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American
Energy

**Nuclear
Power -
A Time for
Decision**

By
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**Federal Energy
Administration**

Washington
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**Remarks of the Honorable
Frank G. Zarb, Administrator
Federal Energy Administration**

**To the Commonwealth
Club of California**

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The answers to this Nation's energy problems depend on balance: balance between our energy and our environmental needs; balance between efforts to conserve energy and efforts to develop new supplies; and balance between the various, abundant sources that the Nation has at its disposal.

The United States possesses extensive resources of fossil fuels—oil, natural gas, and coal—and each must contribute to our energy needs in the years and decades ahead.

When our proved and potential reserves of crude oil and natural gas are added together, estimates indicate that we have a 35- to 50-year supply of gas and a 19- to 32-year supply of oil, at current consumption rates. We must provide adequate incentives to maintain and hopefully to increase domestic production. At the same time we must increasingly turn to coal and nuclear power, the fuels we have in most abundance. Estimates by the U.S. Bureau of Mines indicate that we have 434 billion tons of coal, enough to maintain current coal production for well over 700 years. And, even if we achieve our aim of doubling coal production by 1985, we would still have more than a 350-year supply. But, although we can use more coal for many purposes, it alone cannot fill our needs.

Fortunately, our energy resources of uranium are largely untapped, so we have yet another major energy source to help fill future demand. In fact, assuming successful implementation of breeder reactors, the energy in these reserves is at least 10 times as great as the energy available from coal. Tapping these resources—both coal and uranium—requires that we solve the many problems that are now hampering their use.

I would like to focus on one of those two resources—nuclear power. Nuclear power

can be and should be one of the major keystones of our energy supply strategy in the years to come. At the same time, it *must* also be one of our safest and cleanest sources of energy.

The debate between advocates and opponents of increased development of nuclear power seems, in some respects, to be even more emotional than debates on other energy resources, such as coal and offshore oil. Perhaps this is because the potential hazard in the case of nuclear power—namely, radiation—is newer to us and less tangible than the hazards of air and water pollution from coal and oil.

Nuclear energy has been closely associated in the public mind with two devastating bomb blasts that brought World War II to an end and opened the door to the so-called “nuclear age.” And it’s true that, in the years of atmospheric testing and political uncertainty that followed, the nuclear age, for many people, meant the threat of nuclear war. So, from the outset, nuclear energy has been laden with popular emotion.

But we cannot base our energy policy on emotion; we must base it on the facts:

- The risk-to-benefit ratio of nuclear power in regard to public health is favorable and, like other forms of advanced technology, will be publicly viewed as such, as we go forward with its development.
- There is *no* way we can continue to provide the electricity needed by our Nation in the coming years unless responsible expansion of our nuclear resources takes place.
- Electricity from nuclear power *is* a bargain compared to other sources of electricity, even if *all* costs such as insurance and *safe* disposal of radioactive waste are included.

Today, at a time of energy crisis, at a time when we are buying foreign oil at an annual rate of more than \$25 billion, we must set aside emotion and examine facts of energy life rationally. They indicate, in regard to nuclear power, that we should get on with the job of utilizing this vital, clean, and abundant energy resource.

In short, it is time for reasonable and competent people to work out any remaining questions in the development of nuclear power and get on with its productive use.

Now, some people argue that the question of nuclear power is beyond the comprehension of the average citizen, that we should leave consideration of it to the scientists who understand and deal with its technicalities. This is the argument of many proponents of nuclear delay. They would halt construction of new nuclear plants while various committees of scientists and other experts study and debate and draft reports for another 2 to 5 years and, then, presumably, educate the rest of us so that we could then make a responsible decision.

This approach ignores two basic truths:

First, we already have had 20 years of successful nuclear experience, demonstrating that civilian nuclear power is safe, clean, and represents an important and vital dimension of this Nation’s energy future.

And, *second*, we have *in place today* comprehensive sets of laws and regulations to assure that nuclear power continues to be one of our safest, cleanest, and most reliable sources of energy. The recent separation of the regulatory and developmental functions of the Atomic Energy Commission and establishment of the independent Nuclear Regulatory Commission should assure continued and effective enforcement of these laws and regulations.

I think a judgment on these matters *is* within the understanding of the average citizen, and further that it can be made now, without waiting 2 to 5 more years. A decision to *stop* further development—to go through more studies, debates, and reports—is a decision to ignore these facts, to turn the clock back two decades, and to start all over again where we were 20 years ago.

In our opinion, the U.S. Government's program to develop nuclear power has been one of the greatest technological achievements ever fostered by the American system, under both Democratic and Republican administrations. Some of the milestones are worth considering:

- The Truman administration's basic decision in 1945 placed development of atomic energy under civilian control along with a charter to make its benefits available for peaceful use.
- Eisenhower administration policies led to the successful construction of the world's first commercial nuclear powerplant at Shippingport, Pa., sponsored jointly by the Federal Government and private industry.
- Kennedy and Johnson administration policies helped to develop, in cooperation with industry, more advanced reactor concepts. As you know, this has been continued by succeeding administrations.
- And most recently, the Ford administration decisions set a goal of at least 200 nuclear powerplants online by 1985, encouraged the production of enriched uranium by private industry, and endorsed recommendations of the President's Labor Management Committee aimed at accelerating the construction of both coal-fired and

nuclear powerplants and encouraging research and development to improve their reliability and availability.

