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NO MORE ATOMS FOR PEACE

Having all but abandoned any pretext at arms control, the Administration is launching a new arms race, calling for the production of over 14,000 new nuclear weapons during the next 8 to 10 years (Enclosure 1). Many of the new warheads, including those in some 6,600 nuclear-armed cruise missiles, will utilize plutonium rather than highly-enriched uranium (oralloy) for the fissile component in order to obtain the desired small size, decreased weight, and high yield-to-weight ratio. The Administration also recently decided to produce over 1,000 enhanced radiation, or neutron, weapons, which will probably utilize fissile plutonium but, more importantly, will require doubling the amount of tritium in the present weapons stockpile.

To meet these new warhead requirements, the Department of Energy (DOE) has launched a major effort to increase production of weapon-grade plutonium and tritium.[1] In so doing, DOE is proposing several initiatives that threaten to eradicate the barrier between atoms for peace and atoms for war, posing severe nuclear proliferation risks as well as safety and

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1/ Most of the warheads scheduled for retirement utilize oralloy rather than plutonium for the fissile component.

environmental problems. At the same time, these initiatives would serve to massively subsidize the comatose commercial nuclear power industry.

To meet the new plutonium and tritium demands, during the next three years DOE must rely mainly on its three existing production reactors at the Savannah River Plant (SRP) in South Carolina. DOE plans call for increasing the production of the P, K, and C reactors at SRP from two-thirds to full capacity. DOE is refurbishing the L Reactor at Savannah River with restart scheduled for mid-1984. In addition, DOE has already commenced making weapon-grade plutonium by blending supergrade plutonium (3% Pu-240) produced at SRP with existing stocks of fuel-grade plutonium (12% Pu-240) previously earmarked for the breeder program. Finally, DOE plans to convert the N Reactor (the traditional source of new fuel for the breeder program) from production of fuel-grade plutonium to production of weapon-grade plutonium, and to restart the PUREX plant, both at the Hanford Reservation in Washington. The N Reactor conversion is to be completed by FY 1983 and the PUREX startup is scheduled for mid-1984.

These initiatives alone will enable DOE to more than double the rate of weapon-grade plutonium and tritium production from the equivalent[2] of about 1600 kilograms (kg) of

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2/ In terms of the production capability of the SRP production reactors, one kilogram of tritium is equivalent to 72 kilograms of weapon-grade plutonium. During the Carter Administration, DOE annually produced at SRP about 1400 kg of weapon-grade plutonium and about 3 kg of tritium, or approximately 1400 + (3x72) = 1616 kg of plutonium (equivalent).

plutonium/year during the Carter Administration to about 4100 kg of plutonium (equivalent)/year by mid-FY 1984.

DOE is also in the process of designing a new production reactor. One or more of these, each of which could have a production rate of 600 kg or more of plutonium (equivalent), is scheduled to be in operation by the early 1990s.

An even more serious nuclear weapons proliferation threat is posed by several other measures DOE is considering which involve commercial nuclear spent fuel. Approximately 70 metric tons (MT) of reactor-grade plutonium (about 20% Pu-240) presently exist in the spent fuel stored in pools at commercial nuclear reactor sites. This amount is projected to grow to some 400-500 MT of reactor-grade plutonium by the year 2000. DOE officials are seriously considering several ways to mine this plutonium for use in its weapons program. First, the DOE Defense Program has proposed to modify the Savannah River fuel processing plant(s) to enable it to process this commercial spent nuclear fuel (Enclosure 2). The Savannah River Plant can currently recover only plutonium from DOE production reactors. DOE officials claim that this modification is needed to obtain plutonium to meet R&D needs for the breeder program. Yet DOE Secretary Edwards recently stated that it makes sense to use commercial spent fuel for weapons as well as for the breeder program (Enclosure 3).

