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RIC 94: After Dinner Ruminations

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It is a distinct pleasure for me to see such a large turnout at the 1994 Regulatory Information Conference. These sessions have become an important element in the NRC's efforts to discuss the important issues with a wide range of people and organizations. I firmly believe that this agency has been, and continues to be, the most open agency in the federal system. We spend an enormous part of our budget each year just listening to what others have to say about the issues which face us, and in making information available. That's money well spent, in my view.

I am particularly pleased to have been invited to take part in this year's Conference, because it appears likely that my term as a Commissioner will end in a month or so, and this evening's session gives me an opportunity to reflect with you on my experience with the NRC, and on the very great changes that have taken place in the industry in the last several years.

Some of you have heard me say before that, to speak frankly, I did not aspire to be a Commissioner. I don't mean to elevate myself above the position, or to denigrate the job, but a university community is a hard place to leave, and a Commissioner is a hard thing to be.

Some of you encouraged me to accept the nomination, and I'm glad you did, because I have found the experience to be far more interesting than I had anticipated. A lot of that interest has to do with the challenges of carrying out the agency's mission. Congress has left most of the big policy decisions to the agency, and even the courts defer to the agency's technical judgment. So when it comes to laws governing the civilian uses of nuclear materials, the NRC is a mini-legislature, a trial court, and an executive body -- a daunting collection of roles to play when the subject is so controversial as one as radiation.

But another very large part of the interest in being a Commissioner derives from the people, the soul of the agency. In many respects, the NRC is an excellent agency, among the best in government, with many sincere, highly educated, professional, dedicated, and hard-working people. The agency is not perfect by any means, but it learns well from experience, and it is getting even better.

I've been impressed in particular by the high respect in which the agency is held in every foreign country I have visited while I've been a Commissioner. The help the NRC provides to other regulatory bodies is extensive and greatly appreciated. The NRC contributes greatly to the continuing growth of a strong, open, international nuclear safety culture. The agency is a credit to the United States, and, by its professionalism, technical capability, and dedication to safety, an indirect benefit to U.S. industrial interests.

Of course, such a well-equipped agency, with as much discretion as the NRC has been given, has the power to do harm also. Therefore, it has to know how to govern itself before it can govern others. Critics from across the political spectrum have for years voiced serious doubts that any agency structured as the NRC is structured could produce rational regulation. Judge Stephen Breyer, often mentioned as a possible nominee to the coming vacancy on the Supreme Court, has well described what he calls the "vicious circle" of risk regulation, in which public perceptions, Congressional reactions, and the technical uncertainties which we regulators face, reinforce each other and thus too often yield random and inconsistent regulatory priorities, and a misallocation of resources to what he calls the "last 10%," rather than to more important matters. Although I think the NRC does better at resisting such tendencies than many agencies in this town, I wish I could say that we were completely consistent in this regard.

Let the record show, however, that the NRC has been engaged in self-reform -- in backfitting, in rule-making procedures, the licensing process, the 2.206 process, and more. In the long term, one of the agency's most significant efforts at continuing self-improvement will be to introduce more of a comparative risk perspective into its work. The agency is gaining in its risk perspective. It is increasing its use of risk insights in all aspects of the regulatory process. There are, it is true, sectors of the agency which have a long way to go toward incorporating risk perspective and insights into what is largely a deterministic regulatory process. However, this agency is far ahead of most, if not all regulatory agencies, both here and abroad. I hope that during my term as Commissioner I have in some ways furthered the NRC's growth in this direction. Just yesterday I attended the first White House meeting of the Interagency Committee on Risk Analysis. One of my last official trips will be to Vienna to chair the third of four meetings of small groups of regulators on the subject of regulatory safety goals. It is my view, but admittedly a somewhat biased view, that the Commission deserves much credit for its willingness to stick its neck out and issue its safety goal policy statement, identifying the level of public risk which answers the question, how safe is safe enough. Ever so slowly we are finding ways to incorporate this risk goal into our regulatory process.

Before I move on to say some things about the most important term in the equation of nuclear safety, namely, the licensees, let me wrap up my comments on the agency with a few remarks about that curious institution, the five-member commission.

As some of you may know, I wasn't always a strong supporter of the idea of a many-headed agency. And, to tell you the truth, I know even more about its shortcomings now, after 4 and 1/2 years as one of those many heads, than I did before I became a Commissioner. But I'm also convinced of the value of the institution. When the Commission is working as a collegial body, as I hope you'll agree it has in recent years, there are a number of advantages to the commission structure. At the Regulatory Information Conference in 1991, I spoke about the advantages of this structure. Permit me to quote myself. I said

[The Commission structure] has some definite advantages, particularly for the resolution of highly technical issues. I believe that the weighty nuclear safety and policy issues which the Commission must decide can benefit from diverse and interdisciplinary input. Such input can largely prevent the significant errors which can arise from too narrow a focus. ... [T]he debates which might have taken place in the halls of Congress must take place in the halls of the Commission, and for such debates, many heads are better than one.

