight of shutdown nuclear power plants with performance problems, the NRC has a well-documented process, found in the NRC Inspection Manual, Chapter 0350. The process involves establishing an NRC Oversight Panel, which then develops a Process Plan and a Restart Checklist. Obviously, a well-defined Restart Checklist is crucial for licensees to understand what corrective actions are needed prior to plant restart. I believe there may be opportunities for improvement in this process.

Please note that I have frequently emphasized corrective actions. I am convinced that there is no way to overstate the importance of an effective and timely Corrective Action Program. I am speaking not only about the industry: in fact, I believe there is a need for a Corrective Action Program for the NRC.

I have said little about refueling outages and planned shutdowns. I am sure we all agree that shutdowns should be well-managed and "pay me now or pay me later" has real meaning; therefore, the gold standard is not about how short they are but about how they contribute to long-term safety and reliability.

The NRC's obligation to protect the public can be fulfilled in a number of ways. I believe the public, the NRC, and the industry benefit most when the industry uncovers and fixes the problems. This applies to both plant-specific and generic concerns. While I expect excellence in safety management for the NRC and the licensees, how to achieve it at the power plants is the prerogative of the licensees. However, if there is a lack of understanding of regulatory matters, or lack of commitment to correct deficiencies, problems grow and complications develop, and the NRC would necessarily intervene. I am convinced that good two-way communications and fair and equitable treatment by the regulator can go a long way toward resolving these issues; it does, however, require a licensee commitment to safety. I am committed to fair and equitable treatment across the spectrum of regulatory issues.

Without a doubt much progress has been made over the last 10 years, and it is clear that the industry has significantly improved the performance of nuclear plants, and most of the events, shutdowns and extended shutdowns are now better managed. INPO has contributed to this improvement. I also believe the NRC has improved its oversight and management of regulatory issues. I sincerely hope the progress continues and reaches the point where extended shutdowns become part of the history of nuclear power and not part of the future. To improve their treatments of events and unplanned shutdowns, the industry and the NRC need to do even better. Just as a new Reactor Oversight Program was developed with the strong collaboration of the industry and other stakeholders, I believe

we can do much good by finding ways and taking steps to enhance the 0350 process and better address event and shutdown safety management. Excellence in management has broad applicability; I am taking one bite. Such efforts are needed to reduce the factors leading to or contributing to events or extended shutdowns, to resolve the issues that appear at the interfaces, to demonstrate excellence in management during a shutdown, and to implement the lessons learned throughout the industry, all in a timely manner. Proceeding on this path of enhancing the NRC's and the industry's management of safety will contribute to ensuring the assurance of adequate protection and to increasing public confidence.

Thank you for the opportunity to share my views with you.