Second, DOE is exploring means to join with the nuclear industry in putting into operation the partially completed

Barnwell, S.C., reprocessing plant. Industry recently proposed that it would complete the Barnwell facility in return for a guarantee by DOE to purchase the recovered plutonium (Enclosure 4). Again it is claimed that this recovered plutonium would be used solely for breeder research and development purposes. Barnwell, however, is capable of recovering plutonium at a rate almost nine times that needed for the breeder program. Barnwell can process 1500 MT per year of spent fuel and recover from it 13 MT/yr of reactor-grade plutonium. Yet the entire breeder program would require only 1.5 MT/year of plutonium after existing stocks run out in 1990, even including fuel for the Clinch River Breeder Reactor, should it be built. Eighty-five percent of the Barnwell output, or 11.5 MT/year of reactor-grade plutonium, would thus be available for enrichment, and could make available 7 MT/year of weapon-grade plutonium.

To enrich reactor- and fuel-grade plutonium to weapon-grade, DOE's Lawrence Livermore National Laboratory (LLNL) is accelerating development of a laser isotope plutonium separation process (Enclosure 5). DOE officials have testified that this process could be used to enrich plutonium from commercial reactors to weapon-grade. Enrichment of the currently available 70 metric tons of plutonium in commercial spent fuel would yield about 50 metric tons of weapon-grade plutonium. DOE hopes to have a laser isotope separation production plant is operation by about FY 1987, and the House

and Senate Armed Services Committees have increased the DOE Defense Program budget to meet this schedule. Using the plutonium in the spent fuel accumulated from reactors by the year 2000, this plant could produce about 300 metric tons of weapon-grade plutonium.

The current U.S. inventory of weapon-grade plutonium in, or available for, nuclear weapons is estimated to be 90 ± 20 MT; the tritium inventory about 60 ± 10 kg; and the highly enriched uranium (oralloy) inventory about 500-700 MT.[3] By mining the plutonium currently available in commercial nuclear spent fuel, DOE would be able to increase the plutonium inventory in the U.S. stockpile by about 50%, or enough for some 5,000 additional warheads. The cumulative increase, if DOE were to utilize the commercial reactor spent fuel generated through the year 2000, would be 300%, or enough for 30,000 additional warheads.[4] Given that the U.S. currently has about 30,000 nuclear weapons, this would double the present inventory.

3/ By NRDC estimates.

4/ If DOE combined the proposals to mine commercial spent fuel, through use of Barnwell and laser enrichment, with its other proposals to increase plutonium production at Savannah River, Hanford, and new production reactors, it could increase the rate of weapon-grade plutonium production to about 11 MT/year in the late 1980s. This rate is vastly greater than the 1.4 MT/year produced during the Carter Administration. The new production rate would be sufficient to equip about 1,000 new weapons, such as cruise missiles, per year.

The DOE proposal to mine commercial spent nuclear fuel for use in weapons could lead to a militarization of the entire back end of the fuel cycle. Such a move would eradicate the separation between atoms for peace and atoms for war and set a dangerous example for other countries which could lead to more weapons proliferation. These actions would also serve as a massive subsidy to the faltering commercial nuclear industry.[5]

By turning commercial nuclear reactors into weapons production facilities, DOE would also be able to evade the more stringent licensing review the Nuclear Regulatory Commission (NRC) would otherwise require of transportation and storage of commercial radioactive wastes. Yet, if the Savannah River Plant processed commercial utility fuel, the reprocessing would not be licensed. The resultant high-level radioactive waste would be considered "defense waste" rather than commercial waste. As such, it would not be subject to the NRC criteria for transportation and interim storage now applied to commercial waste. Furthermore, although at present any permanent repository for defense waste must be licensed, the House and Senate Armed Services Committees have made it clear that they are opposed to NRC licensing of DOE defense

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5/ DOE Secretary Edwards originally proposed to purchase the Barnwell facility outright, a move opposed by OMB Director David Stockman, and ultimately President Reagan as well. The latest DOE proposal for Barnwell, however, would serve the same objective of bailing out Allied Chemical and Gulf Oil, the owners of Allied General Nuclear Services (AGNS). With AGNS serving as DOE prime contractor, the Barnwell facility would not have to be licensed.

activities. If these committees are successful in repealing licensing requirements for defense program sites or activities,[6] such a repeal would enable DOE and the nuclear industry to avoid completely NRC licensing of the back end of the fuel cycle. In fact, since uranium enrichment is already an unlicensed DOE activity, DOE's proposals would result in a situation where the only commercial reactor fuel cycle activities requiring NRC licensing, aside from the operating reactor itself, would be the milling of uranium in some states.

