GE STOCKHOLDERS' ALLIANCE, PATRICIA BIRNIE
PAGE 1 OF 1

Date Received: 06/12/96
Comment ID: P0048
Name: Patricia Burney
Address: GE Stockholder's Alliance

Transcription:

Hello, this is Patricia Burney with the G.E. Stockholder's Alliance. And I first want to thank you for having this phone line available for our comments. I am sending a written statement as well which will have my address and phone number so I won't bother you with it now. But I do want to encourage you to oppose the use of MOX, the mixed oxide, as a fuel for commercial nuclear reactors. There are many reasons why that I am stipulating in my letter, but I wanted to just call in with my opposition to it being used. It makes it so much more possible to make the material available for proliferation; it increases the volume and radioactivity of waste that would be generated; it would require military escort when the -- to take care of the unused fuel. There's just so many reasons that it's not wise to follow that option, and we would strongly encourage you instead to use the vitrification process as the choice -- the option that you would choose for this mixed oxide plutonium and uranium. Thank you and I'll send my letter in tomorrow's mail Thank you very much. Bye.

1/08.03.01

2/08.03.01

P-048

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy acknowledges the commentor's support for the Immobilization Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

GE Stockholders' Alliance

for a sustainable nuclear-free future

6340 W. Bar X Street
Tucson, AZ 85713-6402
Phone: (520) 908-0200
Fax: (520) 908-8273

June 7, 1996

Office of Fissile Materials Disposition
U.S. Department of Energy
P.O.Box 23786
Washington, DC 20026-3786

Re: OPPOSITION TO USE OF MIXED OXIDE FUEL FOR COMMERCIAL REACTORS

Dear Sirs:

We strongly oppose the use of mixed oxide fuel (MOX) as a fuel for commercial reactors. | 1/08.03.01

For many years the U.S. has staunchly maintained a policy of separation of civilian use and military use of radioactive materials. This policy should be retained and strengthened. | 2/01.00.00

While it may be tempting to use the plutonium waste from dismantled nuclear weapons as a source of fuel for commercial reactors, we believe the negative factors outweigh the positive.

1. Use of MOX would greatly increase the availability of plutonium for proliferation use since the plutonium would be easily separated from its other components. | 3/01.06.00

2. Use of MOX would greatly increase the volume and radioactivity of waste generated. We don't know what to do with the radioactive waste already generated. Use of MOX would exacerbate an already severe problem. | 4/09.11.08

3. Because of its proliferation potential, used MOX fuel would require military escorts in transportation to waste sites, and military surveillance during storage of the fuel..."forever". | 3/01.06.00 cont.

We believe it would be more responsible of the DOE to vitrify the plutonium waste from dismantled weapons, and in the long run would cost the taxpayer much less. | 5/08.03.01

PLEASE DO NOT CONSIDER USING MOX FOR COMMERCIAL REACTOR USE!

Sincerely,

Patricia T. Birnie

Patricia T. Birnie, Chair

M-273

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

01 00 00 **Comment Number 2**

Comment noted.

01 06 00 **Comment Number 3**

The safeguards and security of storage of the weapons-usable fissile materials will continue to follow existing applicable regulations and requirements. Furthermore, the facilities would be inspectable by IAEA, as appropriate. Transportation impacts are discussed in Section 4.4 and Appendix G of the PEIS. Armed nuclear materials couriers carefully selected and highly trained to operate tractor-trailers and communication systems would be used. These couriers would also be authorized by the AEA to carry firearms and make arrests in the performance of their duties. No military personnel would be used in DOE's management of weapons-usable fissile materials.

The President's Nonproliferation Policy says the United States will not recycle Pu. Burning weapons Pu in reactors does not utilize the recycling process because the Pu in the spent fuel from this process will not be extracted for reuse in new fuel. This is consistent with U.S. policy since no Pu is being recycled. After a once-through fuel cycle, the Pu would be converted to a nonproliferation form as spent reactor fuel.

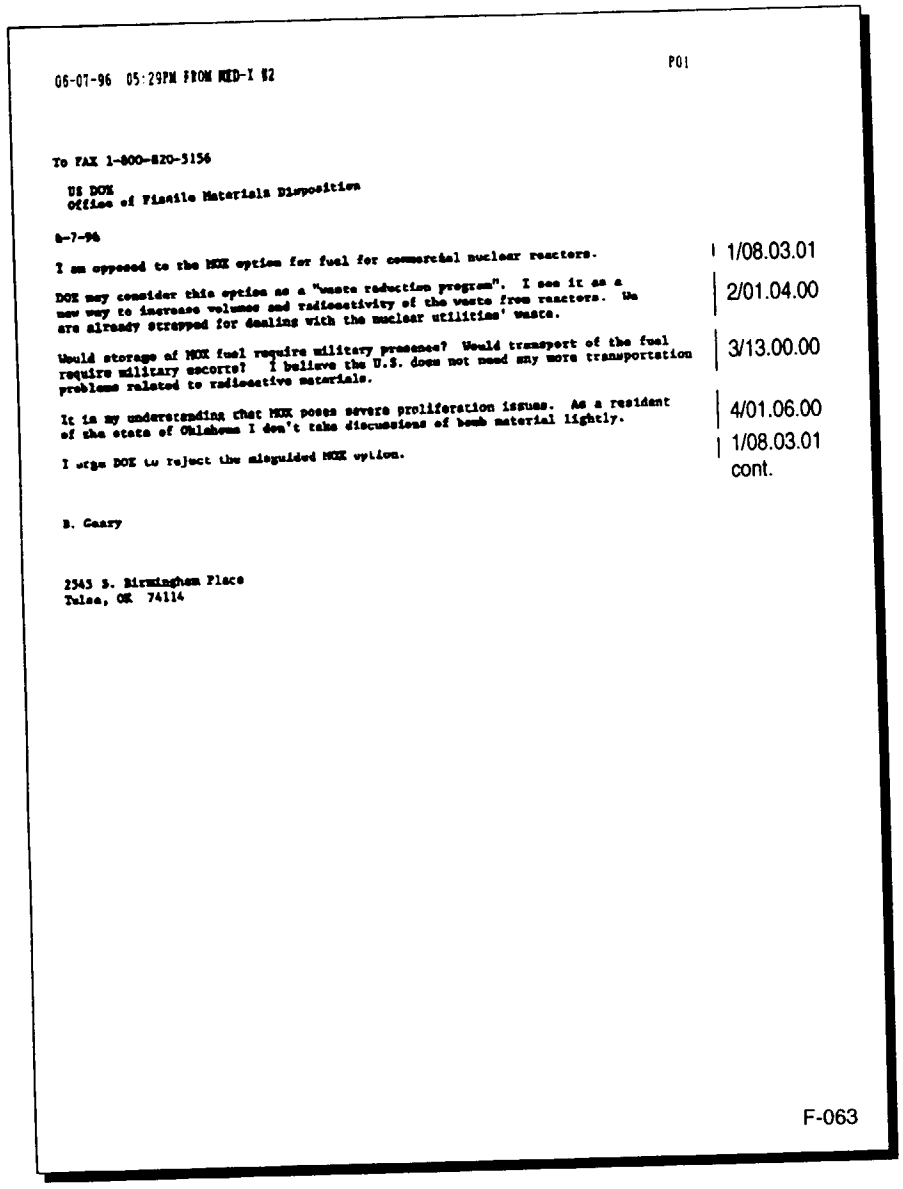
09 11 08 **Comment Number 4**

The MOX Fuel Option is a means of converting weapons Pu to a form that is difficult to retrieve and reuse in weapons. The MOX Fuel Options does not increase the volumes and radioactivity of waste from existing reactors. It replaces the spent fuel that would have been fabricated from other materials

and displaces the spent fuel that would have otherwise been created by other sources of fuel supply. The spent MOX fuel is essentially the same as existing commercial reactor spent fuel. Therefore, it meets the same criteria as other commercial reactor spent fuel in terms of being accepted for placement in a repository. The PEIS acknowledges the fact that constructing and operating a MOX fuel fabrication facility would increase the wastes generated at any sites selected for analyses. The wastes generated for the MOX fuel fabrication facility are presented in Section E.3.2.3. The impacts associated with operating the MOX fuel fabrication facility are presented in Section 4.3.5.1.10.

08 03 01 Comment Number 5

The Department of Energy acknowledges the commentor's support for the Immobilization Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.



06-07-96 05:29PM FROM MED-I 02 P01

To FAX 1-800-820-5156

US DOE
Office of Fissile Materials Disposition

6-7-96

I am opposed to the MOX option for fuel for commercial nuclear reactors. | 1/08.03.01

DOE may consider this option as a "waste reduction program". I see it as a new way to increase volumes and radioactivity of the waste from reactors. We are already strapped for dealing with the nuclear utilities' waste. | 2/01.04.00

Would storage of MOX fuel require military presence? Would transport of the fuel require military escorts? I believe the U.S. does not need any more transportation problems related to radioactive materials. | 3/13.00.00

It is my understanding that MOX poses severe proliferation issues. As a resident of the state of Oklahoma I don't take discussions of bomb material lightly. | 4/01.06.00

I urge DOE to reject the misguided MOX option. | 1/08.03.01 cont.

B. Geary

2543 S. Birmingham Place
Tulsa, OK 74114

F-063

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

01 04 00 **Comment Number 2**

The MOX Fuel Option is not a "waste reduction program." It is a means of converting weapons Pu to a form that is difficult to retrieve and reuse in weapons. The MOX Fuel Option does not increase the volumes and radioactivity of waste from existing reactors. It replaces fuel that would have been fabricated from other materials and displaces the spent fuel that would have otherwise been created by other sources of fuel supply. The spent MOX fuel is essentially the same as existing commercial reactor spent fuel. Therefore, it meets the same criteria as other commercial reactor spent fuel in terms of being accepted for placement in a repository.

13 00 00 **Comment Number 3**

The safeguards and security of storage of the weapons-usable fissile materials will continue to follow existing applicable regulations and requirements. Furthermore, the facilities would be inspectable by IAEA, as appropriate. Transportation impacts are discussed in Section 4.4 and Appendix G of the PEIS. Armed nuclear materials couriers carefully selected and highly trained to operate tractor-trailers and communication systems would be used. These couriers would also be authorized by AEA to carry firearms and make arrests in the performance of their duties. No military personnel would be used in DOE's management of weapons-usable fissile materials.

01 06 00 **Comment Number 4**

The President's Nonproliferation Policy says the United States will not recycle Pu. Burning weapons Pu in reactors does not utilize the recycling process because the Pu in the spent fuel from this process will not be extracted

GEARY, B., TULSA, OK

for reuse in new fuel. This is consistent with U.S. policy since no Pu is being recycled. After a once-through fuel cycle, the Pu would be converted to a nonproliferation form as spent reactor fuel.

GENERAL ATOMICS

GA/DOE-027-96
Project 9866
April 30, 1996

Mr. Gregory P. Rudy, Acting Director
Office of Fissile Materials Disposition
U.S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786

SUBJECT: Comments on Draft Programmatic Environmental Impact Statement (EIS) on Storage and Disposition of Weapons-Useable Fissile Materials

References: (1) R.M. Forssell letter to Howard R. Canter, "Scope for Environmental Impact Statement for Long-Term Storage and Disposition of Weapons-Usable Fissile Material: Plutonium Consumption Modular Helium Reactor," GA/DOE-035-95, February 10, 1995

(2) A.J. Neylan letter to Howard R. Canter, "Programmatic EIS Screening Results," GA/DOE-068-95, June 6, 1995

Dear Mr. Rudy,

This letter provides the comments of General Atomics (GA) on the subject Draft Programmatic EIS. GA has previously provided to DOE via References (1) and (2) its comments on the results of the Screening Process, by which DOE selected the alternatives to be considered in this Programmatic EIS, and on the scope of the Programmatic EIS. Copies of these references are attached to this letter (Attachments 1 and 2). GA requests that the comments in Attachments 1 and 2 be included in the public record as part of its comments on the Draft Programmatic EIS itself. The comments primarily addressed 1) DOE's decision and rationale for not including the Gas Turbine Modular Helium Reactor (GT-MHR) as a reasonable alternative to be considered in this Programmatic EIS and 2) DOE's interpretation of the spent fuel standard as an objective that is not to be exceeded (by eliminating from consideration in this Programmatic EIS all alternatives capable of exceeding the spent fuel standard), without having provided the public with a full comparison of the environmental impacts associated with that decision.

Additional comments are provided with this letter in Attachment 3. These comments address 1) the manner in which DOE has provided only superficial consideration (in a three page appendix to the Programmatic EIS) of multipurpose reactor options for plutonium disposition and tritium supply; 2) the imposed schedule for demonstration of disposition technologies and for completion of disposition and the environmental impacts that result from that schedule; 3) the suitability of final waste forms for permanent disposal in terms of long term safeguards requirements and long term radionuclide containment; 4) issues associated with borosilicate glass as a vitrification option; 5) the viability of using electrometallurgical treatment (pyroprocessing) as an immobilization option; 6) use of a coated particle waste form for plutonium

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A. J. NEYLAN
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Mr. Gregory P. Rudy -2- GA/DOE-027-96

immobilization; and 7) the treatment of certain environmental impacts associated with the CANDU reactor option for plutonium disposition.

GA continues to believe that the GT-MHR (identified as the Plutonium Consumption Modular Helium Reactor [PC-MHR] when applied to the plutonium disposition mission) must be evaluated in the Programmatic EIS because it is a reasonable alternative for plutonium disposition. GA also believes that the manner in which DOE has applied the spent fuel standard is a significant issue that must also be evaluated in the Programmatic EIS, especially in view of the availability of reasonable alternatives such as the GT-MHR, which is capable of exceeding the spent fuel standard and leaving a factor of five less plutonium-239 remaining than reactor alternatives that merely meet the standard. 1/14.00.00 2/01.05.00

The National Environmental Policy Act (NEPA) requires that all reasonable alternatives and significant issues be evaluated in the PEIS process. By addressing all reasonable alternatives and significant issues as required, DOE will provide a strong foundation for the Record of Decision, will avoid the potential for substantial delays in the plutonium disposition effort that might result from legal action as a result of the manner in which DOE has discharged its obligations under NEPA, and will enhance the credibility of DOE's efforts in the eyes of all stakeholders who have an interest in the resolution of the plutonium disposition problem.

GA again respectfully requests that DOE reconsider its decision to exclude the GT-MHR and the interpretation of the spent fuel standard from consideration in the Programmatic EIS. If you have any questions regarding General Atomics' comments or would like further information, please contact Dave Alberstein at (619) 455-2088.

Sincerely,

D. Alberstein for AJN

A.J. Neylan
Vice President, Power Reactor Group

AJN/DA:da

Attachments:

1) GA/DOE-035-95, February 10, 1995
2) GA/DOE-068-95, June 6, 1995
3) Additional General Atomics Comments on the Draft Programmatic Environmental Impact Statement for Storage and Disposition of Weapons-Useable Fissile Materials

cc:

J.D. Nulton, DOE-HQ

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14 00 00 Comment Number 1

The Advanced Deep Burn Reactors Option, including Modular Helium Reactors (MHR), was considered in the screening process. Notwithstanding the many potential benefits of their use, the technical immaturity would call for costly and lengthy development and demonstration efforts to bring them to a viable status. The Screening Committee decided that the increased Pu burn-up offered by this option would not counterbalance its cost, schedule, or technical risks, and therefore eliminated this option from further consideration. Clarification has been provided in Appendix N of the Final PEIS for the various multipurpose reactor concepts.

01 05 00 Comment Number 2

The Department of Energy, in considering the Spent Fuel Standard, did evaluate the adequacy of the Standard versus the greater degree of destruction achievable with other options such as the Deep Burn Reactor and the Accelerator Options in the Screening Report. It was judged that the Spent Fuel Standard is adequate since it would convert the weapons Pu to a form that would make it as difficult to retrieve and reuse in a weapon as the Pu contained in the much larger existing volume of spent fuel from commercial nuclear reactors.

The Department of Energy concluded that the shorter disposition time achievable with more mature technologies was more desirable than the greater Pu destruction that could only be achieved over a much longer time period through the use of Deep Burn Reactors and Accelerators. The NAS also adopted the Spent Fuel Standard as the most acceptable form for conversion of weapons Pu.

ATTACHMENT 1 TO GA/DOE-027-96

GA/DOE-035-95
February 10, 1995

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GA/DOE-035-95
Project 6301
WBS: 5109 91
February 10, 1995

Mr. Howard R. Canter, Technical Director
Office of Fissile Materials Disposition
U.S. Department of Energy
Washington, DC 20585

SUBJECT: Scope for Programmatic Environmental Impact Statement for Long-Term Storage and Disposition of Weapons-Useable Fissile Material: Plutonium Consumption Modular Helium Reactor

Dear Mr. Canter:

Thank you for the opportunity to meet with you on February 1, 1995, to discuss the status of the Plutonium Consumption Modular Helium Reactor (PC-MHR) in the scoping process for the Programmatic Environmental Impact Statement (PEIS) for Long-Term Storage and Disposition of Weapons-Useable Fissile Materials. During that meeting you did not indicate that the PC-MHR had been eliminated in the screening process for the PEIS. However, we note from the draft report to Congress on the multipurpose reactor, which is dated January 31, 1995, and which GA received from your office for review and comment on February 3, 1995, that the PC-MHR has been eliminated from consideration.

GA will provide its comments on the draft multipurpose report, per your request, via a separate letter. The purpose of this letter is to explain why GA believes that it would be improper to exclude the PC-MHR as an alternative in the PEIS for fissile materials disposition and to request that DOE reconsider its decision to exclude the PC-MHR from evaluation in the PEIS. GA is sufficiently concerned about this matter that it has sought the advice of consultants with expertise in the legal requirements of the National Environmental Policy Act (NEPA). We are advised that our concerns are substantive and have merit relative to the requirements of NEPA.

GA believes that under both the letter and the spirit of NEPA the PC-MHR must be included and evaluated in the PEIS. NEPA regulations require that the PEIS evaluate all reasonable alternatives (40CFR1502.14) and provide in depth analysis of all significant issues (40CFR1501.7 and 40CFR1508.27). While NEPA itself does not provide a benchmark for what constitute "reasonable" alternatives, certain principles are clearly discernable from the applicable regulations and court decisions. While the scope of reasonable alternatives must, of course, be bounded by some sense of feasibility or practicality, it is not permissible to exclude any viable alternatives merely on, for example, policy or political grounds. 3/08.00.00

The PC-MHR is a reasonable alternative for plutonium disposition relative to DOE's nine published screening criteria. Among the alternatives that involve construction of a new reactor dedicated to the plutonium disposition mission, it has superior safety and environmental impact characteristics, very low life cycle cost under government ownership (even when remaining engineering development costs are taken into account), a fuel cycle with superior diversion and proliferation resistance characteristics, and a spent fuel form that is best suited for long term disposal in a geologic repository. The strong interest 4/14.00.00

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08 00 00 Comment Number 3

The MHRs were considered as Reactor Alternatives in the screening process. The MHRs were not excluded on political grounds. The Screening Committee decided that the increased Pu burn up offered by this option would not counterbalance its cost, schedule, or technical risks, and therefore eliminated this option from further consideration. Clarification has been provided in Appendix N of the Final PEIS for the various multipurpose reactor concepts.

14 00 00 Comment Number 4

To meet the Nation's goals in support of its nonproliferation policies, DOE determined that the "clear and present danger" demands that the disposition of Pu be initiated within approximately a decade. To achieve this objective, an alternative must be nearly ready for development or be an extension of an existing technology. Clarification has been provided in Appendix N of the Final PEIS for the various multipurpose reactor concepts.

4/14.00.00 cont.

expressed by the Russians in using the MHR for plutonium disposition is clear evidence of its ability to influence disposition of international weapons-useable materials inventories and to foster cooperation with Russia.

5/07.00.00

With regard to DOE's timeliness criterion, under the requirements of NEPA DOE cannot exclude reasonable alternatives on the basis of administrative deadlines or artificial time schedules. It should be noted that regardless of the alternative chosen for plutonium disposition, construction and use of facilities for long term storage of surplus weapons grade plutonium will be necessary. Although the projected schedule for initial deployment of the PC-MHR in the United States is about five years longer than that claimed during Phase I of the DOE Plutonium Disposition Study (PDS) by proponents of other reactor alternatives, the critical factor is that the PC-MHR is capable of completing the plutonium disposition mission within the 25 year overall mission duration that has served as the planning basis for the PDS.

6/01.05.00

The draft report to Congress on the multipurpose reactor basically states that the PC-MHR is being eliminated on the basis of "technical immaturity". This statement is inconsistent with the fact that the MHR has been developed based upon extensive experience with more than 50 gas-cooled reactors built and operated over the last 35 years, including five high temperature gas-cooled reactors that have confirmed the major design features of the MHR.

This statement is also incongruous with previous positions taken by DOE. Only three years ago the MHR was one of the final alternatives under consideration for selection as the New Production Reactor. It was, by most accounts, the most likely alternative to have been selected had that Record of Decision not been postponed only one month prior to its scheduled release date. The MHR had been selected as one of the final alternatives following extensive review by the Secretary's Energy Research Advisory Board. In light of this history, it is unjustifiable that DOE would not evaluate in the PEIS for fissile materials disposition a technology option that so recently was under favorable consideration for a mission that is vital to national security. These facts alone demonstrate that the PC-MHR must be included as a reasonable alternative in the PEIS.

7/14.00.00

The PC-MHR differs from the new production reactor design in only two ways: use of plutonium oxide fuel and use of the direct cycle gas turbine to improve plant efficiency and economics. As indicated by the enclosed white paper on fuel development status, which summarizes information that DOE has had in its possession for almost two years under the Plutonium Disposition Study, coated particle plutonium fuel that meets the performance requirements of the PC-MHR has been successfully demonstrated in six separate irradiation tests in a high temperature gas-cooled reactor environment. These tests confirmed the ability of weapons grade plutonium coated particle fuel to achieve high levels of plutonium destruction while maintaining coating integrity and retention of radionuclides in the fuel particles.

As indicated by the enclosed white paper on the power conversion system, there exists an extensive technology base for the power conversion system major components. Basic research and development are not needed to complete engineering and demonstration of the system. As shown in GA's Phase II Plutonium Disposition Study report, the power conversion system is not on the critical path for deployment of the PC-MHR. The power conversion system of the MHR has been assessed by two organizations recognized throughout the world as experts in gas turbine and Brayton cycle technology - General Electric and AlliedSignal. Both have endorsed the power conversion system and have concluded that it can be demonstrated in a timely manner.

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07 00 00 Comment Number 5

During the PEIS scoping process and related public meetings, DOE asked for input on the screening criteria. Some respondents reacted to the timeliness statement that "The technology concept should be demonstrated within approximately 20 years and disposition should be completed within approximately 50 years." These respondents ranked our stated definition of timeliness low indicating that 20 and 50 years was too long and it was important for DOE to start and finish earlier. Clarification has been provided in Appendix N of the Final PEIS for the various multipurpose reactor concepts.

01 05 00 Comment Number 6

The Department of Energy recognizes the potential benefits (unrelated to Pu disposition) that can be offered by the Plutonium Consumption Modular Helium Reactor (PC-MHR) Option. Nevertheless, as explained in Appendix N of the Final PEIS, because this technology needs further development and the benefits do not counterbalance the cost, schedule, or technical risks associated with this option, there is no justification to develop this technology solely for the purpose of Pu disposition. Pu disposition can be accomplished using existing technologies to achieve the Spent Fuel Standard. It is unnecessary to exceed the Spent Fuel Standard since the amount of Pu that could be declared surplus from weapons is much less than the inventory of Pu in commercial spent fuel.

14 00 00 Comment Number 7

The Advanced Deep Burn Reactors Option, including MHRs, was considered in the screening process. Notwithstanding the many potential benefits of their use, the technical immaturity would call for costly and lengthy development and demonstration efforts to bring them to a viable status. The Screening Committee decided that the increased Pu burn-up offered by this option would counterbalance its cost, schedule, or technical risks; therefore, this option was eliminated from further consideration. Appendix N of the Final PEIS provides further explanation related to the various multipurpose reactors.

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Based upon these considerations, GA believes that there is no rational argument, relative to DOE's nine published criteria for the screening of disposition alternatives or to DOE's stated purpose and need for taking action, upon which the PC-MHR can be eliminated from consideration and evaluation in the PEIS. GA is aware that DOE has eliminated some plutonium disposition alternatives based on the assessment that their deployment would be in violation of certain international treaties or other legal considerations. GA is aware, however, of no such institutional considerations that justify elimination of the PC-MHR from evaluation in the PEIS. 8/01.00.00

In addition to GA's concerns regarding the improper exclusion of the PC-MHR from evaluation in the PEIS, there is an additional significant issue which must be addressed in the PEIS. GA believes that the PEIS must consider the adequacy and acceptability of the spent fuel standard. In addition to its many advantages cited above, the PC-MHR is capable of exceeding the spent fuel standard in a single pass of the fuel through the reactor without recycle. The final product resulting from the disposition of weapons grade plutonium in the PC-MHR contains a factor of five less plutonium-239 than that which results from disposition in other reactor options that merely meet the spent fuel standard. If the PC-MHR and other reasonable "deep burn" alternatives are eliminated from evaluation at this time, such elimination will constitute a de facto adoption of the spent fuel standard without the full evaluation required under NEPA. As noted in the National Academy of Sciences (NAS) report on plutonium disposition, "over the long term, however, steps beyond the spent fuel standard will be necessary." The PC-MHR has the capability to take those steps today and provide a one-step, permanent solution to the problem of disposition of surplus weapons grade plutonium with lower total environmental impact than that resulting from the choice of alternatives that merely meet the spent fuel standard and leave the matter of ultimate disposition, and its associated environmental impacts, for future generations. 2/01.05.00 cont.

During the public scoping meetings for the PEIS held in the summer and fall of 1994, the adequacy and acceptability of the spent fuel standard was a subject of much discussion and disagreement. These discussions are partially documented in DOE's PEIS Scoping Meeting Comment Summary Report of November 30, 1994. However, during its presentations in the public meetings on plutonium disposition on December 13-14, 1994, DOE appeared to dismiss this significant issue on the basis that there did not "appear to be strong sentiment for exceeding the spent fuel standard." Members of Congress have also indicated that a consensus has not been reached in Congress on the adequacy of the standard. Questions have been raised regarding whether the alternatives that merely meet the spent fuel standard will adequately meet one of the major national security objectives of the plutonium disposition effort identified in the NAS report and adopted by DOE in its June 21, 1994, Notice of Intent to prepare the PEIS: to minimize the risk that weapons or fissile materials could be reintroduced into the arsenals from which they came.

DOE appears to be adopting the spent fuel standard without providing to the public the results of an objective assessment of the diversion and proliferation resistance and total environmental impacts of alternatives that meet the standard vs reasonable alternatives for plutonium disposition that can exceed the spent fuel standard. The NAS report recommended that efforts to exceed the spent fuel standard not be addressed at this time based upon certain assumptions about deployment time, cost, and technical uncertainty of alternatives that can exceed the standard. These assumptions were not supported by NAS with any specific analyses. The DOE Plutonium Disposition Study later provided such analyses, and the results indicate that some of these assumptions are ill founded. 6/01.05.00 cont.

01 00 00 Comment Number 8

Comment noted. Appendix N has been revised to provide further explanation concerning the PC-MHR and other multipurpose reactors as alternatives for Pu disposition.

The adequacy of the spent fuel standard is, accordingly, a significant issue which must be evaluated in detail in the PEIS. However, regardless of whether the spent fuel standard is considered in the PEIS and ultimately deemed to be an acceptable interim standard, the PC-MHR is a reasonable alternative for plutonium disposition based on its superior safety and environmental characteristics, cost characteristics, diversion and proliferation resistance, spent fuel form, and level of technical maturity as evidenced by its earlier consideration under the New Production Reactor Program. The ability of the PC-MHR to exceed the spent fuel standard is a readily achievable additional benefit. 2/01.05.00 cont.

In summary, GA believes that the PC-MHR must be evaluated in the PEIS because it is a reasonable alternative for plutonium disposition. GA also believes that the adequacy and acceptability of the spent fuel standard is a significant open issue that must also be evaluated in the PEIS, especially in view of the availability of reasonable alternatives such as the PC-MHR, which is capable of exceeding the spent fuel standard and leaving a factor of five less plutonium-239 remaining than reactor alternatives that merely meet the standard. 1/14.00.00 cont. 2/01.05.00 cont.

NEPA requires that all reasonable alternatives and significant issues be evaluated in the PEIS process. By addressing all reasonable alternatives and significant issues as required, DOE will provide a strong foundation for the Record of Decision, will avoid the potential for substantial delays in the plutonium disposition effort that might result from questions regarding the manner in which DOE has discharged its obligations under NEPA, and will enhance the credibility of DOE's efforts in the eyes of all stakeholders who have an interest in the resolution of the plutonium disposition problem.

GA respectfully requests that DOE reconsider its decision to exclude the PC-MHR and the spent fuel standard from consideration in the Programmatic EIS. 1/14.00.00 cont.

Sincerely,

R. M. Forssell
Senior Vice President
Power Reactor Group

Enclosures:

1) Fuel Development Status of the Plutonium Consumption Modular Helium Reactor (PC-MHR)
2) GT-MHR Power Conversion System - State of the Art Technology

cc:
C.B. Curtis
R.W. DeGrasse
J.D. Nulton
A.I. Cygelman
J.M. Turner, DOE-OAK
S. El Safwany, DOE-OAK

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FUEL DEVELOPMENT STATUS OF THE
PLUTONIUM CONSUMPTION MODULAR HELIUM REACTOR (PC-MHR)

STATUS

Fuel that meets PC-MHR operating requirements has been demonstrated. Additional tests are planned to expand the data base and confirm performance under accident conditions.

BACKGROUND

The PC-MHR can achieve very high levels of weapons grade plutonium destruction without recycle. Destruction of more than 90% of the initially charged plutonium-239 and more than 65% of the initially charged total plutonium is obtained in a single pass through the reactor. This level of destruction makes the discharged plutonium in the spent fuel particularly unattractive for weapons applications relative to the plutonium contained in the spent fuel from other reactor types.

The PC-MHR can achieve this high level of plutonium destruction due, in large part, to the high burnup capability of its plutonium oxide, refractory coated particle fuel. The high burnup capability of this fuel, and its excellent retention of fission product radionuclides, have been demonstrated in irradiation tests of TRISO-coated plutonium fuel conducted in the late 1960s and early 1970s.

The PC-MHR design includes a high pressure, low leakage containment. By taking credit for the enhanced radionuclide retention provided by this containment, the allowable coated particle fuel failure during design basis accident conditions is about a factor of ten larger for the PC-MHR than for the commercial GT-MHR, which has a vented, low pressure containment.

The fuel quality and performance requirements of the PC-MHR during normal operation are similar to performance levels experienced at the Fort St. Vrain reactor, for which more than 30 metric tonnes of TRISO-coated uranium particle fuel were fabricated. This fuel met the required as-manufactured quality levels and, as evidenced by primary coolant radionuclide activity levels that were a factor of 30 less than the design basis, performed much better than required. The core average design basis performance requirement for PC-MHR fuel is a coating failure fraction of less than 4×10^{-4} at an average burnup of about 590,000 MWd/MT (785,000 MWd/MT peak).

Six irradiation tests have been conducted using near weapons grade, highly enriched (88% Pu-239) TRISO-coated plutonium fuel. Five of these tests were performed as part of the Dragon high temperature gas-cooled reactor project (United Kingdom) in the late 60s, and the sixth was performed by General Atomics in the Peach Bottom HTGR in the early 1970s. The fuel for the Dragon tests, which consisted of loose particles in graphite holders, was fabricated by Belgonucleaire in Europe. For the Peach Bottom test, Oak Ridge National Laboratory fabricated the coated particles and standard fuel rod compacts.

These six irradiation tests encompassed a range of irradiation temperatures up to 1450°C and peak fast neutron fluences of up to 2.3×10^{25} n/m^2. Burnups of up to 747,000 MWd/MT were achieved, which resulted in destruction of more than 90% of the initially charged plutonium-239. These irradiation conditions are, with the exception of fast neutron fluence, nearly the same or in excess of those required for the fuel in the PC-MHR. The plutonium fuel like that planned for use in the PC-MHR performed well in these tests, showing release of fission products at a rate that was about a factor of ten less than that required for fuel in the PC-MHR. Based on the results of simulated core heatup tests of other TRISO-coated particle fuels with a range of compositions and irradiation conditions, minimal additional failure of the plutonium fuel particles is expected under accident conditions in which the peak fuel temperature is expected to approach 1600°C.

The plutonium coated particle fuel irradiation test results are consistent with results obtained for other high burnup TRISO-coated fuels. High burnup, highly enriched fuel particles have been under development at General Atomics for more than twenty five years.

The reference fissile fuel particle for the large HTGR designs of the 1973-1982 period was 93.15% enriched uranium carbide featuring essentially the same TRISO coating planned for use in the PC-MHR. In 1978 General Atomics prepared

a safety analysis report on the use of this highly enriched uranium carbide fuel in Fort St. Vrain reload fuel elements. NRC approval for use of this fuel was provided in 1979, based on a review of the safety analysis report and of the irradiation data base for this high burnup fuel.

The irradiation test experience for this fuel at that time included 316,000 particles successfully tested at nominal temperatures from 885°C to 1240°C and fast neutron fluences of 3.5 to 12.0 x 10^{25} n/m^2. A total of 250,000 of these particles were irradiated to burnups of at least 662,000 MWd/MT, and approximately 9,000 particles were irradiated to nominal burnups of 704,000 MWd/MT, which corresponds to destruction of more than 90% of the initially charged uranium-235. Higher burnup levels were achieved in later tests.

NRC approval of use of this fuel in Fort St. Vrain reloads indicates that there is a substantial database that confirms the ability of TRISO-coated particle fuel to achieve high burnup and high levels of destruction of the initially charged fissile material. When these high burnup uranium fuel data are considered in combination with the plutonium fuel irradiation tests in the Dragon and Peach Bottom reactors, it is clear that TRISO-coated plutonium fuel particles can be manufactured to meet operational and safety requirements and to achieve the high levels of plutonium destruction of which the PC-MHR is capable. Table 1 shows a comparison of PC-MHR design conditions with the irradiation experience for high burnup plutonium and uranium TRISO-coated particle fuel.

It should be noted that recent (1990-92) unsuccessful irradiation experience with an experimental, modified fuel design (TRISO-P) for the DOE New Production Reactor and Commercial GT-MHR programs is not relevant to the status of plutonium fuel development. The TRISO-P coating was developed in an attempt to improve as-manufactured quality and inservice performance by about an order of magnitude over the requirements that would apply to PC-MHR fuel. Although the as-manufactured quality was improved, irradiation test results showed that the coating design and fabrication process changes actually resulted in worse inservice performance under irradiation than Fort St. Vrain fuel and previous fuel tests. This modified fuel design has been discarded, and existing prior technology is being utilized. TRISO-coated plutonium fuel for the PC-MHR will be based upon the successful experience obtained on high burnup, highly enriched fissile fuel during the last twenty five years.

Although the results of plutonium fuel irradiation tests obtained to date are positive and performance comparable to PC-MHR requirements was achieved at FSV, more plutonium fuel development work is planned to increase the level of confidence associated with these results and to strengthen the statistical significance of the data. Tests will be conducted on irradiated plutonium coated fuel particles to confirm their behavior under simulated core heatup accident conditions. In addition, the equipment and remote processes used to fabricate plutonium coated particle fuel will be adapted from those used to fabricate uranium fuel and will be qualified for use in a full scale production operation. Plans for these activities have been documented in a plutonium fuel development plan for the PC-MHR.

TABLE 1
COMPARISON OF PC-MHR FUEL OPERATING CONDITIONS
WITH HIGH BURNUP TRISO-COATED FUEL IRRADIATION EXPERIENCE

Parameter	PC-MHR Design Goals	Plutonium TRISO Irradiation Experience	Uranium TRISO Irradiation Experience
Peak Fuel Temperature, °C	1250 (1) 1600 (2)	1275 - 1450	900 - 1550 ~ 2000 (3)
Peak Fast Neutron Fluence, 10^{25} n/m^2 (E > 0.18 Mev)	4.2	2.3	12.0
Peak Burnup, MWd/MT	785,000 (590,000 Avg)	747,000	~750,000

(1) Normal Operating Conditions
(2) Design Basis Accident Conditions
(3) Post Irradiation Heatup Tests

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GT-MHR Power Conversion System - State of the Art Technology

1. Summary

Extensive technology data bases exist for the major GT-MHR power conversion system (PCS) components, including the turbocompressor, bearings, generator, recuperator, and precooler/intercooler. Closed Brayton cycle gas turbine technology is well understood. Some 20 fossil-fired closed cycle gas turbine plants have operated for over one million hours with high reliability and availability.

Based on a highly recuperated and intercooled cycle, an efficiency of about 47% is realizable at a very modest level of turbine inlet temperature (~ 850°C) compared with contemporary open cycle gas turbines.

Experience gained in Germany with the operation of two large helium gas turbine systems (Oberhausen II 50MWe Helium Gas Turbine Plant, and the HHV Test facility) substantiates the claim that helium gas turbine power conversion systems are regarded as state-of-the-art. Within the U.S. there is strong industrial capability to facilitate the transfer of the necessary gas turbine enabling technology to make the GT-MHR a reality within the next ten years.

2. Design Methodology for GT-MHR Power Conversion System

The properties of helium reduce the size and geometrical complexity of the various power conversion components. Dynamic, thermal and structural design procedures, computer codes, and industry standards used are identical to conventional air-breathing gas turbine practices. The existing HTGR materials data base, established over a 3 decade period, involve materials testing in a helium environment by industry and the national laboratories, and is being fully utilized. Fabrication of the power conversion system components can be accomplished with existing techniques, machine tools and processes, and the size of the components is bounded by existing power generation equipment.

3. Turbocompressor

The largest industrial combustion gas turbine operating today is rated at 226 MWe, and units with outputs of over 300MWe are projected to be in utility service before the year 2000. The size of the 285MWe GT-MHR turbocompressor is physically smaller than the aforementioned combustion gas turbine, as a result of the use of helium (at high pressure) as the working fluid. The number of compressor and turbine stages is comparable with existing industrial gas turbines. Compressor and turbine designs are based on a combination of the following: 1) low Mach number, 2) high Reynolds number, 3) clean oxide-free blading surfaces in the closed helium circuit, and 4) close blade-tip clearance for the base-loaded plant (i.e. not subjected to rapid transients) resulting in high efficiency. The turbocompressor is being designed using the same methods, tools, and standards used for aerospace and industrial gas turbines. The performance of helium turbomachinery has been demonstrated in the Oberhausen plant and the HHV test facility.

The turbine inlet temperature of 850°C is about 400°C below that in the aforementioned large industrial gas turbines. This simplifies the turbine design in that un-cooled blades of conventional nickel-base alloys can be used. For the integrated PCS, circumferential static seals are necessary between the turbocompressor and other components and structures. The size of these seals and their operating environment (i.e. temperature and pressure differential) are bounded by existing power conversion systems.

4. Active Magnetic Bearings

The utilization of magnetic bearings has three major advantages: it 1) eliminates the possibility of lubricant ingress to the reactor circuit, 2) provides an on-line diagnostic system for monitoring the health of the rotating assembly, and 3) facilitates adjusting bearing performance on-line. Large vertical rotor systems (centrifuges) have operated successfully with magnetic bearings. While the rotor weight of the GT-MHR is heavier than in applications to date, the thrust bearing unit loadings and peripheral velocities are bounded by current operating experience.

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A formidable magnetic bearing technology base exists: over 5500 units with over 8 million hours in operation, including over 160 large turbomachines (e.g. compressors, turboexpanders) with over 1.5 million hours of operation.

5. Generator

Vertical electrical machines are used in boiler feedwater pumps and hydroelectric plants, and only minor modifications to existing generators are necessary for the vertical orientation of the generator in the GT-MHR plant. While the dielectric strength of helium is different from that of air or hydrogen (used in the cooling of conventional generators), only minor modifications to the electrical insulation are necessary. For the AVR and THTR plants the circulators, embodying electric motor drives submerged in helium, performed trouble-free.

6. Recuperator

The use of a compact plate fin recuperator facilitates the installation of a high performance unit (i.e. 95% effectiveness, 2% pressure loss) within the confines of the PCS steel vessel. Existing recuperator technology established by AlliedSignal Aerospace is directly applicable to the GT-MHR. Over 60 recuperated industrial gas turbines (using this type of heat exchanger) have accumulated over 3 million hours of service. Units with 95% effectiveness have been demonstrated in service. The operating environment for these units, in terms of transients and thermal shock, is more severe than would be experienced in the GT-MHR.

Plate-fin heat exchangers are used extensively in the aerospace industry and Allied Signal has produced several million for aircraft systems. The GT-MHR recuperator will benefit from two air-breathing applications, 1) heavy duty industrial recuperators in terms of materials, fabrication, and high temperature service, and 2) aircraft/aerospace heat exchangers in terms of very compact high performance surface geometries.

7. Precooler/Intercooler

The precooler and intercooler are helium-to-water heat exchangers that operate in a very benign environment, with metal temperatures less than 250°F. The technology for the units is essentially commercially available. These units should not be compared with steam generators since the water side is pressurized only to suppress boiling, and stable operation is assured with single phase fluids on both sides of the unit. Since the helium pressure is greater than the water pressure, the issue of water ingress into the reactor circuit, as a result of a tube failure for example; is obviated. A faulted tube can be plugged at the tubesheet, which is external to the vessel and is accessible.

8. PCS Development and Testing

Based on the utilization of gas turbine and aerospace industry technology bases the PCS can be realized without the need for further basic R&D. Early in the program, data from subcomponent tests (e.g. bearings, seals) will be available for inclusion in the PCS final design.

A hallmark of the program will be the testing of the PCS in an integrated test facility. The turbomachine will be operated at full temperature and full speed. The comprehensive nature of the PCS testing program removes a major risk element, and will give designers a high degree of confidence that all of the PCS requirements will be met when the system is operated with a nuclear heat source.

9. Maintenance

While designed to last the 60 year plant life, the major PCS components have been engineered to facilitate ease of removal and replacement. The turbocompressor will be removed at 7 year intervals (for refurbishment), with a spare unit kept at the plant site. Experience gained from the AGR plants in the U.K. in terms of removal, replacement, and handling of large components (in shielded casks) is particularly germane

ATTACHMENT 2 TO GA/DOE-027-96

GA/DOE-068-95
June 6, 1995

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GENERAL ATOMICS

GA/DOE-068-95
Project 6301
WBS: 5109.51
June 6, 1995

Mr. Howard R. Canter, Technical Director
Office of Fissile Materials Disposition
U.S. Department of Energy
Washington, DC 20585

SUBJECT: Programmatic EIS Screening Results

Dear Mr. Canter:

General Atomics has received your letter of April 14, 1995, which presented DOE's rationale for excluding the Plutonium Consumption Modular Helium Reactor (PC-MHR) from consideration as a reasonable alternative for plutonium disposition in the Programmatic Environmental Impact Statement (PEIS) for Long Term Storage and Disposition of Surplus Fissile Material. GA has also reviewed the PEIS Implementation Plan and the Summary Report of the Screening Process. This letter provides GA's response to your letter and its comments on these documents.

GA has reviewed these documents in an effort to understand the factors that led DOE to reject the PC-MHR as unreasonable and lacking in technical maturity. This was DOE's conclusion even though the technology was, as recently as 1992, the leading candidate for new tritium production capacity and is still under consideration by DOE for the important mission of tritium production.

The summary screening report characterizes the various alternatives against the eleven screening criteria developed by DOE. GA believes that the criteria used were, in general, appropriate. However, DOE's assessment of the PC-MHR against the criteria is, in some cases, very difficult to understand. GA is concerned, based upon its review and upon information it has received from others, that the exclusion of the PC-MHR from consideration is more closely related to an apparent intention not to support the development of advanced reactors, including the gas-cooled reactor, than it is to any objective consideration of the capabilities of the PC-MHR relative to the screening criteria.

1/14.00.00 cont.

Attachment 1 provides GA's detailed comments on DOE's evaluation of the PC-MHR and proposed exclusion of the PC-MHR from consideration in the PEIS. The attachment addresses the assessment of the PC-MHR against the screening criteria, adoption of the spent fuel standard, and DOE's approach to multipurpose options for plutonium disposition and tritium production.

DOE has rated the PC-MHR low relative to the criterion of Technical Viability in spite of the fact that this reactor technology was, only three years ago, the leading candidate for selection as the New Production Reactor. It has also given the PC-MHR a lower rating than other alternatives that have been demonstrated to a lesser degree or about which there are fundamental questions concerning their capability. Nevertheless, the major reason cited by DOE for excluding the PC-MHR from consideration is its lack of "technical maturity". DOE's view may reflect its opinion on the gas

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turbine design of the MHR recommended by GA versus the earlier steam cycle version of the design. In fact, the reactor technology for both the steam cycle and gas turbine plants is the same. Regarding the gas turbine power conversion system, world leading U.S. and international vendors consider it to be essentially a repackaging of existing industrial and aeronautical technology. Substantial engineering is needed, but there are no feasibility issues. Given adequate funding, a fully tested turbomachine could be delivered to a site in less than seven years (see Attachment 2).

DOE has rated the PC-MHR the same as all other fission options relative to the criterion of Environment, Safety, and Health. This conclusion ignores the facts that the MHR is widely considered to be the safest reactor option available and that its 47% overall plant efficiency, vs 31-33% for those reactor options deemed to be "reasonable" by DOE, results in substantial reductions in environmental impacts. DOE's own Draft PEIS for Tritium Supply and Recycle makes the safety advantages of the MHR relative to other reactors very clear. 1/14.00.00 cont.

The PC-MHR is rated the same as other reactor technologies that entail construction of a new reactor dedicated to plutonium disposition relative to the screening criterion of Cost Effectiveness. However, DOE provides no quantitative data to support this cost rating or the relative ranking of any of the alternatives in terms of cost effectiveness. The effects of using the gas turbine on life cycle costs of the gas-cooled reactor have yet to be made available to the public because DOE has not made available its report on Phase II of its Plutonium Disposition Study. However, based upon cost analyses using Phase I costing methodology and groundrules, the PC-MHR has a substantial cost advantage over other reactor alternatives (see Attachment 3). Hence, DOE's rating of the PC-MHR as the same as other reactor alternatives against the criterion of Cost Effectiveness is incorrect and adds to the distorted overall ranking of the PC-MHR.

The PC-MHR is given a low rating relative to other reactor alternatives with regard to the Timeliness criterion. The 12.5 year initial deployment schedule of the PC-MHR is a conservative estimate based on the schedule for deployment of the New Production Reactor that was developed by DOE and its contractors on the NPR program and was twice independently reviewed and confirmed. In the screening report, DOE ignores its own schedule and judges the level of certainty in the schedule to be less than that of the alternatives deemed by DOE to be "reasonable", the deployment schedules for which have never been subjected to the level of scrutiny that was applied to the MHR schedule. (In fact, under more aggressive schedule assumptions, in which first core fuel is produced on the fuel development pilot line, the PC-MHR initial deployment schedule can be reduced to 10 years.) DOE also ignores the fact that the PC-MHR has been shown in DOE's own Plutonium Disposition Study to be capable of completing the plutonium disposition mission within the length of time deemed necessary by DOE. DOE has excluded the PC-MHR from consideration in the PEIS on the basis of an artificial schedule requirement that does not reflect that a small delay in beginning the disposition operation is not significant in the overall timeframe for completing the disposition mission. Use of artificial schedules or administrative guidelines as a basis for declaring an alternative to be unreasonable is clearly in conflict with precedents established by NEPA case law. 1/14.00.00 cont.

The PC-MHR is rated lower than the "reasonable" reactor technologies with regard to the criterion for Fostering Progress and Cooperation with Russia and Others. This assessment is not credible because it ignores the fact that the Russians have repeatedly indicated to DOE and to the Gore-Chernomyrdin Commission their desire to destroy surplus weapons grade plutonium in PC-MHRs to be built at Tomsk-7. It also ignores the fact that the Russians have proposed to DOE a cooperative, cost shared MHR design and development program and have initiated the effort with $1.0 million of their own funding. The Russians have taken no such actions in support of the alternatives deemed "reasonable" by DOE.

The summary screening report rates the PC-MHR as relatively low with regard to the Public and Institutional Acceptance criterion. No explanation is provided for this assessment. The PC-MHR offers distinct advantages relative to this criterion based upon its ability to substantially destroy the plutonium, its superior resistance to diversion and reuse of the residual plutonium in a weapons application, its multipurpose capability, and its unequalled safety characteristics. One can only conclude that DOE has chosen to rate the PC-MHR relatively low against this criterion to be consistent with its apparent intention not to develop advanced reactors in the U.S.. To exclude the PC-MHR at the time of the Record of Decision on the basis of policy matters would be legally permissible; to exclude it from consideration in the PEIS as a reasonable alternative on the basis of policy matters is contrary to precedents established under NEPA case law and is not allowed under Council on Environmental Quality NEPA implementing guidance. 1/14.00.00 cont.

It should also be noted that certain of the alternatives deemed "reasonable" by DOE for consideration in the PEIS and rated higher than the PC-MHR against the Public and Institutional Acceptance criterion will present major, unique public acceptance and policy issues. It is difficult to believe that major policy and public acceptance issues would not be involved in making available large quantities of weapons grade plutonium for disposition either in European nations or in Canada. Not only would major safeguards and security issues be raised, but it would also appear inappropriate to give away to other nations the energy value of the plutonium (which was created at the expense of billions of U.S. taxpayer dollars), to export potential U.S. jobs, and to forego U.S. technology development and deployment in favor of support for foreign technology.

The screening report states that the spent fuel standard was generally accepted, except by "proponents of developmental technologies that could go beyond the spent fuel standard". This statement ignores the letter of December 13, 1994, from Senators Thurmond and Hollings and Representatives Spratt and Spence to Secretary O'Leary that questioned the adequacy of the spent fuel standard. It also continues to ignore the numerous comments in the public scoping meetings which indicated that measures beyond the spent fuel standard would be required to provide ultimate disposition of the plutonium, to ensure that the national security objectives of the plutonium disposition effort would be met, and to extract the maximum possible energy value from the plutonium. The DOE letter of April 14 states that, "all fission options which go beyond the spent fuel standard were deemed unreasonable." By precluding all options that can exceed the spent fuel standard prior to detailed, full evaluation in the PEIS, DOE has withheld important information from 2/01.05.00 cont.

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the public regarding the diversion and proliferation resistance of alternatives that exceed the standard relative to those that merely meet it and has perpetuated the myth that these options cannot be deployed in a timely, cost effective manner. 2/01.05.00 cont.

Congress has consistently directed DOE to give full consideration to multipurpose reactors. However, it appears that DOE has not accepted this direction. The Implementation Plan for the PEIS for Fissile Materials indicates that it will not consider any multipurpose option unless a reactor is chosen for tritium supply, and then that it will consider only whether that reactor option might be suited for multipurpose use. No attempt has been made by DOE as part of the NEPA process to compare the costs, benefits, and environmental impacts of a multipurpose reactor against the combined costs, benefits, and impacts of separate projects for the tritium supply and plutonium disposition missions. This approach to the multipurpose reactor appears contrived, will not result in full and fair consideration of multipurpose reactors, and undermines the underlying philosophy of the NEPA process. In a time of growing concern about limits in government resources and about deficit reduction, the manner in which DOE is trying to avoid full and fair consideration of the multipurpose reactor is difficult to understand. 1/14.00.00 cont.