....

Some say ... that a single administrator will be more efficient and accountable than a Commission. ....

[But] you have to ask, "efficiency with respect to what, and accountability to whom and according to what standards"? Anyone can get a decision out in record time. The question is, how good is it, and how soon will the decision have to be made all over again because it wasn't made right the first time? And even if it was well-made the first time, how vulnerable is it to a change of administration? One side may think that *its* single administrator can get the ball rolling on some policy so well that no later administrator, accountable to someone of the opposite persuasion, can change the policy. But that's a smaller basket than I'd like to put all my eggs into. Also, it may be easier to hold one person accountable than five; at least that's what you say when you think *you're* the one that can hold the single administrator to account. But it's also easier to distort one person's judgment than it is to distort the judgment of five, as you might be tempted to say whenever you think *someone else* is the one who gets to hold the single administrator to account. Increased stability and continuity are important benefits of continuing the current Commission structure.

I said these things three years ago. In those three years, I've seen a great deal that confirms what I said then. To be sure, the Commission structure is not perfect. Why, even a Commission sometimes has to redo a rule. But then neither is any one of us perfect, and so neither is any single administrator. In institutional structures, there is no perfection. There is only a choice among shortcomings. Given the broad mission and great discretion lodged in the NRC, I think we're all better off with a commission structure.

I want to speak now of the dramatic improvement in the industry, especially the contribution of INPO and NUMARC (now part of NEI), but also of the Test, Research and Training Reactors

organization (TRTR) for the non-power reactor community. The importance of such groups in maintaining an apolitical, non-lobbying, technical interaction with the agency -- an interaction in which each side respects the authority, role and independence of the other -- cannot be overestimated.

Let me first point out to you some striking figures about the nuclear industry in the United States. The figures show that the performance of plants has improved considerably, to the point where the better performers are comparable to the best anywhere in the world.

Consider some numbers over the decade from 1983 to 1993: In 1983, there were 74 licensed plants. These produced 280 terawatt-hours of electrical energy, or 12.1% of the total U.S. generation of electrical energy. In 1993, however, there were 109 licensed plants, about a 50% increase in only a decade; but the electrical energy production figure is even more striking. It was about 2.2 times as much as in 1983, representing an increase of about 120%. In 1993 these 109 plants produced 611 terawatt-hours, or 22% of the total national generation of electrical energy.

Part of the increase can be traced to the substantial increase in the average net capacity factor over the decade. In 1983, that factor was 58%. In 1993, it was 73%, an increase equivalent to fourteen 1000 megawatt electric plants operating at a 73% capacity factor. Part of that increase can in turn be traced to the industry's growing experience. Through 1993, the industry had accumulated 1800 power reactor years of experience.

Now it would be too easy to say that these numbers should not be relevant to a safety regulator. And in a certain sense they're not, because we don't write our rules to increase production. However, it would be a little odd to call "safe" a plant that isn't producing anything. Of *course* it's safe, but who would care? A parked car is pretty safe too (as long as it's properly parked). Congress doesn't bother to create safety agencies to regulate machines that don't run.

But even more important, as we all know, the success story we have seen in the production numbers is reflected in the safety numbers the NRC tracks. And this should be no surprise, because the same professionalism and cooperation that enhance production also enhance safety. If we saw numbers which showed consistently low productivity and high safety, I'd hazard a guess that the safety numbers would sooner or later go down.

One of the important developments which has led to considerable improvements in the operation and safety of nuclear reactors, whether they be power or non-power reactors, is an increase in the number of occasions on which professionals work together for the common good. I know of no other industry in which such cooperation, especially in the form of exchange of information and experience, has been so extensive and has proved to be so successful as in the nuclear utility industry.

The formation and development of INPO, the Institute of Nuclear Power Operations, following the TMI accident, has had dramatic effects on the safe and professional operation of nuclear power reactors in the U.S. I know from first-hand observation of INPO's operations that it has provided

a very important way for utilities to help one another achieve excellence in the operation of their plants.

The formation and development of NUMARC, now part of NEI, has led to many highly productive exchanges of views between the NRC and the nuclear power industry on regulatory matters. No one individual, no one organization, be it regulator or industry, has the knowledge or the smarts to know the best answer to the myriad of technical issues that arise over time. But an open exchange of views, in an atmosphere of mutual respect for one another's responsibilities and expertise, frequently leads to solutions which readily meet the needs of both sides.

The organization of Test, Research and Training Reactors (TRTR) continues to develop as an important body, performing for the non-power reactor community something of the same role that INPO and NUMARC have performed for the power reactor community.

