NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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OLD QUESTIONS; NEW ANSWERS

Commissioner Nils J. Diaz
United States Nuclear Regulatory Commission

Remarks Before ICONE-8
Baltimore, Maryland
April 3, 2000

Good Morning, Ladies and Gentlemen. I'm pleased to have this opportunity to discuss a regulator's view of the road ahead for nuclear technology as we enter its second century. The accelerating pace of "technolization" and "informatization", and the expansion of market economies throughout the world continue to creates opportunities and challenges for all areas of endeavor, including the generation and regulation of nuclear powered energy. Change is here, and everywhere; change is here to stay.

Although I am speaking to you as a member of the Nuclear Regulatory Commission, I will be offering my individual views today.

[*Figure 2*] Economic deregulation is a reality in the United States electricity markets and in many places abroad. Sixteen of the 31 states in the United States of America with operating nuclear power plants have already deregulated their electricity supply. It is not the only changing economic factor. In the U.S., sustained performance improvements at nuclear power plants, license renewal, sales of existing plants, and mergers are making headlines. Ten days ago, I had the privilege of participating in a ceremony marking the first 20-year license renewal for a U.S. nuclear power plant, the Calvert Cliffs units, an issue of interest to the General Chairman of this conference, Mr. Poindexter. Good changes are in the air, and yes, there are regulatory changes. The question, therefore, is not whether to change or not to change, but how to make change serve the best interest of each country, in a manner compatible with the worldwide market place.

And, talking about change, let's look back 3 years. In a Wall Street Journal article of June 18, 1997, two old questions facing nuclear power plants were raised in the context of forced early shutdowns: their safety and the cost competitiveness of nuclear power plants. Those were the times of Millstone and design-bases compliance, and of the doomsday predictions of the effects of de-regulation and stranded costs. Two dozen early shutdowns of plants with "marginal safety" and/or cost were forecast by many; up to 50% of the fleet by some. The Wall Street Journal article stated: "more conservatively,

NRC Commissioner Nils Diaz estimates only one dozen early shutdowns." There have been 6, and I am not counting.

In another Wall Street Journal article, this one on October 28, 1999, a different perspective is presented. The article attempts to describe the present merger-buyout financial picture, as other significant changes take place. In this article, the decommissioning gloom of 1997 is replaced by the license renewal boom, and the compliance orientation has been replaced by safety-focused regulation. Most stranded costs are not stranded anymore. More recently, a New York Times article on March 29, 2000, discussed the sale of two New York Power Authority nuclear plants to Entergy for $967 million; "it may have been the ultimate sign of the resuscitation of an industry once thought to be too costly and unsafe to continue operating..." [*Figure 3*]

Independent of financial considerations, the U.S. Nuclear Regulatory Commission has been changing its regulatory regime, improving predictability and accountability for all stakeholders. It would be an understatement to say that the NRC and the entire nuclear industry have experienced change since 1997 when the buzz words preoccupying everyone at the time were...[*Figure 4*]

Compliance vs. Safety.

At that time, "Compliance" and "Safety" were often considered equal. Regulation was event-driven, and based on a set of mostly old and rigid rules and processes. Today, I am happy to report that the U.S. NRC has been developing a regulatory regime with a better focus on safety. It would suffice to say that this Commission, the industry and stakeholders set the crooked path straight and now we have...[*Figure 5*]

SAFETY and compliance.

When the dust settled, the people of the U.S. had won. Something close to a revolution is taking place, and most of it is focused, as it should be, on SAFETY. Safety is a word that creates excitement, fear and devotion; it is part of everyday life in this great country. Watch the frequent news coverage. The safety of this and that; and even when safety is unqualified, it strikes a chord. Is there any more important safety issue than automobile safety? Airplane safety? Anyone for air bags in airplanes? Is that another story?