GA is disappointed in the manner in which DOE is approaching these important matters. Under DOE's implementing regulations for NEPA (10CFR1021) there is still an opportunity for DOE to amend the PEIS Implementation Plan to include the PC-MHR and the multipurpose reactor options. We urge DOE to do so. 6/01.05.00 cont.

If you would like to discuss any of these issues in detail, please feel free to call me at any time at (619) 455-2580 or Dave Alberstein at (619) 455-2088.

Sincerely,

A.J. Neylan, Vice President
Power Reactor Group

AJN/DA:da
Attachments

cc:
C.B. Curtis
G. Rudy
J.D. Nulton
P.T. Rhoads
J.M. Turner, DOE-OAK

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ATTACHMENT 1 TO GA/DOE-068-95
GENERAL ATOMICS COMMENTS ON DOE's EVALUATION OF THE PC-MHR
AND PROPOSED EXCLUSION OF THE PC-MHR
FROM CONSIDERATION AS A REASONABLE ALTERNATIVE IN THE
PROGRAMMATIC EIS FOR FISSILE MATERIALS DISPOSITION

This attachment provides General Atomics' comments on DOE's treatment of the following matters relative to the PC-MHR and its decision to exclude the PC-MHR from consideration in the PEIS for fissile materials (plutonium) disposition: the assessment of the PC-MHR against the screening criteria, treatment of the spent fuel standard, and DOE's approach to multipurpose options for plutonium disposition and tritium production.

Assessment of the PC-MHR Against the Screening Criteria

Technical Viability:

With regard to the Technical Viability criterion, DOE rates the PC-MHR as low relative to other disposition options. The technical viability of the PC-MHR is rated lower than other technologies that have been demonstrated to a lesser degree or about which there are fundamental questions concerning their capability. For example, the technical viability of the PC-MHR is rated lower than that of the ALMR with pyroprocessing, even though the screening report states that this concept "is still under development in a manner different from its intended purpose." The PC-MHR is also rated lower in technical viability than glass immobilization in DWPF, even though the screening report states that this option would require a specially designed melter to be installed and much of the supporting equipment in DWPF to be re-fitted for this application because DWPF was not designed for criticality control.

The ostensible primary reason given for exclusion of the PC-MHR from consideration in the PEIS is its lack of technical maturity. This reason is, however, inconsistent with previous positions taken by DOE. Only three years ago the MHR was one of the final alternatives under consideration for selection as the New Production Reactor. It was, by most accounts, the leading candidate to be selected had that Record of Decision not been postponed only one month prior to its scheduled release date. The MHR had been selected as one of the final alternatives for this vital national security mission following extensive review by the Secretary's Energy Research Advisory Board. In light of this history, it is difficult to justify the DOE decision not to evaluate the MHR in the PEIS for fissile materials disposition. 9/01.05.00

The screening report offers two statements to support the contention that the PC-MHR lacks sufficient technical maturity to be considered in the PEIS as a reasonable alternative for disposition of surplus weapons grade plutonium.

The first statement is the claim that plutonium coated particle fuel is "tested, but not fully demonstrated or proven." In fact, there have been, as DOE is well aware, six successful demonstrations of the capability of weapons grade plutonium coated particle fuel to achieve high levels of plutonium destruction. In contrast, for each of the reactor alternatives that were accepted through the screening process, there is little, if any, irradiation experience whatever with fuels made from plutonium of weapons grade composition. While further demonstration and qualification testing is required for plutonium coated particle fuel (as it will be for weapons grade MOX fuel used in the reactor alternatives deemed "reasonable" by DOE), there have been no feasibility issues identified that would call into question the capability of PC-MHR fuel to perform as required.

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Tritium production is a long-term mission of DOE to support national security. Pu disposition is a shorter term mission that DOE must accomplish to meet the Nation's goals in support of its non-proliferation policies. DOE has determined that the "clear and present danger" demands that disposition of Pu be initiated within approximately a decade. Pu disposition can be accomplished in that timeframe using existing technologies to achieve the Spent Fuel Standard.

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The second statement concerns the use of the direct cycle power conversion system, a new application of previously developed components. As noted several times by GA in reports to DOE and in other correspondence with DOE, development of the power conversion system is not on the critical path for deployment of the PC-MHR. The system has been evaluated by two major turbogenerator vendors that are recognized authorities in direct cycle applications. Both have judged that the power conversion system is essentially a repackaging of existing industrial and aeronautical technology. Substantial engineering is needed, but there are no feasibility issues. Given adequate funding, a fully tested turbomachine could be delivered to a site in less than seven years, a schedule that would support deployment on the time scale needed for plutonium disposition (see Attachment 2).

In addition, DOE has had in its possession since May 1993 information on the capability of the gas-cooled reactor to destroy weapons grade plutonium using a more conventional and previously demonstrated steam cycle power conversion system. However, DOE has chosen to ignore this information in developing its rationale for eliminating the MHR from consideration.

Environment, Safety, and Health:

The summary screening report rates the PC-MHR the same as all other fission options relative to the criterion of Environment, Safety, and Health. This conclusion ignores the facts that 1) the MHR is widely considered to be the safest reactor option available, 2) its 47% overall plant efficiency, vs 31-33% for those reactor options deemed to be "reasonable" by DOE, results in substantial reductions in environmental impact relative to these other reactor alternatives, and 3) gas-cooled reactors have a proven track record of substantially lower radiation exposure to plant workers than any other power reactor type.

The inherent passive safety characteristics of the PC-MHR offer distinct safety advantages over the reactor types that DOE has deemed "reasonable" for consideration in the PEIS. The safety design objectives of the PC-MHR are met through a combination of inherent safety features and design selections that enable passive heat transfer under accident conditions (even loss of coolant or loss of forced coolant circulation) while maintaining fuel temperatures below damage limits. The reactor core is made of all refractory materials that can not melt at high temperatures. The core is slow to heat up under accident conditions, with thermal transients occurring over periods of hours and days rather than seconds or minutes as for other reactor types. Almost all fission products are retained in the refractory coated fuel particles during normal operation and accident conditions, and radioactive release is small. Radiation exposure at the site boundary is less than the Environmental Protection Agency's Protective Action Guidelines, so no off-site actions such as sheltering or evacuation of the public are required, and the risk to public health and safety is minimized. DOE's own Draft PEIS for Tritium Supply and Recycle makes the safety advantages of the MHR relative to other reactors very clear.

Cost Effectiveness:

The PC-MHR is rated the same as other reactor technologies that entail construction of a new reactor dedicated to plutonium disposition relative to the screening criterion of Cost Effectiveness. However, DOE provides no quantitative data to support this ranking or the relative ranking of any of the alternatives in terms of cost effectiveness. The only data that DOE has published regarding plutonium disposition costs are those in its report to Congress that was published following Phase I of the Plutonium Disposition Study. The Phase I report provided relative life cycle costs for various reactor options for plutonium disposition as a function of installed capacity. Costs were developed based on an economic model developed by Oak Ridge National Laboratory personnel under contract to DOE. Information on the gas-cooled reactor in Phase I of the study was developed for the earlier steam cycle version of the plant.

In Phase II of the Plutonium Disposition Study, GA changed its design to incorporate the direct Brayton cycle gas turbine power conversion system. The primary motivation for this change was the improved plant economics, which result from power conversion equipment simplification and an increase in net plant efficiency from 38% to 47%. The increased efficiency results in increased revenue from sale of electricity to offset the costs of engineering development, design, construction, and operation of the PC-MHR.

Although the report to Congress on Phase II of the Plutonium Disposition was due to be delivered to Congress during the Fall of 1994, DOE has yet to release the report. It is GA's understanding that the report has been completed since the end of 1994. Hence, the effects of changing to the gas turbine on life cycle costs of the gas-cooled reactor have yet to be made available to the public. Using the Phase I economic model, which was provided at DOE's request to GA by the staff at Oak Ridge, GA has calculated the life cycle costs of the PC-MHR and compared them against those of the other reactor technologies evaluated during Phase I of the study. The results show that the life cycle costs of the PC-MHR are substantially lower than those of all other reactor alternatives (see Attachment 3). Informal confirmation of these results has been obtained.

DOE has assumed that alternatives that exceed the spent fuel standard will cost substantially more to develop and deploy than those which merely meet the standard, and it has used this assumption as part of its rationale for eliminating as unreasonable options that exceed the standard. These PC-MHR cost analysis results indicate that this assumption is not well founded.

It is GA's understanding that one of the reasons for the delay in releasing the Phase II Plutonium Disposition Study report was that Oak Ridge was asked by DOE to make changes in the cost analyses in the report. GA is unaware of whether the economic model used in Phase II of the Plutonium Disposition Study is substantially different from that used in Phase I. Hence, GA is also unaware of whether the distinct cost advantage of the PC-MHR will be confirmed by the Phase II report. Nevertheless, based upon available information it appears that the PC-MHR has a substantial cost advantage over other reactor alternatives and that DOE's rating of the PC-MHR as the same as other reactor alternatives against the criterion of Cost Effectiveness is incorrect and adds to the distorted overall ranking of the PC-MHR.

Timeliness:

The PC-MHR is given a low rating relative to other reactor alternatives with regard to the Timeliness criterion. The 12.5 initial deployment schedule for the PC-MHR is a conservative estimate based on the schedule for deployment of the New Production Reactor that was developed by DOE and its contractors on the NPR program and was twice independently reviewed and confirmed. In the screening report, DOE ignores its own schedule and judges the level of certainty in the schedule to be less than that of the alternatives deemed by DOE to be "reasonable", the deployment schedules for which have never been subjected to the level of scrutiny that was applied to the MHR schedule. (In fact, under more aggressive schedule assumptions, in which first core fuel is produced on the fuel development pilot line, the PC-MHR initial deployment schedule can be reduced to 10 years.)

Because the initial deployment schedule for the PC-MHR is a mere 30 months longer than DOE's arbitrary criterion of a ten year initial deployment schedule, and even though the PC-MHR has been shown in DOE's own Plutonium Disposition Study to be capable of completing the plutonium disposition mission within the length of time deemed necessary by DOE, DOE claims that the PC-MHR does not meet its requirement for timely deployment. DOE ignores the fact that the total duration of the plutonium disposition mission (several decades) will dwarf the 30 month difference in initial deployment schedule of the PC-MHR, and that during the entire disposition mission duration plutonium pits and other forms of weapons useable plutonium will be maintained, initially in "interim storage", and will be subject to current vulnerabilities unless safer, more secure modes of

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storage are implemented. The emphasis on early, timely deployment should be more properly placed on "long term storage" options rather than disposition options.

DOE has excluded the PC-MHR from consideration in the PEIS on the basis of an artificial schedule requirement that does not reflect that a small delay in beginning the disposition operation is not significant in the overall timeframe for completing the disposition mission. Use of artificial schedules or administrative guidelines as a basis for declaring an alternative to be unreasonable is clearly in conflict with precedents established by NEPA case law.

Fostering Progress and Cooperation with Russia and Others:

The PC-MHR is rated lower than the "reasonable" reactor technologies with regard to the criterion for Fostering Progress and Cooperation with Russia and Others. This assessment is not credible because it ignores the fact that the Russians have repeatedly indicated to DOE and to the Gore-Chernomyrdin Commission their desire to destroy surplus weapons grade plutonium inventory in PC-MHRs at Tomsk-7. It also ignores the fact that the Russians have proposed to DOE a cooperative, cost shared MHR design and development program and have initiated the effort with $1.0 million of their own funding, matched with an equal amount of funding by General Atomics. The Russians have taken no such actions in support of the alternatives deemed "reasonable" by DOE.

In the April 14, 1995, letter to GA, DOE implies that the 12.5 year initial deployment schedule for the PC-MHR in the U.S. disqualifies it for consideration for deployment in Russia and results in its low rating relative to this criterion. This position ignores the fact that deployment in Russia could be accomplished more quickly and less expensively than in the U.S.. Furthermore, it arbitrarily assumes that Russia would agree to the same screening criteria and weighting factors that DOE has deemed appropriate for selection of options in the U.S.. This is clearly not appropriate, as evidenced by the public statements of Russia on plutonium disposition. If DOE wants to foster progress and cooperation with Russia in plutonium disposition, it must deal with the Russians in a manner that addresses the criteria that are important to Russia. The Russians have judged that the PC-MHR provides an approach to plutonium disposition that addresses these criteria. DOE's apparent lack of willingness to support development of the gas-cooled reactor in the United States is not an appropriate basis for down-rating its ability to foster progress and cooperation with Russia.

Public and Institutional Acceptance:

The summary screening report rates the PC-MHR as relatively low with regard to the Public and Institutional Acceptance criterion. No explanation is provided for this assessment. However, the screening report indicates that there were three elements that contributed to this criterion:

- Ability to create a sustainable consensus
- Socioeconomic impacts
- Policy/statute compatibility

There are no indications that the PC-MHR could not create a sustainable consensus or would have net socioeconomic impacts that are particularly adverse relative to other alternatives for plutonium disposition. In fact, as discussed below, the PC-MHR has significant advantages with regard to public acceptance relative to the reactor alternatives deemed by DOE to be "reasonable". Furthermore, there are no indications that selection of the PC-MHR would require significant legislative or regulatory changes.

Hence, one can only conclude that DOE has purposely rated the PC-MHR relatively low against this criterion to comply with an apparent intention not to develop advanced reactors in the U.S.. To exclude the PC-MHR at the time of the Record of Decision on the basis of policy matters would be legally permissible; to exclude it from consideration in the PEIS as a reasonable alternative on the basis of policy matters is contrary to precedents established under NEPA case law (Natural Resources Defense Council v. Morton) and is not allowed under Council on Environmental Quality NEPA implementing guidance (Memorandum, Questions and Answers About the NEPA Regulations, 46 Federal Register, 18026, 1981).

The PC-MHR offers distinct advantages over other reactor options with regard to public acceptance. Reactor disposition of surplus weapons grade plutonium is unlikely to be well received by the general public unless the specific reactor technology chosen offers a clear departure from and clear improvement over the nuclear reactor technologies that are in common use today and that have enjoyed less than enthusiastic public acceptance. The PC-MHR represents such a departure. The following points, which were presented by GA in its Phase II Plutonium Disposition Study report to DOE, should have been considered by DOE with regard to public acceptance of the PC-MHR for plutonium disposition.

Use of the PC-MHR for consumption of weapons-grade plutonium offers numerous advantages relative to other plutonium disposition options. These advantages are derived from its high burnup capability, versatility, and inherent, passive safety characteristics, all of which will further contribute to public acceptance.

To obtain public acceptance of the chosen plutonium disposition option, the approach taken must result in a discharge product with minimal attractiveness for weapons applications, and hence no incentive for theft, diversion, or reprocessing. The high burnup capability of the PC-MHR coated particle fuel gives it the demonstrated capability to destroy 90% or more of the initially charged plutonium-239 (and 65% or more of the initially charged total plutonium) so that the weapons-grade material is truly consumed. This level of plutonium destruction is achieved in a single pass through the reactor. The PC-MHR is the only plutonium disposition reactor option that can achieve such high plutonium destruction levels without reprocessing.

Achievement of high burnup is important for obtaining public acceptance of reactor disposition of excess weapons grade plutonium. As discussed in the National Academy of Sciences report on plutonium disposition, the large and growing inventory of plutonium in discharged commercial reactor fuel is of concern with regard to potential proliferation. Use of a reactor technology that achieves higher burnup than that represented by the "spent fuel standard" will enhance the likelihood of public acceptance because it will not be perceived as adding to the existing problem to the extent of other candidate reactor technologies.

Achievement of high burnup without reprocessing is important to both public and political acceptance of reactor disposition of surplus weapons grade plutonium. Reprocessing of spent nuclear fuel in the U.S. has not been allowed under government policy for several years due to concerns regarding nuclear proliferation from the commercial fuel cycle. Much of the opposition to reactor-based plutonium disposition is based on the concern that it would be used as an opportunity to revive a plutonium-based nuclear energy economy. All of the reactor technologies for plutonium disposition that DOE has chosen to include in the PEIS use fuel types that generate new plutonium during operation. The PC-MHR contains no fertile fuel material; all fissions in the core are plutonium fissions, and no new plutonium is created. The PC-MHR is not commonly associated with development of a plutonium based economy, and its deep burn capability could not result in a signal to other nations that rely on plutonium recycling that the U.S. endorses use of plutonium in fuel cycles that create additional plutonium suitable for use in reactors or in weapons applications.

The discharged fuel elements from the PC-MHR are suitable for direct disposal, without further processing (and

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associated opportunity for diversion), in a permanent repository. The discharged fuel is highly undesirable for use as a nuclear weapons material either by terrorists or governments because it is difficult to divert, its plutonium content is difficult to separate, and even if separated the discharged plutonium is difficult to use in a weapons application.

Diversion of the discharged fuel elements is difficult for all the reasons that apply to any reactor spent fuel (high radioactivity, large mass, extensive safeguards and security, etc.), but also for one reason that is unique to the PC-MHR: low plutonium content per fuel element. While the plutonium content in a single spent fuel assembly from a weapons grade MOX-fueled light water reactor (one of the alternatives deemed "reasonable" by the DOE) is of sufficient quantity to use in a weapons application, one would have to divert up to 102 PC-MHR spent fuel elements (each weighing about 250 pounds) to obtain a similar quantity of discharged plutonium. This would require the diversion of about seventeen truckloads of spent fuel shipping casks or three railcars of multipurpose containers containing PC-MHR spent fuel vs one truckload of spent fuel from a weapons grade MOX-fueled light water reactor. Even if such a large quantity of spent fuel were diverted, the technology for separating plutonium from gas-cooled reactor spent fuel has not been developed, in contrast to the light water reactor, for which plutonium separation technology is well established, being practiced, and is known throughout the world. Finally, although any mixture of plutonium isotopes can, in principle, be used to make a nuclear device, the plutonium discharged from the PC-MHR is, due to the high burnup obtained, particularly high in plutonium-240, 241, and 242 content, which makes it substantially more difficult to use in weapons applications than the discharge from reactors that do not achieve as high a burnup level. GA notes that these advantages were recognized also by DOE in the screening summary report, in which the PC-MHR was rated relatively high against other options for the criterion of Resistance to Retrieval, Extraction, and Reuse. However, these characteristics suggest a substantially larger advantage for the PC-MHR than the nominal difference suggested in the DOE analysis.

These matters are straight forward, easily explained, and understandable for a non-technical audience. Thus, public acceptance of use of the PC-MHR for plutonium disposition is likely to be more readily obtained than for the alternatives deemed "reasonable" by the DOE for consideration in the PEIS.

In addition to its suitability for plutonium consumption, the PC-MHR offers other advantages that would enhance public acceptance. One of the most important of these is its versatility. The PC-MHR offers effective use of government money through its ability to perform multiple missions while simultaneously providing electrical generation and advancing power generation science and technology.

Tritium production capability can be provided as needed. The tritium production capability of the gas-cooled reactor was well established on the DOE New Production Reactor Program. The amount of tritium produced by the PC-MHR can be varied by altering core fuel loading or the loading of tritium-producing targets. It can be produced while consuming surplus weapons grade highly enriched uranium in one or more reactor modules dedicated to tritium production, or it can be produced in a coproduction mode while simultaneously consuming surplus weapons grade plutonium. While some have offered the opinion that plutonium disposition and tritium production missions should not be combined and that selection of plutonium disposition technology should not be influenced by the tritium production capability of the candidate technologies, this view does not recognize the importance of using flexible technology for these missions and of making efficient use of government money in a time when federal budgets are tight and deficit reduction is a high priority. A multipurpose plant that combines the plutonium disposition and tritium production missions would not only be economically efficient, but it would also minimize overall environmental impacts by conducting both missions on one site. All of these factors are important considerations in achieving public acceptance of use of reactors for plutonium disposition, and the PC-MHR is particularly well suited in this regard.

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The inherent passive safety characteristics of the PC-MHR, as described in the discussion of the Environment, Safety, and Heath criterion, offer distinct safety advantages over the reactor types that DOE has deemed "reasonable" for consideration in the PEIS, and this will also enhance public acceptance. The simple approach to safety design used for the PC-MHR is straight forward, easily explained, and understandable for a non-technical audience. Because the design of the PC-MHR is so different from that of other reactor alternatives, it is less likely to be seen by the public as an offering of more of the same reactor technology that has had highly publicized safety problems and has met to date with only limited public acceptance. It is noteworthy that throughout the initial licensing proceedings and subsequent operating lifetime of the Fort St. Vrain gas-cooled reactor in Colorado, no major intervenor opposition to the plant based upon safety concerns occurred. The safety characteristics of the MHR have been significantly enhanced over those of Fort St. Vrain.

While public acceptance of any approach to plutonium disposition will present challenges, the PC-MHR offers distinct advantages in this regard based upon its ability to substantially destroy the plutonium while not developing a plutonium fuel cycle, its superior resistance to diversion and reuse of the residual plutonium in a weapons application, its multipurpose capability, and its unequalled safety characteristics.

Finally, it should be noted that certain of the alternatives deemed "reasonable" by DOE for consideration in the PEIS and rated higher than the PC-MHR against the public and institutional acceptance criterion will present major, unique public acceptance and policy issues. It is difficult to believe that major policy and public acceptance issues would not be involved in making available large quantities of weapons grade plutonium for disposition either in European nations or in Canada. Not only would major safeguards and security issues be raised, but it would also appear inappropriate to give away to other nations the energy value of the plutonium (which was created at the expense of billions of U.S. taxpayer dollars), to export potential U.S. jobs to other countries, and to forego U.S. technology development and deployment in favor of support for foreign technology. Public acceptance and policy issues would also be raised for the alternative of using existing commercial reactors for plutonium disposition, making a sustainable consensus difficult to achieve.

The Spent Fuel Standard

The screening report states that the spent fuel standard was generally accepted, except by "proponents of developmental technologies that could go beyond the spent fuel standard", and your letter of April 14 states that, "all fission options which go beyond the spent fuel standard were deemed unreasonable." These statements ignore the letter of December 13, 1994, from Senators Thurmond and Hollings and Representatives Spratt and Spence to Secretary O'Leary that questioned the adequacy of the spent fuel standard. They also continue to ignore the numerous comments in the public scoping meetings, such as those at Savannah River, Idaho Falls, Los Alamos, and Livermore, which indicated that measures beyond the spent fuel standard would be required to ensure that the national security objectives of the plutonium disposition effort would be met and that maximum possible energy value would be extracted from the plutonium. Rather than providing a representative sampling of the comments made in support of exceeding the spent fuel standard, DOE merely provides in the implementation plan and the screening summary report a limited, unrepresentative selection of these comments and then dismisses them by claiming that the appropriateness of the spent fuel standard was reaffirmed by the scoping process.

The implementation plan states that detailed evaluations of the diversion and proliferation aspects of the various alternatives to be evaluated in the PEIS will be performed as part of the Record of Decision process. This evaluation should have been conducted and the results should have been made available to the public as part of the screening process so that the public could be fully informed about the implications of merely meeting the spent fuel standard rather than exceeding it. An open evaluation of these matters would have given the public an opportunity

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to judge for itself the acceptability of the spent fuel standard and/or the merits of substantially exceeding the spent fuel standard. By precluding all options that can exceed the spent fuel standard prior to detailed, full evaluation in the PEIS, DOE has withheld this important information from the public and has perpetuated the myth that these options cannot be deployed in a timely, cost effective manner.

Regardless of the question of the acceptability of the spent fuel standard, the PC-MHR is a reasonable alternative for plutonium disposition based on its superior safety and environmental characteristics, cost characteristics, diversion and proliferation resistance, spent fuel form, and level of technical maturity as evidenced by its consideration under the New Production Reactor Program. The ability of the PC-MHR to exceed the spent fuel standard is a readily achievable additional benefit, and the fact that it has the ability to exceed the standard is not an acceptable basis for its exclusion from consideration in the PEIS.

Mutipurpose Reactor Options

When work on the New Production Reactor was terminated, Congress authorized and appropriated funds in FY-93 and directed the DOE to undertake assessments of both light water reactor and gas-cooled reactor systems for the multipurpose functions of plutonium consumption, tritium production, and electricity production. The 1995 Energy and Water Appropriations conference report directed the DOE to submit to Congress, within 180 days, a report on the technological feasibility of a multipurpose reactor for the disposition of plutonium and the production of tritium. In a letter to the Secretary of Energy dated December 13, 1994, Senators Thurmond and Hollings and Representatives Spence and Spratt expressed their support for inclusion of a deep burn multipurpose reactor option in the PEISs being prepared by DOE for both tritium production and plutonium disposition.

As indicated, Congress has consistently directed DOE to give full consideration to multipurpose reactors. However, it appears that DOE has not accepted this direction. The Draft PEIS for Tritium Supply and Recycle provides only a comparison of the environmental impacts of tritium production technologies with the impacts of their multipurpose counterparts. The Implementation Plan for the PEIS for Fissile Materials indicates that it will not consider any multipurpose option unless a reactor is chosen for tritium supply, and then that it will consider only whether that reactor option might be suited for multipurpose use. Therefore, if DOE chooses an accelerator for tritium production, multipurpose reactors will not be considered at all for plutonium disposition.

This approach to the multipurpose reactor appears contrived and will not result in full and fair consideration of multipurpose reactors for tritium production and plutonium disposition. It also compromises the underlying philosophy of the NEPA process by effectively precluding alternatives that should result in less total environmental impact than would result from separate projects for each mission. As these evaluations are currently organized by DOE, no effort is being made to compare the costs, benefits, and environmental impacts of multipurpose reactors against the combined costs, benefits, and environmental impacts of the two individual mission technologies. It may well be that DOE could choose the accelerator for tritium production and a nonreactor alternative for plutonium disposition and never provide to the public an assessment of whether a multipurpose reactor could conduct both missions at less cost to the taxpayer and with less total environmental impact. In a time of growing concern about limits in government resources and about deficit reduction, the manner in which DOE is trying to avoid full and fair consideration of the multipurpose reactor is difficult to understand.

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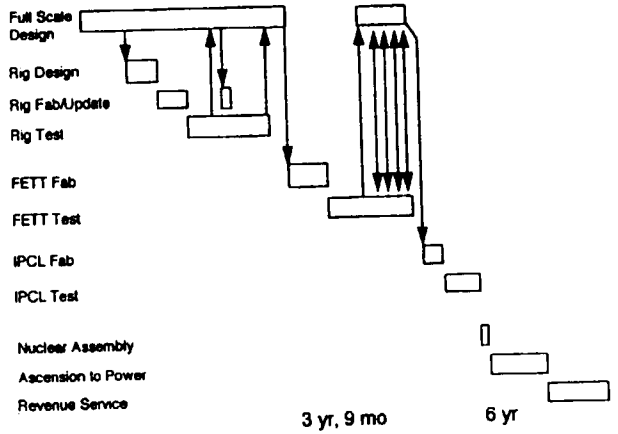
DEVELOPMENT SCHEDULE

Turbomachine Development Schedule Shows First Engine to Test in Less Than 4 Years



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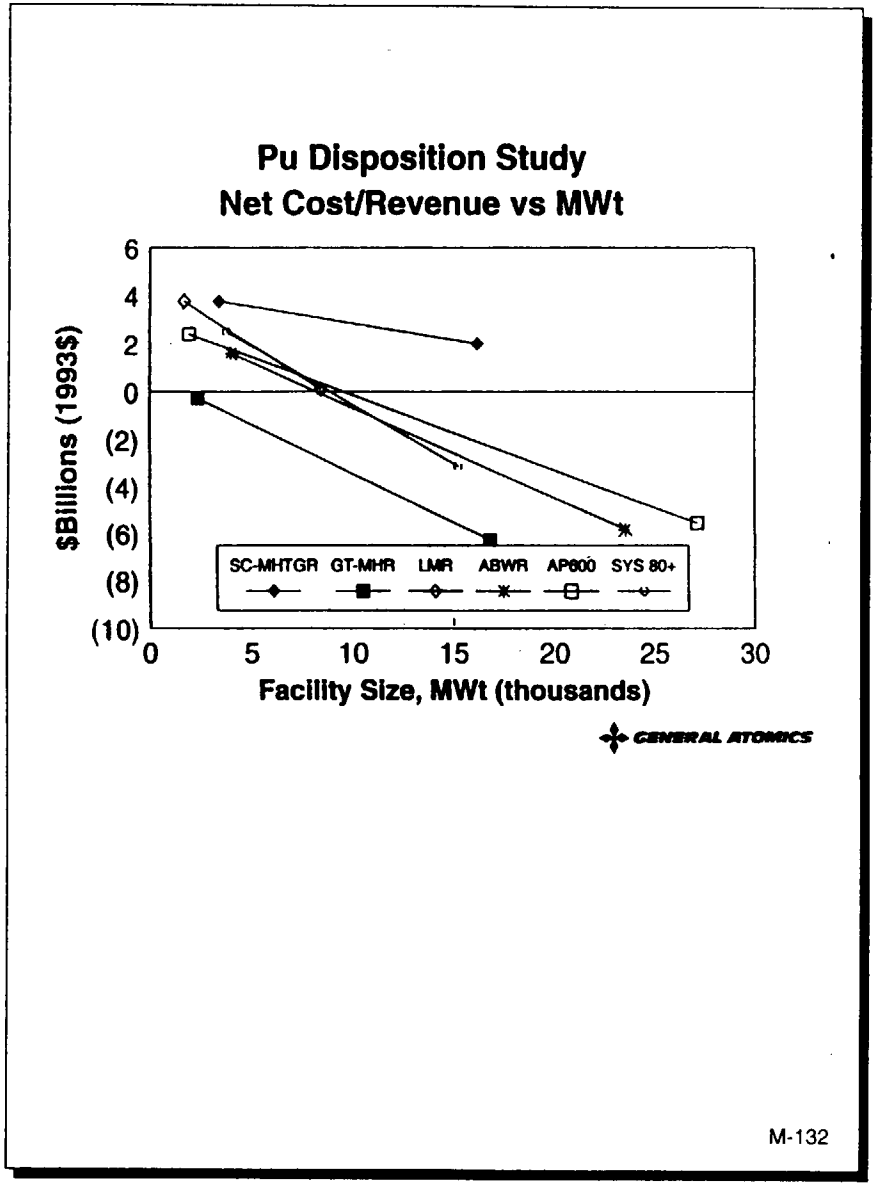

ATTACHMENT 3 TO GA/DOE-027-96
ADDITIONAL GENERAL ATOMICS COMMENTS
ON THE DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
FOR STORAGE AND DISPOSITION OF WEAPONS-USEABLE FISSILE MATERIALS

The following comments on the draft Programmatic EIS are in addition to those in References 1 and 2, copies of which are provided as Attachments 1 and 2, respectively.

Multipurpose Reactors

In References 1 and 2, GA expressed its concerns regarding DOE's approach to consideration of multipurpose reactors in the Programmatic EIS. Subsequently, statutory and Conference Report language from the FY-1996 Defense Authorization Bill (S.1124) has directed that funds authorized to be appropriated to the DOE for Fissile Materials Disposition shall be available for "completing the evaluation of, and commencing implementation of, the interim- and long-term storage and disposition (including storage and disposition through the use of advanced light water reactors and gas turbine gas-cooled reactors) of fissile materials...." The Bill also states that, "sufficient funds shall be made available for the complete consideration of multipurpose reactors for the disposition of fissile materials in the programmatic environmental impact statement of the Department."

These technical assessments, cost/benefit comparisons, and related evaluations would, in the case of the "gas turbine gas-cooled reactor", be a follow-on to the plutonium disposition evaluations performed by General Atomics (GA) for the Gas Turbine Modular Helium Reactor (GT-MHR) during fiscal years 1993 - 1995 under the direction of the DOE in accordance with the provisions of the FY-93 DOE Appropriations Bill.

These studies concluded that the GT-MHR can offer substantial capabilities for the simultaneous disposition of surplus weapons grade plutonium and production of tritium. Evaluations to date indicate that a single 2400 MWt standard plant, comprised of four reactor modules, can process more than 80 metric tonnes of surplus weapons grade plutonium over its 40 year design operating lifetime while concurrently producing tritium at 3/8 of the original New Production Reactor Goal Quantity and generating electricity for sale to offset project costs. The 4x600 MWt modular design provides standardization of construction, enhanced availability, flexibility in mission, and meltdown proof reactor safety. The plant achieves ~47% net plant efficiency, generates 1144 MWe, and significantly reduces environmental impact compared to alternative reactor concepts. The resulting spent fuel is suitable for permanent geologic disposal without further treatment. Design and development costs are ~$750M. The first reactor module could be operational in about 10 years (Ref. 3).

9/01.05.00 cont.

In Reference 4, GA submitted to DOE a recommended program plan for evaluation of the multipurpose capabilities of the GT-MHR which, if accepted and implemented by DOE, would provide the information needed by DOE to comply with the FY-96 Authorization Bill. DOE's response to the recommended program plan (Ref. 5) indicated that DOE believes that previously

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conducted studies sufficiently addressed the gas-cooled reactor both for tritium production and for multipurpose use. The response did not, however, indicate how DOE intends to respond to the requirements of the FY-96 Defense Authorization Bill.

The Draft Programmatic EIS for Fissile Materials makes only minimal reference (a three page Appendix N) to multipurpose reactors as an option for fissile materials disposition. It does so in a manner that is not consistent with the spirit or the intent of the National Environmental Policy Act (NEPA) and does not comply with the provisions of the FY-96 Authorization Bill. The discussion is limited to the possibility that an existing LWR could be used simultaneously for plutonium disposition, tritium production, and generation of revenue through production and sale of electricity. The first sentence of Appendix N of the draft Programmatic EIS provides an incorrect definition of multipurpose reactors as reactors that use plutonium in the form of mixed oxide (MOX) fuel. This definition precludes the use of the gas cooled reactor, which uses only fissile plutonium fuel instead of MOX, in a multipurpose application. Reference is then made to the Record of Decision and the Programmatic EIS for Tritium Supply and Recycling, in which the multipurpose reactor was "preserved as an option for future consideration". Contrary to the requirements of the FY-96 Authorization Bill, no discussion is provided of multipurpose advanced light water reactors or of multipurpose gas turbine modular helium reactors. 10/11.01.08

As noted by GA in its comments to DOE on the Programmatic EIS for Tritium Supply (Ref. 6), the treatment of the multipurpose options in that document is superficial, inadequate, and inconsistent with the requirements of the National Environmental Policy Act. The evaluation is neither full nor fair. The environmental impacts of the multipurpose options are compared only with those of the tritium production options. A full and fair assessment would compare the impacts of the multipurpose options with those of separate plutonium disposition and tritium production options combined. Such a comparison was not provided in the Programmatic EIS for Tritium Supply and Recycling, and if it is not provided in the Final Programatic EIS for Storage and Disposition of Weapons-Useable Fissile Materials, DOE will not have complied either with NEPA or with the FY-96 Authorization Bill.

Disposition Schedule

Before the Draft Programmatic EIS was prepared, all potential options for plutonium disposition were screened using criteria given in Reference 7. The criteria are similar to those used by the National Academy of Sciences (NAS) in its 1994 report (Ref. 8). One of the criteria, timeliness, was initially defined by DOE as follows:

> "The technology concept should be demonstrated within ~20 years and disposition should be completed within ~50 years."

As stated, this criterion would have allowed for development of advanced, deep-burn reactor technologies for plutonium disposition, including the GT-MHR. Of equal significance, this criterion would have allowed for a single, approximately 1GW(e) plant (GT-MHR or LWR) to

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11 01 08 **Comment Number 10**

It was DOE's decision, during the planning for environmental documents in compliance with NEPA, that the TSR PEIS include the analysis of the Multipurpose Reactor Option. Because tritium supply is a long-term mission of DOE compared to the shorter term mission of Pu disposition, the Storage and Disposition PEIS would incorporate, by reference, information developed in the TSR PEIS. This approach is in compliance with the intent of NEPA. Clarification was added to Appendix N in response to the *FY-96 Authorization Bill.*

complete the disposition mission (50 metric tonnes of surplus weapons grade plutonium) over the expected operating lifetime of the plant. In other words, the potential environmental impacts would have been limited to those for a single plant.

In Reference 7, the DOE somewhat arbitrarily changed the timeliness criterion to "require that the disposition be able to start within about a decade and be able to be completed within about three decades." The reason stated by DOE in Reference 7 for adopting this shorter schedule was input from the public and stakeholders "relating to the urgency of taking action stemming from the 'clear and present danger' associated with these materials." However, this reasoning is not supported by the DOE's questionnaire data reported in Appendix A of Reference 7 (see Figures 1 and 2, taken from Reference 7). From Figure 1, five of the nine criteria received higher rankings of "very important" than given to timeliness. From Figure 2, the ranking of timeliness relative to the other criteria indicates clearly that the questionnaire respondents viewed timeliness as being of secondary importance. 11/01.02.00

Other factors also do not justify forcing the plutonium disposition mission to a shorter schedule. According to the draft Programmatic EIS, the DOE also proposes to provide a long-term, 50-year storage system for plutonium and highly enriched uranium declared to be non-surplus. The non-surplus material is categorized into naval nuclear fuel, strategic reserves, material for weapons research and development, and programmatic materials. The DOE acknowledges that some of the non-surplus material could be classified as surplus material in the future. During the disposition mission, it is quite possible that surplus and non-surplus material would be stored and secured at common locations. For plutonium being stored and secured at a given location, it would be absurd to determine that material classified as surplus poses a "clear and present danger," while material classified as non-surplus does not pose a similar risk, particularly when the classification boundary could change over time. The "clear and present danger" argument does not justify adoption of the more urgent disposition schedule, since fissile material of potentially unknown classification (surplus or non-surplus) will be in storage for time periods exceeding the more urgent disposition schedule. 12/01.06.00

The DOE acknowledges that the risks for theft and diversion of fissile material are greater in Russia than in the U.S., because of the less stable political climate in Russia. Perhaps the justification for the more urgent schedule is to encourage the Russians to adopt a similarly urgent schedule, thereby reducing the risks of theft and diversion. While plausible, this strategy is not consistent with desires expressed by the Russians. The Russians have actively encouraged development of the GT-MHR for plutonium disposition. As part of a private, cost-sharing initiative with General Atomics and Framatome, Russian engineers and scientists are presently working on the GT-MHR design. At the recent Third International Policy Forum: Management and Disposition of Nuclear Weapons Materials (Lansdowne, VA, March 19-22, 1996) high level Russian representatives confirmed their strong support for continuing development of the GT-MHR for plutonium disposition. Despite growing international support, the DOE has not been receptive to this private initiative and has implied that the GT-MHR could not be deployed in Russia in a sufficiently timely manner relative to DOE's schedule requirements. From Figure 2, it is interesting to note that the criterion "Influence on Russia and Other Countries" was rated 13/01.03.00

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01 02 00 Comment Number 11

The Department of Energy did not arbitrarily change the timeliness criteria. DOE asked for public input on the proposed screening criteria through a questionnaire which used the approximately 20- to 50-year timeframe for the disposition timeliness criteria. There were some responders to the questionnaire who felt that this timeframe was appropriate. However, the majority of responders expressed opinions that the timeliness criteria was moderate to very important and that the timeframe (20 to 50 years) was too long. Further, the NAS Report states that disposition using Pu as fuel in reactors could begin within 10 years and be completed within 20 to 40 years.

01 06 00 Comment Number 12

The "clear and present danger" is of more concern with Russian materials than with U.S. materials. The "clear and present danger" applies to all materials that are weapons-usable, whether or not they are surplus. The sooner the United States and Russia can disposition surplus materials, the sooner the total volume of material can be reduced. Thus, the "clear and present danger" can be reduced.

The "clear and present danger" cannot be eliminated unless all material is declared surplus and dispositioned. Since this is not likely to occur in the foreseeable future, a safe, secure, and inspectable storage capability, such as that evaluated in the PEIS, must be implemented to assure that non-proliferation objectives in both countries are met.

01 03 00 Comment Number 13

Comment noted. DOE is encouraging the Russians to pursue timely Pu disposition by offering technical assistance, conducting joint assessments of the various disposition technologies, and planning joint demonstrations of some of the technologies to remove uncertainties in their viability.

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as being of somewhat greater importance than timeliness.

Finally, in its 1995 report on reactor-related options for plutonium disposition (Ref. 9), the NAS viewed the shorter schedule as a "very severe constraint" that did not provide a useful basis for comparative evaluations. For comparing the various reactor options, the NAS assumed that 50 metric tonnes of plutonium would be processed over the nominal lifetimes of the reactors.

The impacts of adopting the unnecessarily shorter plutonium disposition schedule are:

The shorter schedule eliminates advanced, deep-burn reactor technologies, such as the GT-MHR, from further consideration.

The required number of approximately 1 GW(e) plants is increased from one to two, and the associated environmental impacts are doubled.

The potential for a strong international cooperative program on plutonium disposition and proliferation-resistant fuel cycles that is of great interest to Russia is hampered.

The Programmatic EIS should be expanded to include a flexible schedule that can accommodate disposition of plutonium over the expected reactor lifetime, and advanced, deep-burn reactor options should be evaluated as part of the EIS process. The "clear and present danger" argument is highly subjective and open to a wide range of interpretation. This argument should not be used to eliminate alternatives that require only a slightly longer schedule than that currently dictated by DOE. 14/01.02.00 15/01.04.00

Final Waste Form Characteristics

An important issue for any plutonium disposition strategy is the suitability of the final waste form for permanent disposal. Respondents to the DOE questionnaire (Ref. 7) recommended additional criteria that should be used to screen plutonium disposition technologies, including several criteria related to final waste form characteristics. During the screening process and preparation of the draft Programmatic EIS, DOE gave little consideration to final waste form characteristics and resulting long term environmental impacts, other than the annual volume of high-level waste generated by the various disposition alternatives. 16/01.05.00

Volume alone is a poor measure of the environmental impact of the final waste form. In fact, a larger volume may be an environmental attribute, since the dilution of plutonium (residual plutonium if the waste is spent fuel) provides greater resistance to diversion and proliferation and their substantial negative environmental impacts. Also, geologic repository loading density and required repository land area are determined by decay heat load of the spent fuel and not by physical volume. For the GT-MHR, the annual volume of spent fuel would be about ten times that from a commercial LWR or plutonium disposition LWR, on an equivalent electrical energy basis, but the required land area for GT-MHR spent fuel would be about one-half that required for LWR spent fuel. The greater volume of GT-MHR spent fuel is a consequence of

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01 02 00 **Comment Number 14**

The cost and schedule analysis was presented in a separate report available for public review beginning in late July 1996. The Advanced Deep Burn Reactors Option, including the MHRs, was considered in the screening process. Notwithstanding the many potential benefits of their use, the technical immaturity would call for costly and lengthy development and demonstration efforts to bring them to a viable status. The Screening Committee decided that the increased Pu burn up offered by this option would not counterbalance its cost, schedule, or technical risks, and therefore, eliminated this option from further consideration.

01 04 00 **Comment Number 15**

The term "clear and present danger" was used by the NAS in their report on the potential proliferation of weapons materials and referred to the situation in Russia and the former Soviet Republics where weapons materials are not subject to the same strict controls as in the United States. The incentive for choosing technologies that can disposition U.S. materials on a relatively short schedule is to provide an equivalent incentive for Russia to also move forward quickly with disposition.

01 05 00 **Comment Number 16**

The PEIS provides a comparative analysis of the HLW forms in Appendix H. The purpose of the Proposed Action is to convert the surplus weapons-usable Pu into a form that meets the Spent Fuel Standard for proliferation resistance. Existing, proven waste forms are sufficient to meet the needs of the Proposed Action.

the low power density of the GT-MHR core, which helps to provide inherent, meltdown-proof safety during normal operation and hypothetical accidents. Approximately 83% of the GT-MHR spent fuel volume is high-purity, nuclear-grade graphite, which by itself would be classified as low-level waste. The high-level waste is confined to the fuel compacts, and the bulk of this waste (99.9%) is contained within the coating layers of the fuel particles. The GT-MHR would destroy and degrade weapons-grade plutonium well beyond the commercial LWR spent fuel standard. The final waste form would be rendered permanently resistant to proliferation, would be contained effectively for geologic time periods by the multiple layers of highly corrosion-resistant ceramic coatings (Refs. 10 through 12), and would be well suited for permanent disposal in a geologic repository. The graphite is also highly resistant to corrosion (Ref. 13) and would serve as an additional protective overpack after permanent disposal. The long-term environmental impacts of permanent disposal would be significantly reduced, and potential high consequence scenarios would be eliminated, including recovery of spent fuel canisters to obtain plutonium for weapons (i.e., the "plutonium mine" issue would be eliminated) and large-scale radionuclide releases caused by severe climatic changes and/or increased seismic activity (i.e., much less reliance would be placed on the geosphere for radionuclide containment). With regard to these issues, GT-MHR spent fuel would be a nearly ideal waste form for permanent disposal (Ref. 14).

In screening reactor technologies for plutonium disposition, the DOE has determined that the commercial LWR "spent fuel standard" was a sufficient end point. The basis for the spent fuel standard stems from the 1994 NAS study (Ref. 8). The NAS recommended that "options for long-term disposition of weapons plutonium should seek to meet a 'spent fuel standard' - that is, to make this plutonium roughly as inaccessible for weapons use as the much larger and growing stock of plutonium in civilian spent fuel." The NAS and DOE have recognized that high levels of radiation are the primary barrier to diversion of plutonium in spent fuel and that this barrier decays over time. The NAS stated that "long-term options will be needed to reduce the proliferation risks posed by the entire global stock of plutonium, particularly as the radioactivity of spent fuel decays," and that "options for reducing these risks include placement of spent fuel in geologic repositories, or pursuit of fission options that would burn existing plutonium stocks nearly completely."

Without performing proper analyses, the DOE has determined that geologic disposal of the waste forms resulting from the alternatives evaluated in the Programmatic EIS will provide the necessary long-term safeguards. In justifying the spent fuel standard, the DOE states in Reference 7 that, "there is a path forward established by the Nuclear Waste Policy Act (of 1982) for disposal of spent fuel in a mined geologic repository, where geologic barriers will reduce the reliance on institutional controls." This conclusion is flawed for the following reasons: 17/12.00.00

> There is no consensus among experts that isolation of spent fuel (or immobilized plutonium) in a geologic repository would provide adequate long-term safeguards. It is important to realize that the NAS study (Ref. 8) makes no judgements and draws no conclusions regarding safeguards provided by geologic isolation. According to the Yucca Mountain Total System Performance Assessment (Ref. 15) and to the 1995 NAS report

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12 00 00 Comment Number 17

The Pu waste forms being considered for disposal in an NWPA-HLW repository meet the Spent Fuel Standard, and therefore, pose no greater safeguards risk than the disposal of commercial spent nuclear fuel. Further, these materials are classified as CAT IV E, and will be subject to the same safeguard requirements as commercial spent nuclear fuel and defense high-level waste (DHLW).

(Ref. 9), the eventual loss of institutional controls and human intrusion is considered to be a credible scenario for assessing long-term performance of a repository. An International Atomic Energy Agency (IAEA) advisory group concluded (Ref. 16) that LWR spent fuel "does not qualify as being irrecoverable at any point prior to, or following, placement in a geologic formation commonly described as a 'permanent repository,' and that safeguards should not be terminated on spent fuel." In a recent report (Ref. 17), the U.S. Congress Office of Technology Assessment (OTA) expressed "concerns about leaving plutonium in a repository that might be mined sometime in the future for the purpose of making weapons." This same concern was raised recently by an American Nuclear Society (ANS) Special Panel on Protection and Management of Plutonium (Ref. 18). During a presentation at a recent DOE workshop (Ref. 19), Peterson concluded that "geologic repositories will provide attractive sources of fissile material for nuclear explosives for roughly 200,000 years." These concerns raised independently by NAS, IAEA, OTA, ANS, and others provide strong justification for developing a disposal strategy in which fissile materials are destroyed before geologic disposal, since safeguards and institutional controls cannot be guaranteed for tens of thousands of years.

Even if it were determined that geologic disposal does provide adequate long-term safeguards, there is currently no permanent repository for spent fuel, and there is the distinct possibility that a repository will not be available for many decades. The political controversy associated with the Yucca Mountain repository project has slowed progress considerably. After spending more than $2 billion, there has still been no determination of whether the site is acceptable for disposal of commercial spent fuel. In the screening report (Ref. 7), the DOE acknowledges "the tremendous cost and time being taken to evaluate the suitability of Yucca Mountain as a mined geologic high-level waste repository."

Mixed-oxide (MOX) spent fuel from an plutonium disposition LWR would be significantly more attractive for diversion than commercial LWR spent fuel, particularly after the radiation field has decayed to lower levels. According to the 1993 DOE Plutonium Disposition Study (Ref. 20), a plutonium disposition LWR MOX spent fuel assembly would contain up to 30 kg of plutonium. This is enough plutonium to manufacture up to 4 weapons. For comparison, a typical commercial LWR spent fuel assembly would contain about 3.5 kg of plutonium of similar quality. A GT-MHR spent fuel element would contain less than 0.25 kg of much lower quality plutonium. In addition to increased diversion risks, the high plutonium content of plutonium disposition LWR MOX spent fuel would have a negative impact on the design of a spent fuel canister and repository handling strategies. Additional processing of MOX spent fuel may be required to lower the plutonium density.

Another issue associated with unprocessed LWR spent fuel as a permanent waste form is poor long-term containment provided by metal-clad fuel rods within metallic canisters. According to the Reference 15 performance assessment, a large fraction of LWR spent fuel would become

exposed within several hundred to several thousand years because of the expected failure of Zircaloy cladding and corrosion of metallic canisters, and the only remaining barrier for release to the accessible environment would then be the surrounding geologic media. The effectiveness of this barrier for long time periods is uncertain and could be compromised by unforeseen events, including climatic changes and increased seismic activity. In testimony before the House Commerce Subcommittee on Energy and Power on June 30, 1995, John Cantlon, Chairman of the Nuclear Waste Technical Review Board (NWTRB), stated that the NWTRB "has repeatedly urged the DOE to develop a robust, long-lived waste package that will work together with other engineered barriers and the geology at the site to provide long-term isolation of the radioactive waste from the accessible environment." Cantlon stated also that "the use of such waste packages can help improve confidence in the long-term performance of the repository and thus facilitate licensing of the facility." Other experts on disposal of high-level radioactive waste have stated (Ref. 21) that "any strategy of isolation should emphasize the near-field containment of radionuclides, a function primarily of waste form or 'waste package' performance" and that "strategies that rely solely on long travel times, dispersal, or dilution, implicitly presume release and movement of radionuclides." In a recent report (Ref. 22), the NAS concluded that the most harmful releases of radionuclides from a geologic repository could occur well after 10,000 years, which further underscores the need to provide effective near-field containment of radionuclides for geologic time periods. Other potential benefits of superior near-field containment are less required geological characterization of the candidate repository site and greater likelihood that a given site would be found acceptable.

Final waste form characteristics (and not just near-term diversion resistance) will determine the overall schedule for achieving effective disposition of plutonium. Plutonium disposition using deep-burn reactors like the GT-MHR could satisfy long-term safeguards requirements without relying on the availability of a geologic repository or the determination that the repository would provide the needed long-term safeguards. This is a very significant advantage for deep-burn reactors that has been overlooked during the DOE screening process. GT-MHR spent fuel would be a highly stable and highly diversion resistant waste form during potentially long-term storage and after permanent disposal. If future generations could respond to the DOE questionnaire, they would undoubtedly rate final waste form characteristics as the most important criterion for evaluating high-level radioactive waste forms, including those generated from disposition of surplus plutonium.

