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"THE ECONOMICS OF ELECTRICITY GENERATION BY NUCLEAR POWER"

Good afternoon, ladies and gentlemen. I am delighted to have been invited to address the luncheon meeting of the Washington Society of Investment Analysts and to share my views on the economics of electricity generation by nuclear power. This is a time of enormous challenges and of commensurately great opportunities, both in the electricity field generally and with regard to nuclear energy in particular. Therefore, the economics of nuclear power and its role in this country's energy future are important and timely issues.

I believe that four primary, interconnected factors must be addressed if the option for new nuclear power capacity is to be considered seriously. First, existing nuclear power plants must continue to operate safely. One of the Nuclear Regulatory Commission's principal duties is to help ensure that licensees operate nuclear power plants safely. However, operational safety is first and foremost the duty of the licensees. Without an extensive period of continued safe operation, and without the public's support and belief that safe operation can, and is occurring, there is no future for nuclear power.

Excellence is in everyone's interest. Greater excellence on the part of utilities, with weaker performers moving up to a level closer to that of the best ones, not only serves the NRC's interest in assuring public health and safety, but also the short- and long-term interests of individual utilities and the industry as a whole. This kind of effort by the nuclear industry can mean not only greater assurance that one weak performer will not imperil the position of every other utility; it can also lead to less intrusive NRC regulation, and economic benefits as well.

Second, there must also be an increase in trust among the public, the NRC, and the regulated industry. While this does not necessarily mean total agreement by the public with regulatory and industry actions, it does mean that there must continue to be an open process to facilitate public input and genuine consideration of such input in decisionmaking. The NRC must be even more open in sharing with the public its understanding and rationale for decisions.

Third, one of the most important power-related activities is the development of a solution to the problem of disposal of high-level radioactive waste. But the interest goes further--safe disposal of high-level wastes is a major environmental objective. The Department of Energy is charged with the responsibility for developing a geologic repository, and at present the focus of their efforts is at Yucca Mountain, Nevada. Before DOE can construct such a repository, the NRC must review DOE's application and make a licensing decision. The NRC is moving forward with a broad program to ensure that, when and if DOE submits an application, we will be ready to review it.

Finally, on the economic scene, the nuclear industry faces the challenge of surviving the economic test in an increasingly competitive electrical marketplace. I would like to use my remaining time to offer some thoughts on the economics of the industry, speaking not as a regulator, and certainly not as a promoter of nuclear power, but rather as an observer of the electricity scene and its public policy implications.

The NRC's area of jurisdiction is, of course, just one part of the overall electricity picture; the compelling need is for an integrated federal policy that makes rational and coordinated decisions about all electricity options, rather than looking at each one in isolation. Once a policy is adopted, there must be a mechanism for putting that policy into effect at the regional and state level, where the actual decisions about supplies of electricity are made.

In recent months we have seen the premature shutdown of Yankee Rowe, San Onofre 1, and Trojan. Other utilities have nuclear units facing declining economic prospects. Rising operating and maintenance cost is often cited as a contributing factor. I believe the control of O&M costs is important, but that this is only part of the problem facing the industry. More broadly, the issue is how to make sensible economic decisions in a world in which strong forces may take an unduly narrow view of what is economically desirable.

Today, ratepayers, bondholders, shareholders, and public utility commissions are all demanding, as never before, better financial management of utilities, and this in turn is creating

unprecedented economic pressures on the nuclear utility industry. It seems to me that the trend toward greater involvement by PUCs in utilities' economic decisionmaking, while salutary overall, has at least one possible drawback: a tendency to focus narrowly on the issue of what is the least costly means of obtaining power in the short run, such that longer term benefits may be overlooked. With Canada a large and efficient producer of electricity, with the regulatory climate favorable toward independent power producers, and with the potential for "wheeling" large amounts of power across systems, the marketplace is quickly becoming much more of a "spot" market. The independent power producers, which are largely unregulated, can construct and operate power plants more easily than the large integrated utilities, and with certain statutory or regulatory preferences. In addition, Congress has passed legislation that permits the independents to have access to the transmission lines of the large utilities. Utilities find that in many cases it makes short-term economic sense to buy power from the independents as opposed to constructing new generating capacity. Furthermore, in some states the utilities are constrained to take power from the independents even when their prices do not make sense. The independents' share of the country's total generating capacity is currently about 6%, and this is likely to increase.

