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TESTIMONY

before

Senate Committee on Energy and Natural Resources
Subcommittee on Energy Research and Development

by

Arthur R. Tamplin
Thomas B. Cochran

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Mr. Chairman and members of the Committee, my name is Arthur R. Tamplin. I have a Ph.D degree in Biophysics from the University of California at Berkeley. I am presently a Staff Scientist at the Natural Resources Defense Council here in Washington, D.C. where I am engaged in a variety of programs related to nuclear energy and energy policy. Prior to joining NRDC some two years ago, I was group leader in the Biomedical Division of the Lawrence Livermore Laboratory. Thomas B. Cochran has a Ph.D in Physics from Vanderbilt University and is presently a Staff Scientist at the Natural Resources Defense Council. For the past five years he has been closely following Federal energy R&D policy, focusing principally on the breeder reactor program and other plutonium related issues.

We have recently prepared "An Analysis of the Carter Administration's FY-1978 ERDA Budget to Congress." We would like to have this included in the record and to take this opportunity to present some of the highlights of this analysis.

ERDA's proposed FY-1978 energy R&D budget under the new Administration continues the Ford Administration's heavy emphasis on nuclear power development, at least pending promised reviews of the Liquid Metal Fast Breeder Reactor (LMFBR) Program and ERDA's program for the development of the nuclear fuel cycle. Approximately 40%-45% of ERDA's proposed R&D budget is allocated to fission power development. Approximately one-half of this amount (20% to 25% of the total ERDA budget) is for one program -- the LMFBR. In contrast only 21% is allocated to conservation, solar and geothermal combined.

Admirably the Carter Administration has doubled the funding for energy conservation and restored the Ford Administration cuts in the funding requested by the conservation division within ERDA.

While President Carter called in the campaign for a strong shift in energy R&D towards solar energy and conservation, the Carter Administration has given the solar program a mere cost of living increase over FY-1977 funding levels. While there have been shifts of funds within the solar program, proposed budget authority for all solar programs for FY-1978 is increased only 5% over FY-1977.

The Ford Administration cut the R&D funding requested by the geothermal division by 29% (budget outlays). The Carter Administration restored none of it. The geothermal program funding is increased by 3.3% over FY-1977, not even a cost of living increase.

ERDA is poised to launch a massive new program to subsidize the back end of the nuclear fuel cycle. Pending the outcome of a Carter Administration review of non-proliferation policy, funding in FY-1978 could be directed toward launching the plutonium economy by "demonstrating" plutonium reprocessing and plutonium recycle programs. Alternatively, if the new Administration decides to postpone plutonium recycle, these funds would be used principally for the management and long-term storage of used reactor fuel.

At the direction of President Carter, ERDA has initiated an intensive review of the LMFBR program, and the Clinch River Breeder Reactor (CRBR) project in particular. Pending this review President Carter has reduced the FY-1978 LMFBR funding by \$200 million in Authority and \$85 million in Outlays from the funding level recommended by the Ford Administration. The recommended FY-1978 budget authority for the LMFBR is presently \$30 million (4.3%) less than the FY-1977 level and the outlays are \$57 million (9.5%) higher. We do not believe

these cuts represent "the severe reduction in our excessive emphasis on this project" as called for by President Carter during the campaign. To the contrary, we believe they simply trim some of the fat from the LMFBR budget without any significant effect on the momentum of the program. In fact, it has been reported that ERDA believes that the effect of these cuts has been to slip the optimistic February 1984 criticality date for CRBR by only 4 to 5 months. If the Committee desires, we will be pleased to discuss in more detail where these budget cuts were made within the LMFBR program and comment on their significance.

We would like at this time to submit for the record a separate report where we have set forth an alternative LMFBR Program that we believe represents a vast improvement over the present program. The rationale for the option we propose is based on the following considerations, each of which is discussed in more detail in the report.

1. The risks associated with the proliferation of nuclear weapons that would be the inevitable results if the U.S. and the world commit themselves to a plutonium fueled economy.
2. This commitment would require massive expenditures on the part of the U.S. to develop the plutonium based energy technology. This would have to be done at the expense of other more appropriate technologies.
3. The present misplaced energy R&D priorities characterized by an excessive emphasis on commercialization of the LMFBR technology, neglect of energy conservation potential, and underfunding of alternative non-nuclear

supply technologies.

4. The enormous cost overruns which the LMFBR program is experiencing.
5. Obsolete design of the CRBR -- a design that does not contain features that could considerably enhance the safety of the CRBR and the commercial viability of the LMFBR.
6. The inconsistency of the present LMFBR program structure, focused on commercialization, with ERDA policy to postpone a decision on commercialization for at least a decade until key issues related to safeguarding special nuclear material, breeder reactor safety, waste management and uranium availability are resolved; and
7. The lack of a clear economic incentive to continue the LMFBR program at the current pace.