Final waste form characteristics and long-term environmental impacts should be given a high priority and careful evaluation when evaluating technologies for plutonium disposition. Advanced technologies that produce clearly superior permanent waste forms and have the potential to eliminate long-term, high-consequence environmental impact scenarios should be evaluated as part of the Programmatic EIS, particularly if the schedules for implementing these technologies are not significantly longer than those for more established technologies and if the potential for strong international collaboration exists. The GT-MHR would clearly meet these conditions.

16/01.05.00 cont.

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Use of Borosilicate Glass for Vitrification

The vitrification alternative proposed in the draft PEIS would involve manufacturing borosilicate glass logs containing plutonium and high-level waste. Recent evaluations have raised significant issues that may preclude borosilicate glass as a host phase for immobilization of plutonium. These issues include potentially poor long-term durability in a geologic repository and long term irradiation effects. These issues received considerable attention during a recent DOE Plutonium Stabilization and Immobilization Workshop in Washington, DC (December 12-14, 1995). Since weapons grade plutonium consists mostly of the fissile isotope plutonium-239, with a half-life of about 24,000 years, the time over which the waste remains highly radiotoxic would likely exceed the expected lifetime of the glass. Scientists at Argonne National Laboratory have been developing a more durable glass for plutonium immobilization (Ref. 23). 18/05.01.08 18/05.01.08 cont.

DOE should acknowledge the potential problems with borosilicate glass and evaluate alternative glass forms during preparation of the EIS.

Viability of Electrometallurgical Treatment

According to the draft Programmatic EIS, the DOE will consider electrometallurgical treatment as an option for plutonium disposition. Electrometallurgical treatment was derived from pyroprocessing technology developed for reprocessing liquid metal reactor spent fuel. In its 1995 report (Ref. 9), the NAS evaluated pyroprocessing as an option for plutonium disposition. The NAS determined that pryroprocessing has several disadvantages that "effectively rule it out as a serious competitor for the near-term plutonium disposition mission." The NAS raised concerns with regard to the maturity of the technology, the size of the facility required to complete the disposition mission, and suitability of the final waste form for permanent disposal. In light of this evaluation by the NAS, the DOE should provide stronger justification for continuing to evaluate electrometallurgical treatment as a viable option for plutonium disposition. 19/05.03.08

Coated-Particle Waste Form for Plutonium Immobilization

Coated particles were once considered by the DOE as an alternative waste form for immobilization of high-level waste, and research programs were conducted at Pacific Northwest Laboratory and Oak Ridge National Laboratory (ORNL) in the early 1980s (e.g., Refs. 10 through 12). The feasibility of coating high-level waste was established at ORNL, and coated particles were judged to have by far the best performance potential of the candidate alternative waste forms. DOE should evaluate the coated-particle waste form for plutonium immobilization as part of the EIS process. 20/14.00.00

Environmental Impacts of the CANDU Reactor Option

While the Programmatic EIS discusses a full spectrum of environmental impacts of using an existing light water reactor for plutonium disposition, several of the similar environmental impacts for use of existing CANDU reactors (such as those at the Ontario Hydro Bruce-A

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05 01 08 **Comment Number 18**

Alternative forms were evaluated before issuing the Draft PEIS. These results are reported in the document (available in DOE Public Reading Rooms): *Screening of Alternative Immobilization Candidates for Disposition of Surplus Fissile Materials*, February 9, 1996 (UCRL-ID 118819 [L-20790-1]).

05 03 08 **Comment Number 19**

Electrometallurgical Treatment was considered a reasonable alternative after completion of the screening process and scoping for the PEIS. The National Research Council recommended successful demonstration of the electrometallurgical treatment process prior to implementation. Upon making the decision on disposition technologies, DOE will demonstrate these technologies.

14 00 00 **Comment Number 20**

During the screening of alternatives for inclusion in the PEIS, various immobilization forms were considered. The decision was made to include immobilization in ceramic and glass forms. The specific ceramic form was not identified. Research and development (R&D) is both on-going and planned to support the disposition alternative(s), which would include pilot facilities for processes (such as ceramic coated particles) and materials, as necessary. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

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Nuclear Generating Station, located on Lake Huron about 300 km (186 miles) northeast of Detroit) are listed in the document as not applicable. Examples include normal radiological impacts, hazardous chemical impacts, and facility accidents. The Programmatic EIS limits its evaluation of the environmental impacts from these sources for all alternatives to a radius of 80 km (50 miles) from the site boundary. The basis for limiting the evaluation to this radius is not presented. It is noteworthy, however, that no such limit is placed upon the evaluation of the environmental impacts from these sources in other Programmatic Environmental Impact Statements such as the Programmatic EIS for Tritium Supply and Recycle.

In effect, DOE has assumed that the environmental impacts from these sources for the CANDU reactor option somehow stop at the U.S./Canadian border and do not affect U.S. citizens living near the plant. This is obviously unrealistic, and DOE should include a full assessment of the environmental impacts of the CANDU reactor option in the final Programmatic EIS. 21/06.05.08

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06 05 08 Comment Number 21

The environmental impacts in foreign nations are not addressed under NEPA. However, if the CANDU Reactor Alternative was selected, an assessment of environmental impacts would be accomplished pursuant to Canadian Federal and Provincial law. Further, the ROI used consistently for analysis of this PEIS for sites and technology, includes an 80-kilometer (km) (50-mile [mi]) radius. The distance from the U.S. border to the Bruce-A-Generating Station is greater than the distance for analysis.

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Relative Importance:	Theft / Diversion	Retrieval / Reuse	Technical Viability	ES&H	Cost	Time	Internat'l Influence	Public / Institutional	Additional Benefits	
Very Important	124	78	104	101	35	54	67	42	49	
Moderate	15	33	38	34	80	49	47	58	39	
Less Important	7	23	2	10	42	32	36	40	40	
Inappropriate	1	15	0	1	9	10	5	5	16	

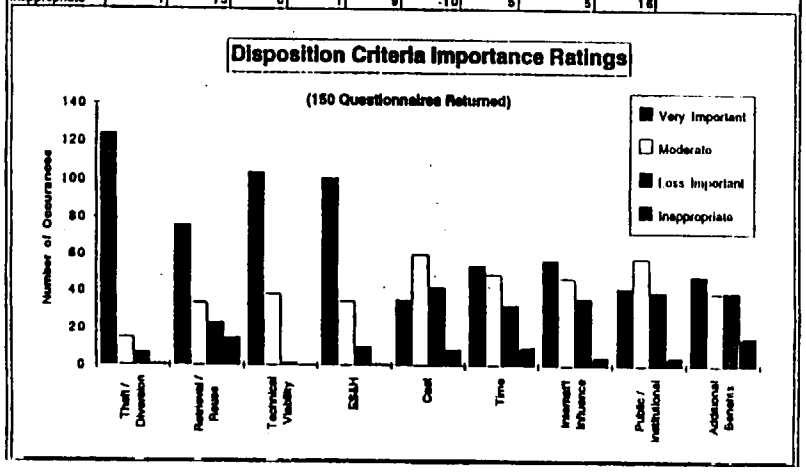

FIGURE 1 (FROM DOE/MD-0002)

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Rank:	Theft / Diversion	Retrieval / Reuse	Technical Viability	ES&H	Cost	Time	Internat'l Influence	Public / Institut'l	Additional Benefits		
1	34	12	12	29	3	7	8	7	8		
2	33	14	20	22	7	8	5	7	2		
3	21	22	27	16	8	6	3	5	9		
4	10	8	27	23	8	13	16	7	5		
5	10	9	20	7	16	16	11	12	17		
6	3	16	5	10	22	15	19	16	11		
7	6	11	6	9	14	23	21	23	5		
8	2	8	2	3	21	19	15	27	17		
9	0	15	0	1	18	11	17	15	41		

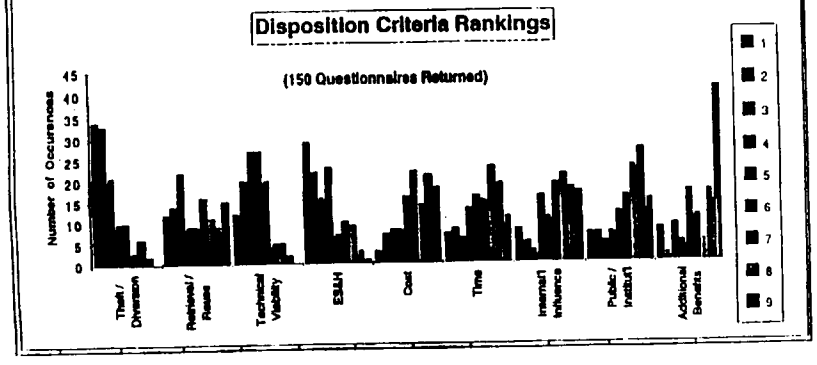

FIGURE 2 (FROM DOE/MD-0002)

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General Electric Company
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May 6, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 200026-3786.

Subject: Comments on the Draft Programmatic Environment Impact Statement for the Disposition of Weapons-Usable Fissile Materials, dated February 1996

Please accept the attached comments related to the disposition of weapons usable plutonium.

Yours Truly

Edward Ehrlich

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Due to the close of the comment period on Tuesday May 7, transmittal of our comments to the DOE will be via by FAX to 1-800-820-5156

cc: Lynn Wallis
Steve Hucik

F-021

Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement
(February 1996)
DOE/EIS-0229-D

Comments

Volume/Section/Page	Comments	
Summary-Abstract/ compared to S-7	The summary abstract conclusion, that the disposition of weapons usable Pu is necessary, is in conflict with a no action alternative. Considering the continuing threat of diversion of Russia's weapons usable plutonium, a near-term bilateral, reliable Pu disposition program would appear to be a highly necessary activity and therefore a no action alternative which would neglect the "clear and present danger" situation, should be entirely unacceptable. The PEIS also fails to adequately address 1) the sense of urgency which should be evaluated by the reliable timeliness of each alternative and 2) the environmental risk which a nuclear threat due to diverted material would represent. Further delay in embarking on a practical disposition program and failure of the chosen alternatives to reliably fulfill the mission would enable and enhance that threat.	1/08.03.01 2/01.00.00
Summary S -5	The PEIS describes international cooperation as a PEIS criteria but fails to give appropriate credibility to the furthering of international cooperation which bilateral reactor based programs in both the U.S. and Russia would provide. It has been publicly suggested by DOE personnel that the disposition programs in each country could be different, however a vitrification program which would leave the weapons usable Pu unchanged and readily recoverable by the industrial infrastructures available in either the U.S. or Russia, cannot be credible to either side. Equivalent programs in the two countries for the large quantities of pit Plutonium must contain an element of irreversibility which only the LWR option offers.	3/01.03.00
	The PEIS fails to give appropriate credit under both its timeliness and cost criteria of the industrial reliability and predictability of the existing LWR option; especially as compared to 1) the uncertainties in the R&D required for other options, 2) the technical, cost, and schedule uncertainties inherent in the prototype stage of other options, and 3) in the reliability and cost uncertainties of the mission production stage of the other options being considered.	4/08.03.01

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08 03 01 **Comment Number 1**

Analyses of the No Action Alternative are required by NEPA to serve as a baseline. As stated in Chapter 1 of the PEIS, the purpose of the Proposed Action is to provide safe, secure, and cost-effective storage for the nonsurplus weapons-usable fissile materials and for surplus Pu pending disposition, since the disposition process would take time. The intent is to conduct the disposition process until all surplus Pu materials are taken care of.

01 00 00 **Comment Number 2**

Timeliness is one of the criteria used in the screening process for selecting reasonable alternatives to be analyzed in the PEIS. The endpoint for each disposition alternative is to convert the surplus Pu into a proliferation-resistant form that meets the Spent Fuel Standard, as described in the PEIS.

01 03 00 **Comment Number 3**

As described in the PEIS, the endpoint for all disposition alternatives is to convert the surplus Pu into a proliferation-resistant form that meets the Spent Fuel Standard. Vitrification of Pu can meet this Standard since the Pu would be as unattractive and inaccessible as that in spent nuclear fuel. The United States and Russia currently have a joint program to assess the feasibility of all the reasonable disposition alternatives, including the use of Pu in LWRs.

08 03 01 **Comment Number 4**

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

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Summary/Reactor Category/S-15	The statement "a dedicated facility would have to be built at a U.S. site to implement the reactor alternative" (MOX fuel fabrication facility) is considered somewhat misleading. MOX fabrication capabilities exist in Europe and could support the reactor alternative. The PEIS explains European capabilities in later sections and details the need for a U.S. capability. However, this paragraph is considered incorrect as written. It may be prudent for policy reasons to proceed with a MOX facility in the U.S. to assure a reliable, proliferation independent MOX fuel supply for a U.S. LWR program, but the decision to build MOX facility in the U.S. is more a political decision than one fully necessitated by the technology, logistics or the available infrastructure.	5/06.01.09
Summary/Existing Light Water Reactor Alternative/S-15	The first paragraph in this section states that a minimum of four (4) BWRs would be required for a Pu throughput of 2-3 t/yr. With optimized fuel and fuel cycle designs recently divulged to the DOE, this throughput can be achieved with two (2) existing BWRs utilizing full MOX cores or with three (3) existing BWRs utilizing a high Pu throughput (no burnable poisons in the MOX fuel rods) design. The PEIS timeliness and technological viability criteria should also consider that BWRs can operate with up to a full MOX core configuration without changes to the plant design, equipment, systems, or fuel bundle mechanical configuration. The capability for operation with MOX is achieved entirely through the design of the fuel pellet and core nuclear design. Systems operations and core and fuel bundle mechanical designs all remain unchanged. MOX cores for BWRs can also be designed within the operating envelope of the current UO_2 fuel design licensing criteria which sustains the existing margin to the licensing basis design limits for current fuel bundle designs. These considerations enable licensing of MOX fuel designs for BWRs and licensing of BWR plants for operation with MOX fuel to be implemented as straightforward, low technical risk activities. This approach has been the basis for MOX fuel designs and MOX fuel operation in BWRs since the onset of GE's Pu disposition evaluations. Modifications of mechanical, chemical, and control systems of pressurized water reactors (PWRs) were required in order to transition from UO_2 fuel to even the nominal 1/3 MOX core operating schemes being used in France. Where more challenging MOX operating cycles are being considered, PWR plants will require even further modifications and changes to reactor control and operating systems. DOE should NOT confuse the PWR requirement for control rod additions and soluble boron reactivity control systems changes as being applicable to BWRs as there are no such requirements for BWRs.	6/01.05.00 7/06.02.09

F-021

06 01 09 **Comment Number 5**

Europe is moving toward a balance between the capacity to fabricate MOX fuel and the capacity to utilize MOX fuel in reactors. Additionally, Europe has excess separated Pu stores which they intend to use as MOX fuel as the fuel fabrication infrastructure and reactor infrastructure permits. Therefore, use of European reactors for consumption of U.S. Pu-source MOX fuel would merely displace the use of separated European Pu and result in no net reduction in world inventories of separated Pu. Hence, the statement that Europe has no excess MOX capacity. Additionally, facility utilization projections indicate that, while some excess MOX fuel fabrication capacity may exist in Europe for the next few years, current capacity is soon expected to be fully utilized for commercial MOX fabrication. Therefore, the United States may not be able to rely on the use of existing European MOX fabrication capacity for the entire disposition campaign. However, as a part of efforts to develop weapons-grade Pu MOX fuel, DOE is consulting with European Fuel Fabricators to benefit from their experience in MOX fuel fabrication and may have some MOX Lead Test Assemblies and/or initial core loads fabricated in Europe. Also, participation in the construction and operation of a MOX Fuel Fabrication Facility in the United States will be open to European fuel vendors.

01 05 00 **Comment Number 6**

The Technical Summary Report for disposition, made available to the public in July 1996, recognizes the fact that full MOX cores could be utilized for Pu disposition. The Final PEIS and Summary have been revised to incorporate this information.

06 02 09 **Comment Number 7**

The Technical Summary Report for disposition, made available to the public in July 1996, recognizes this information.

Summary/Attachment B/S-153	In the Existing Light Water Reactors Alternative (per single unit) column under Waste Management, it states that spent nuclear fuel generation would increase approximately 23 *t* for BWRs. If the BWR operating cycles and core management/outage philosophies are not changed with the introduction of MOX fuel, the amount of spent fuel generated should not increase.	8/09.11.08
Vol. I/1.2, 6th para./ 1-5	We consider the statement that the NAS has identified several disposition options to be misleading. The NAS report states that the "two most promising alternatives" are fabrication and use as fuel (spent fuel option) and vitrification. The third option, burial in deep boreholes, has been less thoroughly studied. Considering the delays and uncertainty surrounding the Yucca Mt. repository, the uncertainties associated with deep borehole burial might be even more uncertain and therefore the program schedule, cost, and technical risks of the deep borehole option would seem to make that option not a credible nor reliable near term option.	9/01.04.00
Vol. I/Table 2.4.5.1-1/2-123	The column "minimum 4 BWR" is incorrect (see similar comment above). The GE ABWR is not listed in the "Evolutionary Reactor Types". Information on the ABWR is provided in NEDO-32351 and the ABWR should be available as an evolutionary reactor option.	10/06.02.09
Vol. I/2.4.5.2, Facility Operations/2-126	Again, "four BWRs" should be changed to "three BWRs" for partial MOX cores or "two BWRs" for full MOX designs.	
Vol. I/Table 2.4.5.2-1/2-129	Given the same fuel cycles as for LEU fuel, MOX cores should not generate additional spent fuel assemblies (as compared to typical LEU cores).	
Vol. I/Table 2.5-2a/ 2-255	If core management philosophy is unchanged, spent nuclear fuel generation would NOT increase by the 23 *t* for BWRs. DOE's assertion does not appear justified.	8/09.11.08 cont.
Vol. II/4.3.5.2.10, 3rd para./4-692	DOE appears incorrect in concluding that the number of discharged fuel bundles is higher for a MOX core than the typical LEU core. This paragraph raises the concern of increased waste and storage requirements for MOX fueled reactors that can be considered neither accurate nor justified.	
Vol. II/4.3.5.5/4-769	This paragraph might infer that there are CANDU reactors within the United States.	11/16.00.00

F-021

09 11 08 **Comment Number 8**

MOX fuel used in the Existing LWR would remain in the reactor until sufficient burnup is achieved to meet the Spent Fuel Standard. This would be shorter than conventional uranium fuel cycles which remain in the reactor to achieve full economic value. MOX fuel will be withdrawn before full burnup is achieved and therefore more spent fuel will be generated. This assumption was used in order to bound the impacts for spent fuel generation and storage. It also would dispose of the excess weapons-usable fissile materials as quickly as possible. If the core management philosophy is different from the assumption used in the PEIS, as noted by the commentor, the resultant environmental impacts would be less. The facility operations section of Chapter 2 of the Final PEIS for the Reactor Alternatives acknowledges that there would be a range in the amount of MOX throughput dependant upon the reactor types and fuel management.

01 04 00 **Comment Number 9**

Comment noted.

06 02 09 **Comment Number 10**

The PEIS has been changed to reflect that 3 to 5 LWRs would be required to accomplish the mission in approximately 25 years and starting up in 10 to 12 years. The Technical Summary Report issued by DOE in July 1996 provides more details.

16 00 00 **Comment Number 11**

Comment noted. Text was changed to improve clarity.

GENERAL ELECTRIC COMPANY, SAN JOSE, CA,
EDWARD EHRLICH
PAGE 5 OF 5

Vol. III/H.4/H-7	The GE Advanced Boiling Water Reactor is designed for MOX fuels, and therefore should be included in this discussion. The PWR discussion in Section H.5 includes all three LWR options.	12/06.04.08
Vol. III/H.4.1/H-7	Dependent upon the DOE decision to pursue partial or full MOX cores, less than four (4) BWRs can accommodate this mission.	10/06.02.09 cont.
Vol. III/H.4.3/H-8	The figures referenced in the paragraphs on criticality and thermal are reversed.	13/16.00.00
Vol. III/App. N, 4th para./N-1	This is a confusing paragraph since BWR fuel designs also use burnable poison rods.	14/06.00.08

F-021

06 04 08 **Comment Number 12**

Section H.4 addresses the existing and partially completed LWRs and Section H.5 addresses the existing, partially completed, and evolutionary LWRs. The General Electric (GE) evolutionary LWR was not addressed in the PEIS but would give comparable results. Additional analyses on the spent nuclear fuel disposition would be completed if the Evolutionary LWR Alternative is selected.

16 00 00 **Comment Number 13**

The commentor is correct. The figures referenced in Appendix H were changed for the Final PEIS. A consistency check was performed on the Final PEIS as a part of the Quality Assurance Procedure.

06 00 08 **Comment Number 14**

The paragraph in Appendix N has been revised in the Final PEIS for clarity.

A PROPOSAL FOR PLUTONIUM DISPOSITION*

W. M. STACEY
J. A. FAVORITE
NUCLEAR ENGINEERING PROGRAM
GEORGIA INSTITUTE OF TECHNOLOGY
APRIL, 1996

PROCESS WEAPONS-GRADE PLUTONIUM IN A VOLUMETRIC NEUTRON IRRADIATION FACILITY TO BUILD UP HIGHER ACTINIDES AND FISSION PRODUCTS SUFFICIENT TO DETER DIVERSION OR THEFT FOR WEAPONS PRODUCTION	1/14.00.00
STORE THE IRRADIATED PLUTONIUM FOR EVENTUAL USE AS A FUEL IN COMMERCIAL NUCLEAR REACTORS	2/08.03.01

* BASED ON A DESIGN STUDY PERFORMED BY A GEORGIA TECH NE&HP DESIGN TEAM AND PUBLISHED IN FUSION TECHNOLOGY, 27, 326, 1995.

M-133

14 00 00 **Comment Number 1**

A fusion-induced neutron flux would not be available until 2015 as described in the comment. This timeframe would not be consistent with the purpose of and need for disposition of Pu to reduce proliferation. In addition, this technology is immature compared to existing fission reactor technology. Several other new reactor technologies were eliminated for similar reasons, as described in Chapter 2 of the PEIS.

08 03 01 **Comment Number 2**

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

GEORGIA INSTITUTE OF TECHNOLOGY, NUCLEAR ENGINEERING PROGRAM, ATLANTA, GA, W. M. STACEY AND J. A. FAVORITE
PAGE 2 OF 3

IRRADIATION OF WEAPONS GRADE Pu TO 115 Mwd/kg (11% ^{240}Pu) IS SUFFICIENT TO DETER THEFT.

A VOLUMETRIC NEUTRON SOURCE CAPABLE OF PRODUCING 10^{21} n/s AND A FAST NEUTRON FLUX OF $2x10^{15}$ n/cm^{2}s OVER AN IRRADIATION VOLUME OF ~60m^3 CAN PROCESS ~10 TONNES PER YEAR OF Pu.

A FUSION NEUTRON SOURCE, BASED ON THE TECHNOLOGY THAT IS BEING DEVELOPED FOR ITER AND THE FUSION PHYSICS THAT WILL BE DEMONSTRATED IN ITER (2008-2015), CAN PRODUCE A DISTRIBUTED NEUTRON SOURCE OF 10^{21} n/s.

1/14.00.00 cont.

A CONCEPT FOR A ~60m^3 IRRADIATION FACILITY HAS BEEN DEVELOPED, BASED ON EXISTING NUCLEAR FUEL TECHNOLOGY, LIQUID LITHIUM COOLING AND A REFRACTORY METAL STRUCTURAL MATERIAL.

THE IRRADIATION FACILITY WOULD BREED THE NEEDED FUSION FUEL (TRITIUM) AND PRODUCE 2700 MW ELECTRICAL POWER.

A FUSION-BASED IRRADIATION FACILITY FOR Pu PROCESSING COULD BE BROUGHT ON LINE IN 2015-25, OR EARLIER WITH AN ACCELERATED PROGRAM.

THE IRRADIATION FACILITY AND THE TEMPORARY STORAGE FACILITY FOR THE PROCESSED Pu WOULD BE ON A GOVERNMENT SITE.

M-133

A TRANSMUTATION FACILITY FOR WEAPONS-GRADE PLUTONIUM DISPOSITION BASED ON A TOKAMAK FUSION NEUTRON SOURCE

KEYWORDS: *plutonium disposal, plutonium transmutation, fusion transmutation facility*

W. M. STACEY, B. L. PILGER, J. A. MOWREY, D. C. NORRIS, M. DIETSCHE, E. A. HOFFMAN, B. A. ABICHEDID, A. W. ANTHONY, M. S. AYRES, T. P. BELFLOWER, J. D. BOHNER, S. F. CAPUTLU, H. M. COWARD, H. M. DILLER, J. A. FAVORITE, P. T. FEIR, J. S. GUSTAFSON, N. L. JENKINS, T. L. JOHNSTON, J. L. MARTIN, C. H. NAHASS, D. M. NICHTER, D. F. PARKER, R. A. SIDWELL, A. L. TURNER, and J. D. WARTELL
Georgia Institute of Technology, Nuclear Engineering and Health Physics Program Atlanta, Georgia 30332-0225

Received September 23, 1994
Accepted for Publication December 20, 1994

It is suggested that weapons-grade plutonium could be processed through a transmutation facility to build up sufficient actinide and fission product inventories to serve as a deterrent to diversion or theft during subsequent storage, pending eventual use as fuel in commercial nuclear reactors. A transmutation facility consisting of a tokamak fusion neutron source surrounded by fuel assemblies containing the weapons-grade plutonium in the form of PuO_2 pebbles in a lithium slurry is investigated. A design concept/operation scenario is developed for a facility that would be able to transmute the world's estimated surplus inventory of weapons-grade plutonium to 11% ^{240}Pu concentration in ~25 yr. The fusion neutron source would be based on plasma physics and plasma support technology being qualified in ongoing research and development (R&D) programs, and the plutonium fuel would be based on existing technology. A new R&D program would be required to qualify a refractory metal alloy structural material that would be needed to handle the high heat fluxes; otherwise, extensions of existing technologies and acceleration of existing R&D programs would seem to be adequate to qualify all required technologies. Such a facility might feasibly be deployed in 20 to 30 yr, or sooner with a crash program.

I. INTRODUCTION

It has been estimated that 100 to 260 tonnes of weapons-grade plutonium (>93% ^{239}Pu) exists in the form of nuclear warheads and in processing and storage systems.[1,2] An even larger quantity, ~1400 tonnes, of highly enriched weapons-grade uranium exists.[2] Under the conditions of the Strategic Arms Reduction Treaties I and II, ~90 tonnes of weapons-grade plutonium and 450 tonnes of highly enriched uranium in the United States and the former Soviet Union will become surplus to military needs as weapons are dismantled over the next decade.[2,3] There is a substantially larger civilian stockpile, ~780 tonnes, of reactor-grade (^{239}Pu admixed with large fractions of higher transuranics) plutonium[2] of which ~80% is in the form of spent fuel, although ~135 tonnes has been separated for reuse in fission reactors.[2]

The disposition of all of this plutonium and highly enriched uranium is a pressing international concern. The security of approximately one-half of the weapons-grade plutonium and uranium that was in the custody of the former Soviet Union is of particular concern; some 25 tonnes cannot be accounted for.[2] The threat of some of this material falling into the hands of unauthorized parties (terrorists groups or irresponsible governments) is quite palpable. Even if the security is improved substantially, these large stockpiles of highly enriched, weapons-grade materials would remain a tempting target for diversion or theft. For the uranium,

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GERRELLS, ELSWORTH, SAN JOSE, CA
PAGE 1 OF 8

May 7, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786.

Dear Sirs:

My comments on the February 1996 Draft Programmatic Environment Impact Statement for the Disposition of Weapons-Usable Fissile Materials are attached.

Yours Truly,

Elsworth Gerrells
1145 Holy Ann Place
San Jose, CA 95120

F-038

Comments on DRAFT Programmatic Environmental Impact Statement for the Storage and Disposition of Weapons Useable Fissile Materials

(Comments apply to the storage and disposition of excess weapons plutonium.)

Timeliness, Reliability, Costs -Risk Effectiveness

The PEIS fails to take into account the potential costs and environmental impact of the most significant risk factor associated with the plutonium disposition program. That is the risk and impact of the divergence or theft of that weapons useable material from the Russian stockpile. 1/01.06.00

Programs underway to establish a better inventory and more reliable physical security over the Russian weapon materials are potentially piecemeal and band-aid activities with uncertain results.

At an April 8,1996 CSIS forum in Washington DC chaired by Dr. James Schlesinger, some key findings with respect to the threat of nuclear material in Russia included:

- threat is escalating,
- desperate, corrupt insiders are a serious threat
- military controls lessening
- finances are short
- trafficking trend is upward
- the threat outpacing security improvements, even with U.S. financial help
- smuggling routes are numerous, shifting through the Caucasus, Europe, Central Asia
- Russian organized crime is involved now - a dangerous mix of power, greed, corrupt officials/military
- countermeasures are expensive - a need to secure at the source
- protection at source paramount, but post-theft measures needed also
- neutralization is worst option - when conducted abroad, political and safety risks abound, capabilities limited.

Recommendations by the task force included:

- sustained funding and long term vision
- institutional measures
- bilateral safeguards (for material removed from warheads)
- the U.S. needs development of an indigenous safeguards culture in the former Soviet Union - not brought in from Los Alamos and put there

At the forum, Mr. Graham Allison urged that focus should be the "loose nukes" (the bomb-making nuclear materials). He concluded we are living on borrowed time.

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01 06 00 Comment Number 1

The purpose of the Proposed Action is, in part, to establish the technical and program infrastructure that will enable the United States to take unilateral action or negotiate reciprocal actions with other nations for the disposition of surplus weapons-usable Pu. This PEIS addresses the environmental impacts of the reasonable alternatives for DOE's Proposed Action. Analyses of the cost, schedule, technical, and Nonproliferation Policy impacts are described in separate documents to support DOE's ROD. The documents related to technical, cost, and schedule analyses were made available for public review beginning in July 1996. The nonproliferation analysis was made available to the public beginning in October 1996. DOE also conducted a series of public meetings, prior to the issuance of the Final PEIS, to discuss the analysis of the Nonproliferation Policy as it relates to the Proposed Action and alternatives.

Comments on DRAFT Programmatic Environmental Impact Statement for the Storage and Disposition of Weapons Useable Fissile Materials

(Comments apply to the storage and disposition of excess weapons plutonium.)

Timeliness, Reliability, Costs -Risk Effectiveness

The PEIS fails to take into account the potential costs and environmental impact of the most significant risk factor associated with the plutonium disposition program. That is the risk and impact of the divergence or theft of that weapons useable material from the Russian stockpile.

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At the forum, Mr. Graham Allison urged that focus should be the "loose nukes" (the bomb-making nuclear materials). He concluded we are living on borrowed time.

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Record of Decision. Therefore these cost differentials between options under consideration should be meaningless when compared to the cost of the proliferation and threat risk. In that context, the overriding cost-benefit analysis clearly makes the most effective, reliable and timely solution available the desirable option. An overriding cost-benefit advantage of the light water reactor option is its assurance that the threat to national security could be reliably and effectively addressed in the short time frame intended, and the light water reactor option should therefore merit DOE support, and given those same considerations, other widespread public and political support. 2/08.03.01

Recognizing this, the National Academy of Sciences urged that costs should not be a major factor in getting on with the Pu disposition program and that a timely and reliable response should be primary.

The environmental impact of a clandestine nuclear device even if only hidden or if exploded in a U.S. city, would have an overwhelming environmental impact compared to some of the trivial issues being studied and elevated to equal consideration in the PEIS. Even a credible threat of a nuclear device by a sub-national terrorist group could cause serious social dislocation.

Timeliness, reliability, and cost-risk effectiveness do not appear to be valued in DOE's PEIS evaluation. Since early 1994 and again since then, the National Academy of Sciences has strongly urged the DOE to expedite the disposition activity. They recognize the "clear and present danger" of divergence or "breakout" of Russian nuclear material. 3/08.03.00

DOE's actions to-date do not reflect the sense of urgency or timeliness in implementing a meaningful disposition program as recommended by the National Academy. Since 1993, resources have been directed to studies, and then more studies, and time and money have been expended on consideration of options with little real potential or technical value and with high technical, cost, and schedule risks. The PEIS and ROD originally advertised by DOE as intended for expedited completion in mid-1996, has been underfunded and most likely, intentionally delayed until after the presidential elections. Even now, resources are being committed or used by DOE on prototype technical activities which could have little real impact on accelerating a meaningful disposition effort but which appear to be undertaken to facilitate the opportunity to make grand but bogus claims of progress, solely to further political purposes in an election year. The PEIS spends years and millions of dollars considering endangered wildlife species and the minute distinctions of potential economic discrimination between the various options. DOE would be better to consider the impact of the delay and underfunding that has occurred in the disposition program on the economic discrimination that would befall all the citizens of any major population center targeted by a terrorist nuclear device, and also the risk that the citizens of that target location could become another endangered species. 4/01.00.00 5/08.00.00

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08 03 01 **Comment Number 2**

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 00 **Comment Number 3**

The time required to implement and complete the Proposed Action under each of the alternatives is included in this PEIS. A detailed schedule, reliability, and cost information have been included in a separate Technical Summary Report. Information on environmental impacts in this PEIS along with technical, cost and schedule information in the Technical Summary Reports, and other information will be provided to the decisionmaker.

01 00 00 **Comment Number 4**

The schedule analysis, along with the cost, technical, and Nonproliferation Policy analyses on the Proposed Action and reasonable alternatives, is presented in separate documents to support the DOE's ROD. The documents related to technical, cost, and schedule analyses were available for public review beginning in July 1996. The nonproliferation analysis was made available to the public beginning in October 1996. The ROD is expected in late 1996.

08 00 00 **Comment Number 5**

Comment noted.

DOE's technical staff clearly and very early identified a dual track approach of (1) converting the bulk of the excess weapons useable Pu materials to mixed oxide fuel and dispositioning it in existing LWRs, and 2) developing some form of vitrification technology for encapsulating smaller quantities of low level Pu from waste steams and scrape Pu that are not suitable for LWR fuel. These are the best available mix of technology and industrially reliable capabilities.

DOE funding should be directed toward accelerating the LWR option which addresses the bulk and weapons useable material while also sustaining a lower level of vitrification activities to address the smaller quantity and less-useable, and therefore less threatening, Pu wastes. 6/08.03.01

Consideration of Vitrification as a single solution for all U.S. excess material does not represent a credible or reliable and unrecoverable option. There are serious environmental and nuclear criticality uncertainties associated with the vitrification of large quantities of fissionable material. 7/08.03.01

There are also so may developmental uncertainties and production reliability concerns with all vitrification options such that the risk of it never providing a reliable bulk conversion option are very great. The vitrification options are considered experimental even by those who advocate their development. There is significant risk in the cost and schedule and successful resolution of technical issues even in an R&D phase in bringing those options to a prototype state. The costs, schedule and program risks are even greater when the prototype technology needs to be expanded and relied upon for the production disposition mission. If the eventually industrial reliability might be only 35-60 % , would it be viable ? Can DOE truly expect to estimate what the O&M costs of production are for a vitrification program ? 8/05.01.08

Furthermore, DOE's own scientists at LANL have published that recovery of Pu from vitrified forms is a simple chemical process and easily achievable. This makes vitrification less of a barrier than the LWR spent fuel option and also must have less credibility for encouraging a reciprocal bilateral program with Russia for that same reason. Therefore, the bulk of the weapons usable material should be dispositioned by the LWR option which is the only option that achieves an isotopic change of weapons usage forms of plutonium and increases the undesirable Pu 240 content and reduces overall the amount of Pu by about 1/3 in a once through cycle. 6/08.03.01 cont.

Proliferation and Technology Issues

At a guest lecture tour through the U.S. in April '96 by a noted expert on Plutonium, Prof. Wolfgang Stoll of Germany; Professor Stoll offered a foreign view of U.S. non-proliferation tactics.

Prof. Stoll offered that the U.S. is undermining its ability to achieve a timely disposition program for weapons usable materials if it rejects MOX fuel technology as a means of

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08 03 01 **Comment Number 6**

The Department of Energy acknowledges the commentor's support for the implementation of both the Reactor and Immobilization Alternatives. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 **Comment Number 7**

The Department of Energy acknowledges the commentor's opposition to the Vitrification Alternative. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

05 01 08 **Comment Number 8**

Further information on the technical viability, schedule, and costs of the Immobilization Alternatives is provided in the Technical Summary Report and related Immobilization Alternative Summary Reports published in July 1996.

dispositioning weapons materials. There is reluctance by some to proceed with disposition of weapons material through burning of MOX because of misinformed expectation by anti-nuclear idealists that if the U.S. does not use the technology, then it will also not be used by others for commercial purposes. Prof. Stoll assured his American audience that other nations are already far ahead of the U.S. in MOX fuel technology, commercial use, and experience with it, and that they will continue to pursue and use that technology to meet their spent fuel disposal and long term energy independence commitments and plans in safeguarded and proliferation resistant programs.

In fact, by not participating in MOX technology, the U.S. is abandoning it's technological leadership to others and will cease to have a voice or influence over the non-proliferation considerations of those programs. The U.S. expectations were characterized as naive, as the U.S. very mistakenly expects the rest of the world to unfailingly march to the beat of our drum. It was suggested that, instead, the U.S. would have much more influence and control over MOX technology by being the technology leader in that discipline, and where the U.S. might be able to turn technical support on or off to control the use of the technology in appropriately safeguarded and non-proliferation committed programs.

In subsequent discussions, it was noted that facilities and production processes for MOX fuel that would be used in a U.S. disposition program could be designed so it would be highly impractical to consider the use of those same facilities for the highly irradiated recycled Pu that would be considered if a commercial MOX program were intended. Furthermore, the facility could be designed for convenient decontamination from low exposure weapons grade Pu and built-in decommission considerations could be designed in so that could be readily achieved upon termination of the disposition program. It is also relevant to explain to the political opponents of LWR disposition that the U.S. disposition program is going to be limited program with only a few plants participating into order to achieve rapid and reliable disposition of weapons for a strategic non-proliferation goal and it is in no way oriented to promote the commercial use of MOX. There are "professional " protest lobbies (Greenpeace for one) that would decry any and all DOE disposition options and especially the LWR option; while others recognize the facility of the LWR option and decry the environment risks of geological disposal of vitrification products. Yet they offer no alternate solution to the environmental threat of doing nothing and the role they play in further delaying meaningful disposition.

Involved locales and common sense public good

Some professional environmental protesters would have the DOE abandon consideration of all near term options and spend additional decades in R&D on "still unidentified, ultimate disposition methods" which, of course, must have no potential for environmental impact. Pursuing a longer term solution for the much less threatening proliferation risk from reactor grade plutonium, instead of focusing on the near term

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security issues stemming from weapons grade plutonium, could result in the proverbial "locking of the barn door after the horses are stolen".

Few activities, if any, undertaken in modern industrial society have no risk. Society chooses to drive automobiles despite 50,000 traffic fatalities yearly. The risks of no action and action too long delayed are much greater than those highly improbable risks that some would demand we avoid in arriving at a record of decision and getting on with the program as expediently as practical. 9/08.03.01

When the general public and their political representatives are given these facts through public meetings and other information initiatives which the Department of Energy should be undertaking, and when they are made aware that the use of MOX fuel in reactors to convert weapons usable materials to spent fuel is a quick, reasonable and practical solution to the threat of diversion and otherwise relatively easy reuse that might be achieved with other options, the LWR option should win broad public and political acceptance.

Public responses at PEIS public scoping meetings in 1995 and this year's draft PEIS comment meeting have clearly demonstrated broad community support in those locales that are candidates for Pu disposition activities. There have been significant expressions of state and local level political and public support. The candidate communities are knowledgeable of the real nature of the plutonium hazard, (not the hyped hysterics that some portray) have favorable experience with plutonium activities, are comfortable with the real issues of plutonium handling and processing activities which will be common to all disposition options, and are confident in the ability of well-managed organizations to conduct the program safely and in an environmentally sound way. Particular locations which have had poor experiences with DOE facilities, or those with a well-established culture of opposition by special interests to DOE and nuclear-related operations are clearly not being considered as sites for program activities and should therefore not be a factor. A key, therefore, to achieving an accurate and meaningful public consensus lies in appropriately identifying and obtaining a consensus of those local and regional stakeholders who are truly affected. 10/08.02.00

Because U.S. national security is potentially affected by a lack of action as much as by specific actions taken in addressing this excess weapons material threat, special interests and/or bias and ideological critics who would seek to block the program with protests in the name of having "a higher vision " than the rest of us, or even by legal challenges, despite it otherwise being a broad-based acceptable solution, are doing a gross disservice to our county. The overwhelming public interest clearly lies in implementing an effective and timely solution. A solution which has broad public and political consensus, which is being hampered by a limited special interest challenge, has a strong argument for passing over those objections, especially when they are clearly politically motivated, largely procedural, filled with slanted and inflammatory "scare tactic rhetoric" or otherwise without substantive merit, considering the all the risks and options.

F-038

08 03 01 Comment Number 9

The Department of Energy acknowledges the commentor's opposition to the No Action Alternative. Decisions on storage of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 02 00 Comment Number 10

Comment noted. However, the storage and disposition of weapons-usable Pu is an issue of national interest. NEPA requires full public participation, and all comments receive equal consideration.

DOE disposition actions must remain focused on the nature and potential of the immediate threat of divergence of weapons useable materials and the timeliness and reliability of the response and solution to the threat offered by the proposed options, and not on "micro" issues of cost, support or non-support of nuclear power, value or use of the Pu material, and local or regional economic or political interests. 11/01.03.00

The LWR option would seem to be the only credible option for the U.S. to offer the Russians to enter into a bilateral program. Anything that does less, does nothing to reduce the threat of diversion of Russian material which will remain at risk until converted into a form not readily useable in weapons. 12/01.03.00

F-038

01 03 00 Comment Number 11

Comment noted.

01 03 00 Comment Number 12

Comment noted. All Reactor Alternatives analyzed in the PEIS are viable options that would serve the same purpose the commentor described.

GILBERT, KIM
PAGE 1 OF 1

May 29, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

To whom it may concern;

I am writing to express my concern about the U.S. Department of Energy consideration of processing plutonium at Hanford. Hanford should be cleaned up, not expanded.

Already, nuclear waste is leaking into the Columbia River and the Billions of dollars that have been spent on cleaning it up have been wasted on bureaucracy rather than actually cleaning it up. 1/08.03.01

This is a very dangerous area and we seriously protest any discussion or ideas of using the area further!

Sincerely,

Kim Gilbert

Kim Gilbert

M-246

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to new missions at Hanford. Decisions on the storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

3902 Loblolly Trail
Martinez, Georgia 30907
May 1, 1996

U. S. Department of Energy
Office of Fissile Materials Disposition
P. O. Box 23786
Washington, D.C. 20026-3786

Dear Sir:

I attended the public meeting for the EIS for the Storage and Disposition of Weapons Materials held in North Augusta, SC, on April 31, 1996. Of the three options discussed, storing the materials and then disposing of them as fuel for commercial reactors appears to me to be clearly the preferred and most desirable disposal method. Since some commercial electric utilities are interested in using the materials as fuels, the materials should then be treated as an asset and not as junk or waste as is the apparent assumption used when considering the vitrification or bore hole disposal methods. Considerable sums of taxpayers money have been spent refining these materials. It seems ludicrous to me to spent additional money disposing of the materials without even attempting to recover any asset value that the material now has. 1/08.03.01

Of the three disposal methods, I would consider the bore hole method as being the least desirable. All to often technologies believed to be inherently safe have been found with time to have unwanted attributes. It would seem to me that if after burying these materials in deep holes and an undesirable condition is found after time, recovery of the materials may be close to impossible and very costly at the least. 2/08.03.01

Again, I wish to express my opinion that disposal of the material as fuels for commercial electric power reactors is a much preferred alternative over disposing of the materials as waste.

Joseph M. Gilkison

M-114

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy recognizes the commentor's concern with the Borehole Alternatives. Decisions on the disposition alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

May 6, 1996

Storage and Disposition of Weapons-Usable Fissile Materials Draft PEIS Public Comment
Charles R. Goergen
510 Boardman Road
Aiken, SC 29803

I am providing this comment to support the a mixture of options for disposition of weapons-usable fissile materials, specifically plutonium. These are based on the following premises:

- Plutonium should be considered a national asset rather than a liability.
- The disposition should not be disposal.
- The plutonium should be used for maximum realization of its energy value.
- There need not be a rush to achieve ultimate disposition of the plutonium.

The long-term disposition of plutonium should be production of energy. The reactor design should maximize the output of usable energy rather than a short term irradiation to transform some material and isotopically dilute the rest. This need not be achieved in the next decade or two. Research and design could be carried out at a pace that current budgetary limits support. As an analogy, the United States has many crude oil wells that are capped because they are currently uneconomical to pump. However, the will come a time in the future that cheap foreign oil is not available and it will be tapped. Until that time comes for plutonium I support a long term storage alternative. 1/08.03.01

Stabilization of plutonium solutions, scrap and residues per the Defense Nuclear Facilities Safety Board (DNFSB) 94-1 Implementation Plan and the Plutonium Vulnerability Management Plan should be vigorously pursued to achieve a form that meets the Criteria for Safe Storage of Plutonium Metals and Oxide. The current inventory of excess plutonium "pits" removed from nuclear weapons when packaged in the AT-400A package will achieve the long term storage standard. The storage standard form is intended to last a minimum of 50 years. This can give the U.S. an adequate period of time to develop the best reactor disposition alternative in a cost-effective manner.

The U.S. should consolidate its excess plutonium storage to a single site under full International Atomic Energy Agency (IAEA) safeguards per the intent of the Non-Proliferation Treaty. If we expect the IAEA to ensure inspected countries are not diverting material, it should be trusted to safeguard American materials. International inspections should be the method by which Americans assure the world that this material will not be reused in weapons. A new storage facility should be built that incorporates the latest and best in monitoring and surveillance techniques. The facility should be expandable in modular fashion to accommodate and facilitate any international agreements for the U.S. to safeguard other countries' inventories. It should be able to be used as a blueprint for building duplicates in other countries. Application and demonstration of exemplary safeguards until eventual disposition use has the highest likelihood of being emulated by foreign governments. 2/08.03.01

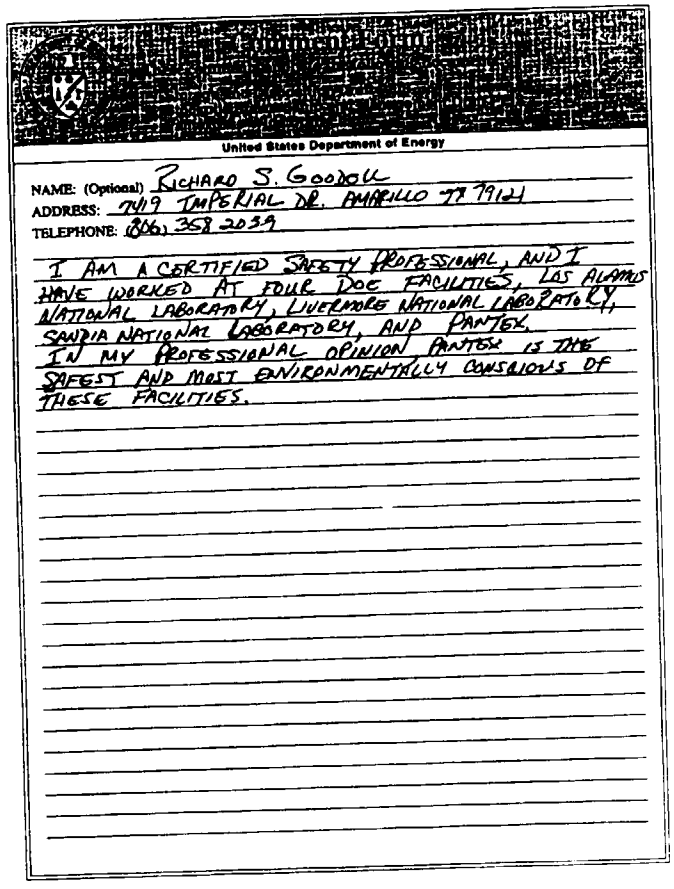
F-020

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy acknowledges the commentor's support for new facilities for long-term storage of weapons-usable fissile materials. Decisions on storage of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.



United States Department of Energy

NAME: (Optional) RICHARD S. GOODELL
ADDRESS: 7119 IMPERIAL DR. AMARILLO TX 79121
TELEPHONE: (806) 358 2039

I AM A CERTIFIED SAFETY PROFESSIONAL, AND I HAVE WORKED AT FOUR DOE FACILITIES, LOS ALAMOS NATIONAL LABORATORY, LIVERMORE NATIONAL LABORATORY, SANDIA NATIONAL LABORATORY, AND PANTEX. IN MY PROFESSIONAL OPINION PANTEX IS THE SAFEST AND MOST ENVIRONMENTALLY CONSCIOUS OF THESE FACILITIES.

1/08.03.01

TX-044

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support of Pantex. Decisions related to future missions at Pantex will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

GOODWIN, MARIAN, BLACKFOOT, ID
PAGE 1 OF 1

Comment ID: P0006
Date Received: April 18, 1996
Name: Marian Goodwin
Address: 455 South Street
Blackfoot, ID 83221

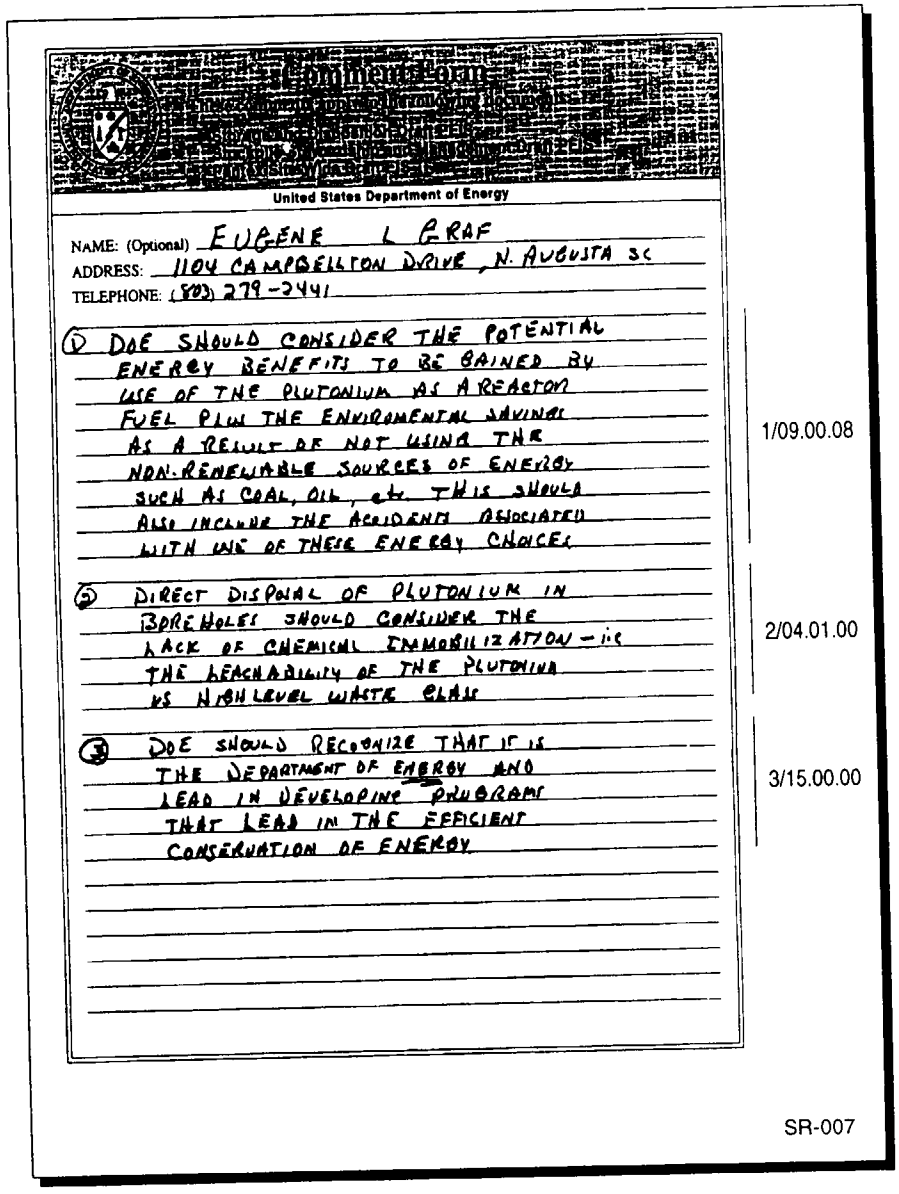
Transcription:

I just want to say that I'm in full support of the INEL and would like to see programs implemented out there to keep the thing going. And I'd also like to say that I'd like to apply for a job when there's an opening. I have a degree in waste management and biology and I can be reached at 208-785-8616 (day) and 208-684-3569 (after 3:30pm). Anyway, I just want to say I'm in support of the INEL. Thank you. | 1/08.03.01

P-006

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for additional missions at INEL. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.