Safety is really the NRC's only business. The transformation that has taken place is to achieve real safety and, until better terms are found, to place the "not important to safety" in its proper place, including no longer issuing notices of violation for trivial findings. Some would think that the transformation involves only risk-informed regulation. I believe this transformation is broader and fundamental to the mission of the NRC: focus attention and resources on what is more important to safety. Three years ago, I called it safety-focused regulation. Demand safety in uncompromising ways, let industry manage it, and have an objective accountability system. I should point out that risk-informed regulation is not only a decision-making tool, but it also has a public information role. It should serve to communicate and clarify the safety relevance of events and regulatory decisions in terms of public health and safety.

Safety brings us back to the very old questions: Is it safe? Is it economical? But in today's competitive marketplace, these two questions are now joined in a dilemma; or is it an opportunity? [*Figure 6*]

Safety vs Cost Competitiveness

I submit that two independent yet related variables -- safety and cost competitiveness -- determine the viability, indeed the survivability, of nuclear power and nuclear technologies. They are both integral quantities and embody most of the determinant issues. Safety and cost competitiveness [*Figure 7*] are both dynamic variables and easily tailored for use in decision-making. They have been, and could be, at odds with each other, but should not be. In the nuclear industry of today, can you have one without the other? In fact, it is imperative that they work together and not against each other.

I suggest that in the United States of America, the marketplace and regulatory reform are coupling nuclear safety and cost in the right manner. In the nuclear industry, safety is the priority that enables cost competitiveness while cost decisions must consider their effects on safety. This coupling is obvious when looking at averaged safety and cost performance indicators, and it is dramatic for "top performers." I believe there is strong supportive evidence for the statement that multiple issues of safety importance became clearer to licensees when cost competitiveness became important. A look at the last ten years of productivity improvements and safety improvements makes the case.[*Figure 8*] There is no doubt that the safest nuclear power plants in this country are generating electricity at very competitive production costs, often lower than coal. The U.S. NRC has matured into a more safety-focused regulator, and the industry is now able to focus more sharply on real safety, licensing and regulatory requirements. It was the industry that first enabled the NRC's shift to real safety by lowering the number and significance of events and improving overall performance. It is the industry that must keep it so.

[*Figure 9*] Safety and cost are also determinants of the credibility of the industry, a factor that cannot be overstated. Safety and cost should work in a synergistic relationship since for the industry, having credible benefits to society, including both safety and cost, is a must. And, for regulators, having credible processes to ensure adequate protection of public health and safety and the environment is fundamental.

The old question deserves a new answer in today's challenging economic, technological, and energetic environment, and the answer is real:[*Figure 11*]

Safety and Cost Competitiveness

Both safety and cost competitiveness are realities and must be addressed with the same open approach that has brought about the effected and about to be effected regulatory improvements. Deregulation, consolidation, increasing productivity and cost cutting are here. Which U.S. industry sector was I talking about? Is there any industry to which this does not apply?

The mere mention of cost competitiveness raises the safety awareness of the NRC and the concerns of stakeholders. Does it equally raise the safety awareness of the entire industry? Can the nuclear industry make safety and cost competitiveness work across the board without infringing on the attained safety performance? Has the indispensability of safety worked its way to every corner affecting safety? It should.

I offer three recent examples of safety-focused regulatory improvements, done openly and with participation of stakeholders and industry. One is the new reactor oversight process, with a balanced array of performance indicators, baseline inspections, girdled by a strengthened Corrective Action

Program. Another one is the new 10 CFR 50.59 change process where the word "minimal" entered the regulatory vocabulary, replacing the de-facto "zero" criterion. The third one is the risk-informed assessment component of the Maintenance Rule.

I believe the top nuclear industry performers are providing clear evidence that real safety as a priority is not only compatible with cost competitiveness, but is a good driver for it. If this compatibility is strengthened, it might even be possible to find cost competitiveness driving safety in specific areas. Clearly, there should be no tradeoff of safety. There are many pathways for cost competitiveness yet they should all have one final filter: safety. The challenge is to optimize the positive feedback between safety and cost competitiveness.