We see in these organizations, and in other organizations, such as the professional societies, a remarkably successful case of self-improvement, very much parallel to the NRC's own efforts to improve itself. Institutionalized self-assessment, self-discipline, and self-improvement are necessary. Agencies like the NRC can be watchful of these efforts, and the agencies should insist that safety get its due, but the agencies cannot do without self-improvement in the regulated industries. The NRC, for instance, just doesn't have the information, or the structure, that would permit it to do without the industry's own organized efforts. Agencies like the NRC should encourage self-assessment, and they must be careful not to stifle it through overprescriptiveness.

I might add that, just as the NRC has had an enormous influence abroad, so too is the U.S. nuclear industry making a great contribution to the continuing development of an international nuclear safety culture. WANO, the World Association of Nuclear Operators, is in essence a world-wide extension of INPO. WANO provides a way for utilities in one country to help, and to learn from, sister utilities in other countries, transcending the restrictions of political and geographical boundaries. The importance of this effort is immeasurable, especially to utilities in countries which have only a single nuclear plant, or in countries whose communications with the rest of the world are highly restricted.

Clearly, we work with a technology which is international, a technology in which barriers of geography, politics and language are daily being overcome by the common desire of professionals to demonstrate that this technology can be used safely to benefit humankind. My main reason for speaking to you today on the subject of cooperation is to urge you not to take it for granted, and not to let the competitive pressures of the market undermine it. It has not yet reached its full potential. It is perhaps unique in major industrial enterprises. It has had, and continues to have, tremendous benefits. Therefore, it should be recognized, preserved and nourished.

Before I close, should I hazard some predictions? That's risky. But here's a safe one: You have a rough road ahead in your dealings with a large part of the public, how large I don't know. Let me borrow again from Judge Breyer's scholarship on risk regulation in the U.S. The public often relies on bright-line distinctions which have a large element of arbitrariness in them, distinctions like "safe/dangerous." The public's ethics are often local, both in time and in space: Just get the risks

off *my* back; never mind who else, in some other place, or at some later time, may suffer because my life has been freed of some risk. The public is often easily impressed by extraordinary events, so that one failure of a technology, or a person, means that that technology or person is not to be trusted again. The public is often unable even to recognize those risks to which it is habituated. Many citizens made up their minds long ago, for slight reasons, and are not inclined to consider the issues anew. And many citizens, though literate, are innumerate.

In these circumstances, all the professionalism and technical capability, all the open communication in the world, won't necessarily persuade the public as a whole that the civilian use of nuclear materials is on balance a good thing. But you can be sure that the *absence* of professionalism, technical competence, and communication, *will* persuade them that the civilian use of nuclear materials is *not* a good thing. Openness and opportunities for public participation will not by themselves increase public confidence in the NRC or the industry. Also required are decisions which command respect because they are well-informed, technically sound, and consistent in the face of political pressures.

Some bright spots on the horizon are the new designs and the new process for reviewing them. The world leadership of the U.S. industry and the NRC is evident here, and both the designs and the new process for reviewing them are proof of the importance of professional cooperation in technical matters. The new design certification process has entailed some significant changes in the way designs are reviewed. Add to this that Part 52 did not answer, and could not have answered, all the important questions. So it is not surprising that the NRC and the vendors have stumbled along the way. However, they have also rebounded. They have learned about, and resolved, unanticipated problems in a professional manner. The NRC staff and vendor personnel have worked hard in an open process. The Commission has been involved and has made necessary policy decisions in a timely manner.

All of this has been accomplished while we all had other things to do, for instance, maintaining and improving the safety and efficiency of operating facilities. At the same time, the NRC has been working to improve certain aspects of its material licensing regulatory process, assuming the responsibility for safety oversight of the two gaseous diffusion uranium enrichment plants, reviewing an application for a centrifuge uranium enrichment plant, and continuing its part of the work on the pre-application phase of the high level waste repository.

In summary, much has been learned, improved, and accomplished since the accident at Three Mile Island. The industry and the NRC are more knowledgeable, more thorough, more experienced. There is no question in my mind that nuclear power plants are safer today than ever before. We must sustain our vigilance and attention to detail. We must continue to work together in an open environment, an environment of fairness, mutual respect, and technical exchange.

It truly has been an honor and a pleasure for me to have been a part of our extremely important joint efforts for nuclear safety. I greatly appreciate the receptivity, hospitality, and courtesy with which I and other Commissioners are received when we visit your facilities. Such visits provide us with valuable insights and knowledge. I have very much enjoyed working with the NRC staff, including

those who have worked on my personal staff and who have provided me with dedicated assistance. I have considerable respect for the responsibilities and the professionalism of NRC employees. I'm pleased to be a part of this Regulatory Information Conference, and I hope there will be many more such conferences. I wish you all well in your work on behalf of nuclear safety. Your efforts are of major national and international importance.