Comment Form

United States Department of Energy

NAME: (Optional) EUGENE L GRAF
ADDRESS: 1104 CAMPBELLTON DRIVE, N. AUGUSTA SC
TELEPHONE: (803) 279-2441

(1) DOE SHOULD CONSIDER THE POTENTIAL ENERGY BENEFITS TO BE GAINED BY USE OF THE PLUTONIUM AS A REACTOR FUEL PLUS THE ENVIRONMENTAL SAVINGS AS A RESULT OF NOT USING THE NON-RENEWABLE SOURCES OF ENERGY SUCH AS COAL, OIL, etc. THIS SHOULD ALSO INCLUDE THE ACCIDENTS ASSOCIATED WITH USE OF THESE ENERGY CHOICES

1/09.00.08

(2) DIRECT DISPOSAL OF PLUTONIUM IN BOREHOLES SHOULD CONSIDER THE LACK OF CHEMICAL IMMOBILIZATION - i.e. THE LEACHABILITY OF THE PLUTONIUM VS HIGH LEVEL WASTE GLASS

2/04.01.00

(3) DOE SHOULD RECOGNIZE THAT IT IS THE DEPARTMENT OF ENERGY AND LEAD IN DEVELOPING PROGRAMS THAT LEAD IN THE EFFICIENT CONSERVATION OF ENERGY

3/15.00.00

SR-007

09 00 08 **Comment Number 1**

Based on comments received, several sections of the Final PEIS include additional analyses. These sections (in Section 4.9) include Impacts on Uranium Mining and Nuclear Fuel Cycle Industries, Avoided Environmental Impacts of Using MOX Fuel Instead of Traditional Low-Enriched Uranium Fuel in Nuclear Power Plants, and Avoided Environmental Impacts of Using Nuclear Power Plants Instead of Fossil Fuel Power Plants. The Avoided Environmental Impacts of Using MOX Fuel Instead of Traditional Low-Enriched Uranium Fuel in Nuclear Power Plants section in the Draft PEIS includes the health impacts avoided to the public and workers for the mining and milling industries. Other avoided impacts to air quality and waste generated were added to the Final PEIS.

04 01 00 **Comment Number 2**

Comment noted.

15 00 00 **Comment Number 3**

Comment noted.

GRAMSTORFF, JEANNE B., FARNSWORTH, TX
PAGE 1 OF 1

Box 250
Farnsworth, TX 79033
April 22, 1996

Department of Energy
1000 Independence Avenue, S. W.
Washington, D. C. 20585
Dear Sirs:

I oppose the use of the Pantex Plant near Amarillo, Texas, for a permanent nuclear waste facility, particularly the processing of plutonium at this site. 1/08.03.01

The Pantex Plant has already contaminated perch water under and near its facility, and endangers neighbors who use the Ogallala ground water for irrigation. Drawing water from the area, as ground water wells do for the water in Amarillo, and for irrigation, draws water to those wells from the area. It will not be long before contaminated water shows up in Amarillo's water supply. We cannot afford to add the dangers of plutonium and permanent nuclear waste storage to this already present danger. The Ogallala is the only water available to the entire Texas Panhandle. When it is contaminated, the area will have to be abandoned. We cannot afford another Rocky Flats pollution disaster in this area. 2/09.04.04

Sincerely,

Jeanne B. Gramstorff

M-238

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to new missions at Pantex. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

09 04 04 **Comment Number 2**

Waste/hazardous material treatment/handling operations are regulated to minimize the potential for releases of hazardous substances to the soil or surface water which could then migrate to the groundwater.

GREENPEACE

PRELIMINARY COMMENTS ON PLUTONIUM DISPOSITION PEIS
April 18, 1996
Greenpeace International

The task of what to do with weapons plutonium produced during the Cold War is a formidable one. We recognize that the process of making and implementing a "disposition" option could likely be an arduous one, with disagreements along the way, but it is clear that the process must lead to one main goal: a world more secure from the threat of continuing proliferation of stockpiles of weapons-usable plutonium.

The plutonium dilemma that now confronts us in the US is yet another legacy of misguided Cold War policies; we must not allow steps which have been made away from the threats of the nuclear arms race to be reversed. In only one way it is good that we are currently faced with the problem of what to do with the plutonium removed from nuclear weapons: the process of disarmament as required under the Nuclear Nonproliferation Treaty (NPT) has finally begun.

START III and Beyond

Given the growing demand by the international community that NPT disarmament obligations be met, the stockpile of plutonium removed from weapons will only grow. The U.S. now faces the challenge to show that it can meet its treaty commitments and quickly move far beyond the high level of nuclear weapons negotiated under the START II agreement. Deep cuts and then elimination of nuclear weapons will lead to a stockpile of so-called surplus plutonium of almost 100 tonnes. 1/01.03.00

The decisions made about what to do with this dangerous material must be made with deliberate and thoughtful analysis. But it appears that the Department of Energy has begun an Environmental Impact Statement process which is lacking in both analysis and depth. DOE must return to the drawing board and newly prepare this document with full consideration given to the global proliferation implications of the disposition decision.

Proliferation Impacts Ignored

While it is of utmost importance to irreversibly remove the plutonium from weapons, what is done with the material will have far-reaching international proliferation impacts. Although it is widely agreed that the meeting of a "high-level waste standard" 2/01.06.00

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DC-002

01 03 00 **Comment Number 1**

Although Strategic Arms Reduction Talks (START) II protocol nuclear-weapons levels are beyond the scope of this PEIS, global proliferation concerns and the need to encourage reciprocal actions by Russia are integral parts of various sections of the PEIS, including the purpose and need and the Preferred Alternative. Furthermore, proliferation implications for the various alternatives and variants are evaluated in DOE's nonproliferation analysis, which was issued for public review in October 1996. DOE's ROD will be based on the nonproliferation analysis, as well as the environmental analyses, technical and economic studies, national policy considerations, and public input.

01 06 00 **Comment Number 2**

As explained in the response to Comment Number 1, global and domestic nonproliferation is considered in various parts of the PEIS. The purpose of the Proposed Action is, in part, to establish the technical and program infrastructure that will enable the United States to take unilateral action, or negotiate reciprocal actions, with other nations for the disposition of surplus weapons-usable Pu. This PEIS addresses the environmental impacts of the reasonable alternatives for DOE's Proposed Action. Analyses of the cost, schedule, technical, and nonproliferation policy impacts are described in separate documents, and will be considered in DOE's decision. The *Draft Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Plutonium Disposition Alternatives* was made available for public review in October 1996. DOE also conducted a series of public meetings, prior to the issuance of the Final PEIS, to discuss the nonproliferation analysis as it relates to the PEIS alternatives and variants.

The analysis of the nonproliferation impacts examines, among other things, the risk of theft, risk of reversal, and arms reduction impacts for the various disposition alternatives.

GREENPEACE, WASHINGTON, DC
PAGE 2 OF 7

is a goal to be strived for, it appears that the DOE has set out on a course which largely disregards both domestic and international proliferation impacts of the plutonium disposition decision.

In reading the Draft Programmatic Environmental Impact Statement, it is striking to realize that there is almost no discussion of the proliferation impact of the decision. It's almost as if the DOE has forgotten or ignored that decisions taken here will have affects far beyond our borders. As it is recognized that the National Environmental Policy Act (NEPA) must consider proliferation impacts, DOE must simply redo this document and correct its grave error of omission. In coming to a decision after such an analysis is done, DOE must choose an option which minimizes both domestic and international proliferation impacts. We feel that such a choice can also be the most environmentally sound. 2/01.06.00 cont.

"Direct Use" Material

Nowhere in the EIS is there an in-depth discussion of the dangerous nature of MOX. Unlike conventional uranium fuel, MOX is regarded by the International Atomic Energy Agency (IAEA) as well as the US Government of requiring protection due to the ease with which the weapons plutonium can be separated from the fuel. The IAEA deems MOX as being of "direct use" in nuclear weapons and the US requires military escort during transport. 3/13.00.00

As a result of the military nature of the material, reactor operators in the US or Canada using MOX would effectively become nuclear weapons storage sites. To incorporate allegedly civilian facilities into the military complex raises serious questions about theft or diversion of the material from the reactors and during transport. The public will be quite hesitant to embrace the idea that their local reactor has become a storage site for nuclear weapons materials. 4/01.04.00

MOX = Reprocessing

It appears that nowhere in the document has DOE recognized the intimate relationship between the reprocessing industry and the use of plutonium fuel (mixed oxide fuel, MOX) in nuclear reactors. Every country which uses MOX fuel is either engaged in reprocessing or has close links with the reprocessing industry. Yet, in the EIS DOE has a total memory lapse, both failing to analyze the international interconnectedness of MOX, reprocessing, and plutonium use and stockpiling as well as failing to analyze potential impacts on a potential domestic plutonium industry. 5/01.06.00

Given the dismal failure of breeder reactors, plutonium reprocessors now present MOX as the justification for

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13 00 00 Comment Number 3

As discussed in the *Draft Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Plutonium Disposition Alternatives*, appropriate safeguards and security would be used for the various steps of the MOX process. The safeguards and security for pit disassembly/conversion and MOX fuel fabrication would likely be similar to safeguards for the weapons-usable fissile materials. Furthermore, the facilities would be inspectable by IAEA. The DOE safe secure trailer (SST) system will be utilized for the transportation of the fresh MOX fuel which includes armed nuclear materials couriers. Once irradiated, the spent MOX fuel would meet the spent fuel standard and be disposed of in a geologic repository.

01 04 00 Comment Number 4

The Reactor Alternatives would utilize a once-through fuel cycle. Spent fuel would be disposed of with other commercial reactor spent fuel. Pu would arrive at the reactor in the form of fresh fuel which could not be used in weapons without extensive reprocessing to extract the Pu. Necessary safeguards and security at the reactors would be provided. The facilities would be inspectable by IAEA, as appropriate. The nuclear reactors would not become nuclear weapons storage sites.

01 06 00 Comment Number 5

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel and the commentor's concerns about reprocessing. The President's Nonproliferation Policy says the United States will not recycle Pu. Burning weapons Pu in reactors does not utilize the recycling process because the Pu in the spent fuel from this process will not be extracted for reuse in new fuel. This is consistent with U.S. policy since no Pu is being recycled. After a once-through fuel cycle, the Pu would be converted to a nonproliferation form as spent reactor fuel. Thus, foreign reprocessing would not be encouraged by the Reactor Alternatives. Section 2.4.5.1 of the Final PEIS has been expanded to clarify that reprocessing would not be part of the Reactor Alternatives. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

reprocessing. What was once an imaginary dream to "complete the nuclear fuel cycle" has now boiled down to a business in search of customers. The European reprocessing companies British Nuclear Fuels (BNFL) and COGEMA are currently building up massive stockpiles of plutonium and are attempting to gain new reprocessing and MOX clients around world. Belgonucleaire is attempting to sell its MOX services to any willing client. Russia and Japan are similarly engaged in reprocessing and plutonium stockpiling with a goal to use both MOX and breeder reactors. Yet DOE has turned a blind eye to this international repr =ssing-MOX connection. 5/01.06.00 cont.

Likewise, the likely connection in the US between a MOX industry created by use of weapons-grade plutonium and a future plutonium economy is ignored in the EIS. The history of interest in MOX in the US, as in other countries, is also tied to the reprocessing industry, as reflected by the GESMO process and the failed West Valley, Morris and Barnwell reprocessing experiments. But in spite of the past connection in the US between MOX and reprocessing, the EIS does not stop to reflect on what the future might hold if the US pursues MOX.

MOX Contradicts US Nonproliferation Policy

In September 1993, President Clinton issued a nonproliferation policy which stated that "The United States does not encourage the civil use of plutonium and, accordingly, does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes. The United States, however, will maintain its existing commitments regarding the use of plutonium incivil nuclear programs in Western Europe and Japan." The policy also stated that the US would "seek to eliminate where possible the accumulation of stockpiles...of plutonium" and "explore means to limit the stockpiling of plutonium for civil nuclear programs." 2/01.06.00 cont.

If implemented, a decision to use MOX will violate this policy in many ways. First, any use of MOX in the US will go far beyond encouragement of the civil use of plutonium. Second, use of MOX will be an active encouragement to reprocessors in Europe, Japan, Russia (and potentially in other countries) which have inextricably woven together the reprocessing and MOX industries. Third, any agreements reached with European MOX fabricators to either provide MOX fabrication service in Europe or to assist in MOX fabrication in the US will constitute a new (not existing) commitment which will heartily be welcomed as boost to reprocessing/MOX. 6/01.06.00 5/01.06.00 cont.

The EIS has failed to evaluate the potential violations of President Clinton's nonproliferation policy or how the policy is anticipated to be changed in the case a MOX-use decision is made. 2/01.06.00 cont.

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01 06 00 Comment Number 6

The Reactor Alternatives, which would use MOX fuel, would not contradict the U.S. Nonproliferation Policy. As explained in the PEIS, the alternatives would pertain only to surplus weapons-usable Pu, such as from dismantled weapons, and would not use or encourage the use of MOX fuel based on other sources.

GREENPEACE, WASHINGTON, DC
PAGE 4 OF 7

MOX Fabrication Facility

It is extremely unclear what would become of a MOX facility in the US once the weapons grade plutonium stockpile had been fabricated into fuel. Given the expense of such a facility and the environmental impacts which would loom after its operation, it would seem that DOE would discuss the fate of the facility once its mission was over. But it does not seem that the decontamination and decommissioning of any MOX plant is included in the EIS. By lack of such a discussion, it is implied that another mission might await such a facility once the weapon-grade stockpile was depleted. Thus, the construction of a MOX plant might serve to stimulate commercial reprocessing as part of the infrastructure to support use of the plutonium would already be in place. 7/01.06.00

By choosing a mix of disposition options including MOX, the incentive to use a MOX fabrication facility for a second plutonium fuel fabrication mission might actually increase. A two or multi-option decision would mean that less plutonium was available for MOX, thus leading to increased cost per unit. With this increased cost, the impetus to continue use of the facility with commercial weapons-usable feedstock in an attempt to recoup cost or justify the facility's construction could actually increase.

Given that the main European reprocessors could be in on operation of any US MOX facility, that a primary DOE contractor (Westinghouse Savannah River Company) at one of the leading sites for a MOX facility (Savannah River Site) has actually prepared a study as to the feasibility of commercial reprocessing, and that a section dealing with "conditioning" (reprocessing) has been included in the Nuclear Waste Policy Act of 1996, we consider that the warning signs of hidden reprocessing agendas are clear. 8/01.06.00

"Expressions of Interest"

Under the plutonium disposition EIS process, no reason can be found for the December 1995 solicitation of "Expressions of Interest" from utilities and nuclear companies for their interest in MOX. The request for EOIs was simply an expediency of the moment apart from the formal EIS process. 9/08.00.00

As has been done in the EIS, the DOE did not outline in the solicitation to the utilities the proliferation risks of MOX use in the US. And the utilities have similarly chosen to also either ignore or obfuscate the connections. Utilities responding to the solicitation have presented their goals as noble - wanting to help with weapons-grade plutonium disposition - yet their real interests clearly are pecuniary in nature. Compensation, not public service, is the motivational factor.

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01 06 00 **Comment Number 7**

A MOX fuel fabrication facility would be constructed, or the existing facility modified for MOX fuel fabrication, only for the purpose of converting weapons-usable Pu into MOX fuel to be burned in a reactor. The Pu would be consumed in a reactor using a once-through fuel cycle, then disposed of as spent nuclear fuel. No reprocessing would be involved in surplus Pu disposition, consistent with the President's Nonproliferation Policy. After completion of the materials disposition mission, the facility would either go through decontamination and decommissioning (D&D) or be converted to another mission, not involving MOX fuel fabrication or reprocessing. D&D costs are considered in the Disposition Technical Summary Report and will be included in the decisionmaking process. Furthermore, DOE will evaluate environmental impacts for decontamination and decommissioning in subsequent tiered NEPA reviews.

01 06 00 **Comment Number 8**

The President's Nonproliferation Policy says the United States will not recycle Pu. Burning weapons Pu in reactors does not utilize the recycling process because the Pu in the spent fuel from this process will not be extracted for reuse in new fuel. This is consistent with U.S. policy since no Pu is being recycled. After a once-through fuel cycle, the Pu would be converted to a nonproliferation form as spent reactor fuel. There is no "hidden reprocessing agenda."

The Westinghouse Savannah River company report referred to by the commentor was prepared to respond to a request by Congressman C. Norwood (GA). DOE did not consider the report a significant issue since this Nation's policy of not reprocessing commercial spent fuel is long standing and there is no Administration support and little Congressional interest in revisiting the issue.

08 00 00 **Comment Number 9**

The request for "Expression of Interest" was made to answer the question: If the Existing LWR Alternative was selected for the disposition of Pu, would there be any utilities interested in implementing the decision and under what

But while the EOIs have become an integral part of the discussion about plutonium disposition they remain apart from the EIS process. Given that DOE sought the "expressions" outside of the EIS process raises serious questions as to the legitimacy of the EIS and decision-making process itself. If the EOI process is serious and is part of the decision-making process, the reactor or facility of each and every respondee should be incorporated officially in the EIS as DOE is in practice conducting a review of the viability of the proposals as they relate to the EIS. Just as DOE sites were covered in the EIS, the private facilities now involved in the process must be brought into the EIS or the entire EIS process should begin again.

9/08.00.00 cont.

An egregious example of monetary interest at work can be seen by the offer of TEAM CANDU, led by AECL Technologies and Ontario Hydro Nuclear. This proposal is to transport MOX fabricated in Canada or Europe to the Bruce A reactor complex on Lake Huron. The idea has been presented as being acceptable to Canadians but the formal process of government approval has not begun and the public debate in Canada over this idea has only just started. That public debate is likely to be quite contentious given that weapons-grade plutonium would roll on Canada's highways and the resulting plutonium-laden spent fuel will be left in Canada.

10/01.03.00

Ontario Hydro has not been forthcoming in stating that the Bruce A reactors are in need of retubing which has been estimated to cost $300 million each. The Bruce 2 reactor was taken out of service in 1995 in order to avoid this costly expense and other major repairs and the other Bruce A reactors are scheduled for retubing beginning in the year 2000. But given the expense of the overhaul and difficulty of justifying such an outlay in an increasingly competitive electricity market, it is possible that Ontario Hydro will have to close the reactors.

Why are the financial problems of Ontario Hydro not mentioned in the Expression of Interest? Is there a desire on their part to justify the expense of retubing by pursuing the MOX mission. And will US taxpayers end up underwriting these expenses? DOE and TEAM CANDU must come forward and reveal the true condition of the reactors at Bruce A and what the anticipated repair costs are.

11/01.03.00

Similarly, if reactor problems such as being experienced by Ontario Hydro exist with the US utilities expressing interest, the EIS must fully reveal and evaluate them.

Lack of Documentation

DOE contends that it does not have to publicly release information concerning the costs of the various options until

12/08.00.00

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general conditions? The request for "Expression of Interest" in the use of existing reactors for the disposition of Pu was only one of a series of actions taken by DOE to obtain technical, cost, schedule, and policy information. That information, along with the PEIS, will be presented to the decisionmaker in order to help ensure a well-informed decision. The *Technical Summary Report for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0003) provides an explanation for the issuing of this request for "Expression of Interest." Should a Reactor Alternative be selected at the ROD, DOE would issue a Request for Proposal to interested parties to solicit MOX fuel fabrication facility design and construction proposals and/or proposals for burning the MOX fuel in reactors.

The disposition sites used in the PEIS for analysis are considered representative, and a combination of sites was used. Tiered NEPA reviews, as appropriate, will examine specific locations, as stated in the PEIS; specific reactor location(s) will depend, in part, on market conditions and contract negotiations. The explanation of representative sites in Section 2.1.4 of the PEIS has been expanded to provide further clarification of the approach used for the sites for the analysis of environmental consequences.

01 03 00 Comment Number 10

Should the CANDU Reactor Alternative be chosen for Pu disposition, further negotiations between the U.S. and Canadian Federal and Provincial Governments will be required before implementation, as well as business negotiations with reactor owners. In addition, according to the Canadian Government (see letter sent by the Canadian Embassy in Washington, DC, dated June 6, 1996, reproduced in this CRD) implementation would be subject to Canadian Federal and Provincial regulations, and an appropriate level of analysis by the licensee of health, safety and environmental impacts would be required before issuance of an operation license and before any decision on burning Pu in a CANDU reactor could be implemented.

01 03 00 Comment Number 11

The Department of Energy (U.S. taxpayers) will not be underwriting the expense of retubing any reactor. Selection of a specific reactor(s) would be

just before a Record of Decision is made. We contend that both as a matter of record for the Draft PEIS as well as in compliance with a sound openness policy that such documentation must be released as soon as it is available and long before the EIS comment period closes.

As the DOE repeatedly states in the EIS that "cost-effectiveness" will be a part of the disposition decision, no tools have been provided to aid in the public in the determination of the costs of the various options. All cost and economic evaluations must no longer be kept secret and be allowed to be reviewed as part of the EIS process. — 12/08.00.00 cont.

It does not appear that reference or citation is made in the EIS to important documents which must be made available to the public during the Draft EIS comment period. For example, a document prepared by AECL Technologies on the CANDU reactor option is not mentioned in the EIS. And documents pertaining to work being done between Oak Ridge National Laboratory (ORNL) and Belgonucleaire in MOX performance are not mentioned in the EIS. — 13/08.00.00

Immobilization

It appears to us that the guiding hand in any decision must be that of nonproliferation linked with environmental protection. Given the risks associated with an endorsement of MOX and the plutonium economy, we believe that immobilization is the only viable disposition option. — 14/08.03.01

Given a need for further research into immobilization techniques, we therefore request that DOE provide more money in FY 1997 to expand research into the various options. Given that the prime mission of the Defense Waste Processing Facility is to vitrify high-level waste and not to be used for plutonium vitrification research, we endorse the idea of a pilot vitrification plant to study the feasibility of this option. — 15/05.01.06

Requests

Given the seriousness of the issue at hand and the need for a careful analysis by the public of the options presented, we hereby make the following requests:

1) That all documents pertaining to cost of the various disposition options be immediately placed in the DOE public document rooms or be publicly released as soon as they are finished and be made a part of the Draft EIS record.

2) That all documents pertaining to research into MOX use and immobilization be placed immediately in the public document rooms and be made part of the Draft PEIS record. — 16/08.01.00

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through responses to Requests for Proposals and follow-on business and contract negotiations.

08 00 00 Comment Number 12

In the interest of openness and more informed decisionmaking, DOE released Technical Summary Reports to the public as soon as they became available. Cost data, along with technical and schedule data, were provided in Technical Summary Reports of both storage and disposition in the summer of 1996. Results of the nonproliferation analysis were made available in October 1996. These analyses, along with the environmental analysis and public input, will be integrated into DOE's decisionmaking process.

08 00 00 Comment Number 13

Based upon this comment, the index of reference materials in the DOE Public Reading Rooms was improved. Further references in the Final PEIS were checked for completeness. The documents referred to by the commentor were not cited in the PEIS. However, the AECL Technologies, Inc., *Plutonium Consumption Program, CANDU Reactor Project*, July 31, 1994 is cited in the *FMDP CANDU PEIS Data Report* which is a cited reference in the PEIS. The work between Oak Ridge National Laboratory (ORNL) and Belgonucleaire was not relied upon for the PEIS.

08 03 01 Comment Number 14

The Department of Energy acknowledges the commentor's support for the Immobilization Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

05 01 06 Comment Number 15

Research and development is both on-going and planned to support the disposition alternative(s). If immobilization is selected in the ROD, DOE may propose pilot facilities. Currently the can-in-canister variant of the Immobilization Alternative is being researched at the SRS Defense Waste

3) That detailed budget figures for Fiscal Years 1996 and 1997 for MOX, storage and immobilization research be made available and that all documents produced in conjunction with such research be publicly released as soon as they are available and be made part of the Draft PEIS record.

4) That the public comment period be extended until such time as pertinent economic and technical documents are made available.

16/08.01.00 cont.

Given the fact that the "Expressions of Interest" in MOX use have de facto become a part of the EIS process and that documentation associated with such expressions was not publicly available until approximately March 29, further justification exists for an extension of the comment period.

Thank you for the opportunity to submit these comments. We will submit more comments and documentation at a later date.

DC-002

Processing Facility (DWPF). Based on public comments, Appendix O has been added to the PEIS to describe this variant.

08 01 00 Comment Number 16

The Technical Summary Reports, which contain cost information for both storage and disposition, were made available to the public (and have been placed in the DOE Public Reading Rooms) in July 1996 and will be included in the decisionmaking process. Documents related to research concerning MOX fuel, storage and immobilization which are cited in the PEIS, are available in the DOE Public Reading Rooms and are part of the PEIS record.

Budget figures and research documents may be made available upon appropriate request. However, the budget is not part of the NEPA process and the budget figures are not included in the PEIS record. Research documents that are cited and relied upon in the PEIS are available in the DOE Public Reading Rooms and are part of the PEIS record.

The Expression of Interest is not part of the NEPA Process. (See response to Comment Number 9).

GREENPEACE, WASHINGTON, DC,
TOM CLEMENTS
PAGE 1 OF 13

GREENPEACE

April 9, 1996

Re: Draft PEIS on Plutonium Disposition

To Whom it Concerns:

I am hereby submitting the following Greenpeace document to be included in the record for the "Storage and Disposition of Weapons-Usable Fissile Materials" PEIS. The document was originally prepared for the G7 summit in Moscow on April 19 & 20, 1996.

As any decision by the U.S. Department of Energy to use mixed oxide fuel (MOX) will have grave international proliferation implications, the final PEIS must thoroughly review those implications. Internationally, the MOX industry is inextricably linked to the reprocessing industry and serves as a stimulus to further reprocessing and associated plutonium stockpiling. The PEIS must address the impact that any U.S. MOX use will have on international plutonium reprocessing and subsequent stockpiling and use as fuel. Use in the U.S. of MOX will likely serve as a global plutonium proliferation stimulus and thus the international MOX and reprocessing implications must be analyzed in the final PEIS. 1/01.06.00

While we will submit additional documents, the attached document will serve as a background on the proliferation implications of the MOX option.

Sincerely,

Tom Clements

Tom Clements
Greenpeace International
Plutonium Campaign

1436 U Street NW • Washington, DC 20009 • Tel (202) 462-1177 • Fax (202) 462-4507 • Tlx 89-2359

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01 06 00 **Comment Number 1**

Comment noted. The President's Nonproliferation Policy says that the United States will not recycle Pu. Burning weapons Pu in reactors does not utilize the recycling process because the Pu in the spent fuel from this process will not be extracted for reuse in new fuel. This is consistent with U.S. policy since no Pu is being recycled. After a once-through cycle, the Pu would be converted to a nonproliferation form as spent reactor fuel. This would not be a subsidization of the nuclear industry, nor provide any further stimulus for international Pu processing.

The Department of Energy has prepared and released for public comment a report on the nonproliferation analysis of the disposition alternatives, including the Reactor Alternative using MOX fuel. A series of public meetings were held on the scope and content of the report, and to receive comments on the report. The results of this nonproliferation analysis will be included in the decisionmaking process, along with the environmental, technical, cost and schedule analyses, and other public comments.

Reprocessing of MOX fuel in foreign countries is beyond the scope of, and not encouraged by, this PEIS. The purpose of this PEIS is disposition of surplus U.S. origin weapons-usable Pu, and storage of U.S. origin weapons-usable fissile materials. The Greenpeace document referred to by the commentor is included in this CRD and is part of the Administrative Record for the PEIS.

CHERNOBYL
10 YEARS AFTER...

GREENPEACE

March 1996

PLUTONIUM AND THE NUCLEAR SAFETY SUMMIT: OUT OF CONTROL !

INTRODUCTION

The threat posed by weapons-usable fissile materials is one of the central topics for the Nuclear Safety Summit to be held in Moscow, April 19-20th, 1996 - and for good reason. Approximately 100,000 nuclear weapons worth of fissile materials (plutonium and Highly Enriched Uranium - HEU) has been produced over the past fifty years as a result of the nuclear arms race and the commercial nuclear industry's promotion of weapons-usable materials as fuels for nuclear energy.

It is therefore to be welcomed that the G7 and Russia recognise that the threat posed by these materials requires action at the highest level. However, as this paper seeks to demonstrate, the political, economic and strategic interests of most of the G7 and Russia means that no real effort to reduce the threat posed by plutonium and other fissile materials will be launched by the Nuclear Safety Summit.

Greenpeace believes that so long as these interests determine the policies of the governments concerned, plutonium stockpiles will continue to grow, as will the global threat. Rather than statements of concern, the problem needs to be dealt with directly. What is required is an international commitment for the negotiation of a comprehensive international convention that would ban all plutonium production and use - the so-called Fissile Material Convention. This would prohibit all further reprocessing of plutonium, no use of plutonium Mixed Oxide Fuel (MOX), inclusive of a ban on MOX as a weapons plutonium disposition option, and the eventual removal from national control of all stocks of weapons-usable fissile materials.

PLUTONIUM DEMAND AND SUPPLY

For the purpose of this paper, all the plutonium referred to is separated (reprocessed) weapons-usable material. Thus, although it is important to state clearly the amount of plutonium in military inventories from material in commercial programmes, the distinction is in fact artificial.

Global plutonium stockpiles at the end of 1993 were in the region of 375 tonnes, of which 255 tonnes is contained within the military stockpiles of the nuclear weapon states - Russia, the United States, France, the United Kingdom, and China. The remaining stocks, around 120 tonnes, is so-called civilian plutonium, produced by commercial nuclear reactors, and reprocessed principally in the United Kingdom and France. However, whereas military plutonium production has almost ceased completely, commercial plutonium stocks are continuing to rise. In 1995, more than 20 tonnes of plutonium was produced at reprocessing plants in the UK, Russia, France and Japan. By the year 2000, so-called civilian stocks of plutonium will be nearly equal to current military stocks.

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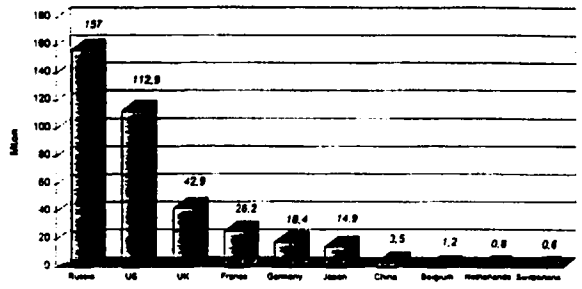
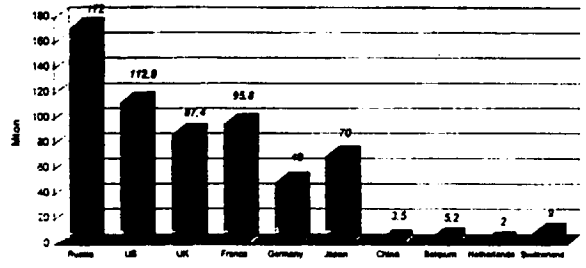
Table 1: Plutonium stocks 1993



All figures are for December 31st, 1993, unless otherwise stated.

Table 2: Plutonium stocks 2003



The figures are inclusive of plutonium loaded into MOX fuel, either loaded or stored for use in FBR and Thermal reactors. For all figures there is at least a ten percent uncertainty margin with the exception of the figure for the US.

Most of the plutonium listed in the non-nuclear weapon states, refers to ownership, in most cases the plutonium is currently stockpiled at three sites: Sellfield (UK), la Hague (France) and Ozersk (Russia). It should be noted however that all of the plutonium under contract at these sites is eventually to be returned to the country of origin.

References:

Russia	+/- 20%, Albright, et al. Figures are at December 31 1993 SIPRI Yearbook 1995
US	DOE, February 9th 1996; Albright, World Inventory of Plutonium and Highly Enriched Uranium, SIPRI, 1993.
UK	+/- 20%, Albright, 1995 based upon March 1994 UK government.
France	+/-30%, figures for Dec. 31, 1993. Albright, World Inventory of Plutonium and Highly Enriched Uranium, SIPRI, 1993 Cogema, June 1, 1995; SIPRI Yearbook 1995
Other Countries	Albright, World Inventory of Plutonium and Highly Enriched Uranium, SIPRI, 1993. Cogema, June 1, 1995; SIPRI Yearbook 1995.

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The reason that global stocks of civilian plutonium are growing so rapidly is due to policies that were adopted during the 1960's and 1970's by many of the G7 nations. During this period the nuclear industry argued that in the near future uranium resources would become scarce, with a direct effect on both the economics and the ability to operate uranium fuelled reactors. Thus large resources were committed to the research and development of Fast Breeder Reactors (FBRs). These reactors were supposed to produce power, while also creating more plutonium than was used originally as a fuel. The fuel for the reactors would initially come from reprocessed plutonium produced in Light Water Reactors, requiring the construction of large-scale reprocessing facilities. However, the FBR reactors that were built, with few exceptions, have failed to operate successfully. France was to have six of these reactors on-line by 1985 - instead two are operating at low-power, and with no plans for new reactors; the former Soviet Union was to have 12, instead three operate, but with constant technical problems. The UK, U.S. and Germany have closed their FBR reactors.

Despite the collapse of the FBR experiment, by the late-1970's, electrical utilities had already signed large commercial contracts for the reprocessing of their nuclear reactor spent fuel with the UK and France. Thus, at the same time that FBR programmes were being abandoned or dramatically scaled back, construction of large-scale reprocessing plants, financed by Japanese, German, UK, French, Swiss, Belgium and Dutch utilities was proceeding.

Having committed billions of dollars for the construction of reprocessing plants, and confronted with large stocks of plutonium, utilities in these same countries (with the exception of the Netherlands) have laterally opted to use the plutonium as fuel in their Light Water and Boiling Water Reactors. However, plutonium use in these reactors is limited by significant political, nuclear safety, economic and environmental factors.

Therefore, while the utilities and governments in these countries seek to attempt to move ahead with larger plutonium use programmes, global stockpiles continue to grow. In 1996, it is estimated that more than 20.000kg of plutonium will be reprocessed in Russia, France, the UK, and Japan. To put this figure in perspective, it is equivalent to more than 7% of the total amount of plutonium produced during 50 years of the Cold war. In 1997 this will rise towards 10%. Clearly, these are the reasons why the G7 and Russia would rather not discuss the real plutonium problem in April 1996.

WORLD REVIEW - SUMMARY

Although the number of large scale (over 100 tonnes heavy metal per year THM/y) commercial reprocessing facilities remains relatively small at nine, reprocessing contracts at some of these facilities mean that many more countries for the first time will soon have significant stockpiles of weapons-usable plutonium.

The main obstacles however with MOX use in LWR's are: that MOX fuel costs are between 3 and 13 times more expensive than uranium fuel; significant technical, safety, environmental and public health problems are introduced due to the fuel fabrication, reactor use and waste storage of MOX fuel; and, the development of a MOX fuel cycle (including reprocessing plants, fuel fabrication facilities, nuclear reactors and waste storage facilities) is a major proliferation concern due to the extensive handling and transport of weapons-usable plutonium.

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As can be seen from Table one, most plutonium in 1993 was contained within the nuclear weapon states, though Japan and Germany already had significant stocks. The largest share of the total is contained within the nuclear weapon arsenals. A proportion of this material is being removed from nuclear warheads as disarmament agreements are implemented, and which certain governments and the nuclear industry are arguing should be used as MOX fuel in reactors. It is possible that the G7 and Russia will make this recommendation at the Nuclear Safety Summit.

FRANCE

France operates two large scale light water reactor (PWR/LWR) oxide reprocessing facilities, at La Hague in northern France, UP-3 and UP-2 800. Annual plutonium production capacity is between 12-13 tonnes. This production is split between domestic plutonium from French reactors operated, and foreign clients - Japan, Germany, Belgium and the Netherlands and Switzerland - in addition, a 400 THM/y Magnox-fuel plant UP1 also operates at La Hague, separating up to 1 tonne each year. This facility is due to close in 1997/98.

As a result of the collapse of commercial Fast Breeder Reactor programmes, the demand side for French plutonium has radically altered over the past ten years. Confronted with growing stockpiles of plutonium the French utility, Electricite de France (EdF) has opted for the use of mixed plutonium/uranium oxide (MOX) fuel in PWRs. Although the reactors are not designed for MOX use, EdF has been licensed for sixteen 900 Mwe PWRs to use MOX. As of March 1st 1995, only seven of these reactors were using MOX.

The MOX that is used in these reactors is fabricated at the 15tHM/y Cadarache facility. In August 1994, the large-scale MOX plant MELLOX began operation. This 120 tonnes per year facility, once fully operational will produce fuel primarily for EdF, but there is also a possibility that contracts with Japanese utilities will be signed in the next few years. To use all the MOX produced at MELLOX, EdF have stated that it intends to increase the number of reactors licensed for MOX use by an additional twelve, bringing the total to twenty-eight reactors. Total plutonium consumption of both MOX facilities, is expected to be over 10 tonnes each year.

Despite the optimistic assessment of the French nuclear industry, EdF still expects to have a surplus of more than thirty-eight tonnes of plutonium by the year 2000. It is could be significantly more.

UNITED KINGDOM

There is no domestic demand for plutonium in the UK, apart from that required in nuclear weapons. Three reprocessing facilities operate in the UK - the 7 tHM/y Dounreay FBR plant, the Sellafield 1500 tHM/y B205 Magnox facility and the 700 tHM/y THORP oxide facility. The most significant for this study is the THORP facility, which after many years of technical and construction delay, was completed in late 1992. Due to domestic political opposition, the plant was only given permission to operate in March 1994.

Contracts with THORP are split between domestic and overseas. Over half THORP's first ten years capacity consists of contracts for Germany, Japan, Italy, the Netherlands, Spain and Switzerland.

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By the year 2003/4, THORP will have separated as much as 47 tonnes of plutonium, 41 tonnes of which will be for overseas clients. Although there is no domestic demand for plutonium fuel, the operators of THORP, the state-owned British Nuclear Fuels (BNF) hope to supply plutonium fuel, MOX, to their clients. Consequently, construction at the Sellafield site is being focused on completion of the Sellafield MOX Plant (SMP), with expectations that at least some of the 120 tHM/y capacity will be available by late 1997/1998. The SMP is based upon German technology from Siemens. Contracts between Germany and the UK were agreed during 1995, and a small Japanese contract was secured in January 1996. Future large contracts with Japan, are uncertain, given recent developments in Japan (see below).

JAPAN

Japan has the most ambitious plutonium programme in the world, and is one of the few countries still publicly committed to the commercial development of the FBR. However, their programme like all others world-wide, has been seriously effected by political, environmental, economic and technical problems. Although the US$6 billion Monju prototype FBR began operation in April 1994, like all FBRs before it, the operators experienced significant technical problems. These peaked in December 8th, 1995, when the reactor suffered a major release of liquid sodium coolant from the secondary circuit. Fortunately, there was no injury or major release of radioactivity. However, the political implications for the entire Japanese plutonium programme are still unfolding. The reactor that the operators believed could not suffer an accident, has shattered public and political confidence in the ability of Japanese industry to safely manage plutonium.

Though plans for construction of the follow-on demonstration FBR has already been delayed until the first decade of the next century, that could now be extended further. Operation of the large-scale Rokkasho-mura reprocessing facility which will separate as much as 6-7 tonnes of plutonium annually, will now not begin until around 2004/5. Due to strong opposition to the transport of 1.7 tonnes of plutonium oxide on board the Akatsuki-maru in 1992 from France to Japan, utilities are now believed to be considering transportation of plutonium MOX fuel from Europe, in the belief that it will not generate significant opposition. The combination of all these factors, has led to a de facto Japanese plutonium storage policy at the La Hague, and THORP sites, with stocks growing annually.

As can be seen by comparing Tables one and two, Japan's plutonium stock could grow from 15 tonnes in 1993 to 70 tonnes by 2003. This will depend upon completion of Japanese utilities first decade reprocessing contracts with the UK and France. Since both BNFL and Cogema gain financially through expensive plutonium storage costs, it is likely that most contracted Japanese spent fuel will be reprocessed by 2003/4.

How much of this is transported back to Japan, and how much is stockpiled in Europe remains unclear. It is unlikely that Monju will operate much before 2000, leaving one other FBR (Joyo) in operation (plus limited demand from the Fugen Advanced Thermal Reactor). In addition, though utilities in Japan, similar to those in France and Germany, have opted for MOX use in LWR's, the Monju accident has directly effected the timing and scale of MOX use in these reactors. Plans for two rising to twelve reactors fuelled with MOX will not be realised by early next century, having now foundered on the fall-out from Monju. Most recently statements from 3 regional prefecture Governors, opposing the licensing of MOX use in reactors unless certain conditions are met. It is quite possible that no MOX use in LWR's will begin before 2000.

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Clearly, supply greatly exceeds demand. Unless Japan delays or cancels reprocessing contracts, and cancels its own domestic reprocessing plant, it will have a total stock of around 110-113 tonnes from around 2010. Even in the optimistic demand projections of the Japanese government, as much as 85 tonnes of this will be surplus to requirements.

GERMANY

German reprocessing contracts with La Hague and THORP over the next ten years will increase the country's stock to 49 tonnes of plutonium. Choices made in the 1970's to enter these contracts were based upon a number of factors, including: providing plutonium for a commercial FBR programme, waste management, and apparently attractive prices from the reprocessing companies.

The miscalculations in the volume of plutonium stocks returning to Germany and the lack of domestic demand for FBR' led to the adoption of MOX for LWR's and BWR's. However, a number of factors have evolved that have led to much less MOX use than anticipated, and consequently an imbalance between large scale plutonium reprocessing and the capacity to fabricate and use MOX has been created. Since 1991, Germany has had no available domestic MOX capacity, since operation of a Siemens plant at Hanau was suspended. That facility has now been abandoned. The larger uncompleted MOX facility at Hanau, which cost almost 1 billion dollars, was abandoned in December 1995. As of March 1st 1995, eleven reactors in Germany were licensed to use MOX, but only five did so. Growing plutonium stockpiles at La Hague of over 12 tonnes in January 1996, will soon be added to by operation of THORP at Sellafield.

BELGIUM

Belgium currently has contracts for reprocessing with Cogema's La Hague plant, which will yield over 5 tonnes by the year 2003. Once again Belgium's plutonium programme is an example of over-supply, with annual demand not expected to be greater than 0.3 tonnes in the period 1996/7-2000. Consequently, this will give Belgium an excess stockpile of more almost 4 tonnes by the year 2003. It will take a further 13 years to consume this plutonium in Belgium reactors.

RUSSIA

Commercial reprocessing is centred at the Radiochemical Combine Mayak site at Chelyabinsk-40, now renamed Ozersk. A 600 tHM/y reprocessing plant, RT-1, has operated since 1976, when it was converted from military production. Throughput of VVER-440 reactor fuel in practise has been around 190 tonnes on average, with recent reports suggesting a decline to 100 THM/y, this has yielded a total of around 27 tonnes by the end of 1994. There is almost no domestic demand for this plutonium. The Russian FBR programme is centred around BN-600 at Beloyarskya but this operates with HEU fuel not plutonium MOX. Plans for construction and operation of three BN-800 FBR's operating on plutonium MOX remain unrealised. In addition to the Chelyabinsk site, there are plans to complete the unfinished reprocessing facility a Krasnoyarsk-26. Construction of this facility was halted in the mid-1980's due to local opposition and financial restrictions from central government. The facility if it is ever built, is intended to reprocess 1500 THM/y of fuel from Russian VVER-1000, as well as

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overseas clients. Discussions have been held with utilities from a range of countries, including: the Republic of Korea, Switzerland, Ukraine, and Taiwan.

A more immediate problem for those concerned about commercial plutonium use is an option under consideration by the Ministry of Atomic Energy, for converting dismantled nuclear warhead plutonium into MOX fuel. Despite all the acknowledged problems with MOX, Minatom appears to favour this option over any other. Currently a study is underway that if implemented would lead to the construction of a small 20 THM/y MOX plant at Chelyabinsk, based upon Siemens technology. Russia has some specific problems due to the nature of its reactors. Only 22 of Russia's largest reactors are theoretically capable of handling MOX, eleven of these are of the RBMK type - thus using MOX would compound their already dangerous operating characteristics.

SWITZERLAND

By the year 2003/4, Switzerland will have acquired a stock of 9 tonnes of plutonium, through contracts at La Hague and Sellafield. Despite initial plans for MOX in all five of its reactors by the year 1998, doubts amongst utilities over the economic penalties of plutonium fuel use have contributed to expected delay's in MOX utilization. Currently, MOX supplied from Belgium, the UK and France, is used in two small PWR's.

SPAIN

Spain has contracts for 169 THM of spent fuel with the THORP facility. This will yield approximately one metric tonne of plutonium for return to Spain. There are however no plans for plutonium use in Spain's reactors. It should be noted that Spain's Vandellos magnox reactor had its spent fuel reprocessed in France, but not returned to Spain. It is believed that plutonium from this reactor entered the French military programme.

NETHERLANDS

The Netherlands has contracts with both the La Hague and THORP facilities, that once completed will yield about 2 metric tonnes of plutonium. As with Spain, there are no current plans for the use of this material, including in which location it will be stored.

PLUTONIUM MOX - REACTOR SAFETY AND PROLIFERATION CONSEQUENCES

It has been reported that the Nuclear Safety Summit will endorse the burning of plutonium from dismantled nuclear warheads in reactors - the MOX option. For a number of reasons this route poses a threat of greater nuclear proliferation, increased safety risks for reactors, additional health hazards for workers, and more problems for radioactive waste storage.

Perhaps the greatest obstacle to the MOX route for plutonium management is an economic, and therefore political, one. Global MOX production capacity by the year 2000 will be less than 350 tonnes each year. Although this is significant in terms of increasing the amount MOX in the world, all of this capacity is dedicated to fabricating MOX from commercial reprocessing - and even then it cannot deal with most of the commercial plutonium stocks. To convert plutonium from nuclear warheads on anything other than an experimental basis will require the construction of new large MOX facilities. On the basis that 100 tonnes of plutonium from warheads is to be converted to MOX, (50 tonnes each from Russia and the United States) it will require one 120 tHM/y plant to operate at full capacity for 27 years. Currently there is no

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industrial scale MOX production capacity in Russia, and Site-300 at Ozersk, if ever built, will have an annual plutonium throughput of around 400kg. This facility would have to operate for over 100 years to convert 50 tonnes of Russia's plutonium stock. The United States Department of Energy is currently considering the options for the disposition of its stockpile of military plutonium. No MOX facility currently operates in the United States. Environmental opposition to plans in both the United States and Russia could prevent any large-scale move to MOX use.

Reactor Safety Implications

If the Nuclear Safety Summit does endorse MOX for military plutonium, it will further highlight the irrelevance of the Summit for improving the safety of nuclear reactors. The reason for this is that the very reactors that would be used to burn the MOX fuel in Russia, are some of the most dangerous reactors operating and using plutonium fuel reduces further the weak safety margins of these plants. The preferred reactors in Russia for MOX use, from a nuclear physics perspective, are the six VVER-440s, of which 4 are the 230 series. Even the IAEA classifies these as being extremely unsafe, and it is unlikely that even MINATOM would consider introducing plutonium fuel into these reactors. Other options also have potentially severe consequences. For VVER-1000's, the problem of reduced pressure vessel size has been countered by moving to a three year fuel cycle. Introducing MOX into these reactors would eliminate the safety benefits of this, thus increasing the probability of a positive temperature coefficient, leading to a power excursion and severe accident. The only other option would be to move ahead with the construction of the BN-800 series of FBR's in Russia. Though this may MINATOM's preferred path, not only are there no funds for these, but safe reliable operation of such reactors has not been demonstrated.

It would indeed be a supreme irony if leaders from the G7 and Russia, meeting for the first time on exclusively nuclear matters, endorsed an option that would dramatically reduce the safety of some of the most dangerous reactors in the world.

Proliferation and Security

Any commitment to increase MOX production and use in reactors, will lead to an increased risk of nuclear proliferation. The plutonium contained within the MOX will either be weapons-grade or blended-down reactor grade. However, whatever its grade it will remain weapons-usable. It is worth mentioning that it has yet to be demonstrated by the International Atomic Energy Agency (IAEA) that it is possible to adequately safeguard plutonium MOX facilities. As fabrication plants for MOX pose a proliferation threat so to does the transport of the MOX to reactor sites. For example, during 1995 the option to have plutonium from Russia shipped to the Hanau MOX facility in Germany, was promoted by the German Foreign Ministry and Siemens (the builder of the uncompleted MOX plant). Highlighting the logistical problems of such an option, it was reported that a transport plan drafted by Siemens envisaged 70 transports every year, involving 4-5 tonnes of plutonium, for ten years. The transport methods considered included by rail through eastern and central Europe, by sea through the Baltic, and by air. Fortunately, the Hanau option was abandoned in December 1995.

In addition, countries now expanding their MOX use programmes are now confronted with the security problem posed by the storage of large quantities of plutonium MOX at reactor sites. Stockpiling plutonium MOX fabricated from dismantled nuclear warhead material raises very serious security concerns. This further raises the spectre of

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draconian measures applied by government agencies seeking to protect stockpiles of such material.

The consequences of producing hundreds of tonnes of weapons-usable MOX, will increase the probability that material will be diverted or stolen. After the past two years when nuclear smuggling, both real and imagined, has focused international attention in the threats posed by nuclear materials, it makes no sense to increase the diversion pathways for plutonium.

CONCLUSION

The unique dangers posed by weapons-usable fissile materials should not be underestimated. No excuses are therefore required when no simple solution is available for dealing with these materials. However, to pretend that the problem only exists in Russia, or that commercial plutonium is somehow a legitimate industrial process, highlights that the G7 and Russia have yet to come to terms with the unique threat posed by these materials. After all, it is these very nations within the group of G7 and Russia that have produced the problem, either as a direct result of the nuclear arms race, or of commercial nuclear programmes. The international community should therefore treat with extreme caution any solution offered by these same states at the Moscow Nuclear Safety Summit.

This summary paper has sought to highlight the fundamental contradiction of the G7 nations and Russia, when as expected they endorse the MOX option for dealing with weapons-usable plutonium. While plutonium production for explicitly military purposes has almost ceased, production for commercial purposes is rapidly expanding. No distinction can be made between these two types of plutonium - it is all weapons usable. The G7 and Russia by ignoring this reality will expose the lack of real political will to overcome the powerful interests of the global nuclear industry.

