

## NUCLEAR POWER AND WEAPONS: A NEW LOOK AT AN OLD ISSUE

The argument has gone on for decades over the connection between nuclear energy for power and nuclear energy for weapons. It was obvious from the beginning that the two overlapped. The 1946 Acheson-Lilienthal Report said they were “in much of their course interchangeable and interdependent.” The Report was flawed in a number of ways, and its proposal for international control of nuclear energy failed, but it contained the powerful insight that gaining the benefits of the new energy source without spreading the Bomb entailed strict international rules backed up by military force. “No system of inspection,” the Report concluded, “could afford any reasonable security against the diversion of such materials to the purposes of war.”

A few years later the United States, discarded that insight and reversed course to launch Atoms for Peace to spread nuclear technology worldwide. Aside from occasional modest adjustment, we have been on that Atoms for Peace course ever since.

We have also continued—to the present—the argument over how dangerous nuclear power was from the point of view of international security, and how much control over it was necessary. Those focused on the benefits lined up on the “Atoms for Peace” side, and those focused on security lined up on the other, arguing for stricter controls, and so they have stayed. Here is how the arguments played out:

1. Promises and inspections. The first difference concerned the post-Atoms for Peace optimistic assumption that “peaceful uses” promises and periodic international inspections would be sufficient to make sure that nuclear technology would not be used for weapons. This was undermined by the India’s 1974 bomb

which used materials covered by such promises, and by more recent cheating by NPT members.

2. Commercial plutonium not suitable for bombs. Of the two major nuclear explosives, plutonium was the first proliferation concern as power reactors produced it in large quantities, and plutonium separation by reprocessing threatened to make the material widely available. A shift to plutonium-fueled fast breeder reactors was the goal of all nuclear program. “Breeder” because they effectively produced more fuel than they burned. It’s essential to grasp this point to understand the hold that this idea had, and continues to have, on the nuclear community. The first argument made to protect plutonium use was that the plutonium that comes out of commercial reactors—which were mostly LWRs—was not suitable for weapons and so is of little concern. This is incorrect and was countered in 1976 by international briefings by US weapons labs.

3. Commercial plutonium can be protected from weapons use. In 1976 US President Gerald Ford, trying to strike a reasonable balance between energy and security, urged that nuclear power should proceed without reprocessing spent fuel to extract plutonium until *there is sound reason to conclude that the world community can effectively overcome the associated risks of proliferation.* Since then plutonium adherents have labeled proliferation dangers of nuclear power, and even reprocessing, as exaggerated. It was argued the plutonium could be made safe enough by various schemes, the latest being to always keep it mixed with uranium. This would provide a very low level of protection against national diversion.

4. In any case it's easy to separate plutonium in a "quick and dirty" plant so there is no point in stopping commercial reprocessing. Pres. Ford's, and later Pres. Carter's, nuclear industry critics went further. They designed a small reprocessing plant that a country with minimal industrial base could build quickly and secretly. The point was that even if power reactor plutonium could be used for bombs it wasn't going to do any good to ban commercial reprocessing, because a country with nuclear reactors could quickly build a small clandestine reprocessing plant, using essentially off-the-shelf components, and use it to produce militarily significant numbers of warheads. But this also undermined the Ford-Carter assumption (that continues in present policy) that LWRs with no commercial reprocessing are a safe proposition. If a country with LWRs but no commercial reprocessing could secretly build a small "quick and dirty" plant to reprocess LWR spent fuel then—contrary to conventional wisdom—it could rapidly separate enough plutonium from spent fuel for nuclear weapons.

5. Small centrifuge enrichment operations can be set up with no connection to nuclear power programs so there is no point in curtailing commercial nuclear power programs. The relatively recent wide distribution of gas centrifuge enrichment technology adds to proliferation concerns, in fact has become the prime concern. While a country could build such a plant apart from any nuclear power program, the presence of nuclear power plants would be advantageous. It would obviously provide a useful cloak to mask some of the clandestine activities, provide a source of trained personnel, but most importantly it could provide a source of low enriched uranium fuel. The use of such feed material would reduce

(either in size or duration) the enrichment effort to produce HEU by as much as a factor of five. This provides another reason, in addition to the concern about small clandestine reprocessing, why LWRs by themselves are not necessarily a safe proposition from the point of view of proliferation.

6. There are administrative ways to deal with these problems without constraining nuclear power technology—increased IAEA inspection, expanded national intelligence, and providing “fuel guarantees” and grouping worrisome fuel cycle activities in “multi-national centers” Increased inspection and national intelligence would be useful, but it isn't unclear that they could scale up to cope with a worldwide expansion of nuclear power—an unlikely eventuality but nevertheless a goal of US policy and that of other countries who are committed to a nuclear “renaissance,” and a number of countries in volatile regions of Asia and Africa have expressed interest. It took years to find a number of secret nuclear facilities (the latest being the Syrian reactor). Fuel guarantees and multinational centers have been talked about for decades and have gotten nowhere and are unlikely to do so in the future. Continued talk about these has the effect of legitimizing use of plutonium fuel.

7. The ultimate argument for not restricting nuclear power is that nuclear power has nothing to do with proliferation. Past nuclear weapons programs did not start from nuclear power programs, or have any connection with nuclear weapons programs, and future ones would not, either, because it would be cheaper to have separate nuclear weapons programs. The basic assumptions here are questionable. For example, the 2006 US-India agreement explicitly allows India to operate

several of its nuclear power plants as part of its weapons complex. Another example: The US Department of Energy uses TVA power reactors to produce tritium for warheads. (When the arrangement drew criticism the DOE assistant secretary said the difference between civilian and weapons applications was only “psychological.”) What really matters, however, is not history, but opportunity. If a country is going to cheat—and we know that countries that were members of the NPT have cheated—it will want to limit the period of maximum vulnerability from the time its bomb program is evident or might be discovered to when it has bombs in its armory. If the most readily available source of nuclear explosives will be in the commercial sector, as it is likely will be if we continue to drift as we are doing, then that is likely where bomb makers will go.

8. The final, final argument made by the nuclear community is that even if nuclear power contributes to proliferation, it will not matter very much. There is not likely to be a significant increase in the number of nuclear weapons states, and that this is not likely to change things very much. States will continue to be deterred from attacking each other, and those who joined the nuclear weapons ranks will mostly find their weapons a liability. One has to hope that this Panglossian view is right because we are continuing to spread nuclear capabilities. We may also, by spreading capabilities that can be turned to weapon, be setting up the conditions for a major breakdown of international security.

Up to now we have allowed, over and over, the interest in gaining the benefits of nuclear power to trump bomb concerns. A partial reason for this is that the bomb concerns have not been clearly spelled out or have been submerged in arguments, on the

one hand, that the concerns were exaggerated, or on the other that there was nothing that could be done about them in the context of nuclear power programs. We need to rethink the possible consequences of proliferation, and to reexamine what measures related to nuclear power make sense if nonproliferation objectives took precedence over economic benefits. At a minimum it would mean not pursuing nuclear projects unless they provided net economic benefits. That would be an important first step in righting the balance.