



Recommendation No. 6

June 20, 1995

Foreign Research Reactor Spent Nuclear Fuel

The FRR DEIS presents a number of alternative present and future actions for the handling and interim management of the spent nuclear fuel from foreign research reactors. The CAB has reviewed these alternatives and has recommendations on a number of these decisions. In this review, we were guided by the CAB-recommended Screening and Performance Criteria for this EIS that were approved at the March 28, 1995 regular meeting. The CAB strongly supports the nuclear nonproliferation policy of the United States and has the following specific recommendations we believe support that objective and are consistent with the other criteria.

1. We believe that Management Alternative 1, the acceptance and management of the spent fuel in the United States, provides the most support for the nonproliferation policy. It allows: (a) the most certain control of the final disposition of weapons-potential materials, (b) the strongest leadership for bringing other nations into LEU reactor usage, and (c) the least possibility that HEU from the reactors might illicitly or legally fall into a weapons program.
2. We support a policy duration of 10 years for LEU or indefinitely, if required, for any HEU not received within this period. As a shorter duration would limit the fraction of foreign HEU that is included, it is less desirable.
3. We understand that, under the Programmatic SNF&INEL EIS, shipments of these spent fuels would be limited to SRS and INEL, with SRS receiving only aluminum-clad fuels. We agree with the selection of SRS for its proposed portion of the materials. For the Phase I wet storage period at SRS, our attention has focused on the L-Reactor Disassembly Basin, which would be required early in the program once RBOF is filled. Although the scheduled upgrade of the L Basin water treatment may well eliminate serious corrosion during the necessary wet storage period, we urge intense scrutiny of corrosion activity in this upgraded basin.
4. We consider chemical separation of these fuels at SRS, followed by blending to LEU, to be the preferred alternative during Phase 2 of this program. We recognize that this is probably the most difficult choice to be made. Chemical separation is preferred over the option of dry storage because: (a) dry storage technology for aluminum clad fuel has not yet been demonstrated in the United States; (b) in comparison with stainless steel cladding, aluminum has far greater corrosion susceptibility and therefore is a much greater challenge in achieving safe, stable, long-term dry storage; (c) the dry storage option has a much greater cost uncertainty; and (d) this processing offers much greater assurance of meeting the geologic repository acceptance criteria required for ultimate disposition.

Our recommendation is difficult because of the uncertainties implied in the extension of the chemical separation activities in the SRS canyons. In view of the age and recent inactivity of the canyons, we recognize the potential for problems and delays that could have a major cost impact. We therefore urge that planning for and evaluation of the process activity be given highest priority. Also, as dry storage will eventually be required

for some portion of these fuels once processing ceases, it is very important for DOE to pursue development of this technology without delay.

We are aware that an argument against chemical separation is that it sets a poor example to other nations whom we discourage from any activity that creates HEU. We believe the blending-down step to LEU could be verified by international observers. This course is a strong demonstration of our nation's commitment to the nonproliferation policy.

5. On the question of the program's financing, we recommend that subsidies be provided to nations only to the degree that they are required to assure cooperation in the program's implementation. We understand that this would probably involve underdeveloped nations. It might also lead to less than full cost recovery with a developed nation that is considering a competitive foreign proposal for fuel disposal.
6. With the alternatives related to shipment and handling, we consider the risks to workers, the local populace and the environment to be minimal. While all established procedures for safe handling must be followed, cost differences between alternatives should be considered. We recognize that the general population and many of their civic leaders have often opposed local handling of spent fuel casks. These attitudes cannot be overlooked in the decision process. A well-conceived education program in the affected areas would be beneficial.

The CAB is well aware that this program cannot be achieved without budgetary support for the very large expenditures involved. In the current environment of reduced spending throughout the DOE nuclear weapons complex, the need for the highest attention to cost minimization is very evident. However, should budget restrictions be seen as undermining your ability to successfully complete this program, CAB will want to participate in whatever steps are then necessary to deal with the problem.

Attachment 2

The attached proposal was presented by Board Member Brian Costner during the June 20, 1995, Citizens Advisory Board meeting and is being submitted as a minority statement of dissent.

**Amendments to the
Savannah River Site Citizens Advisory Board
Foreign Research Reactor Spent Nuclear Fuel
Draft Environmental Impact Statement
Brian Costner, June 20, 1995
*Wet Storage in the L-Reactor Disassembly Basin (#3)***

Currently Proposed Language:

"For the Phase I wet storage at SRS, our attention has focused on the L-Reactor Disassembly Basin, which would be required early in the program once RBOFF [sic] is filled. Although the scheduled upgrade of the L Basin water treatment may well eliminate serious corrosion during the necessary wet storage period, we urge intense scrutiny of corrosion activity in this upgraded basin."

Rationale for Change:

- Use of the L-Reactor Disassembly Basin is central to the management of Foreign Research Reactor Spent Nuclear Fuel as described in the draft Environmental Impact Statement (EIS).
- The basin was not designed for extended storage of spent nuclear fuel, and reactor fuel and targets in the basin show signs of corrosion, some of which is extensive. This corrosion increases potential worker exposures, the chance of a criticality accident, handling difficulties, waste management impacts, and other risk factors.
- The basin does not fully meet current expectations for earthquake protection, leak detection, or safety reviews and documentation. Most facets of basin operations are self-regulated by the Department of Energy, and there are no mechanisms in place for international inspection and verification of material stored in the basin.
- Department of Energy and Westinghouse officials are working to control corrosion in the basin and improve the safety of its operations. Two key purposes of this effort are to: (1) stabilize and ultimately remove corroding materials, and (2) prepare the basin to receive additional spent fuel. Currently, Westinghouse expects that the basin can be expected to safely store spent fuel for years, perhaps as long as 10-20 years.
- The draft EIS does not contain an adequate discussion of the current condition of the L-Reactor Disassembly Basin, plans to improve and maintain the basin's safety, or potential accident scenarios unique to concerns about basin.