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Table 1: Plutonium stocks 1993

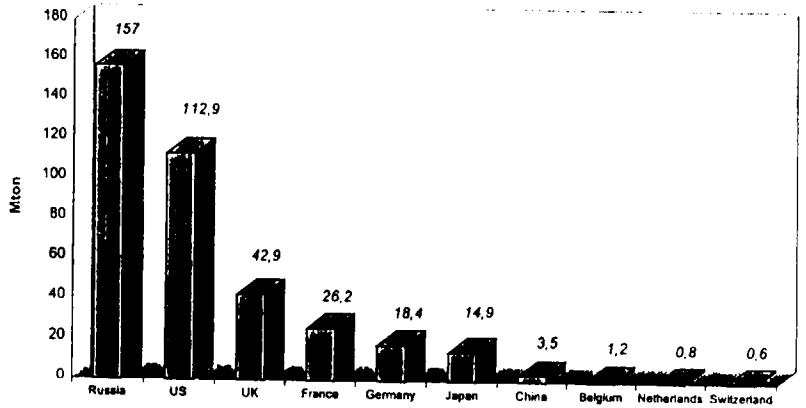

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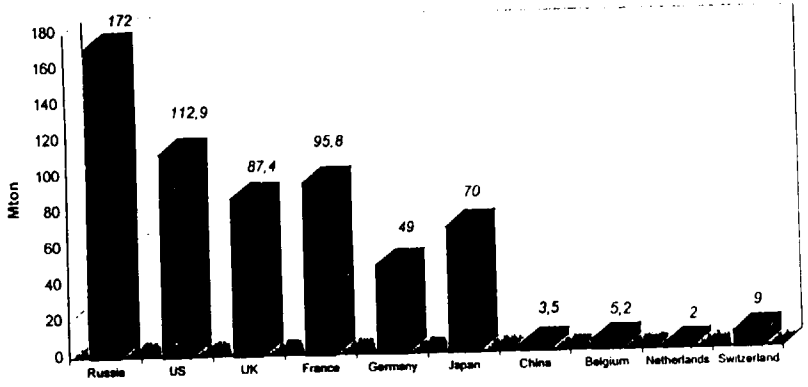
Table 2: Plutonium stocks 2003



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China	figure for Dec.31, 1993. Albright, 1995.
Other Countries	Albright, World Inventory of Plutonium and Highly Enriched Uranium. SIPRI, 1993. Cogema, June 1, 1995; SIPRI Yearbook 1995.

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May 31, 1996

DOE-Office of Fissile Materials Disposition
c/o SAIC-PEIS
P.O. Box 23786
Washington, DC 20026-3786

To Whom it Concerns:

Attached are documents which I request be included as comments on the Storage and Disposition of Weapons-Usable Fissile Materials - Draft Programmatic Environmental Impact Statement:

1. The Problems of Disposing of Military Plutonium as MOX Fuel
2. MOX: A Background Briefing
3. The Use of Mixed Oxide Fuel Rods Containing Plutonium in Light Water reactors
4. MOX or The Plutonium Aberration
5. Industrial and Strategic Aspects of the Plutonium Fuel Cycle in France
6. various new articles on MOX

1/15.00.00

Thank you very much.

Sincerely,

Tom Clements

Tom Clements
Greenpeace International
Plutonium Campaign
tel. 202-319-2506
fax 202-462-4507

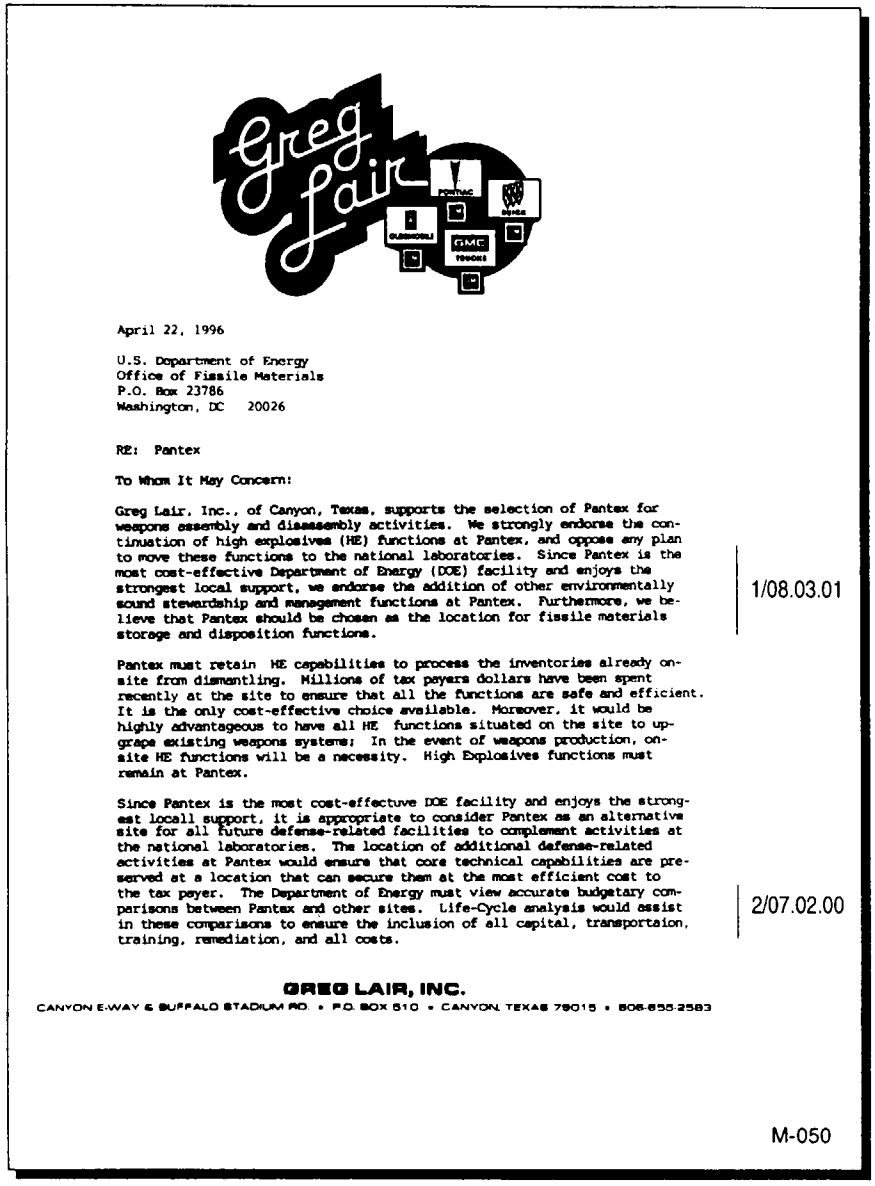
1436 U Street, NW • Washington, DC 20009 • Tel (202) 462-1177 • Fax (202) 462-4507 • Tlx 89 2359

M-250

15 00 00 **Comment Number 1**

Comment noted. The documents referred to are included in the PEIS Administrative Record. Further, this research information was analyzed for comments specific to this PEIS, and is available to the decisionmaker. No comments specific to the PEIS were identified in these documents.

GREG LAIR, INC., CANYON, TX, GREG LAIR PAGE 1 OF 2



April 22, 1996

U.S. Department of Energy
Office of Fissile Materials
P.O. Box 23786
Washington, DC 20026

RE: Pantex

To Whom It May Concern:

Greg Lair, Inc., of Canyon, Texas, supports the selection of Pantex for weapons assembly and disassembly activities. We strongly endorse the continuation of high explosives (HE) functions at Pantex, and oppose any plan to move these functions to the national laboratories. Since Pantex is the most cost-effective Department of Energy (DOE) facility and enjoys the strongest local support, we endorse the addition of other environmentally sound stewardship and management functions at Pantex. Furthermore, we believe that Pantex should be chosen as the location for fissile materials storage and disposition functions. 1/08.03.01

Pantex must retain HE capabilities to process the inventories already on-site from dismantling. Millions of tax payers dollars have been spent recently at the site to ensure that all the functions are safe and efficient. It is the only cost-effective choice available. Moreover, it would be highly advantageous to have all HE functions situated on the site to upgrade existing weapons systems; In the event of weapons production, on-site HE functions will be a necessity. High Explosives functions must remain at Pantex.

Since Pantex is the most cost-effectuve DOE facility and enjoys the strongest locall support, it is appropriate to consider Pantex as an alternative site for all future defense-related facilities to complement activities at the national laboratories. The location of additional defense-related activities at Pantex would ensure that core technical capabilities are preserved at a location that can secure them at the most efficient cost to the tax peyer. The Department of Energy must view accurate budgetary comparisons between Pantex and other sites. Life-Cycle analysis would assist in these comparisons to ensure the inclusion of all capital, transportaion, training, remediation, and all costs. 2/07.02.00

GREG LAIR, INC.
CANYON E-WAY & BUFFALO STADIUM RD. • P.O. BOX 510 • CANYON, TEXAS 79015 • 806-655-2583

M-050

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support of Pantex. Decisions pursuant to potential future missions for storage and disposition at Pantex will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

07 02 00 Comment Number 2

Cost data, along with technical and schedule data, were provided for public comment in a Technical Summary Report in late July 1996.

April 22, 1996

Greg Lair, Inc.
P.O. BOx 510
Canyon, TX 79015

Page -2-

We believe that Pantex should be chosen as the location for plutonium storage. It seems that Pantex is the only facility that has handled assembly and disassembly operations in a safe and efficient manner. If cost savings are considered, Pantex is the only choice for plutonium storage. The facility is already storing plutonium on-site, and has strived significantly to ensure not only safety but environmentally sound practices as well. Not only has the facility made recent upgrades to storage facilities, storage container usage and reconfigurement, and security enhancement, Pantex could also upgrade facilities for any and all storage options being considered by the DOE using processes already in place with minimal cost and difficulty. It makes little sense to re-create storage facilities at another site and then unnecessarily transport large amounts of plutonium across the country from Pantex. The cost and possible consequences of this decision would be enormous. Pantex also should be designated the preferred site for any disposition options and related function. It makes sense to site deposition where storage already exists. Furthermore, it is not feasible, from any perspective, to site strategic storage at one site and surplus at another. Pantex has the necessary safety, security, and surveillance capabilities to accommodate an expanded role with minimal costs, and it is the production site closest to Los Alamos, the planned fabrication site.

1/08.03.01
cont.

Based upon the above reasons and for the continued benefit of the entire community, Greg Lair, Inc. urges the Department of Energy to designate Pantex as the preferred alternative site for all existing and new stockpile management and stewardship functions as well as consolidation of all plutonium storage and disposition and any related functions.

Sincerely yours,

Greg Lair

GL/sm

M-050

HANFORD ACTION OF OREGON, PORTLAND, OR, TERRY HAMMOND
PAGE 1 OF 2

Terry Hammond
Hanford Action of Oregon
4545 NE 78th
Portland OR 97218

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-3786

May 10, 1996

Re: Comment on Plutonium Disposition

Dear DOE:

Since attending the recent DOE meeting in Portland, Oregon, concerning plutonium disposition, I have just been informed of certain business support for the reactor alternative. I wish to record my determined opposition to this choice. 1/08.03.01

1. After decades of denial, the U.S. government is just now beginning to admit to the perils of nuclear radiation and the deaths it causes. Thousands of babies are being killed, thousands of adults are developing horrible radiation-caused diseases, farm animals are suffering disgusting mutations and infertility. With uranium mining, processing, weapons testing and deployment, and energy reactors, the nuclear establishment is conducting random genocide on the human population, while permanently destroying the possibility for healthy life on the planet. This practice must stop. Do not encourage the perpetuation of the nuclear establishment. In the tradition of the Nuremberg trials after W.W.II, consider your decisions a matter of personal accountability. 2/15.00.00

2. There is still no plan for permanent disposition of the mounting tons of nuclear waste in this country. Rather than contribute to the problem by creating more waste with the reactor alternative (as your PEIS indicates it will), some definite line of action must be created that allows us to feel we are moving in the right direction, and which provides a model for the rest of the world. You must stop the forward momentum of the nuclear establishment. 3/01.06.00

3. With childish disregard for the hazardous mess produced by their activities, both the military and energy sectors of the nuclear establishment have never included adequate management of nuclear wastes in their operating budgets. Recent news reports indicate that funds set aside to dismantle reactors are nowhere near enough to cover projected costs. Once again, the U.S. taxpayer is expected to pickup the extra bill, prodded by dire concerns for health and safety. The skyrocketing direct costs don't even include all the costs for generating reports and holding meetings associated with dangerous nuclear-

M-210

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternatives. However, NEPA requires that DOE look at all reasonable alternatives and, therefore, reactor burning must be considered. Decisions on the disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

15 00 00 **Comment Number 2**

Comment noted.

01 06 00 **Comment Number 3**

Comment noted. DOE has the responsibility to find a path forward for surplus Pu disposition to support the President's Nonproliferation Policy. All the alternatives would take the Pu to an end state that produces some nuclear wastes. It is the intention of DOE to minimize waste production in the facilities that will be used for Pu disposition.

waste disposition. The economic side of the nuclear nightmare is already way out of control. You must get a handle on what we have now without encouraging the kinds of facilities that are generating enormous expense directed at the innocent American taxpayer.

4. It would be nice if DOE could direct its reports to energy sources that don't need to talk about death and illness, catastrophic accidents and evacuation. The public anger and distrust of the U.S. government is increasing. The DOE, like its predecessors in the nuclear establishment, has a contemptible reputation, with a history of deceit, denial, cover-up and coercion. We appreciate recent efforts to bring some sunshine into your activities. Please help us regain confidence in DOE, while tackling a huge problem that concerns all of us. We need you. Be a leader in changing course and dismantling the deadly nuclear establishment.

3/01.06.00 cont.

Thank you for your consideration on this matter.

Sincerely,

Terry Hammond
Hanford Action of Oregon

M-210

HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES PAGE 1 OF 11

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

David Nulton
Director, NEPA Compliance and Outreach
Office of Fissile Materials Disposition
Department of Energy
PO Box 23786
Washington, DC 20026-3786

Sent by Facsimile to 1-800-820-5156 and by US Mail

May 3, 1996

Dear Mr. Nulton:

Re: Storage and Disposition of Excess Weapons Useable Plutonium and Special Nuclear Materials (SNM) (HAB Advice #46)

The draft Plutonium Programmatic Environmental Impact Statement (PEIS) indirectly considers Hanford as a potential site for certain activities within the scope of the plutonium safe storage and disposition program by the virtue of the site's current capability and plutonium possession. The Hanford Advisory Board is opposed to the piecemeal approach to nuclear material storage and disposition like that taken in the PEIS on plutonium disposition. We have on three previous occasions adopted advice to USDOE urging an integrated public discussion on these issues. (Board Advice #13, 34 and 38) We have a commitment from USDOE leadership to initiate such a process. Therefore, a ROD on the narrow choices presented in this EIS is premature pending the National Equity Dialogue. The Board is opposed to the use of the bore hole option at Hanford. At this time, the Board has not expressed a preference for one of the other disposal options. However, the Board does have a number of values/issues which relate to a plutonium (Pu) and spent nuclear material (SNM) program. Many of these values/issues have been previously provided to you as advice or recommendations for other Hanford programs. These values are: 1/08.02.00 2/08.03.01

1. Any plutonium or SNM storage or disposal program must be compatible and integrated with the TPA commitments and milestones and should not affect the rate or funding of cleanup. The program would have the safe disposition of Hanford plutonium as a priority. 3/11.00.01

Contact: Confluence Northwest, Facilitation Team
800 NW Sixth Avenue, Suite 342, Portland OR 97209-3715 Phone (503) 243-2863 Fax (503) 243-3683

F-030

08 02 00 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for coordination and increased understanding of decisions to be made concerning the storage and disposition of weapons-usable fissile materials. However, the National Dialogue Project is beyond the scope of this PEIS.

08 03 01 **Comment Number 2**

The Department of Energy recognizes the commentor's concern with the Borehole Alternatives. Decisions on the disposition alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

11 00 01 **Comment Number 3**

Comment noted. DOE's Fissile Materials Disposition Program is an integrated effort that will require the participation of a number of DOE sites that have weapons material experience. DOE acknowledges the commentor's concern about the potential effect that selection of Hanford for new missions could have on the Hanford cleanup program. It is DOE's intent that the implementation of Fissile Materials Disposition Program decisions will have little or no impact to ongoing cleanup programs. Decisions on storage and disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input. The decision process will also give consideration to existing agreements between DOE, the State of Washington, and the Environmental Protection Agency (EPA).

2.	Any plutonium program assigned to Hanford must be fully funded from new funding sources. This funding should include appropriate site infrastructure and overhead costs. Funding should fully cover the cost of treatment, storage and disposal of any new waste streams.	4/07.00.00
3.	The acceptance of plutonium at Hanford should not delay, defer, or negatively impact Hanford cleanup.	5/11.00.01
4.	Appropriate local and regional public information and involvement programs must be conducted by the agencies to ensure that the public is fully informed of the risks, hazards and impacts of such a program. This would be part of the national dialogue on all nuclear materials (noted above) prior to assignment of nuclear materials to a specific site.	6/08.02.00
5.	Any permit or plan approval for new Hanford programs/activities must be fully integrated and must comply with all State of Washington public health and safety rules and regulations.	7/08.03.00
6.	Equity impacts must be addressed in the assignment of new nuclear materials (including plutonium) to Hanford.	8/01.00.00
7.	The transportation of plutonium and special nuclear materials to Hanford storage will require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE for state, tribal, and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.	9/10.01.00
8.	The choice of disposal options re: Pu will be a determinant for sites such as Hanford. Prior to the choice of a disposal option, complete characterization of the material and the impacts of short and long-term disposition technologies must be reviewed by the public and regulatory agencies.	10/08.02.00
9.	Acceptable processing techniques including waste processing must be developed as an integrated part of any new Hanford storage and disposal program. Permanent disposal of waste plutonium at Hanford is not acceptable.	11/09.11.01

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07 00 00 **Comment Number 4**

Funding for all alternatives will be through the Government's budget process. It is not a part of the environmental analysis.

11 00 01 **Comment Number 5**

The Department of Energy will not begin implementation of the Proposed Action at any site without having given full consideration to the environmental, cost, schedule and policy analyses, public comments, and agreements with various states regarding the clean-up activities on the sites. Therefore, implementation of the Proposed Action is not expected to cause adverse impacts to ongoing programs at the selected site(s).

08 02 00 **Comment Number 6**

The Department of Energy uses a wide variety of methods to communicate with the public on these important issues. These methods include public meetings, as part of the NEPA process, and meetings outside of the process, such as the Plutonium Round Table. Numerous fact sheets and displays are made available at the meetings as well as by mail. All of this information is available on the Program's electronic bulletin board.

08 03 00 **Comment Number 7**

It is recognized that the decision to locate any of the alternatives at a site would require coordination with State and local officials on a variety of areas including the mission of the site.

01 00 00 **Comment Number 8**

Comment noted. Equity will be considered in DOE's decisionmaking process along with all other factors.

HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES
PAGE 3 OF 11

10. A "systems" analysis approach should be utilized to select the most effective method for processing and interim storage. This analysis should adequately address public and worker health and safety and environmental issues. | 12/08.03.00

11. If a plutonium disposition mission is assigned to Hanford, every effort should be made to use existing workforce, facilities, technologies, and other resources. | 13/09.00.01

Finally, we note that this PEIS does not address cumulative impacts of nuclear material movement and disposition as required by NEPA. | 14/08.00.00

The Health, Safety and Waste Management Committee of the HAB looks forward to further discussions and working with you on this issue. The Board looks forward to your written response, as called for in our charter.

Very truly yours,

Merilyn B. Reeves, Chair
Hanford Advisory Board

attachments: Board Advice #13, 34 and 38

cc: Thomas Grumbly, DOE
John Wagoner, DOE
Alice Murphy, DOE
Chuck Clarke, EPA
Mary Riveland, Ecology
Cindy Kelly, Designated Federal Official
Linda Lingle, Site Representative
Jim Mecca, DOE (by fax)
The Oregon and Washington Congressional Delegations

F-030

10 01 00 Comment Number 9

Logistical planning and meteorological surveillance are standard concerns which normally receive a great deal of attention during transportation operations such as this; transfer of materials to Hanford would hold no exceptions. Emergency preparedness personnel (that is, Emergency Response Teams) will be supplied with the necessary equipment and training commensurate with Department of Transportation (DOT), DOE, and NRC regulations. Sufficient funding for these concerns will be available to satisfactorily ensure that potential contingencies be dealt with in an effective and timely manner. DOE provides liaison with appropriate agencies for special nuclear material shipments. However, due to their classified nature, specific information on times and dates cannot be provided.

08 02 00 Comment Number 10

Before and after decisions are made on a disposition technology or technologies, DOE will conduct studies and technical demonstrations to fully understand the full impact of disposition actions. This information will be made available to the public, as appropriate.

09 11 01 Comment Number 11

The conceptual designs for the storage and disposition facilities have, as part of their design, waste management facilities that would treat and package all waste generated into forms that enable long-term storage and/or disposal in accordance with RCRA and other applicable Federal and State statutes and DOE Orders. As noted in Section 4.1.10 of the PEIS, waste management activities that would support the long-term storage or disposition of weapons-usable fissile materials were assumed to be per current site practice. Thus, only low-level waste (LLW) and possibly some solid nonhazardous waste was assumed to be disposed of onsite. Any future waste management facilities that may be required to support the long-term storage or disposition of weapons-usable material would be coordinated with any decisions in the waste-type-specific RODs resulting from the Waste Management PEIS and respective site-specific NEPA documentation.

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

Chuck Clarke, Regional Administrator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Mary Riveland, Director
Washington Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

John Wagoner, Manager
Department of Energy, Richland Operations
PO Box 550 (A7-50)
Richland, WA 99352

February 8, 1995

RE: Off-site Mixed Waste Acceptance

Dear Messrs. Clarke and Wagoner, and Ms. Riveland:

The following advice was adopted by the Hanford Advisory Board on February 3, 1995.

The State of Washington and U.S. EPA should not allow the U.S. Department of Energy or U.S. Department of Defense to transfer to the Hanford site any "Mixed (hazardous and radioactive) Waste" unless the following criteria are met:

1. A general condition of permit and plan approval and subsequent off-site waste acceptance in Washington State should be on-going substantive compliance with Washington Dangerous Waste laws and the terms, conditions, and schedules of permits, consent orders and clean-up agreements (e.g. the Tri-Party Agreement) between the DOE and the State.

2. Acceptance of off-site waste must be contingent on existing facility capacity and on availability of funding to handle processing and storage needs, while having a neutral or positive impact on Hanford clean-up.

3. In all instances where DOE proposed to treat off-site wastes at Hanford, a written reciprocal agreement should be required between the State of Washington, the state of origin of the off-site waste and the Department of Energy.

15/15.00.00

Page 1

HAB Consensus Advice #13
Subject: Off-site Mixed Waste Acceptance (Health, Safety & Waste Management Committee)
Adopted: February 3, 1995; Letter to Tri-Parties

Contact: Confluence Northwest, Facilitation Team
800 NW Sixth Avenue, Suite 342, Portland OR 97209-3715 Phone (503) 241-2663 Fax (503) 241-3683

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08 03 00 **Comment Number 12**

Comment noted.

09 00 01 **Comment Number 13**

Comment noted and will be taken into consideration when DOE is ready to select sites to implement Pu disposition technologies.

08 00 00 **Comment Number 14**

The Department of Energy has determined that, based on historical trends and regulatory constraints, impacts associated with transportation of nuclear materials are unlikely and not otherwise significant. Therefore, no cumulative analysis of transportation impacts is performed. The cumulative impacts analysis is located in Section 4.7 of the PEIS.

15 00 00 **Comment Number 15**

The PEIS analyzes the storage of nonsurplus weapons-usable fissile materials and surplus Pu pending disposition. All materials are assumed to have been stabilized and packaged according to recommendations made by the Defense Nuclear Facilities Safety Board (DNFSB) prior to storage, and are not considered waste until disposition actions have been completed.

HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES
PAGE 5 OF 11

4. In deciding whether to approve storage, technical, economic and equity concerns should be addressed. Prolonged storage of off-site wastes prior to treatment, or of post-treatment residuals, generally should not be approved.

5. No pretreatment storage should be allowed at the receiving site unless it has been approved in the written reciprocal agreement between the shipping and receiving states.

6. Plans and schedules to treat off-site wastes should be approved only in instances where there is a binding legal obligation on the part of DOE for primary and secondary off-site storage facilities designed to receive post-treatment residuals before wastes are allowed to be shipped to Hanford. Plans and schedules should specify that generally no residuals will be stored or disposed of at Hanford . In the event of substantial noncompliance with Washington Dangerous Waste Law requirements, or failure to have off-site facilities available for return of post-treatment residuals, off-site waste will not be accepted at Hanford. Lacking specific agreement between the state, DOE and state of origin, waste residuals should be returned to the site of origin or other compliant facilities to be specified in plans and schedules.

15/15.00.00 cont.

7 When reviewing requests from other sites/states to accept mixed wastes for treatment at Hanford, the sending sites's treatment plan should be scrutinized to determining whether there has been thorough consideration of on site treatment and pre-shipment storage. Off-site wastes should not be accepted for treatment where such analysis is lacking or not compelling, unless it is otherwise approved in the reciprocal agreement between the sending and receiving states.

8. Receipt of any off-site wastes for treatment should require submission by shipping state of a schedule for shipment, treatment, and post-treatment residuals management, and prior written approval by the State of Washington.

9. Transport of off-site waste to Hanford for treatment will require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE to state, tribal and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.

10. Cumulative impacts (e.g. of other wastes types) must be analyzed and considered in decisions concerning the movement and treatment of DOE mixed wastes. DOE

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must fully disclose all projected waste types and quantities that maybe shipped to Hanford prior to any consideration by Washington of TSD permits for mixed wastes generated at other facilities. This information must be part of the PEIS and Draft Site Treatment Plan public comment/public participation process, and of an inter-regional and inter-site advisory board dialogue, prior to development of final Site Treatment Plans and any agreement by Washington State to accept off-site wastes.

11. Hanford off-site waste acceptance criteria must include provision for inspection and payment of appropriate permit fees to cover all state costs, including inspection of pre-shipping procedures. Existing Mixed Waste facilities at Hanford must be in substantial compliance with the Tri-Party Agreement milestones, other orders or agreements and RCRA or state law requirements in order for permits to be issued or amended to allow off-site Mixed Wastes to be treated, stored or disposed of at Hanford.

15/15.00.00 cont.

The Board and its Health, Safety & Waste Management Committee will consider both additional information that has not been presented to date as well as agencies' responses to this advice. Based on that additional information and agency responses, it is expected that the Board will offer additional advice and recommendations to the U.S. Department of Energy, USEPA and the Department of Ecology.

The Board would like the State of Washington to explore options to control other materials (including low level waste, plutonium or transuranic (TRU) contaminated waste) intended for transport by DOE to Hanford for storage, treatment and/or disposition.

Very truly yours,

Merilyn B. Reeves, Chair
Hanford Advisory Board

cc: Thomas Grumbly, Department of Energy

F-030

HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES PAGE 7 OF 11

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

Advising:
US Dept of Energy
US Environmental Protection Agency
Washington Dept of Ecology

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Merilyn Reeves

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Patty Burnell

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Frank Cohen

Higher Education
Thomas Engel
Reid Miller

Labor/Work Force
Richard Bangland
Thomas Carpenter
Mark Hammond
Gerald Peterson
Jim Wells

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Local Environment
Rick Leaumont

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Chris Tucker

Nez Perce Tribal Government
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Regional Environmental Citizen
Greg deBruler
Paige Knight
Gerald Pollet

Laurie Stansbridge
Elizabeth Tabbutt

State of Oregon
Shelley Cimon
Michael Graybeal

Confederated Tribes of the Umatilla Indian Reservation
Washington Health Department
Yakama Indian Nation

Thomas Grumbly
Assistant Secretary for Environmental Management
Department of Energy
1000 Independence Avenue SW
Washington D.C. 20585

November 3, 1995

Re: Waste Management PEIS and Public Involvement, HAB Consensus Advice #34

Dear Mr.Grumbly:

At its November 2-3 meeting, the Hanford Advisory Board adopted the following advice relating to the Waste Management PEIS and public involvement.

Advice

The Hanford Advisory Board is concerned by USDOE Headquarters' inadequate planning and decisions for public involvement and information for the Waste Management PEIS. Publicity to promote public involvement has not met the standard expected. There is a need for timely and meaningful disclosure to the public in the Northwest of all relevant waste and nuclear materials movement actions, impacts and alternatives for the Waste Management Programmatic EIS.

This Board expressed strong reservations about USDOE's plans to hold one single multisite videoteleconference hearing for public comment from 6 cities. Those concerns were not heeded nor mitigated.

The Board is upset that DOE-HQ refused to place any notice advertising in major newspapers for 5 of the 6 cities where the hearing will be held, other than in the legal notices.

Northwest stakeholders and the Hanford Advisory Board have urged USDOE to disclose, and integrate impact and alternative analyses into one public document and process, all wastes and nuclear materials which USDOE is considering treating, storing and disposing at Hanford and throughout the complex. You personally committed at the Plutonium Roundtable in Seattle to such integration and disclosure. We remain concerned that such an integrated approach disclosing all interrelated and cumulative impacts should be available in time for public input to this major WM Programmatic EIS.

16/08.00.00

Therefore, the HAB urges USDOE to utilize an independently facilitated inter-site

Contact: Confluence Northwest, Facilitation Team
800 NW Sixth Avenue, Suite 342, Portland OR 97209-3715
Phone (503) 243-2663 Fax (503) 243-1643

F-030

08 00 00 Comment Number 16

This comment is outside the scope of the PEIS and, therefore, has been referred to EM for response.

stakeholder planning process to: cooperatively develop a meaningful integrated public participation process on the Department's proposed actions to ship for storage, treatment or disposal of DOE's nuclear and hazardous wastes and nuclear materials. The HAB requests DOE to keep the WMPEIS comment period open to implement any process resulting from the November 29th intersite meeting.

16/08.00.00
cont.

The Board looks forward to your written response, as called for in our charter.

Very truly yours,

Merilyn B. Reeves, Chair
Hanford Advisory Board

cc: Chuck Clarke, EPA
Mary Riveland, Ecology
John D. Wagoner, Manager
Cindy Kelly, Designated Federal Official
Linda Lingle, Site Representative
The Oregon and Washington Congressional Delegations

HAB Consensus Advice #34
Subject: Waste Management PEIS and Public Involvement
Adopted: November 2-3, 1995

F-030

HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES PAGE 9 OF 11

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

Advising:
US Dept of Energy
US Environmental Protection Agency
Washington Dept of Ecology

CHAIR
Merilyn Reeves

VICE CHAIR
Patty Burnell

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Nez Perce Tribal Government
Donna Powaukee

Public Health
Richard Dubay
Thomas Hann

Public-At-Large
Kelly Hartley
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Gordon Rogers

Regional Environmental/Citizen
Greg deBruler
Paige Knight
Donald Pollet
Todd Martin
Elizabeth Tobiell

State of Oregon
Shelley Cimon
Michael Graybeal

Ex-Officio
Confederated Tribes of the Umatilla Washington Health Department
Yakama Indian Nation

Thomas P. Grumbly
Assistant Secretary for Environmental Management
Department of Energy
1000 Independence Avenue SW
Washington DC 20585

December 8, 1995

RE: Draft Waste Management Programmatic Environmental Impact Statement (DOE/EIS-0200-D)

Dear Mr. Grumbly:

The Hanford Advisory Board believes the following advice reflects the criteria DOE, EPA, WDOE, should use in selecting and negotiating alternatives. This advice is identical to HAB consensus advice #13 on "Off Site Mixed Waste Acceptance" adopted on February 3, 1995, and forms the basis for this additional advice and recommendations.

The State of Washington and U.S. EPA should not allow the U.S. Department of Energy or U.S. Department of Defense to transfer to the Hanford site any hazardous and radioactive waste unless the following criteria are met:

1. A general condition of permit and plan approval and subsequent off-site waste acceptance in Washington State should be on-going substantive compliance with Washington Dangerous Waste laws and the terms, conditions, and schedules of permits, consent orders and clean-up agreements (e.g. the Tri-Party Agreement) between the DOE and the State.

2. Acceptance of off-site waste must be contingent on existing facility capacity and on availability of funding to handle processing and storage needs, while having a neutral or positive impact on Hanford clean-up.

3. In all instances where DOE proposed to treat off-site wastes at Hanford, a written reciprocal agreement should be required between the State of Washington, the state of origin of the off-site waste and the Department of Energy.

4. Technical, economic and equity concerns should be addressed in deciding whether to approve storage. Prolonged storage of off-site wastes prior to treatment, or of post-treatment residuals, generally should not be approved.

Contact: Confluence Northwest, Facilitation Team
800 SW Sixth Avenue, Suite 242, Portland OR 97209-3715
Phone (503) 243-2663 Fax (503) 243-2683

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5. No pretreatment storage should be allowed at the receiving site unless it has been approved in the written reciprocal agreement between the shipping and receiving states.

6. Plans and schedules to treat off-site wastes should be approved only in instances where there is a binding legal obligation on the part of DOE for primary and secondary off-site storage facilities designed to receive post-treatment residuals before wastes are allowed to be shipped to Hanford. Plans and schedules should specify that generally no residuals will be stored or disposed of at Hanford. In the event of substantial noncompliance with Washington Dangerous Waste Law requirements, or failure to have off-site facilities available for return of post-treatment residuals, off-site waste will not be accepted at Hanford. Lacking specific agreement between the state, DOE and state of origin, waste residuals should be returned to the site of origin or other compliant facilities to be specified in plans and schedules.

7. When reviewing requests from other sites/states to accept wastes for treatment at Hanford, the sending site's treatment plan should be scrutinized to determine whether there has been thorough consideration of on site treatment and pre-shipment storage. Off-site wastes should not be accepted for treatment where such analysis is lacking or not compelling, unless it is otherwise approved in the reciprocal agreement between the sending and receiving states.

8. Receipt of any off-site wastes for treatment should require submission by shipping state of a schedule for shipment, treatment, and post-treatment residuals management, and prior written approval by the State of Washington.

9. Transport of off-site waste to Hanford for treatment will require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE to state, tribal and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.

10. Cumulative impacts (e.g. of other wastes types) must be analyzed and considered in decisions concerning the movement and treatment of DOE wastes. DOE must fully disclose all projected waste types and quantities that may be shipped to Hanford prior to any consideration by Washington of TSD permits for wastes generated at other facilities. This information must be part of the PEIS and Draft Site Treatment Plan public comment/public participation process, and of an inter-regional and inter-site advisory board dialogue, prior to development of final Site Treatment Plans and any agreement by Washington State to accept off-site wastes.

11. Hanford off-site waste acceptance criteria must include provision for inspection and payment of appropriate permit fees to cover all state costs, including inspection of pre-

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HANFORD ADVISORY BOARD, PORTLAND, OR, MERILYN B. REEVES
PAGE 11 OF 11

shipping procedures. Existing Waste facilities at Hanford must be in substantial compliance with the Tri-Party Agreement milestones, other orders or agreements and RCRA or state law requirements in order for permits to be issued or amended to allow off-site wastes to be treated, stored or disposed of at Hanford.

The HAB is concerned that the WMPEIS has used the Baseline Environmental Management Report (BEMR) as its source for estimated waste volumes. We urge USDOE to work with individual sites to verify and validate these estimates, as well as other identified assumptions.

USDOE should develop an effective decision-making process to integrate those EISs dealing with waste storage, treatment and disposal from USDOE's facilities. This process must be designed in a way that will earn the agreement of the affected states and Indian nations, and the support of SSABs and other affected stakeholders; this process must also contain a strong public involvement element. Please refer to HAB Advice #34, requesting an integrated public participation process. The SSABs can play a key role in public involvement, but it must be augmented by a broader outreach program. USDOE should work with stakeholders to ensure that their values are factored into alternatives being considered in the WMPEIS. We have attached two documents ("The Future for Hanford: Uses & Cleanup" from the Future Site Uses Working Group and the Final Report of the Hanford Tank Waste Task Force) which identify the values of Hanford stakeholders.

The Hanford Advisory Board urges the Washington State Department of Ecology and the U.S. Environmental Protection Agency be fully involved in decisions that would impact the Hanford site, particularly in decisions that could compete with or detract from the site's cleanup mission and the resources it requires.

We look forward to your written response as is called for in our charter.

Very truly yours,

Merilyn B. Reeves

Merilyn B. Reeves, Chair
Hanford Advisory Board

cc: Chuck Clarke, U.S. Environmental Protection Agency, Region 10
Cindy Kelly, Designated Federal Official
Linda Lingle, Site Representative
Mary Riveland, Washington Department of Ecology
John Wagoner, Department of Energy - Richland Operations
The Oregon and Washington Congressional Delegations

HAB Comment Advice #38
Subject: Draft Waste Mgnt Programmatic EIS (DOE/EIS-0200-D)
Adopted: December 7-8, 1993

Page 3
This advice represents HAB consensus for this specific topic. It should not be taken out of context to extrapolate Board agreement on other subjects matters.

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Hanford Communities

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April 28, 1996

Mr. Jim Hummer
Science Applications International Corp.
3290 Port of Benton Boulevard
Richland WA 99352

Dear Mr. Hummer:

This letter is to ask your help in our review of the draft Programmatic Environmental Impact Statement (PEIS) just released by the Department of Energy on long-term storage and disposal of weapons-usable plutonium surplus to the nation's defense needs. Because the PEIS covers a wide range of issues from transportation safety to environmental and socioeconomic impacts, the Hanford Communities will coordinate a review of the document and recommend a response to member jurisdictions.

Hanford is one of six DOE sites listed in the PEIS as candidates for long-term storage of weapons-usable plutonium. Rather than listing potential disposal sites, the PEIS suggests alternate technologies. Hanford is particularly well situated to support two of those listed -- vitrification and incorporation of plutonium into mixed oxide fuel (MOX) for use in nuclear reactors. 1/08.03.01

We believe our community's response to the PEIS should be carefully developed. It is our responsibility -- not that of "distant stakeholders" -- to appraise the health and safety, transportation, and socioeconomic impacts of weapons usable plutonium mission for Hanford. If properly understood by the public, disposal of weapons-usable plutonium could be embraced as a respectable and noble mission for Hanford. If this issue is not well understood and is strongly opposed by the general public, plutonium transport and long-term storage could have a very negative impact on the Tri-Cities region.

We need to determine whether this community should accept additional plutonium and, if so, under what circumstances. To accomplish this, we have asked a group of 20 individuals to work with us to review the draft PEIS and help us develop a position paper. We would sincerely appreciate your participation in this process. We anticipate that your involvement would include reviewing the draft PEIS working with our consultant to define and shape the issues to be addressed in the white paper and, if you are interested, participating in an issue briefing to convey this information to the community. Pam Brown of my staff will be contacting you to see if you will be willing to help us on this project.

Sincerely,

Joseph C. King
Richland City Manager and Chairman of
Hanford Communities Administrative Board

Independent Communities With Common Interests

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08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for new missions at Hanford. Decisions on storage and disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input.

HANFORD COMMUNITIES, RICHLAND, WA, JOSEPH C. KING PAGE 2 OF 7

James H. Hummer
188 CANYON STREET • RICHLAND WA 99352 • (509) 627-0176

May 2, 1996

Mr. Craig Williamson
Richland Fire & Emergency Services
1000 George Washington Way
Richland, WA 99352

Dear Mr. Williamson:

Subject: Review of DOE/EIS-0229-D, *Storage and Disposition of Weapons-Useable Fissile Materials Draft Programmatic Environmental Impact Statement*

Following is a compilation of comments from the EIS review for transportation issues. To better the review I solicited support from personal acquaintances from the Westinghouse Hanford Company (WHC) Transportation and Packaging Function. Their participation, and my own, is personal and does not represent the views of either WHC or Science Applications International Corporation (SAIC). Reviewers include me and:

Mr. W. F. (Bill) Irvine	Manager, Transportation and Packaging
Mr. J. G. (Greg) Field	Manager, Packaging Engineering
Ms. J. R. (Janet) Green	Engineer, Transportation Risk Assessment
Mr. J. H. (Jim) Portsmouth	Manager, Traffic Management

Overall, we found nothing we would characterize as a showstopper. Safety in transportation of radioactive materials has an excellent track record. However, transportation is an issue because it is visible and may involve (by proximity) persons that would otherwise be miles away from the material. For these, and other reasons, the Department of Energy has an extensive program of public liaison and communication to inform and solicit comments from the public on transportation issues. They also administer training on all aspects of radioactive and other hazardous material transportation and conduct emergency response training and accident recovery exercises. Other programs include self assessment of traffic management and radioactive and hazardous material packaging and transportation operations and third-party evaluation of commercial carriers. The DOE Office of Transportation, Emergency Management, and Analytical Services manages these programs (EM-76). They have not, but should, review this EIS. These programs help the DOE retain its track record in radioactive and hazardous materials transportation. The EIS does not, but should, exploit the benefits of these programs.

Westinghouse Hanford Company is an active participant in several of these programs, particularly training and motor carrier evaluation. As the normal follow-up to WHC's carrier registration, four inspectors from the Department of Transportation (DOT) conducted a

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formal review the week of March 7, 1994, to verify compliance with the federal regulations. They spent the entire week conducting random vehicle inspections, document reviews and personnel interviews in various departments and facilities across the site.

The review included all shipping documents for hazardous materials and wastes leaving the site during the previous year, driver qualification files, vehicle maintenance and inspection records, procedures and policies, hazardous materials employee training records, driver substance abuse testing results, medical files, and liability insurance and hazardous materials registration documentation. The review team found only four discrepancies, which they characterized as minor.

WHC received a "Satisfactory" rating, the highest granted by DOT, and was described in the exit briefing as the best transportation operation in the DOE complex. This may be another advantage that Hanford has concerning this scope of work.

Specific Comments:

The EIS assessment seems thorough, given that the numbers would withstand more rigorous scrutiny. There is concern that the packaging certifications (pedigrees) are not clearly explained; i.e., not all packagings possess the Nuclear Regulatory Commission endorsement. The other overall concern is that the relative risk bases are not presented clearly. — 2/10.00.00

Alternatives in chapter 2 do not address material transportation adequately or consistently. For example, Section 2.4.1, *Pit Disassembly/Conversion Facility*, states that originator will have ultimate responsibility for safe transfer and shippers, transporters, and receivers are responsible for complying with applicable regulations. This is always the case, whether DOE is involved or not so it really says very little about what DOE does, or will do, to safely transport the materials. In Section 2.4.5.2, *Existing Light Water Reactor Alternative*, transportation addresses five types of radioactive material shipments including low-level waste, fresh MOX fuel, and spent fuel. Section 2.4.5.4, *Evolutionary Light Water Reactor Alternative*, discusses low-level waste, mixed low-level waste, hazardous waste, nonhazardous waste, transuranic waste, and spent fuel yet transportation is summed up as "intersite transfers would be made by rail, truck transport, or pipeline as appropriate." All these sections should address all the applicable transportation streams and what special requirements apply such as security or special routing. — 3/10.00.00

There are several references to a DOT Specification 6M in Section 4.4, *Intersite Transportation of Fissile Materials*, and Appendix G, *Intersite Transportation*, as a DOT specification 6M Type B packaging, a DOT approved 6M Type B packaging (using 2R inner containers), a 6M, a 6M-2R, and a model 6M. In addition there is a statement that "A typical 6M, Type B packaging approved for use by DOE is covered by Certificate of Compliance Number 9869, dated January 5, 1994." This infers NRC certification in — 4/10.00.00

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10 00 00 Comment Number 2

The analysis for the storage and disposition alternatives evaluates the potential risks for transporting shippable forms of fissile materials (that is, Pu and HEU) that have been stabilized and packaged for shipment at the originating site. All packaging processes (and certifications) meet DOT and DOE requirements. NRC certification criteria is applied to all Type B packagings, as required by the DOT regulations. Section 4.4.2.2 of the PEIS presents information on packaging criteria established and enforced by Federal agencies. A thorough explanation of risk basis is presented within Sections G.1.1 and G.1.2 for truck/rail and port transit modes, respectively.

10 00 00 Comment Number 3

The transportation issues raised require site-specific knowledge in order to describe the transportation streams and the special requirements which apply to each transportation scenario (security, special routing). Transportation of radioactive material from an existing LWR site and evolutionary LWR site may include several modes of transportation (truck, rail, and barge) depending on the location of the site. Specific transportation streams and special requirements will be addressed if these alternatives are selected for further consideration. Appendix G presents additional information on transportation of radioactive materials and types of packaging specific to the material to be transported.

10 00 00 Comment Number 4

The PEIS uses the terminology "6M Type B package" to designate both the generic package type identified in the DOT specification and the specific variation of the package type used by DOE. The specific package type used by DOE is denoted as the 6M-2R, consisting of the 6M Type B package using 2R inner containers.

All aspects of the transportation of radioactive materials within the United States are regulated at the Federal level by the DOT. The Federal regulations are implemented by both NRC licenses and DOE for the transportation of

HANFORD COMMUNITIES, RICHLAND, WA,
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comparison to a DOT specification packaging. The inconsistent terminology and the careless use of "RM, Type B packaging" can be very misleading. One is an apple (DOT specification packaging), the other an orange (NRC certified packaging). As described, the EIS could lead to unnecessary criticism or debate about the validity of the risk analysis. The DOT specification packaging is not subject to the test sequence on page G-7. There is some controversy, mainly among the regulators (DOT and NRC) and DOE, regarding the DOT specification packaging. The EIS needs to identify clearly which packaging is which. — 4/10.00.00 cont

Section 4.4.2.2, *Packaging*, does not adequately describe the safety basis of the DOT-6M packaging, an old grand fathered DOT Specification packaging container, as shipped in the SST, particularly when compared with the safety basis of a state-of-the-art NRC certified spent fuel cask or the BUSS Cask. The public is probably not aware of the various systems that authorize Type B packages: DOT Specification (old), DOT Certificate of Competent Authority, NRC Certificate of Compliance, and DOE Weapons Program authorizations which include operational considerations. They need to be defined and considered in the risk analysis. — 5/10.00.00

The correct designator for some of these containers would be Type BF versus Type B.

Potential fatalities need to be defined better in Section 4. It is not clear that the potential fatalities reported represent an integrated risk of cancer fatalities from accident and non-accident radiological hazards and non-radiological risks associated with increased automobile emissions and highway fatalities. The numbers in this section would be more meaningful if they reported the radiological and non-radiological results separately. — 6/10.02.00

The section also infers that RADTRAN calculates the non-radiological risk, which it does not.

Page 4-772: The first sentence states "materials would be transported by SST or commercial equivalent truck." There is no commercially available equipment like the SST. — 7/10.00.00

Page 4-773: The second sentence states "For relatively low-level radioactive materials, DOT Specification Type A packaging are used. "Strong tight containers are also allowed for low specific activity radioactive material shipments. — 8/10.00.00

Page 4-780: Given more time to digest the information provided, these items may become more clear. For the "Deep Borehole" emplacement alternative, it is not clear why shipments would follow immobilization and come from lag storage. The shipping volumes of 5.5 mns per year seem slow, when the immobilized pellets could be shipped at a rate of 551 tons per year. Why the large difference in shipping volume capacity? — 9/10.00.00

Page 4-781: The fifth paragraph mentions shipping one rail cask at a time for a total of sixty-four shipments per year. Is this in regular train service or "special train?" There is a — 10/10.00.00

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radioactive materials. Package designs meeting the Type B package performance criteria are considered by NRC and DOE to provide adequate protection of the public and operating personnel in the event of a transportation accident. The NRC has no regulatory authority regarding DOE transport of radioactive materials, although DOE does use NRC criteria for the certification of Type B packaging, including the 6M-2R.

The approval process followed by DOE regarding Type B packaging and transportation of radioactive materials is established by DOE Orders. Package design, testing, and safety information must be prepared for shipping packages proposed for use within the DOE complex. Review and approval of this information results in DOE's issuance of a Certificate of Compliance for the package and its use. In the case of the 6M Type B package, although the package meets DOT specification, the DOE approval process provides additional requirements prior to the package's use within the DOE complex.

10 00 00 Comment Number 5

A discussion of the safety basis of certified nuclear packaging is beyond the scope of the PEIS. The transport index (TI), which is a regulatory characteristic of a package, was estimated to be the maximum allowed by regulatory requirements and used in the transportation risk analysis. A discussion of transport packaging is presented in Appendix G.

10 02 00 Comment Number 6

The human health risks from the transportation of radioactive materials between sites includes both radiological and nonradiological impacts to the public and workers. The categories of calculated risk include nonradiological accident impacts to the public and workers, nonradiological normal operation impacts to the public (air pollution), radiological accident impacts to the public, and radiological normal operation impacts to the public and workers. The risk to the public from radiological accidents is an order of magnitude less than either nonradiological accidents or radiological exposures during normal operations.

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big difference in cost associated with the two options. | 10/10.00.00 cont

Page 4-783: Risk numbers are difficult to understand and follow. For example, it seems that the deference in level of risk between processing in the U.S. versus processing in Europe, as depicted in Table 4.4.3.3-4, would be much greater than shown. | 11/10.02.00

Appendix G: The risk associated with the transportation of the materials would be better understood if it were broken into radiological and non-radiological categories. The radiological risks would also be more meaningful if they reported them for both accident and normal modes. Summing all risks results in numbers that are only useful to compare the alternatives being considered in this EIS. One cannot easily compare them with the other reports, which do not use this method. | 6/10.02.00 cont.

Not enough information was given about the RADTRAN input values used. For instance, the following values should be included and referenced: release fractions (RFAC, HERSOL, RESP), atmospheric dispersion values (for truck and rail, and oncoming highway traffic statistics. | 12/10.02.00

NUREG-0170 severity categories were used for all truck shipments. This may not be appropriate for the 6M shipments or for the 55-gallon drum shipments. | 13/10.02.00

Page G-3: Second paragraph, second sentence states that the 6M packages would be placed on Cargo Restraint Transporters (CRS) to facilitate loading and securing in the SST. At one time, we were told at Hanford to return our CRT's. Are they still being used on the SST's? Just a question. They worked well. | 14/10.00.00

Page G-3: The second sentence in the third paragraph mentions transferring the CRT's from an SST to a standard ISO container. Standard ISO containers do not have the floor tie down capability associated with the CRT's and available in the SST. The CRT's have wheels, and a proper tie down pattern would have to be developed for ocean transport in ISO containers. | 15/10.00.00

In addition, I have reviewed the other material you sent me and offer the following comments for your use.

Both Gordon Rogers and Rob Davis state their belief that transportation is a fully developed technology and with proper coordination and route selection, risk can be minimized. agree with this conclusion. The DOE will likely prepare a plan for a long term shipping campaign such as this, conduct emergency response training along the routes, and perform several other extra-regulatory activities to ensure safety in transportation.

Robert M. Jefferson commented that there seemed to be a complete lack of concern for criticality safety. They do not analyze criticality safety in the EIS. However, several

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10 00 00 Comment Number 7

If commercial trucks were to be utilized, additional requirements (physical and administrative) would be applied to provide equally effective safety and security measures as provided by SST.

10 00 00 Comment Number 8

The commentor is correct that strong, tight packagings can be used for low-level radioactive materials of less than Type A quantities. The text in Section 4.4.2.2 of the Final PEIS was changed to concur.