Currently, natural gas prices are low, and construction of new pipelines is economically attractive. But excessive reliance on the least expensive energy option at one point in time may leave the nation undersupplied with electrical generating capacity at another point in the future, or unable to adjust to unexpectedly changed circumstances. An unforeseen interruption in the supply of one energy source, or a decision to place a much higher priority on the prevention of global warming, could leave a void in the national energy supply.

Indeed, there is no single greater challenge facing the new Administration in the energy field than the problem of translating a national energy strategy -- in which plans are made for reliance on diverse energy sources -- into what are much more localized decisions by PUCs.

The PUCs' closer scrutiny of utility planning has in practice meant substantial pressure on utilities to choose the least costly form of electrical generation at any given time, certainly a healthy development. Unfortunately, this tendency to define least-cost choices on too narrow a basis may be driving the nation in the direction of less diversity, not more. That carries risks.

There is no simple way to achieve diversification, no simple formula that will yield the correct result if only you punch in

the right numbers. This is a national issue, needing to be addressed at the national level.

Let me make clear: there is nothing wrong with least-cost planning in principle. On the contrary, it is salutary that PUCs, ratepayers, and others are demanding to look closely at the costs of different approaches to meeting electricity needs. The question, rather, is how costs are defined. An integrated approach to considering cost would take account not only of the price of a given source of electricity on the spot market, but also of broader and less readily defined costs, such as environmental impacts and the intangible but nonetheless real cost of excessive dependence on a single electrical fuel option. Furthermore, an investment strategy of the type the new Administration is discussing presupposes a realistic -- that is, not too short -- payback period for infrastructure investments. This kind of realistic approach to costs also takes into account uncertainties, and allows for a range of economic, environmental and social objectives to be balanced.

I do not mean to suggest a lack of planning to meet national electrical energy needs, nor that there will not be more such planning under the new Administration. The real task is to figure out how to ensure that "big picture" national planning on sources of electrical generation -- w percent of capacity from natural gas, x percent from coal, y percent from renewables, z percent from nuclear, and so on, with full consideration of alternatives and the need for energy sufficiency -- gets translated into practical decisions at the PUC level. I don't have an easy answer for how that is to be accomplished, but it is clear that it will not and cannot happen unless the federal government develops algorithms that PUCs can use in their decisionmaking, so that the desired mix of sources of electricity generation is achieved in the diverse individual decisions of PUCs. Without workable criteria that they can apply, the tendency will be for all PUCs to point the same way.

Let me emphasize again that I am not speaking as a promoter of nuclear energy but rather as an observer of the national energy picture when I say that I think that rational decisionmakers will decide that nuclear power should continue to play a role, albeit a small one, as one component of the national energy portfolio. It is not my intent to sound a call to arms for a nuclear renaissance; rather, I am offering what I think is the realistic prediction: in a decade in which the endangerment of fossil fuel supplies has played a part in bringing about war, and global warming is thought by many to pose a danger to coastal cities and low-lying nations around the world, decisionmakers in this country and others will be reluctant to forego an option for nuclear energy altogether.

If that point is once conceded, and we assume for purposes of argument that the question "whether nuclear power" is answered in the affirmative, even if only to a modest extent, then the question becomes, "how nuclear power." More specifically, if nuclear power is to continue to be a means of electrical generation in this country, how will plants be built, how will they be operated, how will they be regulated, and what if any roadblocks to their viability must be removed?

In my opinion, the future of nuclear power in this country and the development of a new consensus to support it will neither require nor depend on major changes in the structure or organization of the NRC. Since both advocates and critics alike recognize the need for continuing regulatory oversight of the commercial nuclear sector, the challenge for the NRC is to maintain the high quality performance of its employees while refocusing regulatory attention to address and resolve issues associated with the new generation of reactors, public concern for the environment, and international safety matters.

We have seen nuclear plant operations continue to improve -- and without apparent conflict between operational safety and economic efficiency. This is a tribute to the competence and dedication of the nuclear utilities, the NSSS vendors, and, I believe, the NRC staff.

