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WORLD -- WHY THE NUCLEAR POWER RACE WORRIES THE U.S. F.-49

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*"The world may be headed toward a new Dark Age in which plutonium replaces gunpowder as the explosive of choice, and warfare and terrorism take on a nuclear dimension."*

Senator Abraham A. Ribicoff

Senator Ribicoff's dire warning reflects the fear in Congress that the long-standing U.S. effort to promote nuclear energy for peaceful purposes is having quite the opposite effect. The export of atomic reactors is accelerating the spread of nuclear weapons, Ribicoff contends, because some nations refuse to limit their use solely to generating electricity. Instead, they want to extract plutonium, created during the nuclear reaction, from the plant's spent fuel and use it to build atomic bombs.

Paul F. Leventhal, a staff member of Ribicoff's Senate Government Operations Committee, which has been studying nuclear proliferation, estimates that the reactor capacity outside the U.S. and Russia today would supply enough plutonium to make 1,500 small atomic bombs per year. More than 290,000 additional megawatts of capacity are operating or are planned outside the borders of the two superpowers, he says, and by 1990 reactors in the less-developed countries alone would be able to produce enough fissionable material for an estimated 3,000 bombs per year.

To try to curtail this arms race, Congress is working on a variety of bills

that are designed in one way or another to slap stringent controls on the commercial sale of U.S. reactors, and to restrict government sales of enriched uranium—the fuel for today's reactors—to other nations. But U.S. reactor manufacturers, notably General Electric Co. and Westinghouse Electric Corp., are worried that these proposals

**Power-generating reactors are giving many nations the means to build bombs**

will mean the sacrifice of lucrative export markets.

**Persuading Pakistan.** The Administration also insists that Congressional meddling could undo its own efforts to solve the problem through negotiation. An example of those efforts is Secretary of State Henry A. Kissinger's attempt this week to persuade Pakistan not to buy from France a fuel reprocessing plant—the kind of plant that can extract plutonium from spent fuel. Kissinger threatened to cut off nearly \$200 million in foreign aid and to ban the sale to Pakistan of U.S. fighter-bombers if it did not agree. At mid-week, the Pakistani decision was still unknown.

The pressure from Congress probably stiffened Kissinger's posture. And it undoubtedly helped prompt President Ford late last month when he gave a special assignment to Robert W. Fri, deputy administrator of the Energy Research & Development Ad-

ministration. Fri was ordered to review "our nuclear policy objectives and options, particularly on exports, reprocessing, and waste control."

Although Fri must complete the study by mid-September, his recommendations may come too late. "There's been no executive action," says Dwight Porter, a former U.S. ambassador to the United Nations International Atomic Energy Agency (IAEA) and now in charge of Westinghouse's international government affairs in Washington. "Congress wants to do something right now."

Porter and other industry representatives fear that restrictions on nuclear exports will cripple U.S. efforts to compete abroad at a critical time for the American industry. France, West Germany, Canada, and Sweden are mounting aggressive campaigns to win a larger share of the world reactor market—a market that may be worth \$7 billion annually by 1985. So far this year, in fact, foreign suppliers have walked off with 9 of the 10 export orders for reactors.

**Grounds for concern.** On the other hand, there are ample grounds for Congressional concern. Ribicoff and others point to a number of alarming events:

- Detonation of an atomic bomb by India two years ago. Indian scientists painstakingly withdrew enough plutonium from a 202-megawatt research reactor, supplied by Canada, to build a bomb.
- Purchase by Brazil of a complete nu-

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clear package from West Germany last year. The sale included two 1,325-Mw. reactors, the technology for enriching uranium to provide the fuel, and the reprocessing technology for extracting plutonium from the spent fuel.

■ The growing certainty that Israel has the bomb. The Central Intelligence Agency recently reported that Israel has a small stockpile of nuclear weapons based on material extracted from an Israeli reactor located at Dimona that has been in operation since the early 1960s.

■ Attempts by South Korea to purchase a reprocessing plant from France. The U.S. successfully pressured South Korea to abandon these plans just as it is now trying to dissuade Pakistan.

The ability to reprocess spent fuel is the key to making the bomb. But reprocessing is of interest not only to bomb makers. The economics of nuclear power become much more attractive if the spent fuel is processed to recover "unburned" uranium so it can be used again. And plutonium, the guts of the bomb, is also the element that will fuel what many expect to be a new generation of atomic reactors—the "breeders" that produce more fuel than they consume.

**A loophole.** Still, Congress wants much tighter controls on reprocessing technology. It recently added an amendment to the foreign-aid authorization bill, passed in June, that would bar aid to any nation that reprocesses nuclear fuel unless it agrees to United Nations safeguards, administered by the IAEA, that are part of the nuclear non-proliferation treaty. However, that amendment would allow the President to ignore the ban if he felt that giving aid was in the best interest of the U.S., and some in Congress believe that this is too big a loophole.