10 00 00 Comment Number 9

The Deep Borehole Alternative discusses the disposition of surplus weapons-usable Pu in two forms: (1) direct emplacement of Pu without immobilization and (2) Pu-loaded, ceramic-coated pellets. The amount of Pu to be transported for direct emplacement is estimated to not exceed 5 t (5.5 tons) per year. The amount of Pu-loaded, ceramic-coated pellets to be transported for emplacement is estimated to be 500 t (551 tons) per year. The Pu-loaded, ceramic-coated pellets contain 1-percent Pu. Therefore, the amount of Pu-loaded, ceramic-coated pellets would be 100 times as great as the amount of Pu for direct emplacement, or approximately 500 t (551 tons) per year.

10 00 00 Comment Number 10

Although shipments may be consolidated into "dedicated trains" of more than one car, the risk analysis has considered regular train services for these shipments. Several court decisions have shown there is no safety basis for the use of "special trains" for high-level nuclear materials. DOT, DOE, and NRC have provided no such direction that special trains will be used for radioactive materials.

HANFORD COMMUNITIES, RICHLAND, WA,
JOSEPH C. KING
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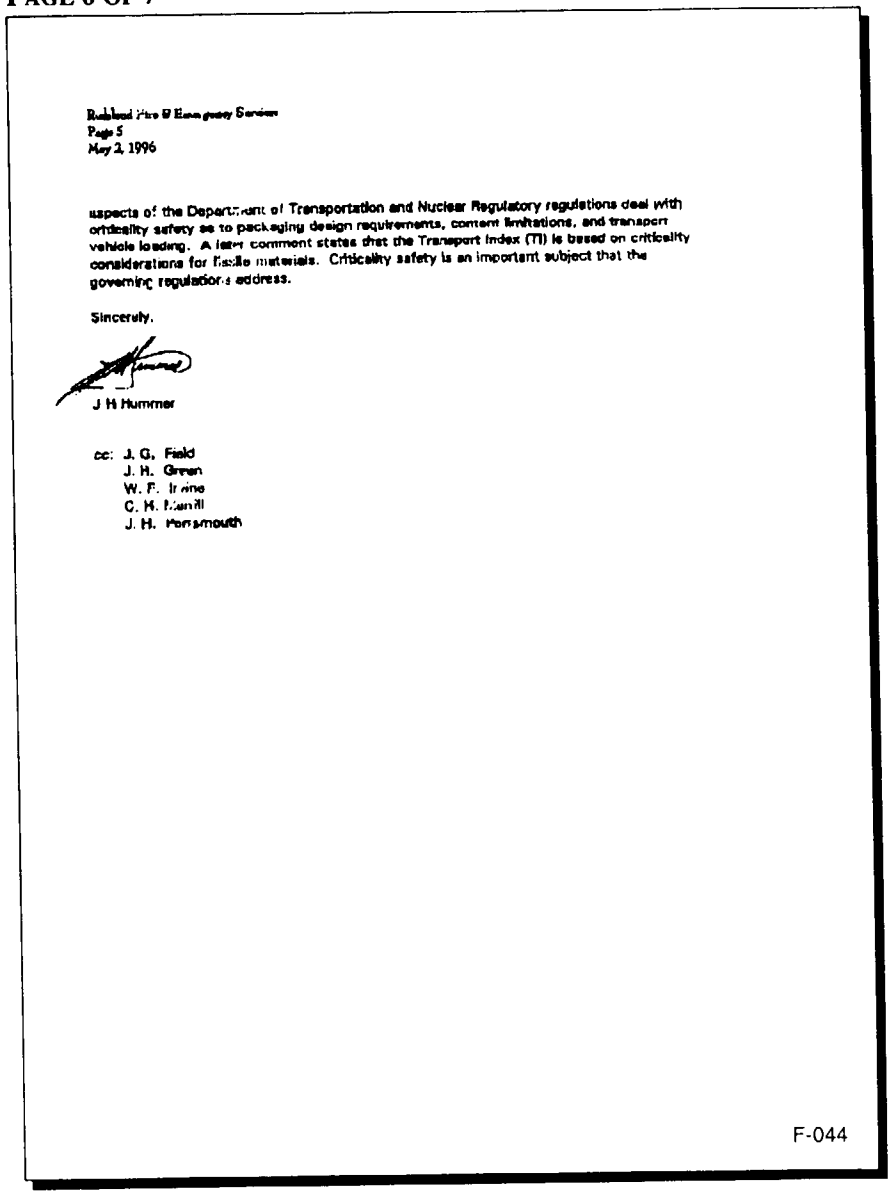

Richland Fire & Emergency Services
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aspects of the Department of Transportation and Nuclear Regulatory regulations deal with criticality safety as to packaging design requirements, content limitations, and transport vehicle loading. A later comment states that the Transport Index (TI) is based on criticality considerations for fissile materials. Criticality safety is an important subject that the governing regulations address.

Sincerely,

J H Hummer

cc: J. G. Field
J. H. Green
W. F. Irvine
C. H. Mansfield
J. H. Portsmouth

F-044

10 02 00 Comment Number 11

The values given in Table 4.4.3.3–4 of the PEIS represent the "Total Potential Fatalities" associated with the transportation of Pu oxide, uranium oxide, and MOX, for the Reactor Alternative category. The quantities presented are a result of direct risk calculations which yield results in "numbers of human fatalities." In regard to accumulating the risks associated with a given transportation process, the maximum risk impacts from the transport of Pu oxide, uranium oxide, and MOX fuel under the Reactor Alternatives may be summed directly from Table 4.4.3.3–4. According to results calculated by the "industry-wide accepted" RADTRAN code, the highest number of total potential fatalities from the transportation of materials from lag storage to fuel fabrication and then to a reactor site is 4.16 for MOX fuel fabrication in the United States. In Europe, the number of potential fatalities for a similar procedural operation would be 4.62. The difference between 4.62 and 4.16 fatalities is essentially negligible. Risk differences between the two "regional" alternatives (that is, the United States vs. Europe) are very small for all stages involved.

10 02 00 Comment Number 12

Appendix G of this PEIS discusses the pertinent methodology and associated parameters utilized in the transportation modeling via the RADTRAN code. The scope of this document does not require scientific detail regarding input parameters to exceed that of a programmatic level.

10 02 00 Comment Number 13

This PEIS evaluated the potential for highway accidents and radioactive releases from the 6M shipments during transport in terms of eight accident severity categories identified in NUREG-0170 and implemented through analysis by the RADTRAN 4.0 computer code. The accident categories ranged from the least severe and most frequent accident (Category I) to the most severe and least frequent accident (Category VIII). NUREG-0170 characterizes package response to these accident categories in terms of release fractions based on the package type, transportation mode, and accident category. DOE considers the accident category information presented in NUREG-0170 to adequately cover the transport mode and package types addressed in the PEIS.

10 00 00 **Comment Number 14**

The Cargo Restraint Transporters (CRTs) are still being used on the SST.

10 00 00 **Comment Number 15**

Transportation component design specific to this situation is beyond the scope of this PEIS. If design changes are necessary for International Standards Organization (ISO) transport to occur, proper modifications would be expedited to meet the necessary criteria.

HANFORD COMMUNITIES, RICHLAND, WA, LARRY HALER, ET AL.
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Hanford Communities

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May 8, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P. O. Box 23786
c/o SAIC PEIS
Washington, D.C. 20026-3786

Ref: Draft Programmatic EIS - Weapons Usable Fissile Materials Disposition - February 1996

To Whom it May Concern:

The Hanford Communities, individually through their respective elected bodies and collectively as a group, provide summary comments and recommendations as noted below relative to the referenced EIS. We appreciate the opportunity to provide input into this vital Department of Energy project and accordingly have taken extraordinary measures to ensure a thorough technical and citizen review. .

We asked community leaders and technical experts to serve as a volunteer advisory group to the Hanford Communities for this draft PEIS. The 30+ persons participating in this capacity divided into seven focus groups: transportation, health and safety, MOX fuel and Pu conversion, reactor burn options, vitrification disposition, socioeconomic issues and national security issues. Their comments complement and go into greater depth than the Hanford Communities' comments and are summarized in Attachment 1. Please review and carefully consider both sets of comments.

While time constraints did not permit public meetings or televised citizen forums during the limited comment period, we intend to hold one or more public meetings or media forums to fully inform the public of this response and gain additional citizen input. We will promptly notify DOE if there are any substantive changes to this transmittal as a result of this additional input.

We strongly support the reactor burn option as the preferred Pu disposition alternative. We believe this option has the best chance of becoming the disposition model internationally because it permits recovery of a significant fraction of the valuable "fuel" value while fully complying with one of the accepted proliferation-resistant disposal alternatives. We believe Hanford offers the best and most compelling cost and schedule advantage with the least environmental, health, safety and proliferation risks for either the reactor burn or the vitrification disposition mode. With Hanford's and Washington Public Power Supply System's existing facilities and infrastructure, and the planned privatization of Hanford's tank waste vitrification program (Figure 1), large savings in capital and operating funds are possible relative to other sites. 1/08.03.01

SUMMARY COMMENTS AND RECOMMENDATIONS

- Excess weapons-usable fissile materials must be promptly safeguarded and disposed of in the U.S. and internationally to prevent nuclear weapons proliferation. Time is of the essence since there is a clear and present danger of illicit use of bomb-grade plutonium and high enriched uranium in the world today. Accordingly we recommend DOE select the preferred disposition alternative and the Pu conversion and disposition sites that best achieve rapid, cost effective, integrated use of already existing DOE facilities; widespread acceptance by the international nuclear weapons community; and minimization of disposition implementation time, new capital requirements and environmental, transportation, safeguards, security, worker and public health and safety, and proliferation risks. 2/08.03.01

- Independent Communities With Common Interests -

M-234

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for new missions at Hanford. Decisions on storage and disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy acknowledges the commentor's support for the disposition of surplus Pu in existing facilities to the extent practical. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

HANFORD COMMUNITIES, RICHLAND, WA,
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- Hanford should be included in the draft EIS as a potential Pu processing and disposition site -- the PEIS currently only considers Hanford as a "long term storage" site, and specifically, the
  - Fuels and Materials Examination Facility should be considered as a potential site for MOX fuel fabrication, Pu conversion and/or small scale Pu vitrification, and the
  - Fast Flux Test Facility reactor should be considered as a viable plutonium "burner" reactor

3/01.04.00

- We oppose any consideration of Hanford as a "long-term Pu storage only" facility. Temporary plutonium storage is acceptable as part of an expeditious, substantive Pu disposition option.

4/08.03.01

- Hanford is unique in that a large, operating, commercial nuclear-electric power station (WNP-2); a plutonium oxide fuel burning test reactor (FFTF); a commercial low-level waste disposal site; a nearly complete plutonium oxide (MOX) fuel fabrication facility; another large, but partially completed, nuclear-electric power station (WNP-1); a soon-to-be-developed vitrification plant; plus all the site infrastructure co-exist within DOE's Hanford site boundaries. These collocated or "clustered" facilities (Fig. 1) should be given preferential consideration in this EIS and Record of Decision and in all assessments of environmental impacts, schedules, capital requirements, life-cycle costs, health, safety, safeguards, security, transportation and proliferation risks.

3/01.04.00 cont.

- Mitigating transportation issues is a high priority. New or expanded Pu storage site(s) should not be determined until after the plutonium conversion site(s), and preferably, after the preferred plutonium disposition method(s) and the plutonium disposition site(s) are finally selected.

5/01.00.00

- We oppose using Canadian CANDU or any other foreign reactors to dispose of U.S. generated weapons grade plutonium. This is neither appropriate nor responsible international U.S. policy.

6/08.03.01

In conclusion, we do not believe the Department of Energy can adequately address or minimize the environmental impacts and associated health, safety, safeguards, security, transportation, schedule and cost impacts of the proposed PEIS until it evaluates its Pu conversion and disposition options relative to the synergistic use of existing, collocated, cost effective facilities in the DOE complex.

2/08.03.01 cont.

We urge you to formally and thoroughly examine the potential benefits of disposing of plutonium as depicted in the attached simplified schematic (Figure 1). We believe implementing this strategy will literally save DOE billions of dollars and shorten the time to initiate Pu disposition by at least 4 to 8 years. The schematic depicts a collocated plutonium disposition "system" involving compatible, already existing Hanford facilities plus new, already scheduled tank waste vitrification facilities. The plutonium conversion step indicated in the schematic could be at Hanford or elsewhere.

3/01.04.00 cont.

We look forward to working with the Department of Energy to refine and improve upon the ideas and concepts provided in this memo. It is essential that DOE's former weapon's complex sites cooperate to find the best, safest, most timely and cost-effective solution to the plutonium disposition problem. Excessive plutonium disposition costs will likely have a negative impact on the entire EM budget and hence adversely affect all sites. It is essential that the on-going Hanford cleanup program not be adversely impacted by the plutonium conversion and disposition program.

7/11.00.01

We urge you to incorporate our plutonium disposition comments and recommendations by whatever means are necessary under NEPA into a final or re-issued PEIS and into the Record of Decision.

Very truly yours,

Larry Haler, Chair
Hanford Communities Governing Board

Attachments: as stated

cc: Mr. T. P. Grumbly, DOE-HQ
Mr. J. David Nulton, DOE-HQ

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01 04 00 **Comment Number 3**

The PEIS considers six DOE sites for long-term storage of Pu. The ROD will choose an approach and site for long-term storage and a technology(ies) for disposition. The same six DOE sites were evaluated with regard to the disposition options addressed in the PEIS. Additional site-specific NEPA analysis may be required before a disposition decision can be implemented. Hanford is among the six sites considered for disposition.

Liquid metal reactors were not included as alternatives for Pu disposition in the PEIS due to the longer time and greater cost required to complete their construction. The FFTF, on the other hand, is an existing reactor and could be used for Pu burning. However, the limited capacity of the FFTF would limit the rate at which Pu could be dispositioned and require a much longer timeframe for disposition than that which could be achieved with the reactor options addressed in the PEIS.

The Department of Energy is in fact considering the FFTF, pursuant to the ROD for the TSR PEIS. The ROD (December 1995, 60 FR 63878) for the TSR PEIS addressed the FFTF for tritium production as follows:

> A private group has recently suggested that it purchase the FFTF from DOE and that DOE then contract with the private group to make tritium at that facility. In the [Tritium Supply and Recycling Final] PEIS, the use of FFTF was considered and dismissed as a long-term tritium supply option because the amount of tritium that it could produce would only meet a percentage of the steady state tritium requirements, and it was not reasonable to rely on operating the facility far beyond the end of its design life. However, DOE will evaluate the presentation made by the private group to determine whether the operation of the FFTF might be able to play any role in meeting future tritium requirements. If any changes are warranted to this ROD following that review, or further NEPA documentation is required, DOE will take appropriate action.

The Secretary of Energy has requested a review by the JASONS Panel (eminent academic scholars and scientists) as part of the evaluation of tritium production with the FFTF. Should the outcome of this evaluation lead to a DOE proposal to restart the FFTF for tritium production, additional environmental analyses would be performed, as appropriate. If the FFTF were to be restarted, a substantial portion of the surplus Pu that would be used

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The Hanford Communities Governing Board and Administrative Board Unanimously Approved the Attached Letter Response to the Department of Energy's "Storage and Disposition of Weapons-Usable Fissile Materials" Draft Programmatic Environmental Impact Statement During Its Meeting May 3, 1996

By Signature Below, We the Cities and the County Comprising the Hanford Communities, During Our Regular City Council or County Commissioner Meetings on May 6 or May 7, 1996 Voted Affirmatively to Send the Same Letter in Response to the Department of Energy's Draft Programmatic Environmental Impact Statement

Max Benitz, Jr., Chair — date 5-6-96
Board of Benton County Commissioners

J. [illegible] Fluckiger, Mayor — date 5-7-96
City of Benton City

Jim Beaver, Mayor — date 5-7-96
City of Kennewick

Charles Kilbury, Mayor — date 5/6/96
City of Pasco

Larry Haler, Mayor — date 5/6/96
City of Richland

Jerry Peltier, Mayor — date 5-6-96
City of West Richland

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for MOX fuel could be used to fabricate the FFTF driver fuel, thereby achieving the Spent Fuel Standard for Pu disposition through irradiation in the FFTF. Further description of the FFTF has been added to Appendix N of the PEIS.

The FMEF is considered for use as a long-term storage facility for Pu, and the impacts are included in Section 4.2.1 of the PEIS. For the production of MOX fuel a generic facility was considered for all six DOE sites. At Hanford this MOX fuel fabrication facility would be located in the 200-Area adjacent to 200 East. The utilization of the FMEF would be a variant for MOX fuel fabrication at Hanford, which is bounded by the environmental analysis for the MOX fuel fabrication facility located in the 200-Area. Table 2.4–1 of the PEIS provides a brief description of variants to disposition alternatives analyzed which includes "Modification/completion of existing facilities for MOX fabrication." The storage options for Hanford also include the construction of a new facility. Utilization of the FMEF for the Upgrade Alternative would not preclude its use to also support Pu disposition activities for either Reactor or Immobilization Alternatives.

08 03 01 **Comment Number 4**

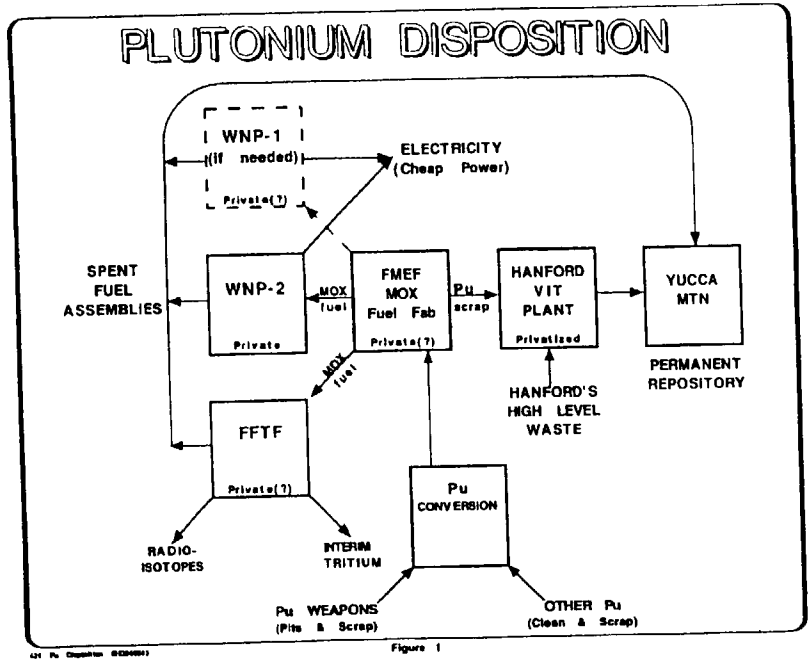
The Department of Energy acknowledges the commentor's opposition to continuing or long-term storage. Decisions on storage of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

01 00 00 **Comment Number 5**

Comment noted.

08 03 01 **Comment Number 6**

The Department of Energy acknowledges the commentor's opposition to the use of the CANDU Reactor Alternative for the disposition of Pu. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy



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considerations, and public input. This will include an appropriate level of analysis by Canada before any decision on burning Pu in a CANDU reactor is implemented.

11 00 01 **Comment Number 7**

Comment noted. DOE's Fissile Materials Disposition Program is an integrated effort that will require the participation of a number of DOE sites that have weapons material experience. DOE acknowledges the commentor's concern about the potential effect that selection of Hanford for new missions could have on the Hanford cleanup program. It is DOE's intent that the implementation of Fissile Materials Disposition Program decisions will have little or no impact to ongoing clean up programs. Decisions on storage and disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input. The decision process will also give consideration to existing agreements between DOE, the State of Washington, and the EPA.

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Attachment #1: Detailed Comments from the Hanford Communities "Citizens Advisory Committee" on the Plutonium Disposition PEIS

The Hanford Communities Advisory Committee[1] represents more than 500 years of experience dealing with billion dollar projects, community interests, and government programs similar to that outlined in this draft programmatic EIS.

Excess weapons-usable plutonium in any form other than a safeguarded "spent fuel standard" represents a clear and present danger to the world's society. The risks of devastating consequences are magnified by the time to reach consensus in today's complex national and international political environment. The "do nothing" option in this PEIS is not acceptable. Time is of the essence. Prompt, decisive United States leadership to demonstrate a cost-effective, near-term path forward that high proliferation-risk countries of the world will adopt, is critical. — 8/08.03.01

In view of the short time permitted for review of the massive amount of detail (~2600 pages), each of seven subcommittees of the Advisory Committee was asked to primarily look for critical or serious issues, gaps, incorrect facts, conclusions or assumptions that could substantially distort the public's view. Also each subcommittee was asked to avoid trying to redo or reinvent the massive amount of valuable detail in the PEIS.

A. Health and Safety

This subcommittee was asked to address the feasibility and appropriateness of the statement in the PEIS relating to public and occupational health and safety within a fifty mile radius of the site. This was to be done in consideration of two possible uses for plutonium disposition at the site: 1) reactor burning of plutonium and 2) vitrifying plutonium together with high level waste into borosilicate glass logs.

A1. The first concern, if there is a concern, is that the summary report does not address the methodology used, so it is really not totally possible to evaluate how good the numbers or the doses are. — 9/09.09.08

A2. The PEIS also stated that occupational and environmental radiological and chemical {doses} will be within accepted limits. The judgment of this committee is that there are sufficient unknowns, certainly with respect to the chemical hazards, that such a statement is difficult to substantiate. The other hazards, such as ergonomic, occupational in general, were not addressed. The only issue was latent cancer due to radiation within the two plutonium disposition alternatives. — 10/09.09.08

[1] The list of invited Advisory Committee participants is attached. Some of those invited could not participate because of potential conflicts of interest, some participated on an ex-officio basis only, and some had only minor involvement because of illness or travel schedules. The majority of those invited did participate, providing valuable contributions to this Attachment.

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08 03 01 **Comment Number 8**

The Department of Energy acknowledges the commentor's opposition to continuing or long-term storage. Decisions on storage of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

09 09 08 **Comment Number 9**

The PEIS Summary presents the Proposed Actions and their potential environmental impacts. It does not include a description of the assessment methodologies used for each environmental resource including human health risk assessment. A description of assessment methodologies used for each environmental resource is presented in the Methodology Report, Chapter 4, and the Appendices of the PEIS.

09 09 08 **Comment Number 10**

Detailed information regarding hazardous chemicals used in the Proposed Action, and their health impacts to workers and the general public, is described in Chapter 4 and Appendix M of the PEIS. This information includes the chemical emissions from the proposed facilities, the toxicity of the emitted chemicals, the predicted chemical concentrations in the environment, and health impacts to workers and the general public. The methodology used for the chemical hazards assessment is also documented in the Methodology Report, Chapter 4, and Appendix M of this PEIS.

A3. Was an ALARA evaluation done? If so, it is not documented or referred to in the PEIS. | 11/09.09.08

A4. The PEIS summary was written before NCRP report 121 was issued. The PEIS summary does not appear to be consistent with the philosophy or guidelines in NCRP 121, which deals with collective dose. This philosophy and guideline, if applied to this analysis, would basically ignore the radiological risks to the general public as the risk of a fatal cancer is less than one. | 12/09.09.08

A5. Based on the guidance provided to the Hanford Communities' subcommittees, we must accept the methodology that is the determinate of risk. On this basis, the radiological risk for cancer latency would appear to be insignificant.

A6. Perhaps more basic is the lack of specificity of what type of hazards, aside from radiation, might be involved, i.e., what types of chemicals, what would be shipping alternatives and what to do about long term release likelihood. Our conclusions are: a) to accept the calculations and risk estimates as done by DOE that the risk of latency for long term cancer causation is basically very small to insignificant, and b) to question the chemical hazards and transportation hazards that have not been fully addressed. (editor comment: note transportation issues in Section E below) | 13/09.10.08 | 12/09.09.08 cont. | 13/09.10.08 cont.

B. Pu Conversion and Mixed Oxide Fuel Fabrication

B1. The Fuels, Materials, and Examination Facility (FMEF) was improperly considered in the PEIS as only a potential storage area. This facility, originally built to manufacture and handle MOX fuel elements, should be considered as the best potential site for MOX fabrication in the United States.

B2. The FMEF capabilities and attributes are understated. The FMEF is a versatile and expandable facility. It was designed to be expanded to the east. All site infrastructure requirements, e.g., electrical capacity, cooling, sewer, security system, etc., are readily available to support an expansion.

B3. The FMEF in its current configuration can house a limited Pu metal-to-oxide conversion and a mixed-oxide (MOX) fuel fabrication line supporting Fast Flux Test Facility (FFTF) plutonium burn. In addition, one of the several large post-irradiation exam (PIE) hot cells can be used to demonstrate vitrification of off-specification or scrap local plutonium. All three of these programs could be implemented within five years, given the advanced completion state of the facilities and knowledge of the processes. | 3/01.04.00 cont.

B4. If an aggressive reactor burn program develops utilizing local light water reactors (LWR), FMEF's expansion capabilities would permit the addition of an adjacent fuel fabrication facility capable of fueling both FFTF and local LWRs. This would provide space within the existing FMEF building to retrofit large-scale Pu metal-to-oxide conversion, plutonium scrap cleanup and limited plutonium

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09 09 08 Comment Number 11

It has been stated in this PEIS that it is DOE's position to keep the health risk for workers and public ALARA although there is no elaboration of how to implement the ALARA practice for each proposed alternative. The ALARA analysis and practice are the refinement of the design and operation. It needs more detailed information about the facility design, which is not available at this stage.

09 09 08 Comment Number 12

As stated in this comment, the PEIS was written before National Commission of Radiological Protection (NCRP) Report 121 was issued. To meet NEPA requirements, the latent cancer fatalities to the population are reported in this PEIS as they are calculated, even if the results are very small or insignificant. To help understand the radiation health risk and latent cancer fatalities, an explanation of these terms is included in Appendix M of the PEIS.

09 10 08 Comment Number 13

The detailed information about hazardous chemicals from the Proposed Alternatives and their health impacts to workers and the general public is described in Chapter 4 and Appendix M of this PEIS. The information contained in this PEIS includes the chemical emissions from the proposed facilities, toxicity of the emitted chemicals, the predicted chemical concentrations in the environment, and their health impacts to workers and the general public. The methodology used for the chemical hazards assessment is documented in the Methodology Report, Chapter 4, and Appendix M of this PEIS. The transportation of hazardous and non-hazardous material is presented in Appendix G.

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vitrification. Expertise and equipment from other countries to expedite early MOX fuel fabrication could be used as appropriate. | 3/01.04.00 cont.

B5. While the PEIS bounds environmental impacts in an extreme fashion, it doesn't represent a realistic fiscal approach nor a rapid deployment approach to a very real plutonium proliferation problem. The PEIS's lack of recognition and understatement relative to a group of facilities that exist and are environmentally adequate and appropriate to economically begin this project make the value of the document questionable. The PEIS must bound, but it must also incorporate realistic solutions. | 14/01.04.00

B6. The current federal government fiscal policy and environment do not correspond to the extreme facility requirements and description in the PEIS. There is a need to take every advantage of facilities and capabilities currently available and pursue a modular approach to the solution. The need for plutonium disposition is too great to have the program collapse upon itself due to inflated need assumptions and criteria. | 15/01.00.00

B7. While land is in plentiful supply at Hanford, the land requirements indicated for facilities necessary to perform disposition activities such as pit disassembly, plutonium conversion, immobilization, and MOX fuel fabrication seem to be significantly overstated. These land use requirements do not seem to be consistent with facilities that have previously accommodated these type of operations. In addition, potential utilization of existing facilities at DOE Sites for these disposition activities would result in considerably less land use than indicated. | 16/01.04.00

B8. It appears that insufficient consideration has been provided in the PEIS to facilities that are already constructed and operational or are partially complete and could be made operational at minimum cost. Facilities such as these, at which most of the costs of siting, design, construction, public safety evaluations, security systems and processes, and public acceptance have already been provided, should be given top priority in these considerations. | 2/08.03.01 cont.

B9. All waste streams that may be generated as a result of the implementation of the selected disposition alternative need to be thoroughly evaluated. Acceptable plans and processes to properly dispose of these waste streams must be solidly in place prior to putting the alternative into production. Further, synergism, not conflict, with vital on-going cleanup missions is possible. | 17/09.11.08

C. Reactor Burn Disposition Option

C1. We strongly recommend the most effective, permanent and fail-proof means of disposing of surplus weapon's materials, i.e., convert it to reactor fuel and irradiate it to the spent fuel standard. The excess plutonium represents hundreds of millions of dollars, if used in the form of reactor fuel that should be used to provide needed electrical power, cancer killing radioisotopes and tritium for | 1/08.03.01 cont.

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01 04 00 Comment Number 14

Comment noted.

01 00 00 Comment Number 15

Existing facilities have been considered in this PEIS to the extent practicable. For example, in the storage action, one of the three alternatives is Upgrade at Multiple Sites, which uses existing facilities. In the disposition action, existing reactors in the United States and Canada are included as alternatives as well as an existing vitrification facility at DOE's SRS.

01 04 00 Comment Number 16

The Department of Energy believes that the land use requirements identified for pit disassembly and conversion, immobilization, and MOX fuel fabrication are correct. If these requirements exceed what is eventually needed, the smaller requirement will be bounded by the environmental analysis.

09 11 08 Comment Number 17

The conceptual designs for the Consolidation and Collocation storage alternatives and the disposition alternatives have, as part of their design, waste management facilities that would treat and package all waste generated into forms that would enable long-term storage and/or disposal in accordance with RCRA and other applicable Federal and State statutes, and DOE Orders. For the Upgrade Storage Alternatives, site-specific waste management facilities were determined to be adequate. As the designs mature, process waste assessments which include individual waste stream characterization will be completed. No waste stream will be generated that cannot be treated and packaged into a form that enables long-term storage and/or disposal.

national defense. We believe the United States should move rapidly to lead the world in the safe and efficient disposal of excess weapons-usable fissile materials using the disposition method to which most other nuclear power countries are committed. 18/01.03.00

C2. No consideration was given to liquid metal reactor concepts for Pu disposition, although LMRs, especially FFTF, are specifically designed for flexibility in fuel use, and are particularly well suited to operate with mixed oxide (MOX). FFTF, the newest reactor in the DOE complex, has more than a 20-year remaining life and can "burn" significant quantities of plutonium, especially if highly enriched MOX fuel is used. FFTF should be included as a disposition option in the final PEIS.

C3. Hanford represents a unique and effective solution to the Pu disposition problem:

- Virtually the entire disposition cycle can be accomplished on a single site (Hanford), which has much of the security, public health and safety considerations and facilities already in place to commence the task.

- There is unprecedented local public acceptance of a Hanford Pu disposition mission. Unanimous endorsement was obtained from every elected city council member (Richland, Kennewick, Pasco, West Richland and Benton City) and county commissioner (Benton County) and from the Hanford Communities governing and administrative boards. Please note the endorsements attached to the cover letter. 3/01.04.00 cont.

- The FMEF is a facility effectively ready to accept plutonium and uranium oxides and convert them to MOX fuel for FFTF irradiation.

- The FMEF can readily accommodate the introduction of LWR MOX fuel fabrication equipment. (Unused state-of-the-art MOX fuel fabrication equipment is available from Siemens. Siemens also represents a local source of expertise to support the installation and operation of this equipment. Sandvik Special Metals represents a local source of high quality, reactor grade tubing for LWR fuel fabrication).

- WNP-2 is a modern BWR that can annually consume approximately 0.5 tons of weapons grade plutonium as MOX fuel.

- FFTF can use about 3/4 tons of plutonium per year as fuel to produce medical radioisotopes and/or tritium.

- WNP-1, if completed, could consume close to 1 ton of plutonium per year in the form of MOX fuel.

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01 03 00 **Comment Number 18**

Comment noted.

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- The weapons grade plutonium on-site plus any received from off-site should not need to be transported more than a few miles and never off the Hanford reservation until it has been converted to a spent fuel standard.

C4. Using weapons usable fissile material to generate electricity in a once-through cycle in existing light water reactors (LWRs) is the most technologically assured option. The PEIS should clearly define the burnup range for the spent fuel standard. Without this range, costs and benefits cannot be reasonably calculated. — 19/08.03.01, 20/01.02.00

C5. Prior to selecting LWRs as one of the preferred alternatives, specifics like ownership and management of the facility (i.e., control of operations), re-licensing, costs, taxes, waste management, new fuel, security, spent fuel and spent fuel disposal charges, if any, should be considered and described. — 19/08.03.01 cont.

C6. The CANDU Reactor alternative is inconsistent with the criteria on 1) demonstrated technical viability, 2) fostering progress and cooperation with other nuclear weapons states and 3) environmental safety and health compliance. Placing U.S. weapons usable plutonium in the hands of a foreign government for disposition does not make sense for long term law, security and environmental, health and safety enforcement. (Recently, protests to this option have developed within Canada). — 21/06.05.08, 22/01.03.00

C7. Selection of the partially completed reactor alternative can provide major cost savings to the United States taxpayer and benefits to future generations. All of the screening criteria are met with this reactor alternative. A number of partially completed reactor sites are available for consideration. The PEIS should reference WNP-1 in its PEIS or remove all references to the TVA plant. The PEIS selects TVA's Bellefonte Nuclear Plant as the benchmark for reasons that even more strongly would justify selecting WNP-1. WNP-1 is on DOE land, less than five miles from the FMEF (the FMEF and WNP-1 share a common sewage treatment facility). DOE's Bonneville Power Administration is formally attached to the site, both financially and through electrical distribution. Prior to selecting a benchmark, a number of factors need to be considered, e.g., continuous preservation program, ASME pedigree maintenance, design documentation and security integrity, NRC inspections results, etc. — 23/06.03.08, 24/01.04.00

C8. Facility and operations "clustering" should be included in the PEIS. One of the current and highly successful business strategies is the concept of "clustering" semi-independent or synergistic businesses. Clustered businesses share overhead (infrastructure) costs and leverage a wide variety of inputs and outputs and resources. Five screening criteria can be directly and substantively influenced using the "cluster" approach: cost-effectiveness, timeliness, ES&H compliance, public and institutional acceptance, and additional benefits. Clusters are more economical because they reduce transportation, provide internal incentives for product and schedule, lower security risk, add regional employment stability and — 25/01.04.00

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08 03 01 **Comment Number 19**

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

01 02 00 **Comment Number 20**

The technical, cost, and schedule analyses of the various alternatives are presented in a separate document to support DOE's ROD. This document was made available to the public for review beginning in late July 1996.

06 05 08 **Comment Number 21**

The following points are given in response to your comments:

a) The CANDU reactor has never been tested with industrial quantities of MOX fuel. However, the Canadians are performing limited testing of MOX fuel in test reactors. It is believed that CANDU reactors can utilize MOX fuel. The Technical Summary Report provides more information on CANDU technology.

b) Contrary to the comment, one of the strengths of the CANDU Reactor Alternative is the prospect of having a joint U.S.-Russian Pu disposition campaign in Canada.

c) In terms of ES&H compliance, the implementation of the CANDU Reactor Alternative would be performed in full compliance with both the U.S. and Canadian ES&H regulations, as applicable.

01 03 00 **Comment Number 22**

Should the CANDU Reactor Alternative be selected for disposition of Pu, agreement with the Canadian Government would be reached on the Pu disposition process, including safeguards and security requirements which call for facility inspection by the IAEA, as appropriate, and environmental analyses conducted with public involvement.

share environmental impacts. Synergism with on-going cleanup commitments would be expected. | 25/01.04.00 cont.

C9. Security or resistance to theft and diversion by unauthorized parties can be enhanced by "clustering". The PEIS should acknowledge that security (and public health and safety) is significantly enhanced when the transportation of weapons grade materials outside a federally secured site is reduced or eliminated. | 26/13.00.00

D. Combined Fuel and Reactor Subcommittees' Comments

The comments from these two combined subcommittees deal with recommendations or changes to the screening criteria. The screening criteria represent the foundational base of the PEIS. Recommended changes to the criteria are shown in bolded italics.

D1. Screening Criteria for Long-Term Storage Option

a. Environmental, Safety and Health (ES&H) Compliance: High standards of public and worker health and safety and environmental protection must be met ***nationally and internationally*** and significant additional ES&H burdens should not be created. ***Combinations of facilities and use of existing nuclear sites should be used to avoid "new" environmental burdens.*** | 27/01.05.00

b. Cost-Effectiveness: Long-term storage should be accomplished in a cost-effective manner and should be compatible with reasonable disposition alternatives. ***Potential for capital cost escalation shall be considered in the decision process. Proven technologies will minimize capital costs and are the least likely to escalate due to unknowns.*** | 28/01.05.00

c. Foster Progress and Cooperation with Russia and Other Countries: A facility ***(all facilities)*** must accommodate international inspection for surplus materials in unclassified shapes and must establish appropriate standards for storage and protection of international nuclear material inventories. ***Technologies used shall consider the applicability to other countries, for example, the selected alternative should be consistent with Russia's national priorities and be within their means to afford and safely implement.*** | 29/01.05.00

d. Public and Institutional Acceptance: An alternative should be able to muster a broad and sustainable consensus on the manner in which long term storage is accomplished. ***The long term storage alternative should be integrated with the existing site mission and provide assurance that proven means of public involvement exist for mission oversight from start to finish.*** | 30/01.05.00

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06 03 08 **Comment Number 23**

Comment noted.

01 04 00 **Comment Number 24**

The PEIS uses the Bellefonte Nuclear Plant as the basis for analysis of a partially completed reactor. If the Partially Completed Reactor Alternative is stated in the ROD, a competitive process would be used to select an actual reactor facility for implementation. This process would consider economics, existing infrastructure, and related factors.

01 04 00 **Comment Number 25**

The Department of Energy, as part of the ROD, will consider the benefits of grouping various facilities at DOE sites in order to take advantage of existing infrastructure, technical expertise, and related factors.

13 00 00 **Comment Number 26**

Comment noted. DOE will consider this information in its analyses and decisionmaking process.

01 05 00 **Comment Number 27**

The commentor's recommended inclusion is already an existing part of the criteria. A detailed description of all the screening criteria appears in Section 2.2 of the *Summary Report of the Screening Process*, March 1995.

01 05 00 **Comment Number 28**

The commentor's concern has been taken into consideration in the cost, schedule, and technical impact analysis which is presented in a separate document made available to the public for review beginning in late July 1996.

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D2. Screening Criteria for Disposition Options

a. Resistance to Theft and Diversion by Unauthorized Parties: Each step in the disposition process must be capable of providing for comprehensive protection and control of weapons-usable fissile materials. ***The comprehensive protection and control approach must demonstrate integration with the previous and following step.*** — 31/01.05.00

b. Technical Viability: There should be a high degree of confidence that the alternative will be technically successful, ***with reliance on proven technology that can be economically supported and is available to former Soviet Union countries and other nuclear weapons states.***

c. Environmental, Safety and Health (ES&H) Compliance: High standards of public and worker health and safety and environmental protection must be met and significant additional ES&H burdens should not be created. ***The selected disposition alternative should take advantage of existing ES&H burdens to minimize total impact. New PEIS ES&H burdens should be integrated with existing federal and commercial ES&H burdens to avoid doubling the burden in the same exclusion zones.*** — 32/01.05.00

e. Cost-Effectiveness: Disposition should be accomplished in a cost-effective manner and be compatible with reasonable long term storage alternatives. ***Disposition should capitalize on existing federal facilities and proven technologies to enhance cost effectiveness. Cost effectiveness shall consider internationally compatible technologies to foster international progress and cooperation. Selected alternatives should include the total life-cycle cost concept and be cost projected through the period estimated to complete the mission.*** — 33/01.05.00

f. Timeliness: There is an urgent need to begin Pu disposition and to minimize the time period that surplus fissile materials remain in weapons-usable form. ***Each step in the process should be fully integrated into an overall project time table that includes steady state operation and D&D. Incentives and market competition shall be used to assure timeliness.*** — 34/01.05.00

g. Public and Institutional Acceptance: An alternative should be able to muster a broad and sustainable consensus on the manner in which disposition is accomplished. ***The nationally and internationally accepted disposition alternative must be integrated with local/regional acceptance of the selected site(s). In addition to local/regional acceptance, decisions about plutonium disposition need to be based on objective analyses of cost, time, and risk. The selected site should have a functional public oversight board with broad regional representation and strong local municipality support.*** — 31/01.05.00 cont.

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01 05 00 **Comment Number 29**

To the extent practicable, the commentor's recommendation was incorporated into the Nonproliferation Policy impact analysis presented in a separate document which was made available to the public for review in October 1996.

01 05 00 **Comment Number 30**

The Department of Energy has an ongoing effort in program integration in which public involvement is an important element.

01 05 00 **Comment Number 31**

Comment noted.

01 05 00 **Comment Number 32**

Comment noted.

01 05 00 **Comment Number 33**

Comment noted.

01 05 00 **Comment Number 34**

The commentor's concern has been taken into consideration in the cost, schedule, and technical impact analysis which is presented in a separate document made available to the public for review beginning in late July 1996.

h. Additional Benefits: The ability to leverage government investments for disposition of surplus materials to contribute to other national or international initiatives should be considered. ***The highest consideration should be given to prior unused or partially used government investments (facilities and/or infrastructure), especially those that are clustered, that could be leveraged to effect rapid, safe and cost effective plutonium disposition and to contribute to other national or international initiatives.*** 32/01.05.00 cont.

i. ***Waste Package and Byproduct Program Integration: The selected alternative shall consider all waste forms and their effective disposition, including provisions for D&D.*** 35/01.05.00

j. ***Local Public and Private Business Sector Involvement: The selected alternative shall use, to the maximum extent practicable, local private and public businesses, best commercial practices and incentives to best accomplish the mission.*** 32/01.05.00 cont.

E. Socioeconomic Issues

Since a number of the recommendations from the Advisory Committee support using already existing Hanford and/or local facilities, there were few new socioeconomic issues to consider. For example the Advisory Committee virtually discarded the "green field" strategy used in the PEIS, e.g., the construction of new facilities on geographically dispersed sites. Not disposing of weapons grade plutonium is believed to have far greater socioeconomic consequences than using existing Hanford assets and capabilities to responsibly and quickly demonstrate a workable international plutonium disposition model. 36/09.08.01

F. Transportation Issues

The group looking at transportation issues did not find anything in the PEIS that would be characterized as a "showstopper". Instead, a number of items of lesser consequences were discussed and are reported here for the purpose of addressing these in the final EIS. On the positive side, transportation of radioactive materials in this country has an excellent track record with few major accidents and no fatalities from release of material in accidents. This subcommittee concluded that transportation is a fully developed technology and with proper coordination and route selection, risk can be minimized. Hanford Site capabilities, as well as those of the surrounding communities, coupled with the new Hazardous Materials Management and Emergency Response (HAMMER) training facility, provide a unique combination of resources in support of on-site/off-site emergency preparedness.

However, because transportation often puts unwanted radioactive or hazardous materials in unwanted places, this topic will remain important relative to plutonium disposition. It is clear that the PEIS can take the position that there is convincing 37/10.00.00

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01 05 00 **Comment Number 35**

"Waste minimization" and "known and manageable waste forms" were included in the screening criteria, as described in the *Summary Report of the Screening Process*.

09 08 01 **Comment Number 36**

The Department of Energy acknowledges the commentor's support for the utilization of existing facilities at Hanford for the storage and disposition of weapons-usable fissile materials. Decisions on storage and disposition will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

10 00 00 **Comment Number 37**

The PEIS transportation analysis includes the movement of material required for disposition at more than one location. If the common activity facilities (for example, pit disassembly facility) are located at the same site as the disposition activity facilities (for example, ceramic immobilization facility), then there would be a reduction in the transportation risk. The current analysis is bounding for activities at multiple sites.

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evidence that "clustering" of some or all of the various steps in locations, such as Hanford, with short relative inter-facility distances will result in lower fatalities due to a non-radiological caused accident. It is also clear, consistent with other commenters, that the PEIS is deficient in not calculating the transportation burden reduction by integrating the various transportation steps for different disposition and storage alternatives.	37/10.00.00 cont. 38/10.00.00
F1. The packaging certifications (pedigrees) are not clearly explained, i.e., not all packagings possess the NRC endorsement.	39/10.00.00
F2. Relative transportation risk bases are not clearly presented.	40/10.00.00
F3. Alternatives in Chapter 2 do not address material transportation adequately or consistently. For example, in Section 2.4.1, Pit Disassembly/Conversion Facility; Section 2.4.5.2, Existing Light Water Reactor Alternative; and Section 2.4.5.4, Evolutionary Light Water Reactor Alternative, all should address all the applicable transportation streams and what special requirements apply such as security or special routing.	41/10.00.00
F4. There are several examples of confusing references to DOT specification packaging versus NRC certified packaging. Some of these occur in Section 4.4, Intersite Transportation of Fissile Materials, and in Appendix G, Intersite Transportation "6M, 6M Type B, 6M-2R, Model 6M". The EIS needs to identify clearly which packaging is which.	42/10.00.00
F5. Section 4.4.2.2, Packaging, does not adequately describe the safety basis of the DOT-6M packaging (an old grandfathered DOT Specification packaging container as shipped in the SST), particularly when compared with the safety basis of a state-of-the-art NRC certified spent fuel cask or the BUSS Cask. Many are not aware of the various systems that authorize Type B packages: DOT Specification (old), DOT Certificate of Competent Authority, NRC Certificate of Compliance, and DOE Weapons Program authorizations. They need to be defined and considered in the risk analysis.	43/10.00.00
F6. "Potential fatalities" should be clearly defined in Section 4.	44/10.02.00
F7. Section 4 infers that RADTRAN calculates the non-radiological risk, which it does not.	45/10.02.00
F8. Page 4-772: The first sentence states "materials would be transported by SST or commercial equivalent truck." There is no commercially available equipment like the SST.	46/10.00.00
F9. Page 4-773: The second sentence states "For relatively low-level radioactive materials, DOT Specification Type A packaging are used". It should be pointed	47/10.00.00

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10 00 00 Comment Number 38

The transportation of materials for storage and disposition have been separated to allow for separate decisions. The summation of the results is conservative since it does not consider the integration of the two actions. All steps (for example, pit disassembly or MOX fuel fabrication) have been included in the transportation analysis for disposition.

10 00 00 Comment Number 39

The analysis for the storage and disposition alternatives evaluates the potential risks for transporting shippable forms of fissile materials (that is, Pu and HEU) that have been stabilized and packaged for shipment at the originating site. All packaging processes (and certifications) meet DOT and DOE requirements. NRC certification criteria is applied to all Type B packagings, as required by the DOT regulations. Section 4.4.2.2 of the PEIS presents information on packaging criteria established and enforced by Federal agencies. A thorough explanation of risk basis is presented within Sections G.1.1 and G.1.2 for truck/rail and port transit modes, respectively.

10 00 00 Comment Number 40

The human health risks of material transportations associated with the proposed Pu storage and disposition alternatives are evaluated and presented in Section 4.4 of this PEIS. The more detailed description of the methodology and supporting data for the analysis is presented in Appendix G. Transportation of radioactive materials between sites includes health risks for both normal operations and accident conditions to the public and workers.

10 00 00 Comment Number 41

The transportation issues raised require site-specific knowledge in order to describe the transportation streams and the special requirements which apply to each transportation scenario (security, special routing). Transportation of radioactive material from an existing LWR site and evolutionary LWR site may include several modes of transportation (truck, rail, barge, etc.) depending on the location of the site. Specific transportation streams and

out that strong tight containers are also allowed for low specific activity radioactive material shipments. | 47/10.00.00 cont.

F10. Page 4-780: For the Deep Borehole emplacement alternative, it is not clear why shipments would follow immobilization and come from lag storage. Also, why the large difference in shipping volume capacity? For example, the shipping volumes of 5.5 tons per year seem low, when the immobilized pellets could be shipped at a rate of 551 tons per year. | 48/10.00.00

F11. Page 4-781: The fifth paragraph mentions shipping one rail cask at a time for a total of sixty-four shipments per year. No mention is made of whether these shipments are by special train or regular train service. There is a big difference in cost associated with the two options. | 49/10.00.00

F12. Page 4-783: Risk numbers are difficult to understand and follow. It seems that the difference in level of risk between processing in the United States versus processing in Europe, as depicted in Table 4.4.3.3-4 would be much greater than shown. | 50/10.02.00

F13. Appendix G: The risk associated with the transportation of the materials would be better understood if it were broken into radiological and non-radiological categories. The radiological risks would also be more meaningful if they were reported for both accident and normal modes. One cannot easily compare the "summed all risks" numbers in this PEIS with other reports that do not use this method. | 51/10.02.00

F14. Not enough information was given about the RADTRAN input values used. For instance, the following values should be included and referenced: release fractions (RFAC, HERSOL, RBSP), atmospheric dispersion values (for truck, rail, and oncoming highway traffic statistics). | 52/10.02.00

F15. NUREG-0170 severity categories were used for all truck shipments. This may not be appropriate for the 6M shipments or for the 55-gallon drum shipments. | 53/10.02.00

F16. Page G-3: Second paragraph, second sentence states that the 6M packages would be placed on Cargo Restraint Transporters (CRT) to facilitate loading and securing in the SST. What's the status on the CRT's? Several sites were told to return them Are CRT's still being used on the SST's? | 54/10.00.00

F17. Page G-3: The second sentence in the third paragraph mentions transferring the CRT's from an SST to a standard ISO container. Standard ISO containers do not have the floor tie down capability associated with the CRT's and available in the SST. A proper tie down pattern would have to be developed for ocean transport in ISO containers. | 55/10.00.00

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special requirements will be addressed if these alternatives are selected for further consideration. Appendix G presents additional information on transportation of radioactive materials and types of packaging specific to the material to be transported.

10 00 00 Comment Number 42

The PEIS uses the terminology "6M Type B package" to designate both the generic package type identified in the DOT specification and the specific variation of the package type used by DOE. The specific package type used by DOE is denoted as the 6M-2R, consisting of the 6M Type B package using 2R inner containers.

All aspects of the transportation of radioactive materials within the United States are regulated at the Federal level by the DOT. The Federal regulations are implemented by both NRC licenses and DOE for the transportation of radioactive materials. Package designs meeting the Type B package performance criteria are considered by NRC and DOE to provide adequate protection of the public and operating personnel in the event of a transportation accident. The NRC has no regulatory authority regarding DOE transport of radioactive materials, although DOE does use NRC criteria for the certification of Type B packaging, including the 6M-2R.

The approval process followed by DOE regarding Type B packaging and transportation of radioactive materials is established by DOE Orders. Package design, testing, and safety information must be prepared for shipping packages proposed for use within the DOE complex. Review and approval of this information results in DOE's issuance of a Certificate of Compliance for the package and its use. In the case of the 6M Type B package, although the package meets DOT specification, the DOE approval process provides additional requirements prior to the package's use within the DOE complex.

10 00 00 Comment Number 43

A discussion of the safety basis of certified nuclear packaging is beyond the scope of the PEIS. The TI, which is a regulatory characteristic of a package, was estimated to be the maximum allowed by regulatory requirements and

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F18. The PEIS transportation burden does not include the risks for intermediate level and low level waste associated with each step of the process. | 56/10.02.00

F19. No analysis of possible criticality incidents under accident conditions is provided. | 57/10.02.00

F20. The PEIS does not adequately analyze both the regulations (NRC, DOT and DOE) and the history of interpretation of those regulations, which form the basis for defining a transportation system for plutonium. | 58/10.00.00

F21. There are no references to the safeguards requirements for shipping Pu, even though these are extensive. It appears on page 4-771 that it is intended to utilize the SST for all shipments of Pu. Yet, on page 4-780, in the penultimate paragraph, it indicates that ceramic pellets containing 1% Pu might be shipped by commercial carrier. This is confusing. | 59/10.00.00

F22. Some of the analysis appears based on RADTRAN without any conscious evaluation of the results. For example, Page G-3 states that "transits to ports are typically through low population density areas." Ports are almost universally located in cities where the population density is the highest. | 60/10.02.00

G. Vitrification Disposition Option

Evidence continues to build that vitrification is a viable alternative or a supplemental alternative to reactor burn as a means of disposing of plutonium. Vitrification supplements reactor burn by serving as a potential disposal means for contaminated plutonium and plutonium scraps otherwise unsuitable for manufacture into MOX fuel assemblies. | 61/08.03.01

Incorporating several weight percent plutonium in a vitrified glass appears to be feasible. Criticality concerns about plutonium pooling in a vitrified melt are being dispelled with experimental data. In addition, neutron absorbers could be added to the matrix if deemed necessary. | 62/05.01.08

Durability of the glass product is a function of the type of glass limited by the maximum temperature of the melter. The borosilicate glass proposed in the PEIS can be processed at about 1050°C. Higher temperature melts can be achieved with less boron and more silicon, e.g., at about 1300 to 1500°C.

