Мирное использование ядерной энергии -

WORLD -- NUCLEAR POWER: UNCLE SAM'S CALL FOR TRUST F.-532

Munich, April 7 1977 (CND) -- the following article by David Fishlock, appeared in The Financial Times, April 7,1977

IT IS PROBABLY prudent to assume that nuclear explosives will spread beyond the six nations which have already demonstrated convincingly that they possess them. After all, in spite of the determination of the U.S. Government immediately after the World War II to retain total control of the technology of the Manhattan Project, over less than three decades nuclear explosives have spread successively to the USSR, Britain, France, China and (by 1974) to India.

There are clear temptations for other nations to acquire nuclear explosives. For the oil-producing nations there is the temptation to use their wealth to procure them as an insurance against any decline in their world influence as their oil reserves diminish. For ostracised nations or those encircled by hostile neighbours, there is the tempfation to procure nuclear explosives as a deterrent to any attack. For some developing nations there is a temptation to use nuclear explosives to gain a seat at the same table as the world's more influential nations.

For three decades, after the McMahon Act excluded Britain from the Manhattan Project technology which Britain had helped freely to develop — obliging Britain to launch a crash programme to develop its own nuclear explosives — the U.S. has been wrestling with the problem of controlling proliferation of nuclear weapons. No aspect of nuclear policy has occasioned more international discussion, albeit mostly behind closed doors.

The U.S. Government is expected to-day to announce its latest policy for minimising the pace of proliferation. President Jimmy Carter, in San Diego on the campaign trail last autumn, declared that he would "seek to withhold authority for domestic commercial reprocessing until the need for it, the economics and the safety of the technology are clearly demonstrated." Without reprocessing, of course, there can be no fast reactors,

TABLE 1

Estimated proportion of the world uranium resources

(Excluding the East Bloc)

	1975	1985
	%	%
U.S.	45	46
Canada	25	13
South Africa	≤15	16
France	≤10	4
Nigeria	6	
Niger	—	7
Australia	—	6
All others	9	8

Source: Nuclear Energy Policy Study Group

fuelled with plutonium and simultaneously breeding fresh nuclear fuel from "spent" uranium.

The basic points of Mr. Carter's policy have already been put to a handful of nations which, two years ago, were persuaded by the U.S. to start meeting in secret in London. It wanted them to agree upon tighter controls over exports of three "sensitive technologies"—uranium enrichment, plutonium refining, and heavy water production — closely associated with nuclear explosives. The four basic tenets of the anti-proliferation policy will be:

- U.S. reprocessing of spent nuclear fuel and the recycling of plutonium as fuel for existing types of reactors to be deferred indefinitely;
- U.S. development of the fast "breeder" reactor, fuelled by plutonium, to be slowed down;
- U.S. fast reactor funds to be channelled into alternative nuclear fuel cycles that might avoid access to the three "sensitive technologies";
- A large expansion of U.S. uranium mining production to keep light water reactors fed with fuel.

The four points are all spelled out in the recommendations of a report from the Nuclear Energy Policy Study Group, sponsored by the Ford Foundation and published last month. This group of 21 eminent U.S. Government officials and advisors under the chairmanship of Dr. Spurgeon M. Keeny Jr., spent a year pondering the problems of whether, and to what extent, and in what form nuclear energy was needed.

It concludes that nuclear energy is already "a fact of international life and will provide a significant proportion of the world's electricity by the end of the century." Observing that it is "a present reality, not a future prospect," it records that the U.S., with 40,000 MW of nuclear electricity already on-line, is expected to bring another 170,000 MW into service by the mid-1980s. Comparable figures for the rest of the world are 35,000 MW on-line and another 130,000 MW under construction.

On the economic justification for nuclear electricity it concludes rather grudgingly that it would "on average be somewhat less costly than coal-generated power." Outside the U.S. it finds that some 30 nations in addition to those which already possess nuclear weapons have nuclear plants operating, under construction or ordered.

