Amid Confusion, A Primer On Nuclear Energy Policy

By VICTOR K. McELHENY

This week, the Carter Administration unveiled its plans for nuclear power, a significant part of its forthcoming energy policy package. The preview of a redirection in atomic energy came in a statement about how to avoid spreading the ability to make nuclear bombs throughout the world. The statement left many people confused about the complex issues involved and what the Carter proposals mean.

Q. What was the key issue underlying the statement?
A. Finding adequate energy for the United States economy in a time of dwindling oil and gas supplies at home and uncertain supplies abroad.

Q. What alternative energy sources exist?
A. Despite growing economic pressures toward conservation and possible future contributions from such sources as solar power, the main proven supplies of extra energy for the United States are coal and uranium, both of them used chiefly in electric power plants.

Administration's Attitude

Q. What is the Carter Administration's announced attitude toward nuclear power?
A. It seeks to extract the maximum amount of energy from the splitting of uranium atoms in power plants without increasing the danger of putting a weapons-grade byproduct, plutonium, in the hands of unstable governments or even terrorist groups.

Q. How does it propose to do this?
A. By delaying plans to reprocess used nuclear fuel after it is withdrawn from nuclear power plants—either those generating electricity today or the much discussed "breeder" plant being developed for later. The reprocessing would recover plutonium in purified form that might be "diverted" from its intended use: recycling back into today's types of power plants or fueling the breeders.

Q. Where does the statement leave the finished but unused reprocessing plant at Barnwell, S.C.?
A. The plant is equipped to store unprocessed used fuel and, this capacity could be expanded to accommodate such fuel as it builds up. The plant itself, which costs about $20 million a year to maintain, involves a $250 million investment by the Allied Chemical Corporation and its partner, General Atomic, a joint venture by the Gulf Oil Corporation and Royal Dutch Shell. They are expected to seek to withdraw from the project.

The plant had been held up anyway, pending decisions as to who would pay for additions, such as a waste-solidification plant and a facility to turn byproduct plutonium into a solid, that were required by tightened Federal regulations.

Q. Where does the Carter Administration decision leave the nation's breeder program?
A. Despite a rollback of the proposed budget for the next fiscal year to this year's figure of about $600 million, the program remains the largest single Federal Government effort to develop a new energy source.

Project Will Be Halted

Work at the industrial demonstration project on the Clinch River in Tennessee apparently is to halt at the design stage, at a cost of $500 million, instead of proceeding to construction at a cost of a further $1.5 billion. Work on a huge new breeder research facility at Hanford, Wash.,

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costing more than $500 million to build, will continue.
Q. What is the Hanford facility?
A. To be completed next year, the so-called Fast Flux Test Facility, planned for many years and beset by slow-
downs, is the centerpiece of not only the United States but the world's breeder plants, expected to be many times larger and more flexible than the Experimental Breeder Reactor II at the Idaho National Engineering Laboratory.
The fast-flux reactor will test many advanced types of uranium oxide, uranium carbide and uranium nitride fuels—in search of improved economics for commercial breeders that are expected in small numbers in the 1990s abroad if not in the United States.
Q. What is the main justification for trying to develop a breeder?
A. As an insurance policy against po-
tential uranium shortages.
Q. How could these shortages de-
velop?
A. From a failure of the industries that mine, mill, gasify and enrich ura-
nium to expand resource discoveries and production facilities fast enough to meet the expected growth of nu-
clear power.
Q. What is the forecast for nuclear power growth?
A. The United States nuclear power industry is expected to reach a generat-
ing capacity of 500 billion watts in the year 2000—about the nation's total electrical capacity today. The latest nu-
clear estimates are less than half those of a few years ago, despite rapidly growing American dependence on for-
eign oil and years of hesitation in set-
ting environmental rules for coal min-
ing.

Outlook on Uranium Resource

Q. But didn't the Ford Foundation recently express confidence that the total uranium resource, at $30 a pound as its price, would reach 3.7 mil-
ion tons? That's almost four times more than would be needed by 500 billion watts' worth of reactors for their 30-
year lifetimes?
A. Many geologists consider the technical basis for that confidence to be weak. They note that individual uranium ore concentrations are not extensive, and that the rate of first ura-
nium has been going down in recent years, when exploratory drilling in-
creased.

According to the Energy Research and Development Administration, only 700,000 tons of uranium ore can be considered proven, with 1 million more tons listed as probable, 1.2 million as possible and 3 million as "specula-
tive." An additional 140,000 tons could come as a byproduct of phosphate fer-
tilizer mining.

Q. Now that the United States is dropping out of fuel reprocessing and the recycling of plutonium, are other nations likely to follow suit?
A. Neither Japan, nor the Soviet Union, or, as far as is known, France, with large reprocessing plants operating or under expansion, and Japan, whose plant is nearing comple-

Q. What about the United States' plan to stop reprocessing?
A. Because their dependence on for-
eign oil is so much greater than that of the United States that they cannot afford to stop. They need the 15 or 20 years' worth of enriched plutonium from which they would obtain from reprocessing plu-
tonium into their present-generation nuclear power stations.

Other Nations' Program

Q. Are other nations continuing their breeder programs?
A. Yes. Britain, France and the Sovi-
eet Union all are operating industrial demonstration reactors as large or larger than the Clinch River plant would be, and all are planning larger plants.
Q. Is most of the world's plutonium created in power plants?
A. No. Most of it to date has been produced in reactors, such as those at Hanford, Wash., Savannah River, S.C., Windscale in Britain and Marcoule in France, that were specially designed to turn out plutonium for weapons. For power purposes, most of it re-
mains for a few months at most in the reactor to minimize buildup of an iso-
otope of plutonium called plutonium 239, that would make bombs less effi-
cient.
Q. Is nuclear power the easiest and cheapest way toward nuclear weapons?
A. No. None of the six nations that have set off nuclear explosives to date got their first bomb material from nuclear power stations. For example, the plutonium for India's first explosion in May 1974 was made in a British research reactor of Canadian design that began operating in 1960, nearly a decade before India's first nuclear power station started up. Plutonium was extracted chemically in a small re-
processing plant near the Trombay re-
search reactor that was built without foreign aid and began operating in 1964. Since then, the plant has been isolating enough plutonium for a few bombs each year.

Q. Will the United States risk near-
term nuclear fuel supply problems be-
cause of a decision not to reclaim plu-
tonium and uranium by reprocessing?
A. Possibly on thursday.

This would be to assign all the ca-
pacity of a so-called breeder, which is to be in an enrichment plant at Portsmouth, Ohio, to foreign customers to win their agree-
ment to a moratorium on using plutoni-

Such a step could increase the raw-
material requirements of the three ex-
isting Government-owned uranium en-
richment plants, which would focus on the domestic nuclear-power market.
The shaded portion shows what will be affected by the President's policy.