During this 30-year period, the laws regulating the use of civilian nuclear power have been continually strengthened and improved, by both the executive and legislative branches of government. And we are continuing to improve them.

Consider the question of nuclear plant safety. Despite the tremendous amount of adverse publicity given to hypothetical accidents and their potential consequences for health and safety, the safety record of the nuclear power industry is without parallel. No radiation injury or death has resulted from the operation of any licensed U.S. nuclear powerplant.

This unprecedented record, involving many types and designs of nuclear facilities dispersed throughout America, was not achieved by chance. From the start, we recognized and faced up to the high level of standards necessary for working with nuclear power. As a result, the nuclear industry is one of the safest in the world for the employee.

Formal and rigorous regulatory and public surveillance programs have been maintained that are without parallel in the history of any technology. There are more assessments involving safety in the nuclear industry, more factual data on actual and potential problems, than in any other energy industry. Nuclear hazards are far better understood than those of thousands of widely used chemical and biological agents.

Each year a U.S. citizen is exposed to an average of 182 units of radiation. Natural radiation, both cosmic and terrestrial, accounts for 109 units. Another 73 units come from medical X-rays and therapeutic radiation. As of today, the operation of all of our

nuclear powerplants, 55 operating installations and their supporting activities, adds less than one-tenth of a single radiation unit to that average.

Of all pollutants our society introduces into the environment, none is so thoroughly monitored, nor are the consequences of any so well understood, as radiation. The environment is being observed and checked constantly and extensively to guarantee that our food, air, soil, and water are kept free of harmful radioactive contamination. The results of these surveys are published monthly by the Environmental Protection Agency.

In all nuclear facilities, people who are potentially exposed to radiation wear exposure-measuring devices to assure that their cumulative exposure is limited to permissible levels. From its inception, the nuclear industry in this country has maintained exposure records for every person who has worked in a nuclear facility—the equivalent of a record of the number of cigarettes smoked by every smoker in the Nation, or a record of all the carbon monoxide, carbon dioxide, and sulfur every American has breathed over the past quarter of a century.

Not only do we have better records of our exposure to radiation than to other pollutants, but our knowledge of radiation's biological effects probably exceeds that of almost every chemical or physical agent. And that knowledge is constantly expanding, a result of a Federal research budget of some \$90 million per year.

All this is not to suggest that we should rest on our laurels. We must continue to be vigilant so that the procedures and methods that have been so effective in the past will be equally successful in the future. The likelihood of serious reactor accidents is very

small and will continue to decrease as the benefits of design standardization, improved quality assurance, and continuing safety research are realized.

Despite this record and these facts, popular doubt persists about nuclear power, doubt fed by criticisms that, though generally sincere and well-intentioned, are all too frequently ill-founded in substance.

In other words, the obstacles to a rational public dialogue on nuclear power are difficult to overcome. But dialogue *must* proceed, and it requires that we deal with those aspects of nuclear power that have become focal points of concern, such as disposal of waste products from nuclear powerplants.

Here again, the facts are reassuring. The *spent fuel* discharge from reactors is not waste. It is chemically processed to extract the uranium and plutonium, which represent a large energy resource. The *waste* remaining from the chemical separation is extremely small. A single aspirin tablet has the same volume as the waste produced in generating 7,000 kilowatt-hours, which is about one person's share of the country's electric output for an entire year.

Compared to large quantities of other harmful materials, the volume of nuclear waste is minuscule. Of course, we must guarantee that this waste is safely and responsibly stored over extended periods of time.

Some people argue that we must have an ultimate means of waste disposal before proceeding to build any more powerplants. But the excellent record of the past 20 years shows that nuclear wastes can be handled without impact on public health and safety. The Energy Research and Development Administration has a major program underway to determine even more permanent storage methods.

Adequate and safe waste-disposal methods utilizing waste concentration and solidification are in use today. And still better processes are under development and expected to be in commercial use in the 1980's. The important thing is that we have adequate, safe storage methods that meet reasonable requirements, while we explore the best means for ultimate disposal of wastes.

Another subject that has recently moved up on the nuclear "worry list" is plutonium safeguards. During the past 30 years, thousands of pounds of plutonium and highly enriched uranium have been in widespread use in research reactors, experimental facilities, nuclear powerplants, and weapons programs. These materials have been produced, shipped, fabricated, processed, and stored safely without diversion.

Still, in view of the increased frequency of terrorist activities and the proliferation of nuclear weapons capability among the nations of the world, public concern is understandably aroused. The Nuclear Regulatory Commission and ERDA are conducting a comprehensive study of current safeguards and of possible changes to improve their effectiveness for the future. Obviously, such improvements will be pursued and implemented.