In other words, there is no suggestion in the Ford Foundation report that nuclear energy as it exists commercially to-day —which for the U.S. and most other countries means by way of light water reactors (LWRs) —should now be abandoned. Quite the reverse, in fact, for the basic argument is that at least for several decades to come the U.S.—and everyone else—should be prepared to rely on these U.S.-designed reactors. They should be prepared to forego more advanced technologies which promise to be more economical with uranium fuel, but which could also encourage proliferation of nuclear explosives.

The study group's confidence about uranium supplies appears to start with the figures shown in Table 1, which indicate that the U.S. is sitting on the world's richest stockpile of uranium. It then goes on to assert has the current assessment of uranium reserves "probably substantially underestimates the supplies that will become available."

Uranium at prices making LWRs competitive with the fast breeder reactor "will be available for a considerably longer time than previously estimated." The report's comment

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will bring cold comfort to those who have been claiming that thermal reactors were scarcely worth pursuing because the world would soon run out of uranium. But in the context of the Ford Foundation study it is used to justify the conclusion that the U.S. and its allies need not bother too much about the fast breeder reactor or the reprocessing of spent nuclear fuel, and their potential for conserving nuclear fuel by extracting up to a hundred times as much energy from a given amount of uranium.

Unfortunately, the study group tends to undermine its own case a sentence or two later by arguing that, if the costs of nuclear power should rise, it will not matter, for "coal available at roughly current costs will look increasingly attractive." But an underlying assumption of the study in any case is that energy prices generally must increase steeply, and nothing much can be done to prevent this happening.

From this position it moves into its case for abandoning reprocessing and fast reactors. Basically it concludes that there is no compelling economic reason at this time to introduce plutonium fuel or to anticipate its use this century.

But how will the rest of the world see the Carter Administration's proposals, with their strong implications that nations need only put their faith in Uncle Sam and all will be well?

The Canadians, who were deeply upset by the cynical way in which India, using plutonium transmuted in a Canadian-designed research reactor, let off a nuclear "device" in 1974, are under great pressure to align themselves with the new U.S. anti-proliferation policy. They have always stored spent nuclear fuel from their Candu reactors—as the U.S. now suggests should be done with LWR fuel—to an extent where one of their engineers claimed recently that Canada possessed the largest plutonium mine in the world.

The Canadian Government may even go along with the U.S. in trying to extract an undertaking from its overseas customers that they will make no attempt to reprocess uranium mined in Canada.

But the other five founder-members of the original London Group of nuclear exporters all see reprocessing and the recycling of plutonium in the fast breeder reactor in quite a different light. All have highly developed fast reactor programmes. Britain and France and the USSR have large-scale demonstration reactors already running. West Germany has one under construction; and Japan has the 300 MW Monju project which it hopes to launch shortly. France and Germany have recently embarked on the commercial-size (1,200 MW) Superphénix reactor.

Of the five, only the USSR (believed to have a lot) and France have found commercially significant indigenous sources of uranium. All see the fast breeder reactor as a powerful insurance against rising world uranium prices, and against any collective action by the uranium-producting nations—that is, the risk of a "uranium OPEC."

Britain, and the two nations (Japan and Italy) which purchased Britain's Magnox reactor, have another problem. Magnox fuel is simply not suitable for long-term storage, as the electricity industry has already discovered to its cost.

But a still more formidable obstacle to the Carter proposals is that reprocessing represents for Britain and France a major nuclear export prospect, serving nations—such as Japan and Sweden—whose laws require nuclear plant operators to show that they have made acceptable provisions for dealing with spent nuclear fuel.

Britain is also much further advanced than any other nation in "closing the fuel cycle" for the fast breeder reactor. By this is meant the technology of reprocessing intensely radioactive fuel and recycling it as fresh fast reactor fuel. At Dounreay the U.K. Atomic Energy Authority is commissioning a new reprocessing plant for the task.

What other Governments—including Britain's—are likely to fear above all about the new U.S. anti-proliferation proposals, however, is that they could encourage organisations opposed to nuclear energy in any form to redouble their efforts to block even those nuclear activities still acceptable to U.S. energy policy. It could also encourage the oil-producing nations to raise their prices sharply.

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