A better regulatory system would be an enabling factor for a safer and more economical nuclear industry. In this regard, I maintain that it is as important for the regulator to be cognizant of the industry as it is for the industry to be cognizant of the regulations and their implementation.

[*Figure 10*] Furthermore, a reality check reveals that there can be no credible regulator without a credible industry, nor can there be a credible industry without a credible regulator.

I would be remiss if I do not tackle one of my favorite subjects and its relationship to reasonable assurance of adequate protection.[*Figure 12*]

The Big "Zero Factor"

Last year, when talking about the zero factor in 10 CFR 50.59, I used a mathematical emphasis to illustrate how to get to zero:[*Figure 13*]

$$0 = 10^{-\infty}$$

Zero shows its Medusa-type head in many places, especially when risks are mentioned!

I believe there is a "Zero Factor" that needs to be discussed and subsumed into reasonable assurance in the near future:[*Figure 14*]

The "Zero" Radioactive Risk
The "Zero" Radioactive Release
The "Zero" Radioactive Dose

The influence of the "zero factor", often underestimated, needs to be addressed when discharging the radiological protection mission. After all, this is the regulator's most important function, where everything starts and ends.

Let me talk about the U.S. NRC and zero risk. It is clear that the U.S. courts, interpreting the law, have ruled [*Figure 15*]

> "the level of adequate protection, need not, and almost certainly will not, be the level of 'zero risk'"

Furthermore,

"the courts have long accepted the Commission's definition of its statutory mandate to 'provide adequate protection of public health and safety' as requiring not a risk-free environment, but a 'reasonable assurance'..."

Risk as in radioactive risk. Radiation is radiation yet radioactive risks are often treated quite differently depending on the source. The risks from radiation need to be scrutinized and given equal treatment under the law. If different treatment of the same radiation risk were of benefit to this country, I would be its strongest advocate. But it is not beneficial and I disapprove of the arbitrary imposition of a zero factor to narrowly selected radiological risks with no importance to public health and safety. I oppose it not only because it is contrary to the law governing the NRC, but because it hampers debate and gets in the way of good regulation.

From the start of the atomic age, the premise for developing peaceful uses of radiation and nuclear energy has been that these uses would benefit the general public in medical applications, food preservation, industrial utilization and electricity generation. The fundamental public health and safety objective for nuclear technology applications has always been, and will remain, that these uses would not pose unacceptable risks to public health and safety. National interests demand that the imposition of public health and safety regulations further the uses of nuclear technologies so that citizens can receive their benefits without compromising health or safety. The convergence of these two fundamental objectives requires embracing the regulatory and operational effectiveness changes. It also requires the application of complex, yet familiar, state-of-the-art technologies, as well as consideration of socio-political issues.

In summary, I am pleased to report that, in the United States, the changes made by the regulators and the industry are making a difference. The real and perceived status of nuclear power plants, from safety, economic, and financial considerations, has improved, and confidence is building in their predictability and reliability. Plant licenses are being renewed, large investments are being made, and financial transactions are multiplying. It is believed that as many as 85% of the current fleet of plants will initiate the license renewal process in the next decade. The benefits of predictable electricity production and low production costs are being felt and factored into corporate America's planning and government strategies. Competition is no longer death -- it might even be new life. I categorically state that nuclear safety has been and is improving. The national interest is being served.

There will always be the question of how far can the industry go in increasing productivity and cost competitiveness. From a regulator's viewpoint, there is only one answer: as far as real safety allows it. At that point, a more complex and demanding issue surfaces: how to establish the boundaries of reasonable assurance of adequate protection of public health and safety through the effective utilization of experience in an open, credible and reliable manner.

It is my privilege to serve my country and to participate with you in creating pathways for progress. Thank you.