However, this does *not* mean we should stand still while even more effective systems of safeguards are being studied. Providing proper safeguards has major international implications. Large quantities of plutonium already are deployed throughout the world in nuclear weapons, and increasing quantities are coming into commercial use. A ban on plutonium recycling within the United States would not guarantee us protection against its illicit use because the material could be obtained abroad.

Another aspect of safeguards that concerns some people is the medical hazards of plutonium. Now there is no doubt that plutonium, because of its radioactivity, must be handled with great care, as must other hazardous substances such as arsenic and mercury. However, the evidence of more than 30 years of plutonium processing in U.S. civilian and military facilities convinces us that the need for care in handling should not prevent us from extracting the enormous energy in plutonium.

Indeed, when one hears the frequent claim: "Plutonium is the most toxic substance known to man," he ought to ask: "How many recorded deaths are attributable to the toxic nature of plutonium?" The answer is: *none*.

A Federal Energy Administration study of nuclear and fossil powerplant productivity ("A Report on Improving the Productivity of Electric Powerplants," March 1975) has identified many actions that can be taken by industry and government to improve productivity of both nuclear and fossil powerplants. One of our major goals is to implement these actions on a timely basis so that utilities and their customers will reap the benefits of improved productivity in this decade. However, even if *no* improvement were made in nuclear plant productivity, nuclear power would still be a bargain for the consumers.

The issues involved in nuclear power are vital to this Nation, and they must be resolved. But there is a real danger that we will wind up studying them to death—that by direct or indirect action, or inaction, we will wind up with an unnecessary and counterproductive moratorium on building nuclear powerplants.

A moratorium, despite intentions to limit it to a brief span of years, could weaken the country's capacity to produce nuclear powerplants to the extent that nuclear power would

be foreclosed as a major energy option in this century. The effect of such a course on our overall energy situation and on the economy—on employment, on our level of oil imports, on the balance of payments—could be devastating.

Regardless of the course we choose in the United States, other members of the world community will move ahead in their increasing use of nuclear power. Given this fact, can we afford *not* to proceed ourselves? Is it not in our interest to maintain the technological lead which other nations will follow in the increasingly nuclear-powered world of the future?

We are satisfied that the excellent public health and safety record of nuclear power in America reinforces the decision taken by this administration to move forward promptly, *but with care and control*, toward an expanded use of nuclear power.

We have, after all, only a few practical options in our lifetime for sustaining essential supplies of reliable, economic, and clean energy, even for the most urgent of our needs. Elimination of grossly wasteful energy consumption practices and employment of maximum conservation efforts will help, but we still must satisfy almost all our energy needs from oil, gas, coal, and nuclear sources.

Unfortunately, less than 5 percent of our total energy comes from the 55 nuclear plants that are now operating, although nearly 188 others are being built or have been planned. Despite the vital need, many new plants have been delayed or canceled outright by the utilities over the past 2 years, primarily because of a shortage of capital and uncertainty as to projected load growth and the energy policies of the State and Federal governments.

The President and leaders of both labor and industry have urged that immediate steps be taken to expedite completion of these nuclear plants. They know that each plant represents a *real saving* equal to *12 million barrels* of oil a year—or, at current rates, about \$144 million of imports. The price of those imports is measured in terms of American jobs, productivity, and security from another more devastating embargo.

Beyond this, the ready availability of domestic energy at reasonable costs is necessary if the United States is to realize its great goals for the last quarter of the 20th century: to seek full employment, to sustain and improve our standard of living, to extend the benefits of a productive Nation to its less fortunate citizens, to preserve our finite resources for their most useful purposes, and to restore, sustain, and enhance our environment.

And they know that attaining those goals, or even making meaningful progress toward them, requires commitment to the continued development of the nuclear power industry.

That commitment must be made by all segments of American society—by business leaders, by labor leaders, and by public officials at every level. We in the Federal Government must demonstrate *our* commitment to this goal by developing a coherent and coordinated *national* policy for the safe, clean use of nuclear power.

We at the FEA anticipate that, in conjunction with the Nuclear Regulatory Commission and the Energy Research and Development Administration, we will provide a focal point to assure the policy analysis and coordination necessary at the Federal level to see that nuclear power plays its proper role in our energy future.

But, ultimately, the commitment to the use of nuclear power must engage the American

people as a whole. By rigorously applying tough health and safety standards and by fostering technological developments that will enable us to meet ever-rising standards, government must guarantee the public that nuclear power remains the safe source of energy that it has proven to be thus far in its history.

Our national commitment on nuclear power cannot coexist with the myths of fear that have too often surrounded questions of nuclear energy in the past. Rather, it depends on an accurate perception of the *facts* of nuclear power and a clear-sighted view of the contribution it can, and *must*, make to this Nation's future.

It will be a vital part of our job in government to see to it that those myths are *rightly* dispelled and that the true facts of nuclear power fully justify the role we envision for it in the years ahead.

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