Finally, the DOE proposal to mine utility spent fuel for weapons is likely to severely curtail public access to information on utility management of commercial reactors and the decisionmaking process regarding the nuclear fuel cycle. It will lead to an increase in police surveillance of workers and groups opposing nuclear power, and to other infringements on civil liberties. DOE has already proposed legislation, recently approved by the Senate Armed Services Committee, that wuld allow DOE to prevent the dissemination of a broad range of unclassified information regarding atomic energy defense programs.

6/ The DOE waste isolation program is currently examining several alternative sites for a high-level waste repository. Two of these are on DOE sites: the Nevada Test Site and the Hanford Reservation in Richland, Washington, where major weapons activities are conducted.

Given the grave risks posed by these new Administration initiatives, we urge each of you to make the defeat of these intiatives your highest priority.

ENCLOSURE 1

New Nuclear Weapons Planned for Production in the Next 8-10 Years

(NRDC estimate of requirements contained in the Oct. 28, 1980, Nuclear Weapons Stockpile Memorandum)

2000	MX
3500	ALCM
500	GLCM
2600	SLCM (2600 nuclear capable, 5200 total)
200	PERSHING II
1680	TRIDENT
500	HARPOON/STANDARD/ASW Standoff
1000	B-83 Bomb
2000	155-mm artillery
1180	Neutron weapons, 8" artillery/LANCE
?	LoADS
?	ASALM
14,620	Total

Enclosure 2

Inside Energy / formerly Inside D.O.E.

An exclusive weekly report on federal energy activities

September 4, 1981

DOE CONSIDERS SAVANNAH RIVER LWR FUEL AS SOURCE OF PLUTONIUM FOR BREEDER

High-level DOE officials are seriously considering an internal proposal to modify the Savannah River plant so that it could reprocess N-reactor and civilian light-water-reactor (LWR) fuel to provide plutonium for both the breeder and weapons programs, *Inside Energy* has learned. Currently the Savannah River plant reprocesses only military and DOE r&d fuels and provides plutonium only for the weapons program.

The proposal – considered but quashed in DOE's budget exercise last year – is being pushed hard for FY-83 by DOE's Defense Program (DP) division, officials there said. Those officials claim that modifying the Savannah River plant would be less expensive and faster than building a new defense reactor, the only other alternative under consideration to eliminate a potential shortage of plutonium (besides steps already taken).

According to the DP officials, the proposed plant modification – if approved by DOE, other Reagan Administration officials and Congress – would be started in FY-83, cost a total of about $500 million and take about six years to complete. This is compared to the $1- to $2-billion total cost and 10- to 12-year period it would take to build a new facility, those officials said.

No conflicts seen. DP officials claim that taking civilian fuel and producing plutonium for a civilian program at the Savannah River plant – in effect, combining civilian and military uses of the plant – would not cause problems. "We don't worry about civilian application so much as commercial application" for military facilities, one DP official said. The problem with commercial facilities, he said, is that they have to be licensed – a potentially delaying process from which military facilities are exempted. "We don't see that [licensing is needed]

here as the breeder program is a government program," the DP official said.

DP officials also claimed that modifying Savannah River would not eliminate the need for a commercial reprocessing facility, such as the Barnwell plant in South Carolina, to provide plutonium for the breeder program. "They're completely separate," said one DP official about Savannah River and commercial reprocessing. He said both would be needed.

Specifically, DP officials are proposing to build a "shear leach" on the head-end of one of two existing "processing canyons" or reprocessing facilities at Savannah River. The shear leach would be capable of chopping the cladding and leaching the uranium from N-reactor and LWR fuels. N-reactor fuel is fuel from DOE's N-reactor in Richland, Wash.

Would assure plutonium for breeder. DP officials are also claiming that modifying the Savannah River plant would be the best way to assure available plutonium for the breeder program in the late 1980's and early 1990s. DP officials earlier this year told DOE Nuclear Energy (NE) division officials they would be able to provide the 10 metric tons expected to be needed by the early 1990s for the Clinch River Breeder Reactor (CRBR) and other breeder-program activities. But despite the offer to NE, the DP officials are seriously concerned that they will not be able to meet the breeder-program needs if there is a significant increase in the military's need for plutonium for the weapons program. Such an increase appears likely since both the Reagan Administration and DOE, in particular, have made defense activities a top priority (Issue of 28 Aug, 1).