United States
Nuclear Regulatory Commission

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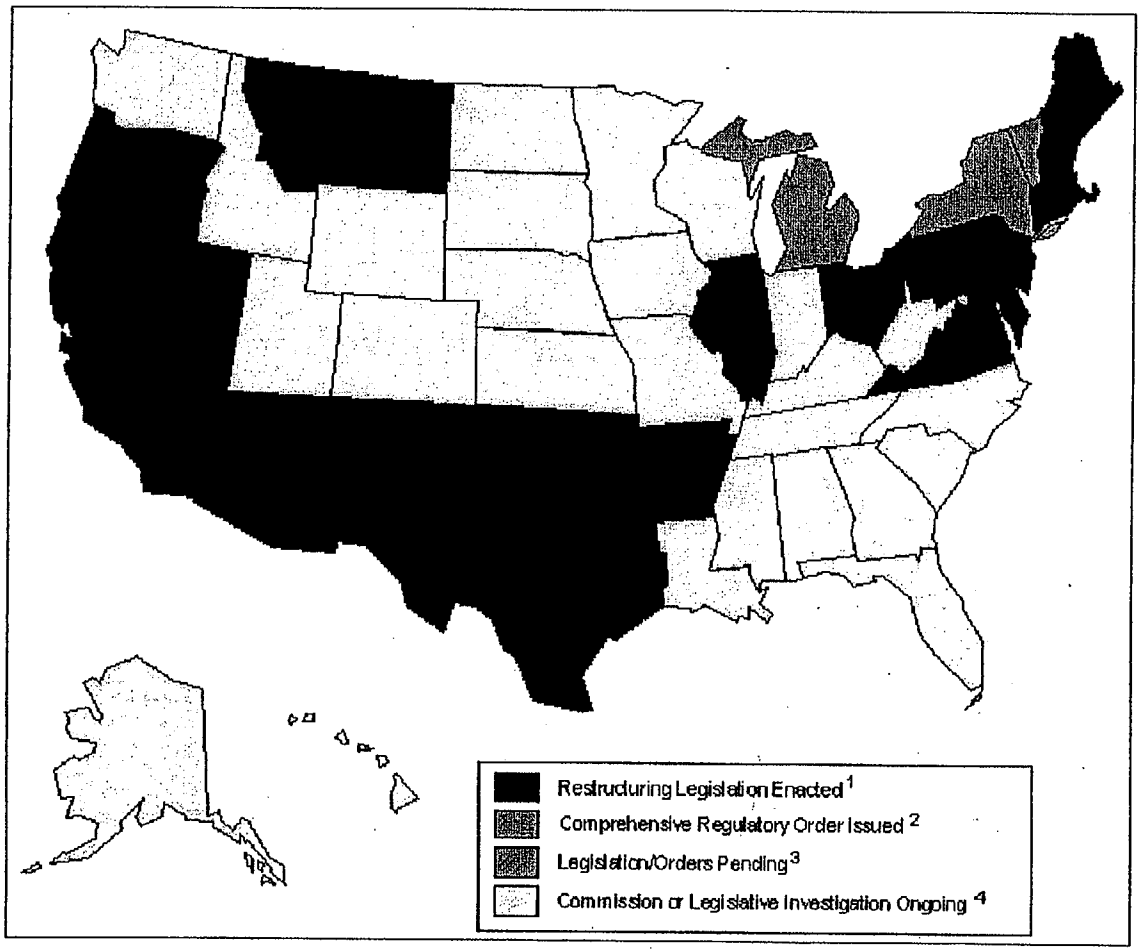
Status of State Electric Industry Restructuring Activity as of March 2000



1. Arizona, Arkansas, California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Montana, Nevada, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, and Virginia.
2. Michigan, New York, and Vermont.
3. None
4. Alabama, Alaska, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, Utah, Washington, West Virginia, Wisconsin, and Wyoming.

Source: Energy Information Administration

"It may have been the ultimate sign of the resuscitation of an industry once thought to be too costly and unsafe to continue operating..."

