

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A. By delaying plans to reprocess used nuclear fuel after it is withdrawn from nuclear power plants—either those generating electricity today or the much discussed "breeder" plant being de-

veloped 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 of the United States but the world's breeder program. It is intended 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 1990's 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 potential uranium shortages.

Q. How could these shortages develop.

A. From a failure of the industries that mine, mill, gasify and enrich uranium to expand resource discoveries and production facilities fast enough to meet the expected growth of nuclear power.

Q. What is the forecast for nuclear power growth?

A. The United States nuclear power industry is expected to reach a generating capacity of 500 billion watts in the year 2000—about the nation's total electrical capacity today. The latest nuclear estimates are less than half those of a few years ago, despite rapidly growing American dependence on foreign oil and years of hesitation in setting environmental rules for coal mining.

Outlook on Uranium Resource

Q. But didn't the Ford Foundation recently express confidence that the total uranium resource, at \$30 a pound in today's prices, would reach 3.7 million tons—in time to supply for 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 finding uranium has been going down in recent years, when exploratory drilling increased.

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 600,000 tons as "speculative." An additional 140,000 tons could come as a byproduct of phosphate fertilizer 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. No. Such nations as Britain and France, with large reprocessing plants operating or under expansion, and

Japan, whose plant is nearing completion, are understood to have told the Carter Administration flatly that they will not obey its call join a moratorium.

Q. Why won't the other nations stop reprocessing?

A. Because their dependence on foreign oil is so much greater than that of the United States that they cannot afford to stop. They need the 15 or 20 percent extra energy from uranium they would obtain from recycling plutonium into their present-generation nuclear power stations.

Other Nations' Program

Q. Are other nations continuing their breeder programs?

A. Yes. Britain, France and the Soviet 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 this purpose, the uranium rods remain for a few months at most in the reactor to minimize buildup of an isotope of plutonium called plutonium 240 that would make bombs less efficient.

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 sole explosion in May 1974 was created in a small research reactor of Canadian design that began operating in 1960, nearly a decade before India's first nuclear power station. The plutonium was extracted chemically in a small reprocessing plant near the Trombay research 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.

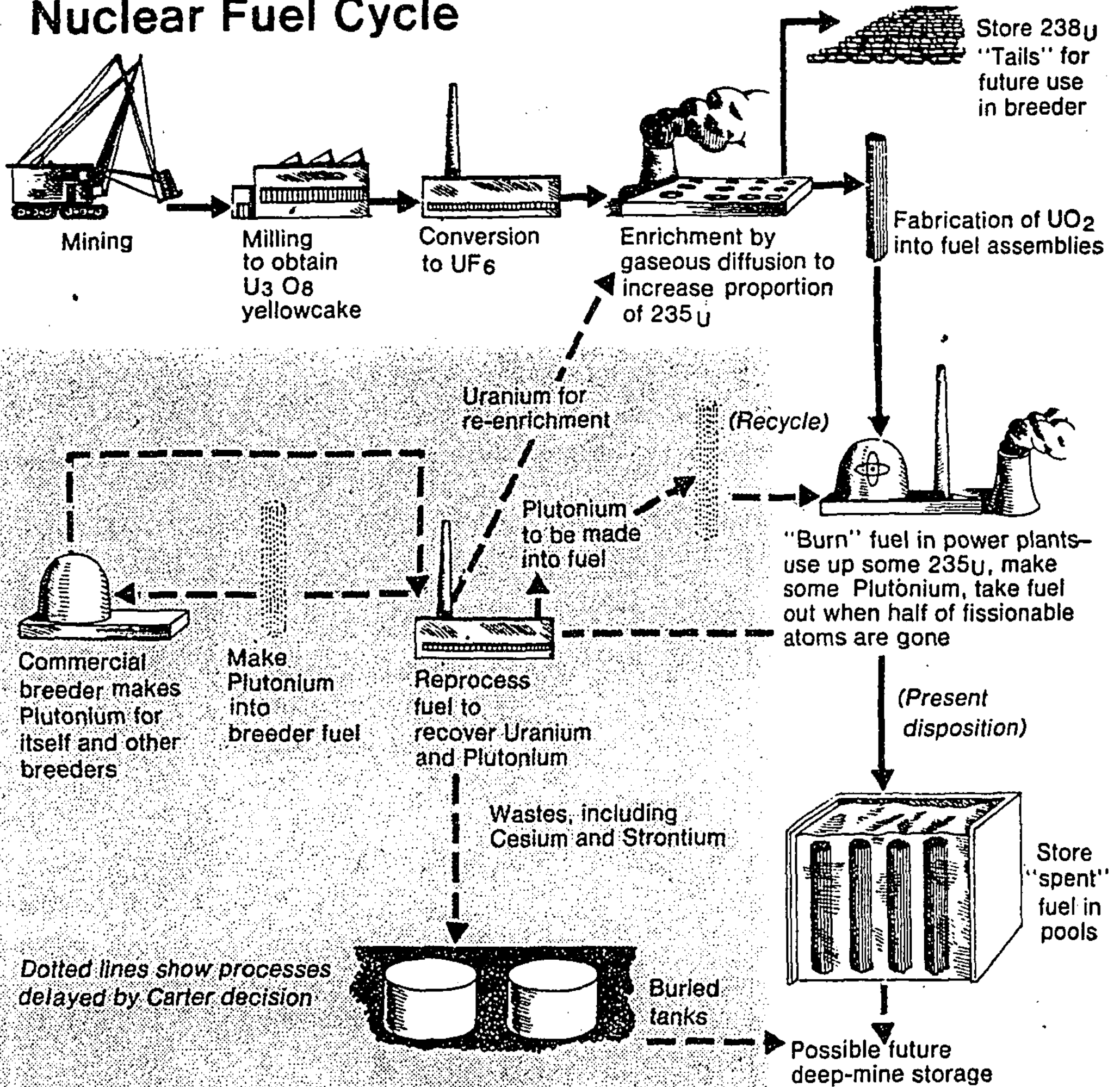
Q. Will the United States risk near-term nuclear fuel supply problems because of a decision not to reclaim plutonium and uranium by reprocessing?

A. Possibly. Uranium mines and mills delivered some 16,000 tons of the uranium ore known as yellowcake last year. Demand could nearly quadruple by the mid-1980's because of domestic expansion and also because of a step being considered by the State Department.

This would be to assign all the capacity of a so-called "add-on" uranium enrichment plant at Portsmouth, Ohio, to foreign customers to win their agreement to a moratorium on using plutonium.

Such a step could increase the raw-material requirements of the three existing Government-owned uranium enrichment plants, which would focus on the domestic nuclear-power market.

Nuclear Fuel Cycle



Robert Strimban

The shaded portion shows what will be affected by the President's policy

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