Small melter vitrification technology developed at Hanford over the past several decades and demonstrated in the 324 Building can be used as the basis for implementing a scaled-up version in a suitable Hanford facility. The planned TWRS high level tank waste vitrification project provides an opportunity for high radiation field "immobilization" techniques to be used for higher throughputs. In summary, all of the vitrification technology necessary to deal with a variety of vitrification alternatives resides at Hanford ready for implementation. | 63/05.01.01

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used in the transportation risk analysis. A discussion of transport packaging is presented in Appendix G.

10 02 00 Comment Number 44

Potential fatalities are a conservative estimate of those fatalities that would result from both radiological and nonradiological risks from normal operations and accident conditions for a Proposed Action. A definition has been added to the Glossary (Chapter 7, *Glossary*) of the Final PEIS.

10 02 00 Comment Number 45

RADTRAN calculated only the radiological risk due to materials transportation. Nonradiological risk is calculated as described in Section G.1.1. Section 4.4.1 was clarified to state that RADTRAN only calculated the radiological risk.

10 00 00 Comment Number 46

If commercial trucks were utilized, additional requirements (physical and administrative) would be applied to provide equally effective safety and security measures as provided by SST.

10 00 00 Comment Number 47

The commentor is correct that strong, tight packagings can be used for low-level radioactive materials of less than Type A quantities. The text in Section 4.4.2.2 was changed to concur.

10 00 00 Comment Number 48

The Deep Borehole Alternative discusses the disposition of surplus weapons-usable Pu in two forms: (1) direct emplacement of Pu without immobilization and (2) Pu-loaded, ceramic-coated pellets. The amount of Pu to be transported for direct emplacement is estimated to not exceed 5 t (5.5 tons) per year. The amount of Pu-loaded, ceramic-coated pellets to be transported for emplacement is estimated to be 500 t (551 tons) per year. The Pu-loaded,

G1. Page 2-109: Under facility operations, it should be clarified whether the 25 kg per operating day throughput is for Pu only or for the immobilized waste form. This same comment applies to the ceramic waste form. | 64/05.01.08 | 65/05.02.08

G2. Page 2-110: Under waste management, what are "criteria" pollutants? | 66/05.01.08

G3. Use of Cs-137 or high level waste as a deterrent – Anything that requires massive shielding will probably increase the cost of operations by a factor of 100. Any significant gamma emitter will decay away in less than 300 years and will be of no long term value. | 67/05.01.08

National Security

This subcommittee of the Advisory Committee had nothing new to add to the PEIS. Other participants of the Advisory Committee agreed with the screening criterion in the PEIS that "there is an urgent need to begin Pu disposition and to minimize the time period that surplus fissile materials remain in weapons-usable form." | 68/01.00.00

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ceramic-coated pellets contain 1 percent Pu. Therefore, the amount of Pu-loaded, ceramic-coated pellets would be 100 times as great as the amount of Pu for direct emplacement, or approximately 500 t (551 tons) per year.

10 00 00 Comment Number 49

Although shipments may be consolidated into "dedicated trains" of more than one car, the risk analysis has considered regular train services for these shipments. Several court decisions have shown there is no safety basis for the use of "special trains" for high-level nuclear materials. DOT, DOE, and NRC have provided no such direction that special trains will be used for radioactive materials.

10 02 00 Comment Number 50

The values given in Table 4.4.3.3–4 of the PEIS represent the "Total Potential Fatalities" associated with the transportation of Pu oxide, uranium oxide, and MOX, for the Reactor Alternative category. The quantities presented are a result of direct risk calculations which yield results in "numbers of human fatalities." In regard to accumulating the risks associated with a given transportation process, the maximum risk impacts from the transport of Pu oxide, uranium oxide, and MOX fuel under the Reactor Alternatives may be summed directly from Table 4.4.3.3–4. According to results calculated by the "industry-wide accepted" RADTRAN code, the highest number of total potential fatalities from the transportation of materials from lag storage to fuel fabrication and then to a reactor site is 4.16 for MOX fuel fabrication in the United States. In Europe, the number of potential fatalities for a similar procedural operation would be 4.62. The difference between 4.62 and 4.16 fatalities is essentially negligible. Risk differences between the two "regional" alternatives (that is, the United States vs. Europe) are very small for all stages involved.

10 02 00 Comment Number 51

The human health risks from the transportation of radioactive materials between sites include both radiological and nonradiological impacts to the

HANFORD COMMUNITIES, RICHLAND, WA, LARRY HALER, ET AL.
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Hanford Communities Advisory Committee

Review of Plutonium Disposition
Draft Environmental Impact Statement

Invited Participants*

Mr. Jack Baker
Mr. Walt Blair
Mr. Joe Burn
Dr. John Calcagni
Dr. Tom T. Claudson**
Mr. Rob Davis
Mr. Laurin R. Dodd
Dr. Ersel Evans**
Mr. Greg Field
Dr. Michael Fox
Ms. Janet Green
Dr. Tom Henn**
Mr. Harold Heacock
Dr. John Honekamp
Mr. Rich Hoyt
Mr. Jim Hummer
Mr. Bill Irvine
Mr. Bob Jefferson
Mr. Ron Kathren
Mr. Jack McElroy
Mr. Jim Mecca
Mr. Jim Mohatt
Mr. Jim Morgan**
Ms. Wanda Munn
Mr. Jim Portsmouth
Mr. Gordon Rogers
Mr. Bill Root
Mr. Don Segna
Mr. Jim Steffen
Dr. Marjorie Swindt
Mr. Leo Thompson
Dr. Lee Thornton
Dr. Alan Waltar**
Mr. Jim Watts
Mr. Craig Williamson**
Mr. Gene Wirth
Dr. Martin Wistisen
Mr. Tom Woods**

Ms. Pam Brown, Hanford Analyst
Dr. Ray Robinson, Project Consultant

*Some of those invited could not participate because of potential conflicts of interest, some participated on an ex-officio basis only, and some had only minor involvement because of illness or travel schedules. The majority of those invited did participate providing valuable contributions.
**Sub-committee Chairs

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public and workers. The categories of calculated risk include nonradiological accident impacts to the public and workers, nonradiological normal operation impacts to the public (air pollution), radiological accidents to the public, and radiological normal operation impacts to the public and workers. The risk to the public for radiological accidents is an order of magnitude less than either nonradiological accidents or radiological exposures during normal operations.

10 02 00 Comment Number 52

Appendix G of the PEIS discusses the pertinent methodology and associated parameters utilized in the transportation modeling via the RADTRAN code. The scope of this document does not require scientific detail regarding input parameters to exceed that of a programmatic level.

10 02 00 Comment Number 53

This PEIS evaluated the potential for highway accidents and radioactive releases from the 6M shipments during transport in terms of eight accident severity categories identified in NUREG-0170 and implemented through analysis by the RADTRAN 4.0 computer code. The accident categories ranged from the least severe and most frequent accident (Category I) to the most severe and least frequent accident (Category VIII). NUREG-0170 characterizes package response to these accident categories in terms of release fractions based on the package type, transportation mode, and accident category. DOE considers the accident category information presented in NUREG-0170 to adequately cover the transport mode and package types addressed in the PEIS.

10 00 00 Comment Number 54

The CRTs are still being used on the SST.

HANFORD ADVISORY BOARD

A 24th Special Advisory Board, Chartered under the Federal Advisory Committee Act

David Nulton
Director, NEPA Compliance and Outreach
Office of Fissile Materials Disposition
Department of Energy
PO Box 23786
Washington, DC 20026-3786

Sent by Facsimile to 1-800-820-5156 and by US Mail

May 3, 1996

Dear Mr. Nulton:

Re: Storage and Disposition of Excess Weapons Useable Plutonium and Special Nuclear Materials (SNM) (HAB Advice #46)

The draft Plutonium Programmatic Environmental Impact Statement (PEIS) indirectly considers Hanford as a potential site for certain activities within the scope of the pluronium safe storage and disposition program by the virtue of the site's current capability and plutonium possession. The Hanford Advisory Board is opposed to the piecemeal approach to nuclear material storage and disposition like that taken in the PEIS on plutonium disposition. We have on three previous occasions adopted advice to USDOE urging an integrated public discussion on these issues. (Board Advice #13, 34 and 38) We have a commitment from USDOE leadership to initiate such a process. Therefore, a ROD on the narrow choices presented in this EIS is premature pending the National Equity Dialogue. The Board is opposed to the use of the bore hole option at Hanford. At this time, the Board has not expressed a preference for one of the other disposal options. However, the Board does have a number of values/issues which relate to a plutonium (Pu) and spent nuclear material (SNM) program. Many of these values/issues have been previously provided to you as advice or recommendations for other Hanford programs. These values are:

69/08.02.00

70/08.03.01

1. Any plutonium or SNM storage or disposal program must be compatible and integrated with the TPA commitments and milestones and should not affect the rate or funding of cleanup. The program would have the safe disposition of Hanford plutonium as a priority.

7/11.00.01 cont.

Page 1

HAB Consensus Advice #46
Subject: Storage and Disposition of Excess Weapons Useable Plutonium and Special Nuclear Materials (SNM)
Adopted May 2-3, 1996

Contact: Confluence Northwest, Facilitation Team
800 NW Sixth Avenue, Suite 342, Portland OR 97209-3715 Phone (503) 243-2963 Fax (503) 243-3683

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10 00 00 Comment Number 55

Transportation component design specific to this situation is beyond the scope of this PEIS. If design changes are necessary for ISO transport to occur, proper modifications would be expedited to meet the necessary criteria.

10 02 00 Comment Number 56

The number of shipments of LLW and TRU waste is stated in the waste management section for each storage and disposition alternative. The radioactive wastes included in the transportation analysis is shown in Table 4.4.2.2–1. Transportation of the wastes is included for each storage and disposition option as stated in Section 4.4.3.

10 02 00 Comment Number 57

The form and limited quantities of material shipped and the design of the packaging system prohibit criticality. Controls are implemented by following DOT regulations for the TI.

10 00 00 Comment Number 58

The comment was given consideration for the Final PEIS but only current regulations are stated in the document. A list of Federal and State regulations is included in Appendix J.

10 00 00 Comment Number 59

The mode (SST, commercial truck, rail) for shipping materials under each alternative is identified in Table 4.4.2.2–1. The safe secure transport of special nuclear materials is described in the new Section G.6. Transport of immobilized Pu-loaded ceramic coated pellets (1 percent) could be by either SST or appropriate commercial truck. The decision would be made in siting studies if either of the Deep Borehole Categories is selected.

10 02 00 Comment Number 60

RADTRAN analysis considers population densities as explained in Section G.1. Because of the radioactive nature of the material being shipped, the

HANFORD COMMUNITIES, RICHLAND, WA, LARRY HALER, ET AL. PAGE 19 OF 23

2.	Any plutonium program assigned to Hanford must be fully funded from new funding sources. This funding should include appropriate site infrastructure and overhead costs. Funding should fully cover the cost of treatment, storage and disposal of any new waste streams.	72/07.00.00
3.	The acceptance of plutonium at Hanford should not delay, defer, or negatively impact Hanford cleanup.	73/11.00.01
4.	Appropriate local and regional public information and involvement programs must be conducted by the agencies to ensure that the public is fully informed of the risks, hazards and impacts of such a program. This would be part of the national dialogue on all nuclear materials (noted above) prior to assignment of nuclear materials to a specific site.	74/08.02.00
5.	Any permit or plan approval for new Hanford programs/activities must be fully integrated and must comply with all State of Washington public health and safety rules and regulations.	75/08.03.00
6.	Equity impacts must be addressed in the assignment of new nuclear materials (including plutonium) to Hanford.	76/01.00.00
7.	The transportation of plutonium and special nuclear materials to Hanford storage will require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE for state, tribal, and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.	77/10.01.00
8.	The choice of disposal options re: Pu will be a determinant for sites such as Hanford. Prior to the choice of a disposal option, complete characterization of the material and the impacts of short and long-term disposition technologies must be reviewed by the public and regulatory agencies.	78/08.02.00
9.	Acceptable processing techniques including waste processing must be developed as an integrated part of any new Hanford storage and disposal program. Permanent disposal of waste plutonium at Hanford is not acceptable.	79/09.11.01

HAB Consensus Advice #46 Page 2
Subject: Storage and Disposition of Excess Weapons Useable Plutonium and Special Nuclear Materials (SNM)
Adopted: May 2-3, 1996

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Military Ocean Terminal, Sunny Point, North Carolina, was used for analysis in the PEIS. Sunny Point is a remote, controlled-access port for military ammunition shipments and would likely be the shipping point.

08 03 01 **Comment Number 61**

The Department of Energy acknowledges the commentor's support for the Immobilization Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

05 01 08 **Comment Number 62**

Comment noted.

05 01 01 **Comment Number 63**

Comment noted.

05 01 08 **Comment Number 64**

Clarification was made in Section 2.4.4.1 of the Final PEIS.

05 02 08 **Comment Number 65**

Clarification was made in Section 2.4.4.2 of the Final PEIS.

05 01 08 **Comment Number 66**

Criteria pollutants are defined in the *Clean Air Act* (CAA) in a listing of chemical pollutants for which certain concentration levels are not to be exceeded without monitoring and possible mitigation.

05 01 08 **Comment Number 67**

Comment noted. The Spent Fuel Standard involves a radiation barrier that decays over time.

10. A "systems" analysis approach should be utilized to select the most effective method for processing and interim storage. This analysis should adequately address public and worker health and safety and environmental issues. | 80/08.03.00

11. If a plutonium disposition mission is assigned to Hanford, every effort should be made to use existing workforce, facilities, technologies, and other resources. | 81/09.00.01

Finally, we note that this PEIS does not address cumulative impacts of nuclear material movement and disposition as required by NEPA. | 82/08.00.00

The Health, Safety and Waste Management Committee of the HAB looks forward to further discussions and working with you on this issue. The Board looks forward to your written response, as called for in our charter.

Very truly yours,

Merilyn B. Reeves, Chair
Hanford Advisory Board

attachments: Board Advice #13, 34 and 38

cc: Thomas Grumbly, DOE
John Wagoner, DOE
Alice Murphy, DOE
Chuck Clarke, EPA
Mary Riveland, Ecology
Cindy Kelly, Designated Federal Official
Linda Lingle, Site Representative
Jim Mecca, DOE (by fax)
The Oregon and Washington Congressional Delegations

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01 00 00 Comment Number 68

Comment noted.

08 02 00 Comment Number 69

The Department of Energy acknowledges the commentor's support for coordination and increased understanding of decisions to be made on the storage and disposition of weapons-usable fissile materials. However, the National Dialogue Project is beyond the scope of this PEIS.

08 03 01 Comment Number 70

The Department of Energy recognizes the commentor's concern with the Borehole Alternatives. Decisions on the disposition alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 00 Comment Number 71

The Department of Energy acknowledges the commentor's concern about the potential effect that the selection of Hanford for new missions could have on the Hanford clean-up program. Decisions on storage and disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input. The decision process will also give consideration to existing agreement between DOE, the State of Washington, and the EPA.

07 00 00 Comment Number 72

Funding for all alternatives will be through the budget process, and is not a part of the NEPA process.

11 00 01 Comment Number 73

The Department of Energy will not begin implementation of the Proposed Action at any site without having given full consideration to the

environmental, cost, schedule, and policy analyses, public comments, and agreements with various states regarding the clean-up activities on the sites. Therefore, implementation of the Proposed Action is not expected to cause adverse impacts to ongoing programs at the selected site(s).

08 02 00 **Comment Number 74**

The Department of Energy uses a wide variety of methods to communicate with the public on these important issues. These methods include public meetings, as part of the NEPA process, and meetings outside of the process such as the Plutonium Round Table. Numerous fact sheets and displays are made available at the meetings as well as by mail. All of this information is available on the Program's electronic bulletin board. A video produced by the Oregon Department of Energy was underwritten by DOE.

08 03 00 **Comment Number 75**

It is recognized that the decision to locate any of the alternatives at a site would require coordination with State and local officials on a variety of areas including the mission of the site.

01 00 00 **Comment Number 76**

Comment noted. Equity will be considered in DOE's decisionmaking process, along with all other factors.

10 01 00 **Comment Number 77**

Logistical planning and meteorological surveillance are standard concerns which normally receive a great deal of attention during transportation operations such as this; transfer of materials to Hanford will hold no exceptions. Emergency preparedness personnel (that is, Emergency Response Teams) will be supplied with the necessary equipment and training commensurate with DOT, DOE, and NRC regulations. Sufficient funding for these concerns will be available to satisfactorily ensure that potential contingencies be dealt with in an effective and timely manner. DOE provides

liaison with appropriate agencies for special nuclear material shipments. However, due to their classified nature, specific information on times and dates cannot be provided.

08 02 00 **Comment Number 78**

Before and after decisions are made on a disposition technology or technologies, DOE will conduct studies and technical demonstrations to fully understand the impact of disposition actions. This information will be made available to the public, to the extent possible.

09 11 01 **Comment Number 79**

The conceptual designs for the storage and disposition facilities have, as part of their design, waste management facilities that would treat and package all waste generated into forms that enable long-term storage and/or disposal in accordance with RCRA and other applicable Federal and State statutes and DOE Orders. As noted in Section 4.1.10 of the PEIS, waste management activities that would support the long-term storage or disposition of weapons-usable fissile materials were assumed to be in accordance with current site practice. Thus, only LLW and possibly some solid nonhazardous waste was assumed to be disposed of onsite. Any future waste management facilities that may be required to support the long-term storage or disposition of weapons-usable material would be coordinated with any decisions in the waste-type-specific RODs resulting from the Waste Management PEIS and respective site-specific NEPA documentation.

08 03 00 **Comment Number 80**

Comment noted.

09 00 01 **Comment Number 81**

Comment noted and will be taken into consideration when DOE is ready to select sites to implement Pu disposition.

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08 00 00 Comment Number 82

The Department of Energy has determined that, based on historical trends and regulatory constraints, impacts associated with transportation of nuclear materials are unlikely and not otherwise significant. Therefore, no cumulative effects analysis of transportation impacts were performed. The cumulative impact analysis is located in Section 4.7 of the PEIS.

HANFORD WATCH, PORTLAND, OR, LYNN SIMS
PAGE 1 OF 1

May 6, 1996

USDOE
Office of Fissile Materials Disposition
Washington, DC 20026-3786

Dear Mr. Nulton,

We respectfully request an extension of the deadline for public comment on the Storage and Disposition of Weapon-Usable Fissile Material Draft PEIS because we have not had sufficient time to collect and review all available documents from public reading rooms, which we will need to revise and extend remarks. 1/08.01.00

The great dimension of the implications of this project in the economic, research, environmental and social sectors indicate that we should move very carefully concerning this decision making. Please grant an extension for the comment period.

Thank you,

Lynn Sims

Lynn Sims, Hanford Watch
3959 NE 42nd
Portland, OR 97213
503-287-6329

F-009

08 01 00 **Comment Number 1**

At the request of several organizations and individuals, the public comment period was extended to a total of 92 days.

HANFORD WATCH, PORTLAND, OR, PAIGE KNIGHT PAGE 1 OF 2

Storage and Disposition of Weapons-Usable Fissile Materials
Draft Programmatic Environmental Impact Statement Comment

The people of Oregon have been and will continue to be impacted by the activities and hazardous wastes at the Hanford Nuclear Reservation. Air and groundwater contamination generated from the Hanford site in Washington are a serious concern to Oregonians because we share a long border, the valuable and irreplaceable Columbia River, a vital part of our environment.

Hanford has already done its part in nuclear production and the people in this region have already paid a terrible price due to the legacy of the volumes of chemical and radioactive wastes produced there.

Chemical and radioactive wastes at Hanford pose severe, very long lived toxic risks. Although the mission at the site has shifted from production to cleanup, critical budget cuts and the problem of inadequate technologies have left the many monitoring, containment and precise cleanup plans yet to be assured or formulated.

Now we face the possibility that Hanford may become involved in activities related to the storage and disposition of warheads and weapons-usable fissile materials under the reactor disposition alternative offered in the current DPEIS. That the DPEIS considers the MOX option at all is inconsistent with any plan to reduce high level nuclear wastes in this country. 1/09.00.01

The option would also signal to the world that plutonium is a valuable resource and should be endorsed as a commodity to be traded and used in new and continuing nuclear enterprises.

Specifically, we are concerned about:
*the enormous expenses to the public, both economic and environmental

*the transport and handling risks of fissile materials

*the risks involved in fuel fabrication

*the public apprehension concerning the risks and true costs of nuclear power plant operation

*the creation of even more waste

*the dilemma of the lack of technology, funds or an acceptable licensed site for the permanent repository for these long lived toxic wastes

Therefore, we the undersigned strongly oppose the consideration of Hanford as a site, or the WPPSS plants for any operations pertaining to the reactor disposition alternative. 2/08.03.01

F-062

09 00 01 Comment Number 1

The construction and operation of a nuclear power reactor would generate economic benefits in the form of new jobs and income generated in the region where the proposed reactors would be located. The reactor would serve to eliminate the surplus Pu, meeting the purpose and need of this PEIS. Additionally, the reactor would generate electricity for commercial and residential use.

Table 4.4.3.3–4, presents total potential fatalities (including both radiological and nonradiological risks) associated with the transportation and handling of fissile materials used in the production of MOX fuel. These materials include surplus Pu, which would be transported from the lag storage sites, and uranium oxide, each of which would be transported to a foreign or domestic MOX fuel fabrication site. Risks associated with the transport and handling of the fabricated MOX fuel to a reactor site are also included in this table.

The risks to public and occupational health and safety related to MOX fuel fabrication are described in Section 4.3.5.1.9 of this PEIS. They are summarized in Table 2.5–3. The health risks from the operation of a MOX fuel fabrication facility are also analyzed in the PEIS which indicates that the operation of a nuclear reactor would not pose significant health risks to the surrounding population.

08 03 01 Comment Number 2

The Department of Energy acknowledges the commentor's opposition to new missions at Hanford. Decisions on the storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

HANFORD WATCH, PORTLAND, OR, PAIGE KNIGHT PAGE 2 OF 2

In addition to objecting to burning MOX in reactors at Hanford, we also oppose using the Fast Flux Test Facility (FFTF), or any other facility at the site for tritium production for the US weapons arsenal. The proposed tritium production is not consistent with USDOE's mission. FFTF is slated for closure in the carefully negotiated TriParty Agreement. Please ensure the mission at Hanford is "cleanup". Do not allow the mission to revert to "military production". 3/14.00.00

Because it is apparent that a sound technological solution to the disposition problem does not exist, we urge you to aggressively fund development efforts aimed at achieving a real long-term solution to the plutonium problem. 4/14.00.00

Hanford Action of Oregon, Robin Klein
25-6 NW 23rd Pl.#406
Portland OR 97210
PH: 503-235-2924 FAX: 503-736-0097

Hanford Watch, Paige Knight
2285 SE Cypress
Portland OR 97214
503-232-0848 FAX: 503-287-6329

Don't Waste Oregon Council, Lloyd Marbet
19142 SE Bakers Ferry Rd.
Boring, OR 97009
PH: 503-637-3549 FAX: 503-637-6130

Columbia River United, Greg DeBruler
P.O. Box 667
Bingen, WA 98605
509-493-3950

Citizens Interested in Bull Run, Frank Gearhart
P.O. Box 3426
Gresham, OR 97030
PH: 503-665-4777 FAX: 503-669-9429

Northwest Environmental Advocates, Eugene Rosalie
133 SW 2nd
Portland, OR 97204
295-0490

Paige Knight (l.s.)

F-062

14 00 00 **Comment Number 3**

Comment noted.

14 00 00 **Comment Number 4**

Comment noted. During the remainder of fiscal year 1996 and into fiscal year 1997 DOE plans to continue to expand a range of small-scale tests and demonstrations of Pu disposition technologies to fill gaps in our technical knowledge, remove uncertainties in the viability of certain technologies, and to demonstrate the practical usefulness of some of the technologies that might be employed for disposition of surplus weapons-usable Pu.

HANNUM, WILLIAM H., NAPERVILLE, IL
PAGE 1 OF 1

213 Arlington Avenue
Naperville, IL 60565
5 June 1996

Department of Energy
Office of Fissile Materials Disposition
P. O. Box 23786
Washington, D. C. 20026-3786

Subject: Comments on Draft Environmental Impact Statement: DOE/EIS-0229-D; Storage and Disposition of Weapons-Usable Fissile Materials

Gentlemen:

The subject draft appears to have been carefully and exhaustively prepared. Those who managed and carried out this effort are to be commended.

I have two comments which I feel deserve attention. These comments are my own, have been prepared on my own time, and do not necessarily represent the view of my employer:

- In evaluating the reactor alternatives, it appears that no credit has been given for the environmental insult avoidance associated with the power generated by the nuclear plants. Since coal is the dominant fuel for electricity generation, and by all projections (including those of DOE) will continue to be the dominant fuel for electricity generation, credit should be given for the reduction in coal burning equivalent to that required to produce the electricity generated by the plutonium burning nuclear plants. 1/09.08.08

- Among the "Disposition Options Considered But Eliminated From Further Consideration," two reactor options (the modular helium reactor and the integral fast reactor) are qualified as follows: *If [this concept] is developed and successfully operated for other missions, it will be considered for Pu disposition as well.* Given the projected world energy growth, the commitment of many countries to further nuclear development (whether nuclear power is developed and deployed in the U.S. or not), and the involvement of other nations in these two technologies, it must be considered that one or both of these technologies will be developed and successfully deployed for other missions. Therefore, these options must be fully evaluated. 2/01.05.00

William H. Hannum

M-263

09 08 08 **Comment Number 1**

Based on comments received, several sections of the Final PEIS include additional analyses. These sections (in Section 4.9) include Impacts on Uranium Mining and Nuclear Fuel Cycle Industries, Avoided Environmental Impacts of Using MOX Fuel Instead of Traditional Low-Enriched Uranium Fuel in Nuclear Power Plants, and Avoided Environmental Impacts of Using Nuclear Power Plants Instead of Fossil Fuel Power Plants. The Avoided Environmental Impacts of Using MOX Fuel Instead of Traditional Low-Enriched Uranium Fuel in Nuclear Power Plants section in the Draft PEIS includes the health impacts avoided to the public and workers for the mining and milling industries. Other avoided impacts to air quality and waste generated were added to the Final PEIS.

01 05 00 **Comment Number 2**

The termination of the Integral Fast Reactor project was decided by DOE and Congress in 1994 and is beyond the scope of the PEIS.

Comment ID: P0029
Date Received: April 18, 1996
Name: Steven Hanson
Address: 306 East 4 South
Rexburg, ID
Phone: 208-356-8613

Transcription:

My opinion of the use of plutonium and storage and basically research and investigation into that is favorable. I think it should be done. I think that as we try and find a solution for radioactive materials that we have to deal with it, and I would be in favor of storage both in Idaho and processing, because I feel that it's one of the best ways that we can do to handle this material and use it productively. I my personal feeling of nuclear power is also very good. I would expect to use it effectively and I think that there's a lot of scare tactics that are driving people away because they don't understand it. So, my opinion is favorable. I think we ought to do it. I don't think we have much choice, because the fossil fuels are just not going to last that long. So I'm positive for nuclear power and storage and processing here in Idaho. Thank you.

1/08.03.01

P-029

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for additional missions at INEL. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

HARLEY, MARY LOU, BRIDGETOWN, NS
PAGE 1 OF 2

R.R. #4
Bridgetown, N.S.
B0S 1C0
May 12, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786 Washington, D.C.
U.S.A 20026-3786

RE: Storage and Disposition of Weapons-Usable Fissile Materials
Draft Programmatic Environmental Impact Statement

While some members of the Canadian government have been promoting the idea of bringing the plutonium from the planned arms reduction program into Canada in the form of MOX fuel, this idea has not been debated at any House or public level. 1/01.03.00

During the recent public hearings on the concept of geological disposal of nuclear fuel wastes, several groups reported concern that the possibility of using MOX fuel fabricated from weapons plutonium in Canadian CANDU reactors had been spotted in American documents (most notably the "Management and Disposition of Excess Weapons Plutonium Reactor-Related Options" by NAS). At these hearings, government officials brushed the issue aside saying it was not yet a "fait accompli". Within a week of the end of Phase I of these hearings, the government was promoting this idea. As well as the concept of importing weapons plutonium into Canada in the form of MOX fuel, the ethics of the process by which this idea is being promoted has been called into question.

The United States is capable of handling the excess weapons plutonium to meet the spent fuel standard and you have the primary responsibility for coping with the weapons-grade plutonium.
1.The U.S. light-water reactors are capable of using MOX fuel containing weapons plutonium and have been recommended for this option by the National Academy of Sciences.
2. The weapons-grade plutonium could be embedded in glass logs of suitable specifications in the U.S. and managed in the same way as planned for U.S. defense high-level wastes. 1/01.03.00 cont.

Canadians should not be expected to bear the burden of security, safety and health risks associated with the transportation, storage and use of MOX fuel or the potential hazards and costs of the management of the resultant high-level nuclear waste.
You are aware that the use of weapons plutonium as MOX fuel does not get rid of the plutonium. The objective of the MOX fuel approach is to contaminate the weapons-grade plutonium with other isotopes of plutonium and other radioactive material so that the excess weapons plutonium would be no more accessible that the plutonium in commercial spent fuel. Use of MOX fuel would result in significantly higher plutonium in the spent fuel compared to the present waste going into the nuclear fuel waste management

M-207

01 03 00 Comment Number 1

Comment noted. The CANDU Reactor Alternative is one of the reasonable alternatives analyzed in the PEIS. Should this alternative be selected for implementation of the Proposed Action, agreement with the Canadian Government would be reached on the Pu disposition process, including appropriate environmental analysis with public involvement.

program in Canada. Once through the fuel cycle the spent MOX fuel would be Canada's management problem, at least until it was aged more than a decade; possibly it would be permanently our problem, for hundreds of thousands of generations into the future. | 1/01.03.00 cont.

Conversion of the weapons plutonium into spent MOX fuel may make it less accessible for bomb production, but the plutonium is still there, still posing a proliferation risk only requiring more care and expense, still releasing radiation, still toxic, still posing a health risk to the planet. | 2/08.03.01

The "spent fuel standard" to make weapons plutonium no more accessible for weapons use than the plutonium in commercial spent fuel has not been promoted because it provides safety but because to go beyond this spent fuel standard is not considered justified unless the accessibility of the global stock of plutonium in spent fuel is similarly reduced. However, the level of purity of the plutonium which makes it attractive for weapons, also makes it more amenable to directed intervention designed toward rapid reduction of radioactivity over time frames accelerated over those of the natural half-life decay processes. In the haste to handle the security risk, do not lose sight of the health risk posed by this material; ask of any approach what the consequences will be with respect to reducing the toxicity of the material. | 3/01.00.00

With respect to the weapons uranium, please take a balanced view. It would be irresponsible to make it more toxic by putting it into the nuclear fuel stream. Please consider management by a means that will not involve converting a portion of it into plutonium and other radioactive materials of higher toxicity than the original uranium. | 4/15.00.00

If this spent fuel standard approach for dealing with weapons plutonium is the best interim step, it is the U.S.A. that should be taking that step. You have the capability and the responsibility. There is no justification for Canada to become involved in importing weapons plutonium in the form of MOX fuel. | 1/01.03.00 cont.

Sincerely,

Mary Lou Harley

Mary Lou Harley, PH.D.

M-207

08 03 01 **Comment Number 2**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

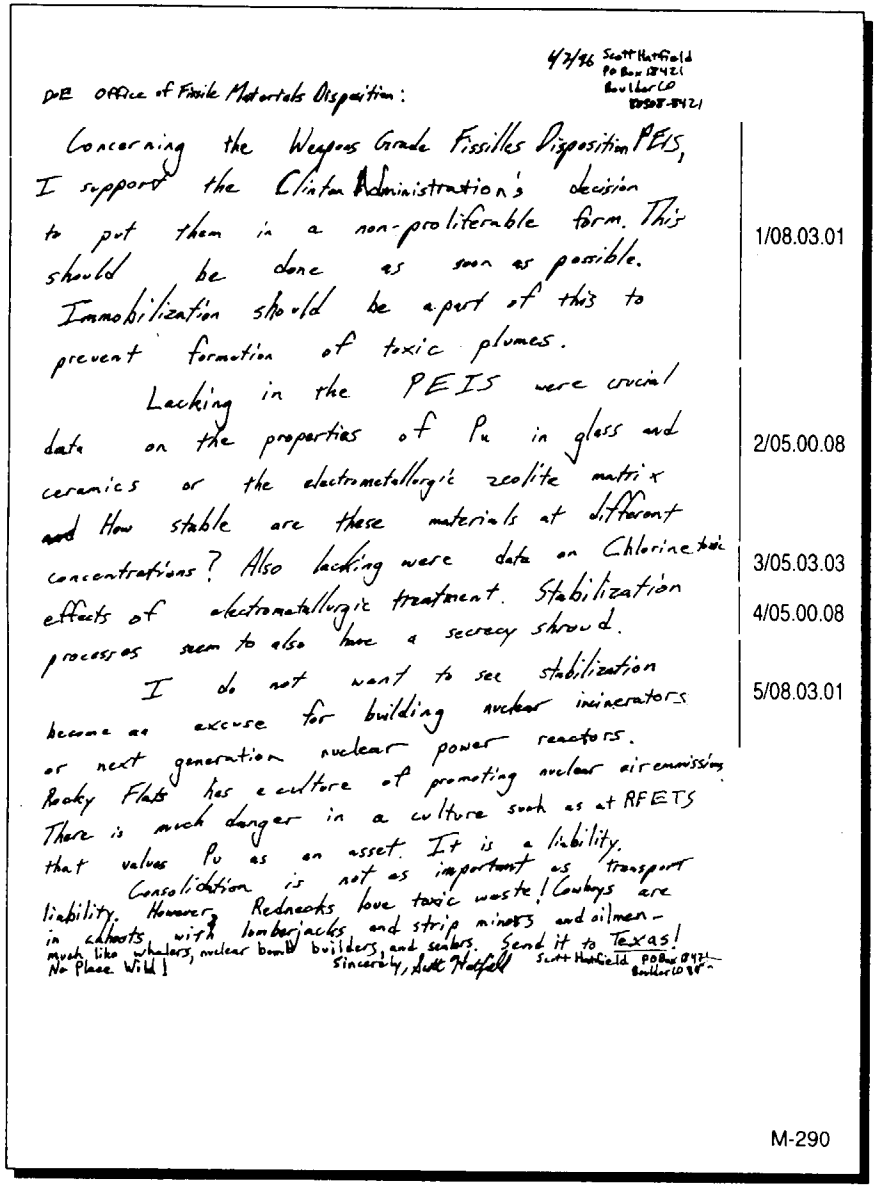
01 00 00 **Comment Number 3**

Comment noted.

15 00 00 **Comment Number 4**

The HEU covered in this PEIS refers to those materials that are not surplus to national defense needs. Therefore, the path forward for these materials would be storage only.

HATFIELD, SCOTT, BOULDER, CO
PAGE 1 OF 1



4/3/96 Scott Hatfield PO Box 18421 Boulder CO 80308-8421

DOE Office of Fissile Materials Disposition:

Concerning the Weapons Grade Fissiles Disposition PEIS, I support the Clinton Administration's decision to put them in a non-proliferable form. This should be done as soon as possible. Immobilization should be a part of this to prevent formation of toxic plumes. 1/08.03.01

Lacking in the PEIS were crucial data on the properties of Pu in glass and ceramics or the electrometallurgic zeolite matrix and How stable are these materials at different concentrations? Also lacking were data on Chlorine toxic effects of electrometallurgic treatment. Stabilization processes seem to also have a secrecy shroud. 2/05.00.08 3/05.03.03 4/05.00.08

I do not want to see stabilization become an excuse for building nuclear incinerators or next generation nuclear power reactors. Rocky Flats has a culture of promoting nuclear air emissions. There is much danger in a culture such as at RFETS that values Pu as an asset. It is a liability. Consolidation is not as important as transport liability. However, Rednecks love toxic waste! Cowboys are in cahoots with lumberjacks and strip miners and oilmen - much like whalers, nuclear bomb builders, and seals. Send it to Texas! No Place Will I 5/08.03.01

Sincerely, Scott Hatfield

Scott Hatfield PO Box 18421 Boulder CO 80308-8421

M-290

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for the Vitrification Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

05 00 08 Comment Number 2

All proposed immobilized waste forms have been analyzed to support the comparison of the technical performance related to long-term releases and behavior to other forms currently being evaluated for disposal in an NWPA geologic repository (for example, commercial and DOE-owned spent nuclear fuel and HLW). The results of these analyses are reported in the *Report on Evaluation of Plutonium Waste Forms for Repository Disposal*, Rev. 1, TRW Environmental Safety Systems Inc., March 29, 1996.

05 03 03 Comment Number 3

While this level of detail is lacking in the PEIS, further technical information on disposition alternatives is provided in the Technical Summary Report and related alternative summary reports published beginning in July 1996.

05 00 08 Comment Number 4

Further information on the technical viability of alternatives was provided in the Technical Summary Report and related alternative summary reports made available for public review in July 1996.

08 03 01 Comment Number 5

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternatives. However, NEPA requires that DOE look at all reasonable alternatives and, therefore, reactor burning must be considered. Decisions on the disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

HEALTH PROFESSIONALS FOR GLOBAL SURVIVAL, MONTREAL, QC, ERIC NOTEBAERT
PAGE 1 OF 2

PROFESSIONNELS
DE LA SANTÉ
POUR LA SURVIE
MONDIALE

HEALTH
PROFESSIONALS
FOR GLOBAL
SURVIVAL

Médecins Professionnels de la Santé pour la Responsabilité Nucléaire / formerly Health Professionals for Nuclear Responsibility
515, av. des Pins ouest, Montréal, QC H2W 1S4 • Téléphone : (514) 987-9709

Montreal, May the 6th, 1996.

U.S. DEPARTMENT OF ENERGY,
OFFICE OF FISSILE MATERIALS DISPOSITION
P.O. BOX 23786
WASHINGTON, D.C. 20026 - 3786
U.S.A.

Re: STORAGE AND DISPOSITION OF WEAPONS - USABLE FISSILE MATERIALS,
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.

To whom it may concern,

The Government of Canada via Prime Minister Jean Chrétien announced during the recent G-7 meeting (April 19-20, 1996) that it considers importing in Canada Plutonium fuel for the Candu reactors of the Bruce " A " Nuclear Generating Station on Lake Huron. This plutonium from dismantled U.S. and Russian nuclear bombs would be contained in " mixed oxide " (MOX) fuel.

Our organization, which has been for many years involved in nuclear issues and studies, military or civilian, is deeply concerned with this proposal that we consider totally irresponsible, for many reasons:

1. The Government of Canada has no mandate from the population to make such a proposal with potential serious consequences, and ought to make formal consultations with the all the groups interested in the subject in Canada. 1/08.03.01

2. This makes Canada a dumping ground for foreign military radioactive waste.

3. It creates huge security problems during the transportation and handling of plutonium (an accidental self-sustained nuclear chain reaction can happen

PRIX NOBEL DE LA PAIX NOBEL PEACE PRIZE

PSSM est le chapitre québécois de l'Association des médecins pour la survie mondiale (Canada)
HPGS is the Québec chapter of Physicians for global survival (Canada)

M-175

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the use of the CANDU Reactor Alternative for the disposition of Pu. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input. This will include an appropriate level of analysis by Canada before any decision on burning Pu in a CANDU reactor is implemented.

HEALTH PROFESSIONALS FOR GLOBAL SURVIVAL, MONTREAL, QC, ERIC NOTEBAERT
PAGE 2 OF 2

PROFESSIONNELS DE LA SANTÉ POUR LA SURVIE MONDIALE

HEALTH PROFESSIONALS FOR GLOBAL SURVIVAL

autrefois Professionnels de la Santé pour la Responsabilité Nucléaire / formerly Health Professionals for Nuclear Responsibility

515, av. des Pins ouest, Montréal, QC H2W 1S4 • Téléphone : (514) 987-9709

with disastrous consequences).

4. It creates security problems in order to prevent theft of plutonium.

5. The cost linked to the " retubing " of the Candu reactors is very high (about $ 300 million per reactor), and those reactors may well not be able to function for the planned 25 years period, because they are aging.

6. And finally, it violates the spirit of Canada's non-proliferation stance, which is to isolate the Canadian nuclear industry from the military weapons programs of other countries, in making Ontario Hydro a commercial recipient of military fissile material

1/08.03.01 cont.

For all these reasons, we strongly oppose the idea of importing in Canada the plutonium from dismantled U.S., or Russian nuclear bombs.

Sincerely yours,

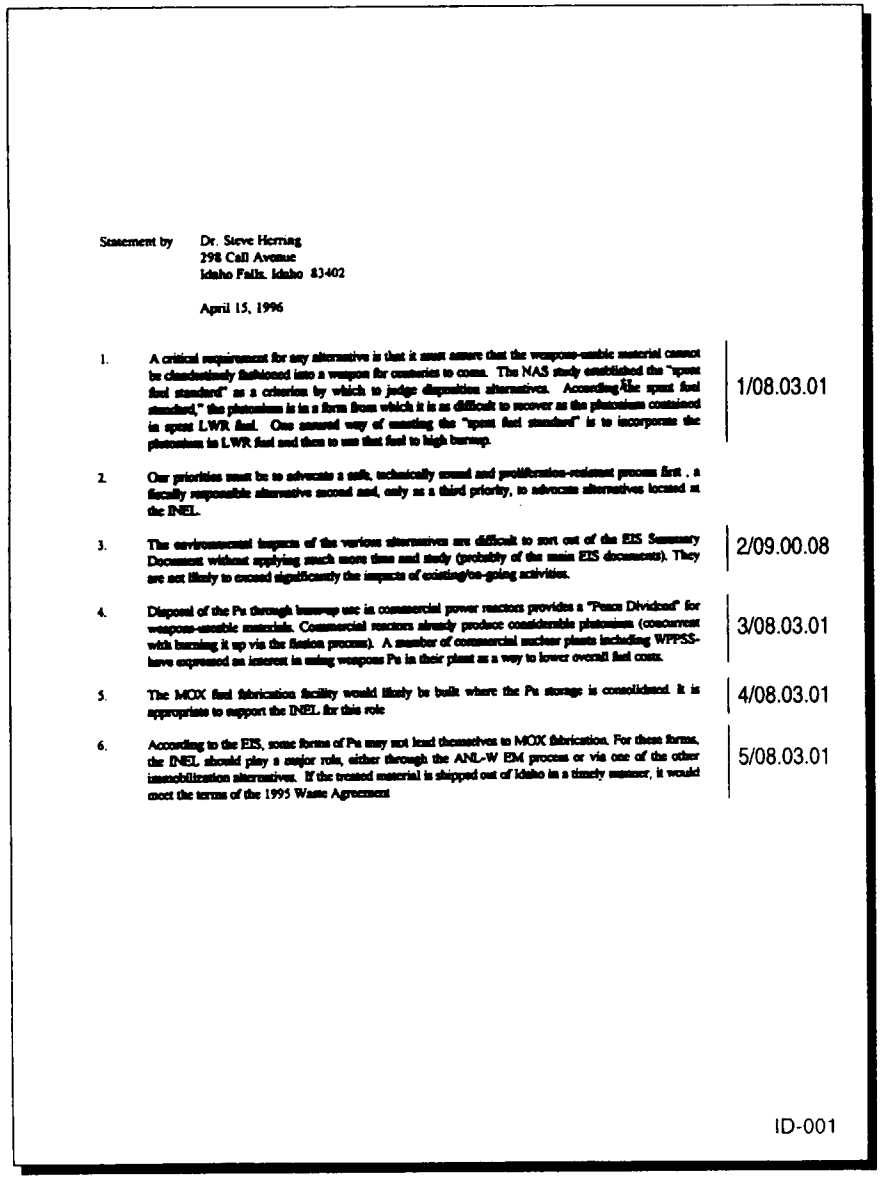
Dr Eric Notebaert, President.

c.c. The Right Honourable Jean Chrétien
Prime Minisrter of Canada.

PRIX NOBEL DE LA PAIX NOBEL PEACE PRIZE

PSSM est le chapitre québécois de l'Association des médecins pour la survie mondiale (Canada)
HPGS is the Québec chapter of Physicians for global survival (Canada)

M-175



Statement by Dr. Steve Herring
298 Call Avenue
Idaho Falls, Idaho 83402

April 15, 1996

1. A critical requirement for any alternative is that it must assure that the weapons-usable material cannot be clandestinely fashioned into a weapon for countries to come. The NAS study established the "spent fuel standard" as a criterion by which to judge disposition alternatives. According the spent fuel standard," the plutonium is in a form from which it is as difficult to recover as the plutonium contained in spent LWR fuel. One assured way of meeting the "spent fuel standard" is to incorporate the plutonium in LWR fuel and then to use that fuel to high burnup. 1/08.03.01

2. Our priorities must be to advocate a safe, technically sound and proliferation-resistant process first , a fiscally responsible alternative second and, only as a third priority, to advocate alternatives located at the INEL.

3. The environmental impacts of the various alternatives are difficult to sort out of the EIS Summary Document without applying much more time and study (probably of the main EIS documents). They are not likely to exceed significantly the impacts of existing/on-going activities. 2/09.00.08

4. Disposal of the Pu through burnup use in commercial power reactors provides a "Peace Dividend" for weapons-usable materials. Commercial reactors already produce considerable plutonium (concurrent with burning it up via the fission process). A number of commercial nuclear plants including WPPSS-have expressed an interest in using weapons Pu in their plant as a way to lower overall fuel costs. 3/08.03.01

5. The MOX fuel fabrication facility would likely be built where the Pu storage is consolidated. It is appropriate to support the INEL for this role 4/08.03.01

6. According to the EIS, some forms of Pu may not lend themselves to MOX fabrication. For these forms, the INEL should play a major role, either through the ANL-W EM process or via one of the other immobilization alternatives. If the treated material is shipped out of Idaho in a timely manner, it would meet the terms of the 1995 Waste Agreement 5/08.03.01

ID-001

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

09 00 08 Comment Number 2

Based on comments received, the Summary of the Draft PEIS was revised. The text in the Summary was revised to clarify the comparison of impacts and to delete the reference to "adverse" impacts.

08 03 01 Comment Number 3

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition of weapons-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 4

The Department of Energy acknowledges the commentor's support for construction of the MOX fuel fabrication facility at INEL. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, existing agreements, and public input.

08 03 01 Comment Number 5

The Department of Energy acknowledges the commentor's support for the Electrometallurgical Treatment Alternative and other Immobilization Alternatives at INEL. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, existing agreements, and public input.

HERRING, STEVE, IDAHO FALLS, ID
PAGE 1 OF 1

Dr. Steve Herring
298 Call Avenue
Idaho Falls, Idaho 83402-3040

May 6, 1996

DOE-Office of Fissile Materials Disposition
c/o SAIC-PEIS
P. O. Box 23786
Washington, DC 20026-3786

I attended the hearing held in Idaho Falls and have since studied the draft PEIS in more detail. I would like to add the following comments:

1. A critical requirement for any alternative is that it must assure that the weapons-usable material cannot be clandestinely fashioned into a weapon for centuries to come. The NAS study established the "spent fuel standard" as a criterion by which to judge disposition alternatives. According the spent fuel standard," the plutonium is in a form from which it is as difficult to recover as the plutonium contained in spent LWR fuel. One assured way of meeting the "spent fuel standard" is to incorporate the plutonium in LWR fuel and then to use that fuel to high burnup. 1/08.03.01

2. Disposal of the Pu through burn-up use in commercial power reactors provides a "Peace Dividend" for weapons-useable materials. Commercial reactors already produce considerable plutonium (concurrent with burning it up via the fission process). A number of commercial nuclear plants including WPPSS-2 have expressed an interest in using weapons Pu in their plant as a way to lower overall fuel costs.

3. All of the long term storage options seem to be acceptable from the standpoint of safety and environmental impact; however, the option for the Collocation of the Plutonium and Highly Enriched Uranium receives my support as the most favorable alternative. I also believe that any of the Long Term Storage sites proposed could be designed to be acceptable. 2/08.03.01

4. According to the EIS, some forms of Pu may not lend themselves to MOX fabrication. For these forms, the INEL should play a major role, probably through the ANL-W Electrometallurgical process. 3/08.03.01

5. The environmental impacts of the various alternatives are difficult to sort out of the EIS Summary Document. These impacts are not likely to significantly exceed the impacts of existing/on-going activities 4/09.00.08

I thank you for the opportunity to comment on this draft Programmatic Environmental Impact Statement.

Sincerely yours,

J. Stephen Herring

M-194

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for the Reactor Alternatives. Decisions on storage and disposition of weapon-usable fissile materials will be based on environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy acknowledges the commentor's support for the Collocation Alternative. DOE agrees that all long-term storage options are accepted from the standpoint of safety and environmental impacts. Decisions on storage alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 3

The Department of Energy acknowledges the commentor's support for the Electrometallurgical Treatment Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, existing agreements, and public input.

09 00 08 Comment Number 4

Based on comments received, the Summary of the Draft PEIS was revised. Text in the Summary was revised to clarify the comparison of impacts and to delete the reference to "adverse" impacts.

HILL, LEO JAMES, FALLS CHURCH, VA
PAGE 1 OF 1

Leo James Hill
3030 Sleepy Hollow Road
Falls Church, Virginia 22042-3142
1-703-237-7507

26 March 1996

Written Comments on DOE/EIS-0229-D

Reference 2.4.3	"doubtful that potential proliferation... or host country could recover... without detection."	1/01.06.00
Reference figure 2.4.3.1-2 Security	Geostationary satellites with laser monitoring of sealed downhole with constant reporting to centralized ground command center. Insuring expedient intervention to any attempted breach of secured area.	2/13.00.00
Reference 2.4.3.1	"earthquakes" Leading edge technology now used for seismic studies of earthquake safe areas, balanced rocks, has the capability of measuring how many hundreds of thousands of years an area of basalt or bedrock has been stable. Newly discovered ionization and weathering measurement capabilities can accurately determine the stability of an area.	3/04.01.00

M-004

01 06 00 **Comment Number 1**

Comment noted.

13 00 00 **Comment Number 2**

The security aspects of the storage and disposition alternatives will be developed further in detailed designs for the selected alternative(s).

04 01 00 **Comment Number 3**

Comment noted.

