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Pemex has broken off contract negotiations in our efforts to purchase natural gas from Mexico. Further, they have stated that they will not extend or renew the letter of intent which expires at year end. The reason given for their action on their part was that both the (U.S.) State Department and the (U.S.) Department of Energy have told them unequivocally that the price

negotiated with six gas purchases is unacceptable and will not be approved.

This is indeed an unfortunate turn of events. I have requested a meeting with Dr. Schlesinger or his staff to discuss the possibility of revising the project although the Mexicans were quite firm in rejecting my request for further consideration.

(signed)
Jack Ray

U.S. Utilities Journal Calls For Fast Breeder, Fusion

The EPRI Journal, the official publication of the Electric Power Research Institute (EPRI) published this editorial in its most recent issue. EPRI is the private research arm of the nation's electric utilities and funds basic research into technologies for electric power production. The signed editorial is written by R.E. Balzhiser, director of the EPRI Fossil Fuel and Advanced Systems Division.

While Nero fiddled, Rome burned — and so it may be with society as we know it today — Washington fiddles over control versus deregulation, tax incentives versus taxes, and so it goes. While there is ample need for concern over energy supply in the next decade or two, it is equally imperative we recognize that as of now we have no option we are confident will be deployable in sufficient quantity to meet United States needs as early as the year 2000.

EPRI analyses identify the need for significant contributions early in the next century from new technologies, even given significantly reduced demand growth as a result of conservation. With lead times of 10-15 years required for new plants utilizing commercialized technologies, one should quickly recognize that utility planners will be making decisions in the next decade on what they must order to meet needs in the year 2000.

Coal and LWR power plants appear the only options, but neither is assured. Resource availability and/or environmental problems could limit the extent of either's contribution. Uncertainties associated with both are simply too great for us to be sure that either will be available to the extent required.

*Of the so-called long-term options, only the breeder and fusion appear capable of meeting the nation's needs on the scale and with the geographic deployment flexibility required. To be sure, each has its potential liabilities as well, but these *do not include resource limitations*. While other difficulties, hopefully, can be engineered around, an inadequate resource base cannot.

*My purpose here is not to argue the case for the breeder as the earliest alternative to coal and LWR; that fact is not disputed among knowledgeable energy experts. It is rather that the EPRI analysis concludes that

even with coal, LWR, and the breeder, we will begin experiencing generation shortages early in the next century. Simple wisdom requires that we not only move aggressively with breeder technology development but also maintain a concerted effort to harness the potential of fusion. With the many uncertainties relating to resources, environmental impacts, and technology, it seems imperative that we do not depend entirely on one or even two long-term options. Diversity is essential, and fusion clearly offers the potential of another option; in the more distant future, it is perhaps the ultimate option.

My conviction reflects the rapid scientific progress that has been made in fusion research in recent years — leading, I believe, to what will be a cascading of results over the next 5 years. But these results will represent only the first milestone, the so-called scientific breakeven. Even more important is the recognition of the enormous technological barriers that must yet be overcome before fusion power can seriously be considered by energy suppliers. The time and cost required to resolve these challenges are substantial; let's not deceive ourselves in that respect.

Demonstration-scale projects are likely still 20-25 years away. The ultimate fusion option, a neutronless fuel, is undoubtedly further away, but the incentive here is so large that we simply cannot ignore it, particularly with the ray of light that has emerged in this area in EPRI studies over the past year. We must recognize that even after more than 25 years of research, fusion is still an infant. We must avoid prematurely foreclosing different approaches that could ultimately prove most attractive to the user and yet initiate development of an applied thrust that begins to provide the engineering design base for power-producing systems.

Fusion lacks a Rickover or a mission with the popular appeal of the space program. For this reason it is entering a precarious stage within the federal R&D program. It is too long-term for today's politicians and too costly, risky, and long-term to survive normal discounting practices, even in the government's economic analyses. Utilities, the principal users eventually, are so preoccupied with current problems and so unfamiliar with fusion's status and uniqueness that as an

industry they have largely ignored it to date. True, some utilities have actually supported fusion work and EPRI has an active program in this area, but what is needed is industrywide recognition that fusion is a must sometime in the next century, perhaps earlier than it is now possible to achieve, even with an all-out effort. Fusion requires both the support and the direction of utilities as it enters the technology phases. User input is essential to the physics community if user criteria are to properly influence the continued research and the emerging development and power reactor phases.

Fusion is not without its potential Achilles' heel, just like each of the other alternatives, but its potential problems are fundamentally different from those that could constrain coal, LWR, and breeders. Most importantly, fusion problems are susceptible to technical resolution. Resolution will not be simple, cheap, or even assured, but the risk of not sustaining an aggressive program is simply unacceptable, given the future as I see it. To rely *solely* on the breeder as our long-term option, or to naively assume that solar can meet the nation's electricity needs, is playing Russian roulette with our children's future.

Correction

A private nuclear industry study on the effects of the Administration's policy against nuclear technology exports predicted that the cost to the American economy was the loss of more than \$20 billion in export dollar earnings over the next five years on the projected world demand for roughly 83 gigawatts of nuclear electrical power capacity. In the *Executive Intelligence Review's* last issue (Vol. IV, No. 52), typographical errors in the *Energy* report erroneously rendered these figures as \$20 million and 83 megawatts, respectively.

The same study projected that the Administration's policy meant the loss of roughly 2,180,000 man-years of jobs over the same five-year period — not man-hours, as the article incorrectly states.