Defense Dept. plutonium needs will not be known until late this year, after DOE budget proposals are sent to the Office of Management and Budget, sources said. This is because the Defense Dept. budget exercise typically runs about two months behind that of other agencies, they said. – *Lynn Stevens*

Enclosure 3

Transcript of Proceedings

UNITED STATES DEPARTMENT OF ENERGY
ENERGY RESEARCH ADVISORY BOARD

Pages: 274 through 395

Washington, D.C.

September 3, 1981

Acme Reporting Company

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I think it is very essential to do that. I also think we ought to just touch quickly on nuclear. I think most of you around this table, with some few exceptions, may see the need for vigorously developing a nuclear potential.

I am happy to report that there was an eight percent increase in nuclear production in 1981. The first time we have had an increase in nuclear production in a good many years, and I hope that is a sign of things to come, because it has such a great potential for fulfilling some of the energy needs, particularly electrical energy needs.

I am sure that we have got to find, and you around this table certainly are very capable to help us start finding ways to bury waste, researching ways. I don't know how much more research we can do on this particular subject. But I think it is time to move ahead. We have to bury some of the waste.

The question is whether we bury it with six percent of the energy left or we reprocess it. I personally would like to reprocess it. There are some many advantages to reprocessing.

One of the advantages, for example, is that we are going to be needing some more plutonium for our weapons program, and the best way I can see to get that plutonium is to solve your waste problem. Reprocess it, pull out the plutonium and you may have to upgrade that.

Many of you know more about that than I do, but I understand that we have to upgrade the plutonium to weapons grade. It makes sense to me that if you are short of plutonium, let's reprocess some of the fuel rods and get the uranium out to be used in a light water reactor.

We could also use the plutonium in the breeder reactor and get that technology proven and move ahead in that area, and we would solve two problems at one time. It just makes a lot of sense to me to go that route.

But in nuclear, we are dealing with a finite resource in oil, gas and even coal in this country and when we run out of that, what are future generations going to do? Because we have fusion we hope to fall back on it.

Once again, this where you gentlemen come into play. I hope we can start generating some electrical power from fusion in the years to come, but you will probably have to tell me when that will be. I wish you will tell me when that will be, because that will be very important for me to know that as we plan ahead.

I would like to touch on one other thing, on the Strategic Petroleum Reserve and then I will be through. Our national security is one of the most important things that we have to do in this Department, both in the weapons program but even more importantly, probably, or as important, is the Strategic Petroleum Reserve.

A McGraw-Hill Publication Enclosure 4 Incorporating NUCLEONICS

NUCLEONICS WEEK

Vol. 22 No. 35 September 3, 1981

UTILITIES DRAFTING PLAN FOR PRIVATE REPROCESSING WITH GOVERNMENT SUPPORT

A plan emanating from within the electric utility industry and expected to emerge this fall will propose private financing to develop the Barnwell nuclear fuel plant in return for strong federal government support in the form of loan guarantees and other assurance, Nucleonics Week has learned. Under the plan, the government also would be committed to purchasing the plutonium from the facility. Although the plan is sure to win support at DOE, it could run into problems at the Office of Management & Budget where Director David Stockman would be expected to frown on government guarantees, a top DOE source said. The plan also would face obstacles in Congress where extensive legislation would be needed to put the proposal into action.

The plan brings new hope, however, to DOE officials who optimally want private financing for reprocessing, and want it in place before the FY-83 budget request goes to Congress in January. "Before January, you will see the issue of reprocessing surface again at the top of this Administration with the budget," the source said, indicating that reprocessing would be addressed in some way in the next budget cycle.