Other Congressional proposals to limit the spread of the bomb are still in the talking stage. One bill, for example, would insist that the U.S. control the reprocessing of spent fuel from U.S. reactors sold abroad. The most controversial approach is advocated by Ribicoff, who calls it "carrot and stick." The carrot: The U.S. would help organize a cartel that would divide up the world nuclear market among today's major suppliers. The stick: Unless foreign suppliers agreed to do this, the U.S. would cut off shipments of reactor fuel to them and their customers. The U.S. still has a virtual monopoly on atomic fuel with its three massive uranium enrichment plants, built during and right after World War II.

All of these proposals tend to make government and industry officials shudder. In one way or another, they argue, such anti-proliferation ideas are naive, impractical, unworkable—and

likely to backfire. For example, ERDA officials point out that the idea of cutting off nuclear fuel sales is naive because France, West Germany, the Netherlands, and Britain are currently expanding their small enrichment plants to commercial size and already are willing to take on contracts to supply enriched fuel.

**A turning point.** Ironically, the U.S. government is indirectly helping them. In 1974 it announced that its enrichment plants were fully booked for the immediate future. "It was a turning point, since we could no longer claim to be a reliable supplier of fuel," says an ERDA official.

That, in turn, affected a lot more than fuel contracts. Bitter executives at both GE and Westinghouse claim that the U.S. announcement helped push the Brazilians two days later into signing the package deal with Germany rather than choosing a U.S. supplier. "If countries can't rely on the U.S.," says James R. Birlle, marketing manager at GE's Nuclear Energy Div., "they will proceed in their own best interests."

The difficulties of inhibiting nuclear buyers has led the U.S. State Dept. to see what it can do to with the sellers. Earlier this year the U.S. signed a "code of conduct" with Russia, Britain, France, Canada, West Germany, and Japan that would govern nuclear exports of equipment, material, and technology (BW—Feb. 16). Since then, the Netherlands, East Germany, Sweden, Italy, and Belgium also have signed the informal pact. At the heart of the agreement is a clause demanding that

### Congress wants tighter control of the technology for reprocessing fuel

a nation purchasing a reactor abide by IAEA regulations and allow the agency's inspectors into its nuclear facilities.

But the agreement did not include exports of enrichment and reprocessing plants. So today the U.S. is pressuring France and Germany to drop plans its salesmen may have to offer such technology, and is having some small success. A German official reports that the order covering the sale of two 1,300-Mw. reactors to Iran by Kraftwerk Union contains stiff safeguard clauses, and that there is no provision in the contract for the future sale to Iran of reprocessing plants such as those sold to Brazil.

**The suspicious French.** The French, however, are skeptical about U.S. motives. They suspect one U.S. aim is to control the plutonium supply when the breeder era arrives. The French suspicions extend to one of the latest U.S. proposals—that reprocessing plants capable of

producing plutonium be multinational entities. The U.S. is lagging in its program to develop a breeder reactor, while France is about to start on a full-scale commercial breeder (BW—Aug. 16). They suspect that the U.S. hopes to introduce uncertainty as to the supply of plutonium and thus discourage export sales of the French breeder, known as Super-Phenix.

Even in the U.S., though, the concept of the multinational reprocessing center meets with skepticism. It is "kind of an unnatural thing," says Carl Walske, president of the Atomic Indus-

**Nuclear reactor exports: The U.S. is losing**

Year	Number of reactors exported	
	By U.S. companies	By foreign companies
1971	8	0
1972	8	1
1973	5	2
1974	8	3
1975	4	2
1976	1	9

Data: BW, Westinghouse, Atomic Energy Canada Ltd.

trial Forum, the nuclear industry's lobbying group.

Walske and others in the industry think that the whole issue of proliferation through fuel reprocessing has been overblown—at least for the types of reactors the U.S. sells abroad. Small nations, they contend, cannot afford to operate a commercial reactor to provide electricity and also use it to produce enough material for a weapons program. Moreover, scientists claim that plutonium drawn from today's commercial reactors is so highly radioactive that it could produce a fizzle instead of a blast.

This does not convince Fred C. Ikle, director of the U.S. Arms Control & Disarmament Agency. Ikle is dubious about most of the control schemes that others are advocating, and he has his own simple—if drastic—idea of what to do instead. Drop the whole idea of reprocessing plutonium for the breeder, he says, and thus the need for dangerous reprocessing technology.

But men like Walske and Westinghouse's Porter just as firmly believe that the breeder era is near and that reprocessing will be forced on the world. Rather than banning exports, they say, the U.S. must work harder to strengthen the U.N.'s inspection force, which today has only 600 professionals and an annual budget of only \$39 million. Beefing up the IAEA is a more realistic solution, the industry argues, than the unilateral actions that many in Congress want the U.S. to take.

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