Of these seven considerations, by far the most important is the first, the risks associated with the proliferation of nuclear weapons.

In a third report, "Nuclear Weapons Proliferation - The State Threat and the Non-State Adversary," which we would also like to submit for the record, NRDC presents a detailed analysis supporting why it is of utmost importance and urgency for the U.S. to unequivocally reject the idea of reprocessing nuclear fuel for plutonium recovery in the foreseeable future either here or abroad.

An often repeated argument for proceeding with the plutonium economy is that the genie is out of the bottle and any country that wants a weapons option can build the necessary facilities dedicated to achieving that option. This argument fails to recognize that if reprocessing, and recovery and stockpiling of plutonium are permitted

by non-weapons states, then without violating any of the international safeguards agreements and treaties, any non-weapons state could move to a point of being as little as hours away from having nuclear weapons, perhaps needing only to cast the plutonium and place it into the weapon. The non-weapons state in such an event would have all its options open. Like Israel, it could declare itself a non-weapons state, yet, at any time, it would be only moments away from having a weapons option. Under these conditions, there is insufficient time for diplomacy to reverse the policy of a non-nuclear weapons state seeking a weapons option, and the international safeguards regime serves nothing more than a cover for nascent weapons states, concealing the signs of critical changes taking place prior to the actual diversion.

Furthermore, once reprocessing is accepted, large flows of recovered plutonium and plutonium stockpiles become a worldwide reality. As a consequence, the shortest road to a weapons option is no longer the time-consuming and obvious construction of dedicated facilities. Instead, the preferred route would be through the civilian nuclear power program, through the peaceful atom.

Several proposals, the possibility of multinational ownership of fuel reprocessing facilities, "co-processing" of breeder fuel, and restricting breeders to weapons states have been suggested as a means to curb their proliferation potential. These concepts offer little, even if they could be shown to be practicable.

Multinational facilities would legitimize the argument of non-participating countries that their national plutonium facilities and stockpiles are peaceful. They would supply participating non-weapons states with large amounts of usable plutonium in the form of fresh

fuel. And they would provide opportunities for the clandestine diversion of plutonium, targets for expropriation, and the means of spreading reprocessing technology. Similar arguments apply to the concept of restricting breeders to weapons states. It is unrealistic to believe that separated plutonium can be restricted to nuclear weapons states in a world heavily dependent on plutonium fuel with reprocessing.

Co-processing of breeder fuel has been proposed by ERDA as an approach that "could potentially eliminate separated plutonium from the reprocessing and recycle scheme". A country with such a facility would need only to change the solvents used in the reprocessing operation, a trivial exercise in chemistry, to convert the facility to the production of pure plutonium. Furthermore, it is a simple chemical operation to separate the plutonium from the co-processed plutonium and uranium mixture. Thus a non-weapons state would still be only a matter of days away from having weapons usable material in hand.

It is noteworthy that an independent study group of twenty-one leading scientists and economists sponsored by the Ford Foundation has reached essentially the same conclusion regarding the desirability of the present breeder reactor program.

The report of this group, Nuclear Power Issues and Choices, finds that the proliferation of nuclear weapons is the most serious risk associated with nuclear power. It concludes that nuclear power can seriously complicate proliferation problems if plutonium is introduced into the fuel cycle. The Study Group recommends that plutonium reprocessing and recycle in current reactors be postponed indefinitely since it has little, if any, economic significance, and that the commercialization of the breeder should be deferred and the breeder pro-

gram recast as a long-range insurance program against high future energy costs. Although plutonium breeders are a major long-range energy source, the Study Group concluded that they will not compete with current reactors or coal in this century or have a significant economic advantage in the early decades of the next century.

It is essential that the U.S. breeder effort, if allowed to proceed, be restructured to pursue only breeder and near-breeder technologies that are more proliferation resistant. A minimum criterion for acceptability in this regard would be that the technology must be as proliferation resistant as existing light water reactors operating in the once-through fuel cycle mode, that is, without reprocessing, and with the additional constraint that no spent fuel storage would be permitted in non-weapons states. In other words, the development and commercial utilization of such technologies by a non-weapons state must leave that state months to years away from obtaining weapons usable material. Thus, the shortest route to a weapons option would still be the time-consuming development of a dedicated facility.

Thus, under the alternative LMFBR program we are proposing the commercial component of the present LMFBR program would be cancelled and commercialization of this technology postponed indefinitely; the breeder option would be preserved, however, as an alternative for the "post fossil fuel era" by continuing a basic R&D effort; but the R&D would be redirected toward breeder and near-breeder concepts that are intrinsically more proliferation resistant than the present plutonium based technologies and this effort would be at a much reduced funding level.

In its immediate effect, the CRBR demonstration plant is cancelled and the LMFBR priority, in terms of funding, is substantially reduced. In the near term, the program is focused on advanced design work, basic safety research in support facilities, and advanced fuels research in the Fast Flux Test Facility (FFTF).