Several other solutions to the reprocessing puzzle also are circulating and being given serious attention by DOE in case the favored plan falls apart. One plan would "bootstrap" enrichment to reprocessing, a source said. Under this plan revenue from enrichment services would pay a large chunk of the reprocessing bill. Another approach which has the "general support" of DOE, according to an internal DOE memorandum, is a government/industry corporation as envisioned by Rep. Manuel Lujan (R-N.M.). The corporation would buy Barnwell and utilities could contract with it for services. Like the anticipated utility proposal, the Lujan proposal would keep funding for services off-budget, protecting them from political fluctuations, sources said.

Asked about the prospects for a private financing plan for Barnwell, the DOE source said, "We're trying very hard to encourage something to occur on the private side. We have some very good people working very hard in and out of government. I'm hopeful that we will be successful. I'm determined that we will be successful." – *Sandy Cannon*

Enclosure 5

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July 22, 1981

The Honorable James Edwards
Secretary of Energy
Washington, D.C. 20545

Dear Sir:

We are writing to express our deep concern about a Department of Energy (DOE) program to develop a laser enrichment technology for plutonium.

In 1975, DOE launched a program to apply laser isotope separation (LIS) technology to plutonium. This technology, which was originally used with uranium, would enable DOE to enrich reactor-grade plutonium to the highest quality material for atomic weapons. DOE officials recently testified before the House Armed Services Committee that the LIS process would make some 70 tons of plutonium in commercial spent nuclear fuel available for use in U.S. nuclear weapons (see enclosed Fact Sheet).

The plutonium LIS program carries grave nuclear weapons proliferation risks, and is totally inconsistent with the fundamental objective of President Reagan's nuclear non-proliferation policy. American efforts to prevent the spread of nuclear explosives while promoting "peaceful" nuclear cooperation will not be credible if at the same time the Administration has a major program underway designed to divert our own civilian nuclear material to the production of nuclear weapons. The plutonium LIS program would provide further encouragement to proliferation-prone nations to undertake their own programs and to stockpile plutonium, which can be directly used in nuclear weapons without enrichment. India, Brazil, South Africa, Argentina, Iraq, and Taiwan already have small LIS research efforts underway. The development of plutonium LIS technology also would increase the danger of theft of weapons-usable plutonium by terrorists or other sub-national groups.

We recognize that DOE has identified several other applications for the plutonium LIS process, including its use to enrich fuel-grade plutonium produced by the DOE N-reactor in Hartford, Washington, which is the traditional

source of fuel for the breeder reactor R&D program. It could also be used to reduce somewhat the exposure to low-level radiation of those who manufacture, handle, and deploy nuclear weapons. Yet it appears that these applications would not serve as adequate justification for the program, particularly in light of the severe proliferation dangers. We thus request that you immediately terminate the plutonium LIS program.

Should you decide not to halt this program, we call your attention to the need for a thorough public review of this program pursuant to the National Environmental Policy Act, (42 U.S.C. §4321 et seq.). The plutonium LIS program is a "major Federal action significantly affecting the quality of the human environment," and an environmental impact statement must be prepared. The DOE regulations implementing NEPA set out this requirement:

> For energy technology research, development, demonstration and commercialization programs, DOE will: Initiate the applicable general procedures specified above concurrent with program initiation; and, if required, prepare the relevant environmental document when environmental effects can be meaningfully evaluated.

45 Fed. Reg. 20694, 20698 (Mar. 28, 1980). The regulations further provide that "the relevant environmental document would normally be prepared in advance of a decision to proceed with the development phase of a research, development, demonstration, and commercialization program." Id.

With regard to the timing of an EIS, DOE is required to consider:

> The extent to which continued investment in the new technology is likely to cause the program to reach a stage of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives.

Id. The degree to which continued funding of the LIS program is likely to determine subsequent development or restrict later alternatives is apparent from DOE's requested FY1982 budget. Proposed Department of Energy Authorization Legislation (National Security Programs) for Fiscal Year 1982: Hearings before the House Subcommittee on Procurement and Military Nuclear Systems, 97th Cong., 1st Sess. 149, 157, 159-62, 174-176, 236 (Mar. 4, 1981). The plutonium LIS program was begun secretly in 1975 at a very low level of effort, but DOE

is now requesting a major increase in funding over the next three fiscal years totalling over $155 million. This money would be spent on research and development of the LIS process and construction of a pilot plant. DOE is also proposing to construct a $200 million multipurpose plutonium isotope separation production plant by FY 1987.