The most salient economic reality confronting nuclear utilities today is the crucial importance of license renewal. Anyone who ever thought that license renewal was an issue that need not be dealt with for another decade, when plants would be reaching the end of their 40-year license terms, should know by now that decisions about capital investments are being made continuously, and that license renewal is crucial to rational decisionmaking on these investments. For a utility deciding whether to make a significant capital improvement in a plant, it is absolutely essential to know whether that investment will be amortized over a 30-year span or only over the 10 years remaining in the license term. A utility which lacks some degree of assurance that the investment will be useful over 30 more years of operation may feel it has no choice but to shut down rather than upgrade to meet safety assurance or economic requirements. Without an effective license renewal program, therefore, we can expect premature shutdowns of additional plants, even though such shutdowns may run counter to the national interest in maintaining supplies of electricity and to the utilities' economic interests. We at NRC will not sacrifice safety to keep a plant operating, but we can and will endeavor to make sure that a strong and clearly defined license renewal process is in place. It is therefore incumbent on us, I believe, to redouble our efforts in this area.

Utilities, in deciding whether to pursue license renewal or to operate a nuclear power plant when faced with significant additional capital investment, need to know how to handle sunk or "embedded" costs. If the ratepayers must pay for these capital costs, for which they will get no additional benefit, it is fair to the utilities who made the investments on the assumption they would operate throughout the term of their license, but it may shortchange the ratepayers.

If the ratepayers don't pay for these costs, then these costs would be treated as if they are not really sunk at all. The bias in a utility's decisionmaking would then be to keep the plant operating until they can amortize these costs -- a decision based on an accounting method rather than on the true economic situation. Therefore, the issue of who pays for unamortized sunk costs is absolutely critical to the decision of whether to continue to operate plants of otherwise marginal economic desirability.

Some of the broad issues affecting the viability of the nuclear option, of course, are not within the NRC's purview to solve; but we can and do commit ourselves to work unstintingly to see that a solid license renewal program is put in place as rapidly as possible.

Deeply interrelated with license renewal is the need for progress toward the long-overdue solution of high-level nuclear waste disposal. What we are looking toward, ideally, is a process in which there are assured answers to two questions -- (1) what does it take to assure that a plant originally licensed for 40 years can operate safely for 60 years? and (2) what will be done with existing and newly generated waste? -- so that utilities can make rational decisions based on the third question, which is: Given the answers to questions (1) and (2), are the economics of license renewal attractive? In that way, nuclear utilities will have the tools they need to make rational decisions in a world in which the equations have too many unknowns.

License renewal is one way to get the most out of current nuclear investments. It will present the challenge of demonstrating to all concerned regulatory agencies and the public that, first, plants will continue to be safe over the period of extended operation and, second, this safety can be achieved at a competitive price. The issuance of the NRC's final rule on license renewal, in December 1991, marked the successful completion of five years of intensive work on this very important regulatory issue. This rule establishes the procedures that a utility must follow in submitting an application, defines the requirements that an applicant for license renewal must meet, and

clarifies the information that must be submitted so that the Commission can determine whether the requirements have been met.

Finally, there must be a focused effort on the part of the industry to maximize the return on current investments. This includes both supply and demand side management. Electricity conservation must be emphasized and encouraged and the public must be confident that any and all construction that is undertaken is actually needed. Also, those assets which can be better used, for example through license renewal or construction completion, must be seen as fully used. Only then can new plants even be considered.

We already have seen electric utilities, in part responding to their state PUCs, taking the lead in encouraging consumers to use more energy-efficient appliances, and providing financial incentives to consumers to reduce peak-load demand. We need to pay attention to renewable resources; to use well the limited amount of environmentally benign energy resources we have; and to finish what we start, by which I mean both to complete facilities that have been begun and to use existing facilities to the end of their useful life. We need a way to evaluate costs and benefits of energy sources that is realistic and comprehensive enough to take into account not only short term costs but also long-term and indirect consequences, such as the cost of nuclear waste disposal, the environmental effects of fossil fuel combustion, and the consequences of dependence on foreign oil. And we need a way to translate these evaluations into tools useful at the PUC level.

I will be happy to take some questions.