Amendment, replace proposed language with:

"We are very concerned about DOE's plans to use the L-Reactor Disassembly Basin for extended storage of spent nuclear fuel during Phase I of the proposal. The final EIS should contain a thorough discussion of current conditions in the basin, plans to improve and maintain the basin's safety, and potential accident scenarios unique to the basin's design. Moreover, before making a decision to place additional spent fuel in the basin, DOE should complete the facility modifications and safety documentation necessary to reasonably assure safe storage for a period of at least ten years. DOE should also accelerate its efforts to provide independent inspection, verification and regulation of the basin."

Reprocessing of Foreign Research Reactor Spent Nuclear Fuel (#4)

Currently Proposed Language and Rationale for Change:

"We consider chemical separation of these fuels at SRS, followed by blending to LEU, to be the preferred alternative during Phase 2 of this program."

- The draft EIS does not thoroughly evaluate dry storage or reprocessing of foreign research reactor spent nuclear fuel. The document does not have the information necessary to support a sound decision.
- For reprocessing, the draft EIS does not adequately consider the current condition of facilities, necessary steps to upgrade the canyons for long term operations, costs, accident scenarios, or other factors.
- For dry storage, the draft EIS does not adequately explain the applicability of various technologies to foreign research reactor spent nuclear fuel, discuss accelerated construction schedules, or consider all relevant information.

"Chemical separation is preferred over the option of dry storage because: (a) dry storage technology for aluminum clad fuel has not yet been demonstrated in the United States..."

- There's nothing unique about the spent fuel which will make its behavior in the U.S. any different than its behavior in Japan or Australia. There is ample experience in the U.S.

with dry storage technology generally as well as with spent fuel management to provide confidence that it can be used here.

- Many treatment and disposal technologies for high-level, transuranic, and mixed wastes generated through reprocessing have not been demonstrated in the U.S. either. In some cases, these technologies may be more problematic to implement because of the nature of reprocessing wastes and the type of technology (e.g., incineration).

"...(b) in comparison with stainless steel cladding, aluminum has far greater corrosion susceptibility and therefore is a much greater challenge in achieving safe, stable, long-term dry storage..."

- This does not mean, though, that safe, stable, long-term dry storage cannot be accomplished with aluminum clad spent fuel.
- A more appropriate comparison is between the safety and stability of storing aluminum clad spent fuel with the storage of the wastes generated by reprocessing that fuel. This comparison has not been done.
- Many details of dry storage technology were not discussed by the subcommittee prior to preparing this recommendation, and they are not adequately addressed in the draft EIS.

"...(c) the dry storage option has a much greater cost uncertainty..."

- This conclusion is based on incomplete and misleading information about reprocessing costs in the draft EIS and in presentations to the subcommittee. First, the cost of canyon operations is unfairly divided between reprocessing foreign spent fuel and other operations so that reprocessing foreign spent fuel appears very cheap. Second, the full potential costs of upgrading one or both canyons to is not included in the cost estimates. Third, the presentation to the subcommittee assumed reprocessing could continue smoothly until 2005 - two to five years longer than currently planned. Fourth, the cost estimates don't consider accidents, unexpected safety issues, and other uncertainties associated with running forty year old facilities.

"...and (d) this processing offers much greater assurance of meeting the geologic repository acceptance criteria required for ultimate disposition."

- There is no repository criteria, but there is also no reason to assume that the foreign research reactor spent nuclear fuel cannot be prepared to meet repository criteria once it is established.
- Even with reprocessing at SRS, the disposition of aluminum-clad spent fuel and/or spent fuel with highly-enriched uranium must be addressed eventually by DOE because not all this type of spent fuel will be reprocessed.

"Also, as dry storage will eventually be required for some portion of these fuels once reprocessing ceases, it is very important for DOE to pursue development of this technology without delay."

- The ability of DOE to fully budget and plan for dry storage while reprocessing has not been considered.
- All concerns about dry storage must apparently be resolved in any case.

"We are aware that an argument against chemical separation is that it sets a poor example to other nations whom we discourage from any activity that creates HEU. We believe the blending down step to LEU could be verified by international observers. This course is a strong demonstration of our nation's commitment to the nonproliferation policy."

- The larger concern about reprocessing is that it separates weapons-usable plutonium in an environment in which accountability is very difficult, even with international observers present. The U.S. has tried very hard to discourage North Korea and other countries from reprocessing either as a part of their nuclear fuel cycle or as a waste management operation. If the U.S. selects reprocessing as a preferred technology, then other countries may be strengthened in their desire to reprocess.
- The criteria currently being used in the U.S. for making weapons-usable fissile materials proliferation resistant is the "spent fuel standard." Since foreign research reactor spent fuel already meets this criteria, there is no compelling reason to adopt a higher standard.
- The draft EIS does not indicate that DOE has any plans to conduct the blending of highly-enriched uranium to low-enriched uranium with any form of verification or international inspection.

Amendment, replace item #4 with:

Before accepting the large quantity of spent fuel described in the draft EIS, DOE must have in place a sound plan for managing the spent fuel. Unfortunately, the draft EIS does not present such a sound plan because the two key long-term management options - dry storage and reprocessing - are not (adequately evaluated. DOE should more carefully analyze these alternatives before making a determination.

Agency Responses

[Department of Energy-SR](#)