New York Times, 3/29/00

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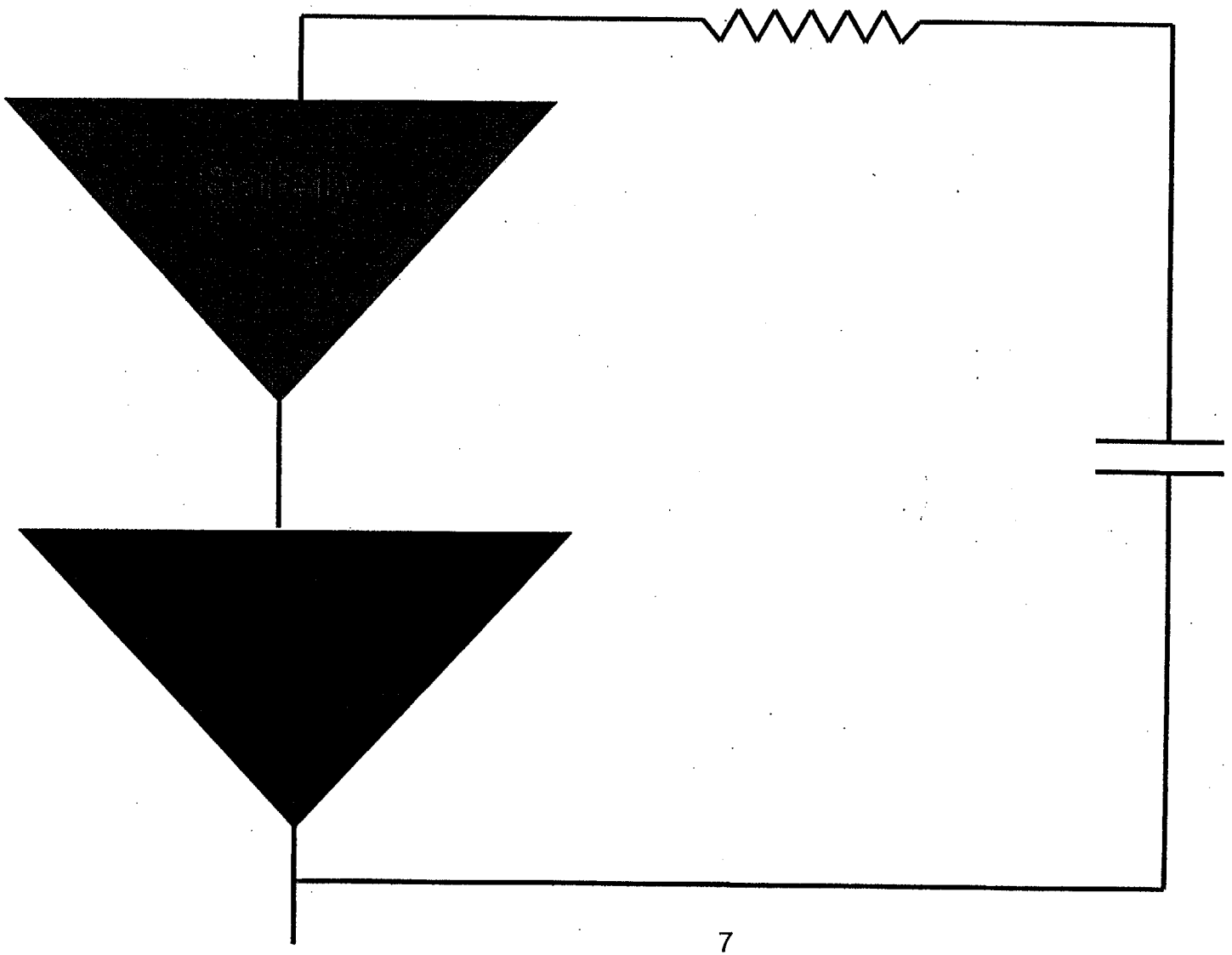
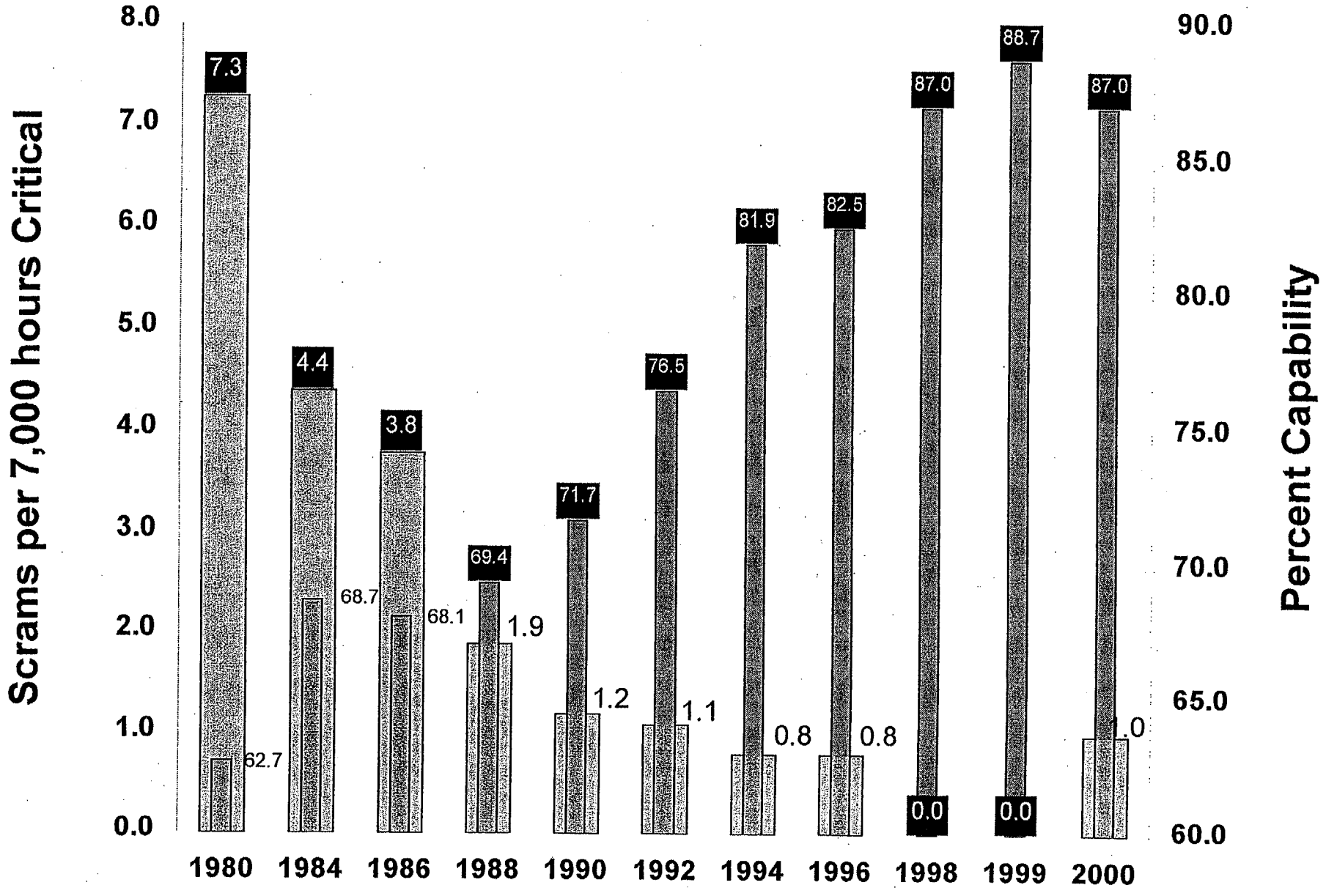
SAFETY and compliance