If DOE insists on continuing the LIS program, it is essential that an EIS be prepared now before funds are committed to the development of a commercial production plant, at which point discussion of alternatives would be severely limited. Please let us hear from you on what actions you propose to take on this matter.

Sincerely yours,

Dr. Thomas B. Cochran
Senior Staff Scientist

Barbara A. Finamore
Attorney

Enclosure

FACT SHEET

In 1975, the Department of Energy (DOE) launched a research effort to develop a plutonium enrichment technology using lasers. This classified research was conducted at two DOE nuclear weapons laboratories -- Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory. This Laser Isotope Separation (LIS) program for plutonium was funded at $5 million in FY 1980 and in FY 1981.

The purpose and scope of the LIS program were revealed recently when the testimony of DOE and laboratory officials before the House Armed Services Committee was declassified.[1/] These officials stated that the same atomic laser isotope separation (LIS) process utilizing copper vapor lasers under development at LLNL for uranium enrichment, is being applied to plutonium. The weapons-related applications of the plutonium LIS process which were discussed include:

1) Making available for weapons use approximately 70 tonnes of plutonium by reprocessing commercial power reactor spent

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1/ Proposed Dept. of Energy Authorization Legislation (National Security Programs) for Fiscal Year 1982: Hearing before the House Subcomm. on Procurement and Military Nuclear Systems, 97th Cong., 1st Sess. 149, 157, 159-62, 174-176, 236 (Mar. 4, 1981)(statements of F. Charles Gilbert, Asst. Sec. for Nuclear Materials, DOE; and John Emmett, Assoc. Dir. for Lasers, Lawrence Livermore National Laboratory).

fuel and then enriching the plutonium to weapons-grade by LIS.[2/]

2) Conversion to weapons-grade of fuel-grade plutonium produced by the Hanford, Washington N-reactor. As of the end of FY 1980, there were some 4.2 tonnes of fuel-grade plutonium in unprocessed N-reactor spent fuel, 1.3 tonnes in scrap and 4 tonnes processed but unallocated fuel-grade plutonium. Much of this inventory will not be available since the N-reactor is the source of fuel for the U.S. plutonium breeder program, including the Clinch River reactor. Furthermore, that which is allocated for weapons would not require LIS enrichment, since it is and will continue to be converted to weapons-grade plutonium by blending it with super-grade plutonium from the DOE's Savannah River Plant.

3) Reduction in the Pu-240 impurities in weapons-grade plutonium in order to decrease the radiation hazard to DOE Defense Program personnel during plutonium recovery operations

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2/ According to testimony of F. Charles Gilbert, Assistant Secretary for Nuclear Materials, DOE:

> The various categories of plutonium represent the degree of purity of the plutonium. For simplicity, the categories of plutonium normally are related to the major plutonium isotopic contaminate which is Pu-240. The purity of plutonium decreases as the concentration of Pu-240 increases. The Pu-240 content of the different categories of plutonium are as follows:

Category	Percent Pu-240
Supergrade (high purity)	2-3
Weapon-grade	less than 7
Fuel-grade	7 to less than 19
Reactor-grade	19 or greater

Supra p. 170.

and weapon fabrication and disassembly, and to DOD personnel during weapon deployment in ships and submarines.

4) Provision of a source of two special isotopes for use in weapon research and development activities.

Non-weapons applications of the plutonium LIS process include:

1) Separation of the Pu-238 isotope. Pu-238 is currently produced in the Savannah River Plant production reactors. It is used as a heat source in thermoelectric generators used to power space satellites.

2) Separation of the Pu-241 isotope, which decays to Am-241 with a 15 year half-life. Am-241 is used for well logging and in smoke detectors.

These non-weapons applications currently require less than two percent of the output of the Savannah River Plant.

DOE and laboratory officials estimate that, given sufficient funding ($61.3 million in FY 1982, $50 million in FY 1983, and $65 million in FY 1984) it would be possible to have a multipurpose plutonium isotope separation plant on line by FY 1987. A pilot plant would cost about $40 million and a larger (production) plant about $200 million.