Safety vs. Cost Competitiveness

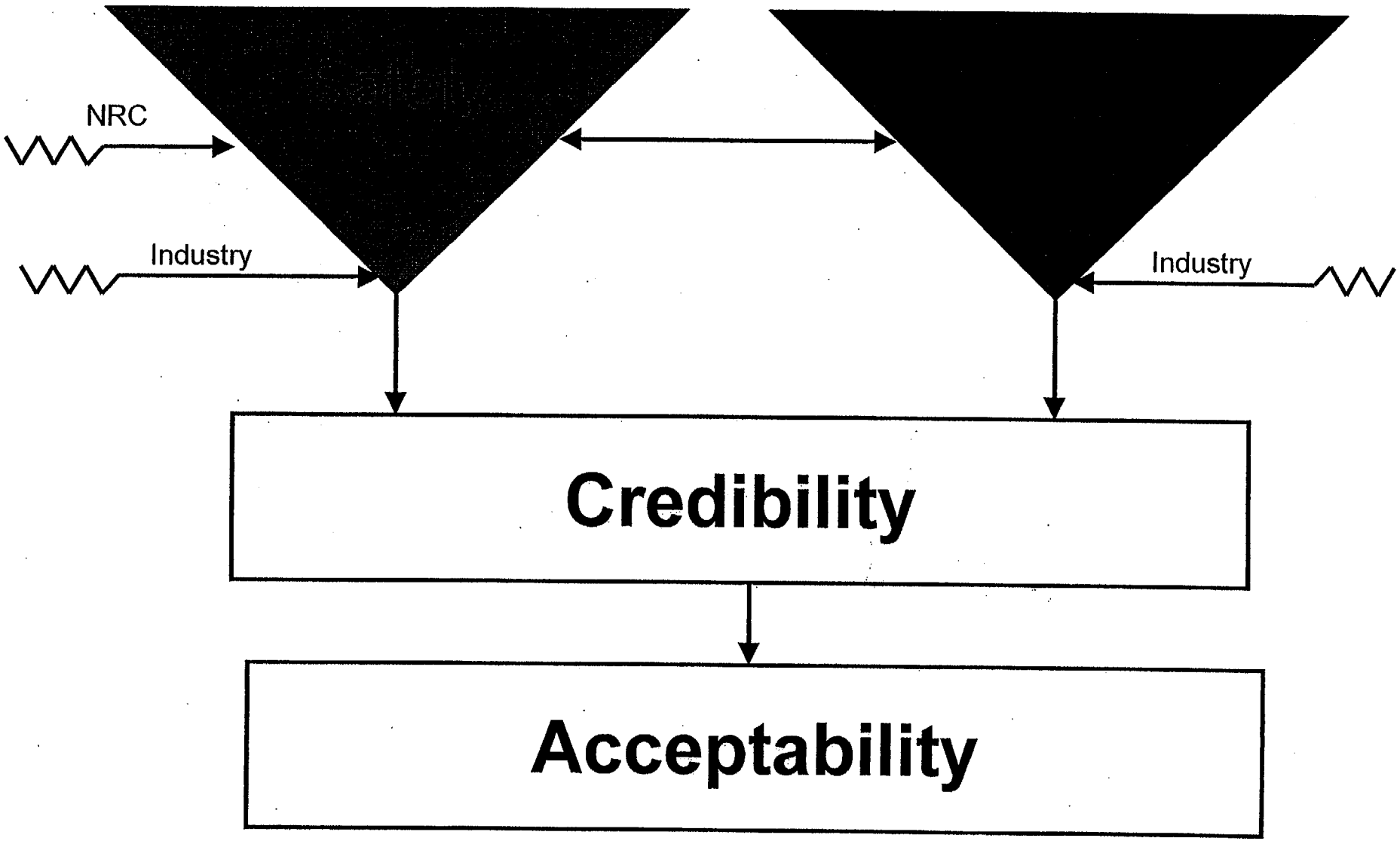
Safety and Cost: Friends or Foes



Unplanned Automatic Scrams Unit Capability Factor



Credibility and Acceptability



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