HIND, KURT
PAGE 1 OF 1

Comment ID: P0022
Date Received: April 18, 1996
Name: Kurt Hind
Address: none given
Phone: 208-526-2212

Transcription:

I currently work at the site. My work phone number is 208-526-2212. I would welcome the bringing of weapons-grade plutonium here for the jobs. I believe that we can store it safely. That it will be safe here, and I would welcome, like I said before, the adventation of jobs and a more stable economy here. Thank you. | 1/08.03.01

P-022

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for additional missions at INEL. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

April 20, 1996
Marlette, Michigan 48453

To: U.S. Department of Energy
Office of Fissile Materials Disposition
P. O. Box 23786
Washington, D.C. 20026-3786

Prime Minister Chretien
House of Commons
Ottawa ON K1A 0A6
CANADA

From: Ward J. Hodge
6150 Mayville Road
Marlette, Michigan 48453

Gentlemen: One Planet-- One Letter, One problem:

This is about a political and an economic pendulum that has swung too far to one side. The big news story of 1996 will be that citizens on the North American continent will share many of the same economic, social, and environmental concerns for the future.

As an economist, I find little to cheer about from either our state or our nation's capitol today. Far right ideologies are replacing rational thought. Unprecedented firestorms of anti-regulatory legislation have turned traditional economic theories upside-down. Established regulatory lines between government agencies and our corporations are being rapidly erased.

Subversive agendas are promoting the privatization of public facilities and glorifying competition in our public utilities. Where is the concern on the part of our government officials for the future sustainability of the human race? Please respond to this letter with your plans to address the new wave of citizen anti-nuclear sentiment on your horizon. You are in a unique position to help stop the continued proliferation of nuclear waste on this planet.

I have recently received a draft copy of a news release regarding the sale of USA surplus plutonium to Canada. From one viewpoint, it is immaterial what this will be used for. The news release, from the Nuclear Awareness Project in Uxbridge, Ontario tells about the possible production of mixed oxide (MOX) fuel for use in two of the Bruce "A" nuclear reactors, "A proposal put forward by Ontario Hydro and Atomic Energy of Canada Limited (AECL) through AECL's U.S. Subsidiary, AECL Technologies."

This AECL Technologies proposal is, "Based on the assumption that (the) Bruce reactors will be retubed 'because there is a demand for electricity'". I believe this is a faulty assumption fueled by corporate agenda needs to continue a government supported planet-wide nuclear power base that is not sustainable.

M-048

HODGE, WARD J., MARLETTE, MI
PAGE 2 OF 3

Page 2 - U.S. Department of Energy/Ward Hodge

If I read the reports correctly, This exchange of considerable Canadian money for surplus U.S. Plutonium will mean trucking monthly shipments of approximately 2 metric tons per year to Canada for 25 years. No where do I read that there is a guarantee that this is a safe way to dispose of 50 metric tons of nuclear poison.

The trucks moving this waste will travel within a short distance of where I am presently living-- across the Blue Water bridge at Port Huron into Sarnia Canada. To me, This seems an outrageous crapshoot and a waste of Canadian financial resources.

According to the Nuclear Awareness Project (NAP) draft, The AECL Technologies proposal boasts that a provisional Environmental Assessment could likely be avoided by treating the MOX fuel "Mission" as being exempt under the Environmental assessment exemption granted to Bruce "A" reactors in 1976.

(Haven't we learned anything in the past twenty tears?) Also according to the NAP draft, "The original plutonium is not actually eliminated and additional plutonium is created within the fuel bundles in the process."

As this is being written, USA President Clinton is involved with other world leaders and Russia's Yeltsin to agree on a nuclear test ban sometime in the future. In today's news, Our President uses superlatives to describe what this will mean in our future.

April 1, this year, Canada's GLOBE AND MAIL reported that, "Senior government sources confirmed that Prime Minister Chretien supports (this) MOX fuel proposal, including importing Russian MOX fuel for use at the Bruce reactors... Chretien is apparently planning to endorse the whole scheme at the April 19-20 1996 Nuclear Safety & Security Summit of world leaders in Moscow."

Sir, It is no secret that we must do things differently in the next century if we want a sustainable future. First nation Americans continue to look ahead seven generations, while most of the ancestors of European emigrants in North America consider themselves lucky if they can look ahead to their next pay check, or their next election. Is that the kind of progress that we want here?

Albert Einstein is quoted in Chapter three of a new book about W. Edwards Deming, "THINKING ABOUT QUALITY -- Progress, Wisdom, and the Deming Philosophy."

> "The significant problems we face canot be solved at the same level of thinking we were at when we created them"

Before any further action is taken on either side of our mutual border, all government and corporate officials involved should consider the implications of the following:

M-048

Page 3 U.S. Department of Energy/Ward Hodge

1) In a January 1994 WAR AND PEACE DIGEST article headlined, "Physicist Chernousenko speaks Out on Horrors of Chernobyl", We read that a "Cover-up (was) lifted during U.S. Speaking Tour.

> "Vladimir Chernousenko,the heroic Ukranian Nuclear physicist who supervised the "clean up" of Chernobyl, reveals the true magnitude of the disaster. Like a voice crying in the wilderness, he is now committed to alerting the world of the fatal dangers of nuclear power. This may be his final effort. A victim of radiation poisoning resulting from the Chernobyl accident, Chernousenko is now dying of cancer."

2) Harvey Wasserman, Senior Adviser for Greenpeace, has written a message in the latest Mother Jones magazine headlined, "Slaying The Nuclear Dragon." According to Wasserman, "A combination of strong activism, and bad economics has halted the building of nuclear reactors in the U.S. and Europe... Asia is a different story." (Is development so dear and life so cheap in China and India that nuclear power is the only option there?)

3) In the January/February, 1996 WORLD WATCH Magazine Christopher Flavin has written about the next Energy Revolution entitled, "POWER SHOCK". He says that we may soon witness the most dramatic changes in a world energy economy in a hundred years. He writes that, "Once technological change gathers momentum, it can move at Lightning speed." He includes solar electrical power and fuel cells in his analysis. "In a new joint venture called EnergyWorks, Bechtel Enterprises, Inc., and PacifiCorp, a giant utility... will pursue projects around the world based on wind turbines, biomass, industrial energy efficiency, and other technologies that most large energy firms have spurned as puny..."

Sir, I speak against any further development of nuclear power, both in this hemisphere and anywhere else on this planet until we have solved the problem of disposing this life-threatening waste, some of which can be with us for at least a quarter of million years. That, in itself is too long to even comprehend in a rational manner considering the frailty of life here, and the speed at which we are presently destroying our natural resources and our eco-systems. 1/08.03.01

On this continent we are neglecting our future because we are in denial about our present, and have forgotten much of our past. On both sides of our border, government officials working with multi-national lobbyists, must stop measuring human progress in terms of dollars gained and natural resources destroyed. If Canada is doing this, as suggested, to help nuclear disarmanent efforts of the USA and Russia, I believe it to be folly of the worst sort that will not reflect well on this administitation or your department.

Sincerely,

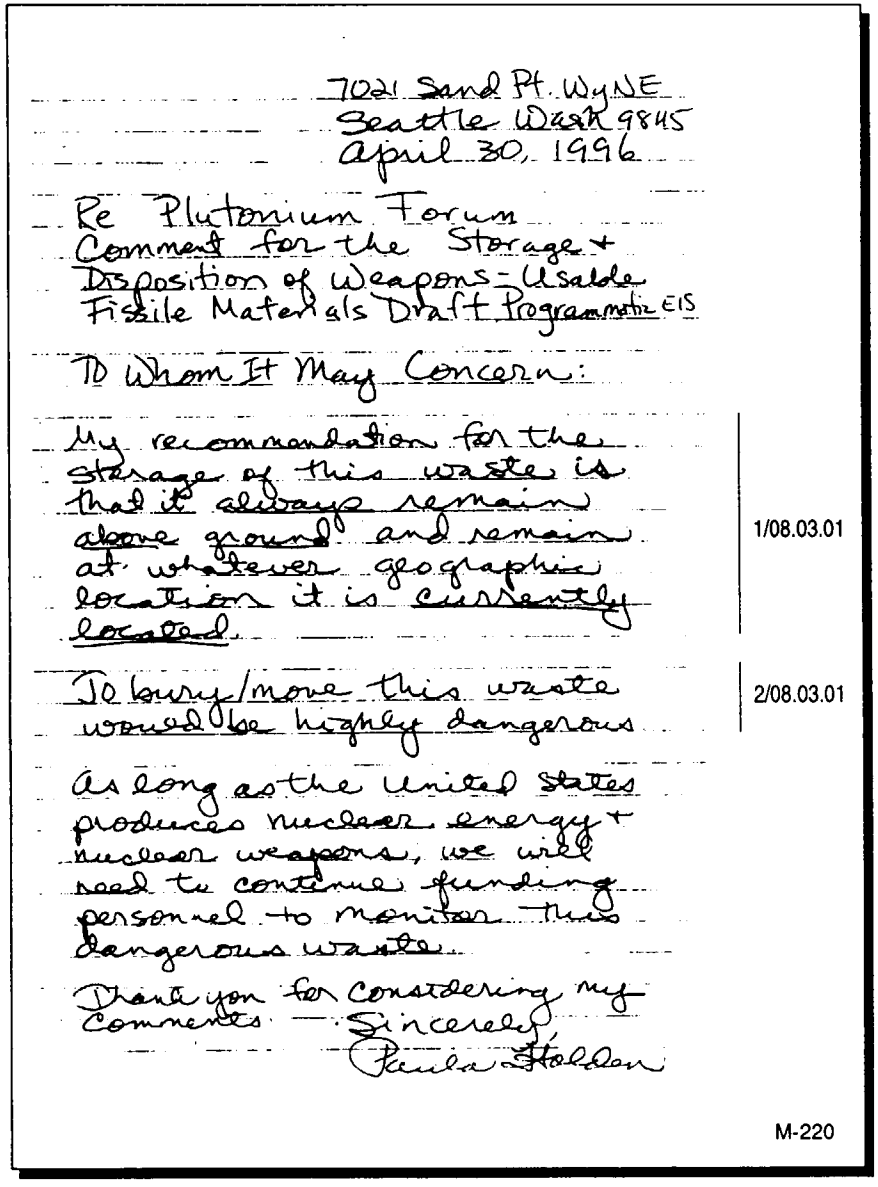
Ward J. Hodge

M-048

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternatives. However, NEPA requires that DOE look at all reasonable alternatives and, therefore, reactor burning must be considered. Decisions on the disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

HOLDEN, PAULA, SEATTLE, WA
PAGE 1 OF 1



7021 Sand Pt. Wy NE
Seattle Wash 9845
April 30, 1996

Re Plutonium Forum
Comment for the Storage + Disposition of Weapons-Usable Fissile Materials Draft Programmatic EIS

To Whom It May Concern:

My recommendation for the storage of this waste is that it always remain above ground and remain at whatever geographic location it is currently located. 1/08.03.01

To bury/move this waste would be highly dangerous 2/08.03.01

As long as the United States produces nuclear energy + nuclear weapons, we will need to continue funding personnel to monitor this dangerous waste.

Thank you for considering my comments. — Sincerely,
Paula Holden

M-220

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for long-term storage of fissile materials. Decisions on storage of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 Comment Number 2

The Department of Energy recognizes the commentor's concern with the Borehole Alternatives. Decisions on the disposition alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

Comment ID: P0038
Date Received: May 1, 1996
Name: Linda Hyatt
Address: Dallas, TX

Transcription:

I wish to express my support for jobs and development in the Panhandle that don't endanger workers. I have family members that live there, and I also am concerned about the natural resources in Texas, and especially our agricultural products. Thus, I am opposed to any plutonium processing in the Texas Panhandle. Also to bringing plutonium to Pantex from other sites, and I am opposed to any long-term storage of plutonium over the aquifer in that area. Thank you very much. 1/08.03.01

P-038

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to new missions at Pantex. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

ICF Kaiser Engineers/DANA Engineering Incorporated, Kennewick, WA, William P. Dana
Page 1 of 1

READER RESPONSE CARD

The purpose of this card is to encourage communication between readers of the Newsletter and the Office of Fissile Materials Disposition. Your views, comments, and suggestions are appreciated.

Name: William P. Dana MAR 08 1996 M0001

Address: 4000 S. Irby St S+D-M-001

City, State, Zip: Kennewick, WA 99337

Affiliation: ICF Kaiser Engineers / DANA Engineering Incorporated

Comments: The Plutonium burning plan to use the Washington Public Power Supply Reactors to generate power would help economic recovery efforts as Hanford downsizes. Please keep the jobs here in the Tri-Cities [illegible]

Please mail response card to: U.S. Department of Energy • Office of Fissile Materials Disposition, MD-4 • Newsletter Editor • Forrestal Building • 1000 Independence Ave., S.W. • Washington D.C. 20585

1/09.08.01

M-001

09 08 01 **Comment Number 1**

The primary purpose of the Fissile Materials Disposition Program is to store and dispose of surplus weapons-usable fissile materials in a manner that achieves both national security and ES&H objectives. Selection of a Preferred Alternative was based on numerous factors including socioeconomics. While the creation of jobs is a benefit of the program, it is not the only factor used to determine the alternative or the location for implementing a Federal action.

IES UTILITIES, CEDAR RAPIDS, IA, WALTER NODEEN
PAGE 1 OF 1

Comment ID: P0040
Date Received: May 8, 1996
Name: Walter Nodeen
Principal Engineer of Nuclear Fuel
Organization: IES Utilities
Address: Cedar Rapids, Iowa

Transcription:

We operate the Duane Arnold Energy Center Nuclear Power Station which is a BWR. I just wanted to register our comments on the PEIS and say that we are much in favor of going ahead with the plutonium disposition that uses the plutonium for reactor fuel. In fact, we hope to be one of the reactors that is able to utilize that fuel. We think that is the best process and best policy to follow for several reasons. It saves the energy content of the plutonium instead of just wasting it by throwing it away. That appears to us to be the best way to go. Thank you. 1/08.03.01

P-040

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

JOBE, LOWELL A., IDAHO FALLS, ID
PAGE 1 OF 1

14469 N. 55th E.
Idaho Falls, ID 83401
May 7, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-3786

re: Storage & Disposition of Weapons-Usable Fissile Materials DPEIS

Gentlemen:

As a retired Systems Engineer and having worked in the water and waste treatment industry, 20 years at the INEL CPP plant, taught chemical engineering, and developed a Process Technology program at EITC, my judgement of the DPEIS document is that it does not consider the real final solution to the destruction of weapons-usable fissile materials. The only probable answer to this problem that I have seen is the IFR (Integral Fast Reactor) developed at ANL because it is the only option I know of for providing a closed-loop system to destroy Pu and other actinides by recycling them back to a fast reactor, using an electrometallurgical process to separate fissile materials from fission products. The recycled fissile materials are so radioactive and the Pu so impure as to be non-proliferable. The by-product stream contains a lower volume of radioactive fission products and other materials than the original fuel elements, with a lower heat load for final disposition. The side advantage of providing additional power, using a passively safe reactor that can't undergo devastating environmental consequences of Chernobyl or TMI are powerful reasons to consider the IFR for this and for the even more extensive Pu/SNF problem coming up in the near future. 1/14.00.00

To merely convert this fissile material into a form for burial either as glass or ceramic logs or as SNF from a LWR does not render it permanently free from proliferation at some future date. The President's Non-Proliferation Policy is inconsistent in stopping all Pu processing in the U.S. while supporting it in western Europe and Japan; also in seeking to eliminate accumulation of HEU and Pu, yet stopping further development of newer, safer nuclear power reactors such as the IFR, which would reduce HEU and Pu inventories. The IFR appears to me to be the only currently valid way to meet the President's Non-Proliferation Policy. Yet I find no mention of the rest of the 37 alternatives for Pu disposition referred to on p. S-6 of the Summary document, nor in Vol.I, as referred to in its Foreward. Western Europe, Russia and Japan have given no indication of backing down from their use of Pu or the PUREX method of reprocessing, which produce Pu for nuclear weapons. 1/14.00.00 cont.

Thus, I place little credence in this Draft PEIS for solving the real problem of destroying Pu, let alone maximizing power generated from this resource and enviromental protection from the by-products. To not do so is immoral, illogical, and is a symptom of the worst of our throw-away culture; total systems thinking is required for the best interests of the U.S. and the world.

For what could possibly be used from this DPEIS as a reasonable alternative, I consider the ANL Electrometallurgical Alternative as being the most cost effective of any alternative, since it requires the least area, equipment, personnel of any; it showed up as best in the comparative tables on most items. The equipment and information might be usable if the U.S. wakes up to its real responsibilities; let science & engineering make the decisions. 2/08.03.01

Respectfully submitted:

Lowell A. Jobe

M-186

14 00 00 **Comment Number 1**

During the screening of alternatives for inclusion in the PEIS, a Reactor-Burning concept was evaluated involving a variation of the Integral Fast Reactor concept. However, this concept, which would use a reactor fuel cycle design still under development, would be more costly and less timely than other mature reactor options. The development program was recently terminated by the Administration and Congressional action. Since Pu disposition can be accomplished using existing technologies, there is no justification for developing this advanced technology for Pu disposition.

08 03 01 **Comment Number 2**

The Department of Energy acknowledges the commentor's support for the Electrometallurgical Treatment Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, existing agreements, and public input.

Comment ID: P0026
Date Received: April 18, 1996
Name: Rob Johnston
Address:

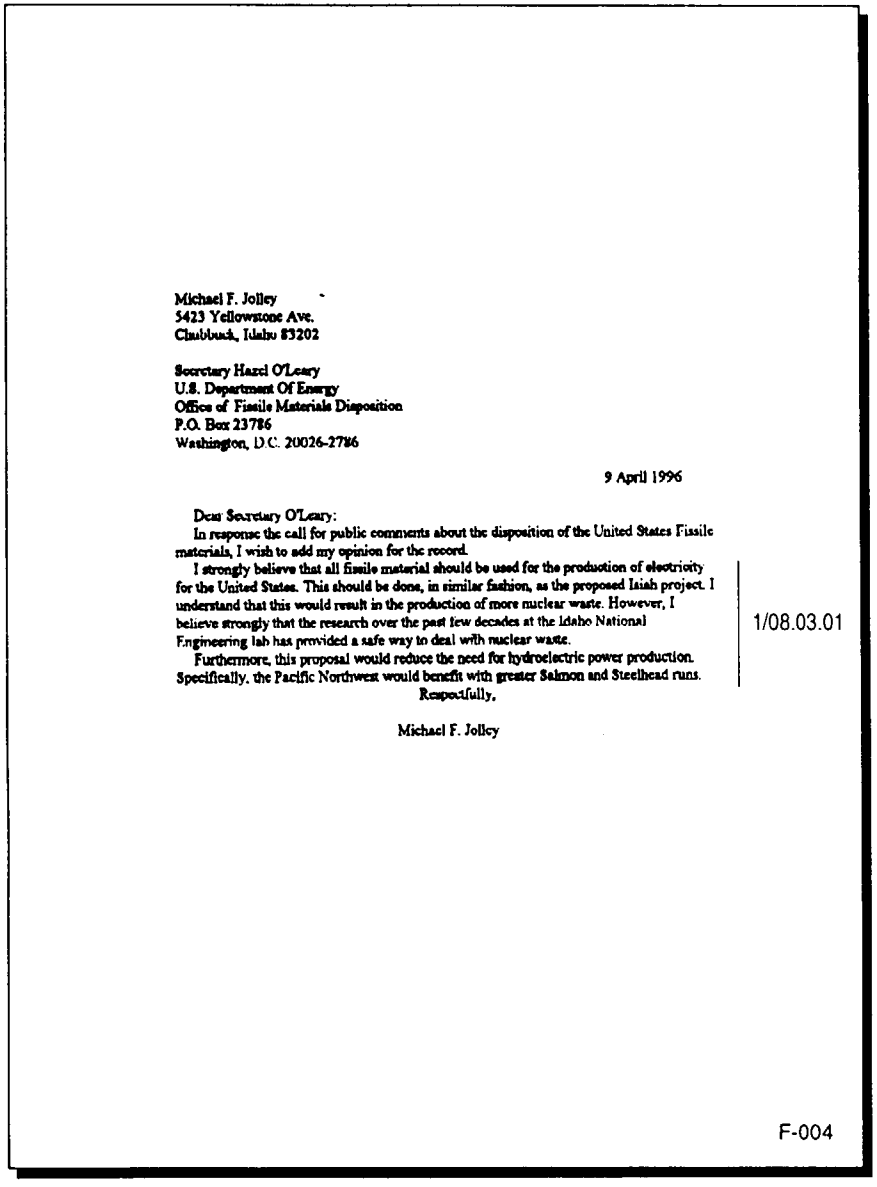
Transcription:

I want to comment on the plutonium disposal. I prefer that they use it in light water reactor and use the energy up as available. It's a smart way to do it. It's economically supported through scientific research, and I think it's a waste of taxpayer's dollars to just dispose of it. Thank you. 1/08.03.01

P-026

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.



Michael F. Jolley
5423 Yellowstone Ave.
Chubbuck, Idaho 83202

Secretary Hazel O'Leary
U.S. Department Of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-2786

9 April 1996

Dear Secretary O'Leary:

In response the call for public comments about the disposition of the United States Fissile materials, I wish to add my opinion for the record.

I strongly believe that all fissile material should be used for the production of electricity for the United States. This should be done, in similar fashion, as the proposed Isiah project. I understand that this would result in the production of more nuclear waste. However, I believe strongly that the research over the past few decades at the Idaho National Engineering lab has provided a safe way to deal with nuclear waste.

Furthermore, this proposal would reduce the need for hydroelectric power production. Specifically, the Pacific Northwest would benefit with greater Salmon and Steelhead runs.

Respectfully,

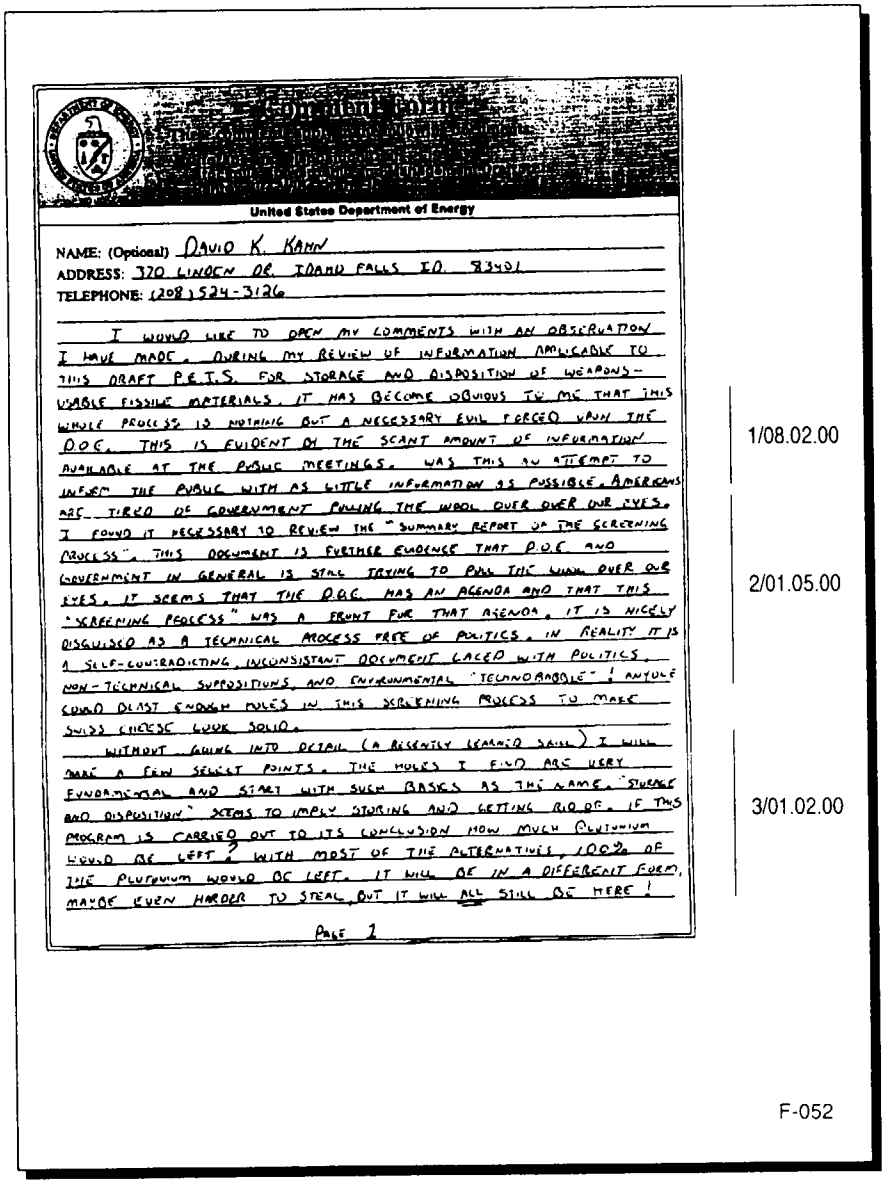
Michael F. Jolley

1/08.03.01

F-004

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.



United States Department of Energy

NAME: (Optional) DAVID K. KAHN
ADDRESS: 370 LINCOLN DR. IDAHO FALLS ID. 83401
TELEPHONE: (208) 524-3126

I WOULD LIKE TO OPEN MY COMMENTS WITH AN OBSERVATION I HAVE MADE. DURING MY REVIEW OF INFORMATION APPLICABLE TO THIS DRAFT P.E.I.S. FOR STORAGE AND DISPOSITION OF WEAPONS-USABLE FISSILE MATERIALS, IT HAS BECOME OBVIOUS TO ME THAT THIS WHOLE PROCESS IS NOTHING BUT A NECESSARY EVIL FORCED UPON THE DOE. THIS IS EVIDENT IN THE SCANT AMOUNT OF INFORMATION AVAILABLE AT THE PUBLIC MEETINGS. WAS THIS AN ATTEMPT TO INFORM THE PUBLIC WITH AS LITTLE INFORMATION AS POSSIBLE. AMERICANS ARE TIRED OF GOVERNMENT PULLING THE WOOL OVER OUR EYES. I FOUND IT NECESSARY TO REVIEW THE "SUMMARY REPORT OF THE SCREENING PROCESS". THIS DOCUMENT IS FURTHER EVIDENCE THAT D.O.E AND GOVERNMENT IN GENERAL IS STILL TRYING TO PULL THE WOOL OVER OUR EYES. IT SEEMS THAT THE D.O.E. HAS AN AGENDA AND THAT THIS "SCREENING PROCESS" WAS A FRONT FOR THAT AGENDA. IT IS NICELY DISGUISED AS A TECHNICAL PROCESS FREE OF POLITICS. IN REALITY IT IS A SELF-CONTRADICTING, INCONSISTANT DOCUMENT LACED WITH POLITICS, NON-TECHNICAL SUPPOSITIONS, AND ENVIRONMENTAL "TECHNOBABBLE"! ANYONE COULD PLANT ENOUGH HOLES IN THIS SCREENING PROCESS TO MAKE SWISS CHEESE LOOK SOLID.

WITHOUT GOING INTO DETAIL (A RECENTLY LEARNED SKILL) I WILL MAKE A FEW SELECT POINTS. THE HOLES I FIND ARE VERY FUNDAMENTAL AND START WITH SUCH BASICS AS THE NAME. "STORAGE AND DISPOSITION" SEEMS TO IMPLY STORING AND GETTING RID OF. IF THIS PROGRAM IS CARRIED OUT TO ITS CONCLUSION HOW MUCH PLUTONIUM WOULD BE LEFT? WITH MOST OF THE ALTERNATIVES, 100% OF THE PLUTONIUM WOULD BE LEFT. IT WILL BE IN A DIFFERENT FORM, MAYBE EVEN HARDER TO STEAL, BUT IT WILL ALL STILL BE HERE!

PAGE 1

1/08.02.00

2/01.05.00

3/01.02.00

F-052

08 02 00 **Comment Number 1**

The Department of Energy uses a wide variety of methods to communicate with the public on these important issues. These methods include public meetings, as part of the NEPA process, and meetings outside of the process, such as the Plutonium Round Table. Numerous fact sheets and displays are made available at the meetings as well as by mail. All of this information is available on the Program's electronic bulletin board.

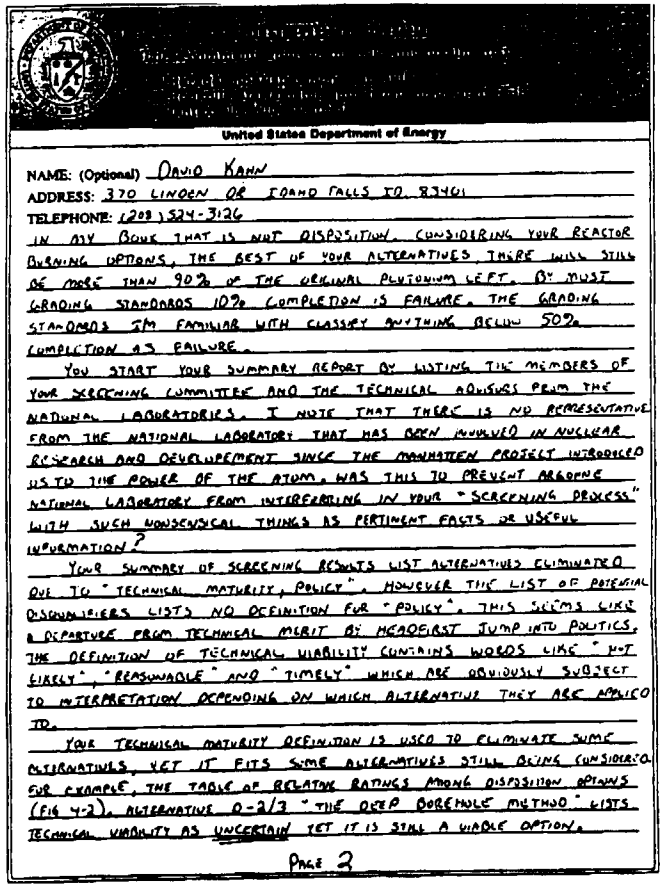
01 05 00 **Comment Number 2**

Comment noted.

01 02 00 **Comment Number 3**

The purpose of the Proposed Action for Pu disposition is to convert Pu into proliferation-resistant forms that meet the Spent Fuel Standard (options for long-term disposition of Pu should seek to meet a standard that makes Pu as inaccessible for weapons use as the much larger and growing quantity of Pu that is found in spent nuclear fuel from commercial power reactors, as suggested by the NAS), thereby fulfilling the President's Nonproliferation Policy. The disposition alternatives would convert 100 percent of the material into a proliferation-resistant form.

KAHN, DAVID K., IDAHO FALLS, ID
PAGE 2 OF 4



United States Department of Energy

NAME: (Optional) DAVID KAHN
ADDRESS: 370 LINDEN DR IDAHO FALLS ID 83401
TELEPHONE: (208) 524-3126

IN MY BOOK THAT IS NOT DISPOSITION. CONSIDERING YOUR REACTOR BURNING OPTIONS, THE BEST OF YOUR ALTERNATIVES THERE WILL STILL BE MORE THAN 90% OF THE ORIGINAL PLUTONIUM LEFT. BY MUST GRADING STANDARDS 10% COMPLETION IS FAILURE. THE GRADING STANDARDS I'M FAMILIAR WITH CLASSIFY ANYTHING BELOW 50% COMPLETION AS FAILURE.

YOU START YOUR SUMMARY REPORT BY LISTING THE MEMBERS OF YOUR SCREENING COMMITTEE AND THE TECHNICAL ADVISORS FROM THE NATIONAL LABORATORIES. I NOTE THAT THERE IS NO REPRESENTATIVE FROM THE NATIONAL LABORATORY THAT HAS BEEN INVOLVED IN NUCLEAR RESEARCH AND DEVELOPMENT SINCE THE MANHATTEN PROJECT INTRODUCED US TO THE POWER OF THE ATOM. WAS THIS TO PREVENT ARROGANT NATIONAL LABORATORY FROM INTERFERRING IN YOUR "SCREENING PROCESS" WITH SUCH NONSENSICAL THINGS AS PERTINENT FACTS OR USEFUL INFORMATION?

YOUR SUMMARY OF SCREENING RESULTS LIST ALTERNATIVES ELIMINATED DUE TO "TECHNICAL MATURITY, POLICY". HOWEVER THE LIST OF POTENTIAL DISQUALIFIERS LISTS NO DEFINITION FOR "POLICY". THIS SEEMS LIKE A DEPARTURE FROM TECHNICAL MERIT BY HEADQUARTERS JUMP INTO POLITICS. THE DEFINITION OF TECHNICAL VIABILITY CONTAINS WORDS LIKE "NOT LIKELY", "REASONABLE" AND "TIMELY" WHICH ARE OBVIOUSLY SUBJECT TO INTERPRETATION DEPENDING ON WHICH ALTERNATIVE THEY ARE APPLIED TO.

YOUR TECHNICAL MATURITY DEFINITION IS USED TO ELIMINATE SOME ALTERNATIVES, YET IT FITS SOME ALTERNATIVES STILL BEING CONSIDERED. FOR EXAMPLE, THE TABLE OF RELATIVE RATINGS AMONG DISPOSITION OPTIONS (FIG 4-2), ALTERNATIVE D-2/3 "THE DEEP BOREHOLE METHOD" LISTS TECHNICAL VIABILITY AS UNCERTAIN YET IT IS STILL A VIABLE OPTION.

PAGE 2

3/01.02.00 cont.

4/01.05.00

5/01.05.00

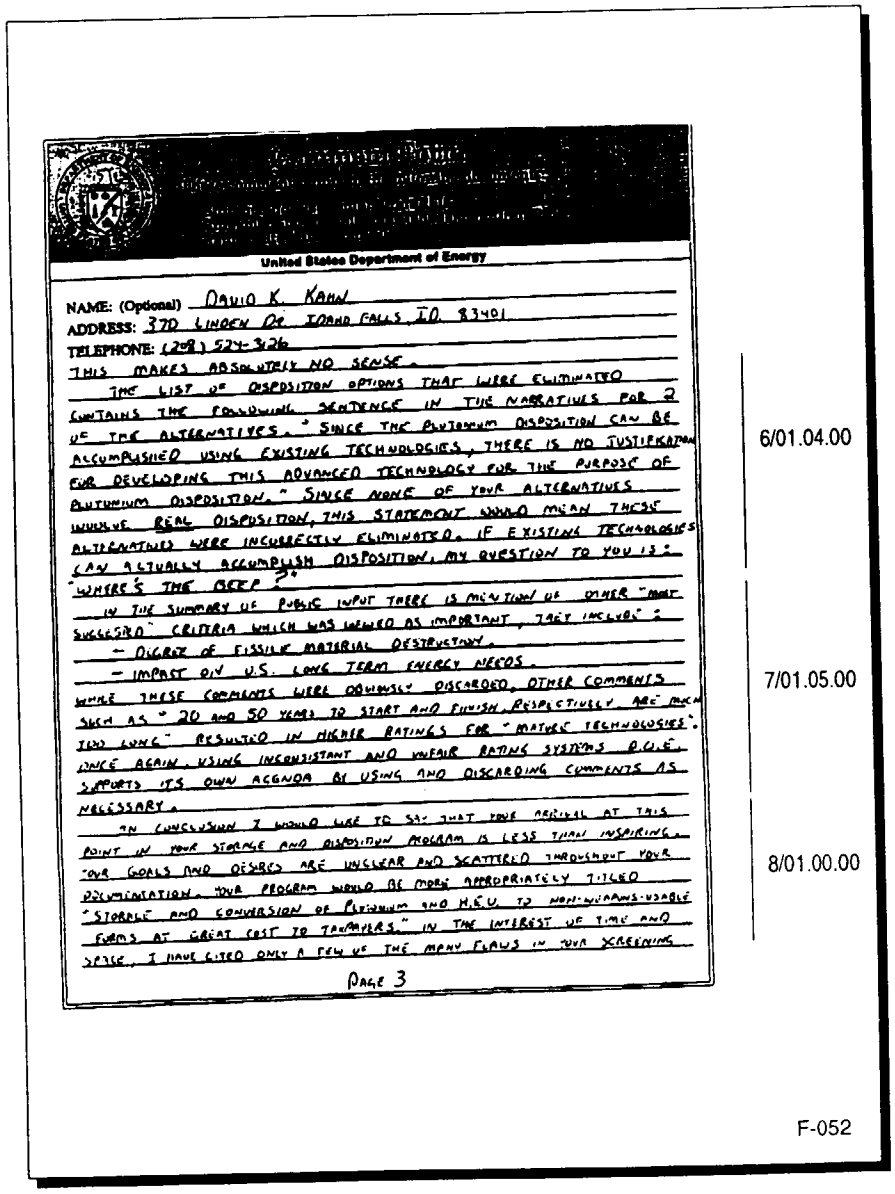
F-052

01 05 00 Comment Number 4

The screening process provided a reasonable basis for evaluating options for further consideration in a report that was made available in March 1995.

01 05 00 Comment Number 5

In considering the technical maturity of an option for Pu disposition, DOE looked at the risks and uncertainties associated with the development and implementation of the option, the time and cost required to minimize risks and uncertainties, and how these factors affect DOE's ability to accomplish the disposition mission. Though the borehole category may not be as developed and mature as the reactor and immobilization categories, it does provide a category of technology alternatives for Pu disposition different from the other two. The borehole category gives three different technology paths for consideration of disposition alternatives, of which one or more could be selected to fulfill the PEIS purpose and need.



United States Department of Energy

NAME: (Optional) DAVID K. KAHN
ADDRESS: 370 LINDEN DR. IDAHO FALLS, ID. 83401
TELEPHONE: (208) 524-3126

THIS MAKES ABSOLUTELY NO SENSE.

THE LIST OF DISPOSITION OPTIONS THAT WERE ELIMINATED CONTAINS THE FOLLOWING SENTENCE IN THE NARRATIVES FOR 2 OF THE ALTERNATIVES. "SINCE THE PLUTONIUM DISPOSITION CAN BE ACCOMPLISHED USING EXISTING TECHNOLOGIES, THERE IS NO JUSTIFICATION FOR DEVELOPING THIS ADVANCED TECHNOLOGY FOR THE PURPOSE OF PLUTONIUM DISPOSITION." SINCE NONE OF YOUR ALTERNATIVES INVOLVE REAL DISPOSITION, THIS STATEMENT WOULD MEAN THESE ALTERNATIVES WERE INCORRECTLY ELIMINATED. IF EXISTING TECHNOLOGIES CAN ACTUALLY ACCOMPLISH DISPOSITION, MY QUESTION TO YOU IS: "WHERE'S THE BEEF?"

IN THE SUMMARY OF PUBLIC INPUT THERE IS MENTION OF OTHER "MOST SUGGESTED" CRITERIA WHICH WAS VIEWED AS IMPORTANT, THEY INCLUDE:

- DEGREE OF FISSILE MATERIAL DESTRUCTION.
- IMPACT ON U.S. LONG TERM ENERGY NEEDS.

WHILE THESE COMMENTS WERE OBVIOUSLY DISCARDED, OTHER COMMENTS SUCH AS "20 AND 50 YEARS TO START AND FINISH, RESPECTIVELY, ARE MUCH TOO LONG" RESULTED IN HIGHER RATINGS FOR "MATURE TECHNOLOGIES". ONCE AGAIN, USING INCONSISTANT AND UNFAIR RATING SYSTEMS D.O.E. SUPPORTS ITS OWN AGENDA BY USING AND DISCARDING COMMENTS AS NECESSARY.

IN CONCLUSION I WOULD LIKE TO SAY THAT YOUR ARRIVAL AT THIS POINT IN YOUR STORAGE AND DISPOSITION PROGRAM IS LESS THAN INSPIRING. YOUR GOALS AND DESIRES ARE UNCLEAR AND SCATTERED THROUGHOUT YOUR DOCUMENTATION. YOUR PROGRAM WOULD BE MORE APPROPRIATELY TITLED "STORAGE AND CONVERSION OF PLUTONIUM AND H.E.U. TO NON-WEAPONS-USABLE FORMS AT GREAT COST TO TAXPAYERS." IN THE INTEREST OF TIME AND SPACE, I HAVE CITED ONLY A FEW OF THE MANY FLAWS IN YOUR SCREENING

PAGE 3

6/01.04.00

7/01.05.00

8/01.00.00

F-052

01 04 00 **Comment Number 6**

The purpose of the Proposed Action is to convert Pu into a proliferation-resistant form that meets the Spend Fuel Standard in a prompt manner. Destruction of Pu is not a necessary requirement for meeting the purpose of the Proposed Action.

01 05 00 **Comment Number 7**

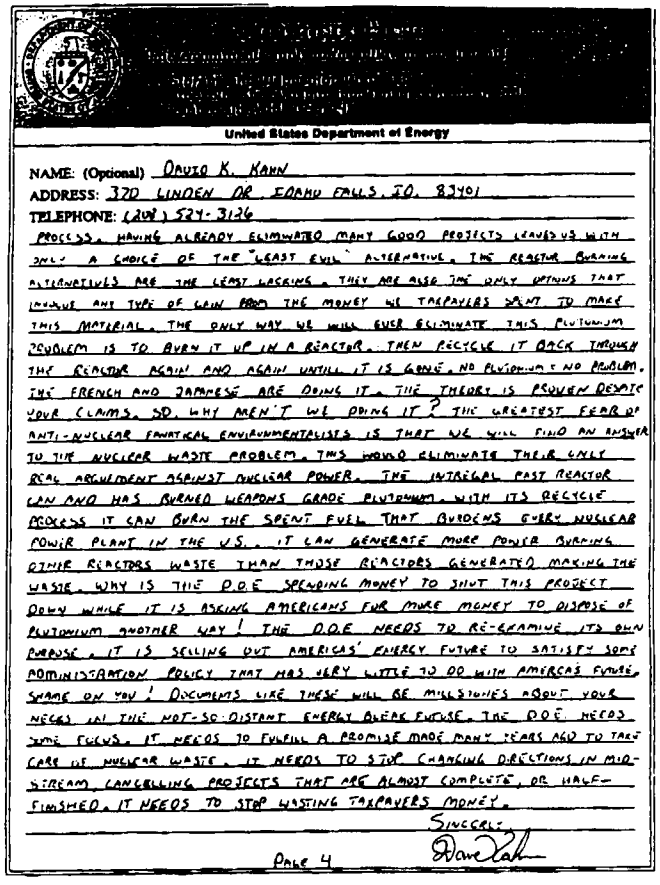
The Department of Energy developed screening criteria which were used as a basis for narrowing technology options for disposition. This criteria were provided to the general public for comment and discussed at the scoping meetings. The criteria were changed as a result of public comment. Other factors were considered in the screening process, but were not included as "criteria."

The degree of fissile materials destruction and impact on U.S. energy needs were among the factors considered. However, in some cases, such as vitrification, these factors were outweighed by other benefits.

The technologies selected for evaluation in the PEIS will be capable of starting disposition in 8 to 10 years and finishing in 16 to 20 years (that is, in much less time than 20 to 50 years). Less mature technologies would take much longer due to the greater degree of R&D required. Therefore, more time would be required to start disposition.

01 00 00 **Comment Number 8**

Comment noted.



United States Department of Energy

NAME: (Optional) DAVID K. KAHN
ADDRESS: 370 LINDEN DR. IDAHO FALLS, ID. 83401
TELEPHONE: (208) 524-3126

PROCESS. HAVING ALREADY ELIMINATED MANY GOOD PROJECTS LEAVES US WITH ONLY A CHOICE OF THE "LEAST EVIL" ALTERNATIVE. THE REACTOR BURNING ALTERNATIVES ARE THE LEAST LACKING. THEY ARE ALSO THE ONLY OPTIONS THAT INVOLVE ANY TYPE OF GAIN FROM THE MONEY WE TAXPAYERS SPENT TO MAKE THIS MATERIAL. THE ONLY WAY WE WILL EVER ELIMINATE THIS PLUTONIUM PROBLEM IS TO BURN IT UP IN A REACTOR. THEN RECYCLE IT BACK THROUGH THE REACTOR AGAIN AND AGAIN UNTILL IT IS GONE. NO PLUTONIUM = NO PROBLEM. THE FRENCH AND JAPANESE ARE DOING IT. THE THEORY IS PROVEN DESPITE YOUR CLAIMS. SO, WHY AREN'T WE DOING IT? THE GREATEST FEAR OF ANTI-NUCLEAR EXTREMIST ENVIRONMENTALISTS IS THAT WE WILL FIND AN ANSWER TO THE NUCLEAR WASTE PROBLEM. THIS WOULD ELIMINATE THEIR ONLY REAL ARGUMENT AGAINST NUCLEAR POWER. THE INTEGRAL FAST REACTOR CAN AND HAS BURNED WEAPONS GRADE PLUTONIUM. WITH ITS RECYCLE PROCESS IT CAN BURN THE SPENT FUEL THAT BURDENS EVERY NUCLEAR POWER PLANT IN THE U.S. IT CAN GENERATE MORE POWER BURNING OTHER REACTORS WASTE THAN THOSE REACTORS GENERATED MAKING THE WASTE. WHY IS THE D.O.E SPENDING MONEY TO SHUT THIS PROJECT DOWN WHILE IT IS ASKING AMERICANS FOR MORE MONEY TO DISPOSE OF PLUTONIUM ANOTHER WAY! THE D.O.E NEEDS TO RE-EXAMINE ITS OWN PURPOSE. IT IS SELLING OUT AMERICAS' ENERGY FUTURE TO SATISFY SOME ADMINISTRATION POLICY THAT HAS VERY LITTLE TO DO WITH AMERICAS FUTURE. SHAME ON YOU! DOCUMENTS LIKE THESE WILL BE MILESTONES ABOUT YOUR NEEDS IN THE NOT-SO-DISTANT ENERGY BLEAK FUTURE. THE D.O.E NEEDS NEW FUELS. IT NEEDS TO FULFILL A PROMISE MADE MANY YEARS AGO TO TAKE CARE OF NUCLEAR WASTE. IT NEEDS TO STOP CHANGING DIRECTIONS IN MID-STREAM, CANCELLING PROJECTS THAT ARE ALMOST COMPLETE, OR HALF-FINISHED. IT NEEDS TO STOP WASTING TAXPAYERS MONEY.

SINCERELY,
Dave Kahn

PAGE 4

9/01.04.00

10/01.04.00

F-052

01 04 00 **Comment Number 9**

Comment noted.

01 04 00 **Comment Number 10**

Comment noted.

Comment ID: P0016
Date Received: April 18, 1996
Name: Mike Keesler
Address: 4320 East 540 N
Rigby, ID 83442
Phone: 208-745-8552

Transcription:

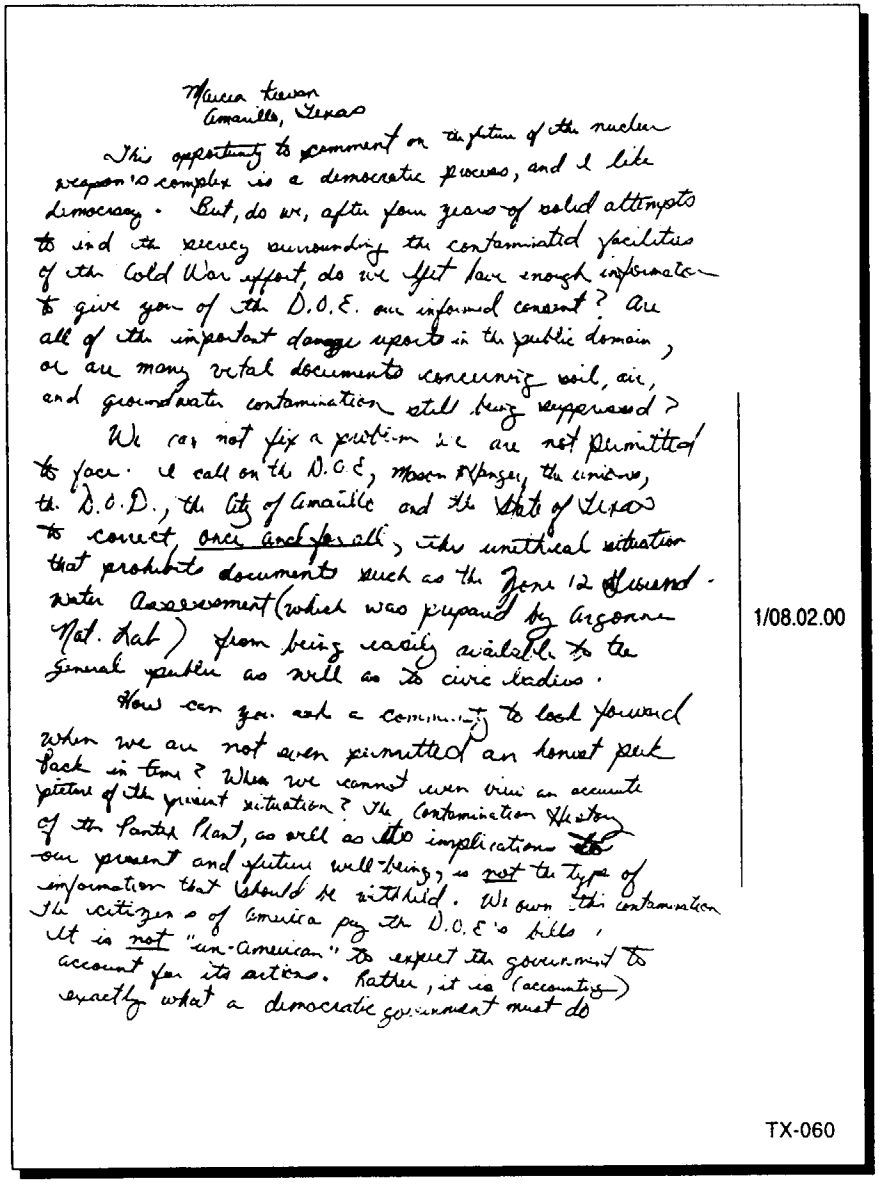
It seems as though we had a perfect solution or dealing with this with these warheads and the weapons grade plutonium when we had the IFR project going. I mean burning it through those reactors would definitely take care of it. It would fuel the reactors for many many years to come and provide us with an almost free source of power by doing that, but it seems that they didn't think about it. Anyway, they could still revive the project or burn them in other reactors, I guess, if that's what it takes, but that seems the most viable alternative to getting rid of this waste or the byproducts from the nuclear weapons. Thank you. 1/08.03.01

P-016

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

KEEVAN, MARCIA, AMARILLO, TX
PAGE 1 OF 5



Marcia Keevan
Amarillo, Texas

This opportunity to comment on the future of the nuclear weapons complex is a democratic process, and I like democracy. But, do we, after four years of valid attempts to end the secrecy surrounding the contaminated facilities of the Cold War effort, do we still have enough information to give you of the D.O.E. our informed consent? Are all of the important damage reports in the public domain, or are many vital documents concerning soil, air, and groundwater contamination still being suppressed?

We can not fix a problem if we are not permitted to face it. I call on the D.O.E, Mason & Hanger, the unions, the D.O.D., the City of Amarillo and the State of Texas to correct once and for all, this unethical situation that prohibits documents such as the Zone 12 Ground-Water Assessment (which was prepared by Argonne Nat. Lab) from being readily available to the general public as well as to civic leaders.

How can you ask a community to look forward when we are not even permitted an honest look back in time? When we cannot even view an accurate picture of the present situation? The contamination history of the Pantex Plant, as well as the implications for our present and future well-being, is not the type of information that should be withheld. We own this contamination the citizens of America pay the D.O.E.'s bills, it is not "un-American" to expect the government to account for its actions. Rather, it is (accounting) exactly what a democratic government must do

1/08.02.00

TX-060

08 02 00 **Comment Number 1**

All of the documents used to prepare this PEIS have been made available to the public. Copies of the reference documents have been placed in DOE Public Reading Rooms near each of the potentially affected sites.

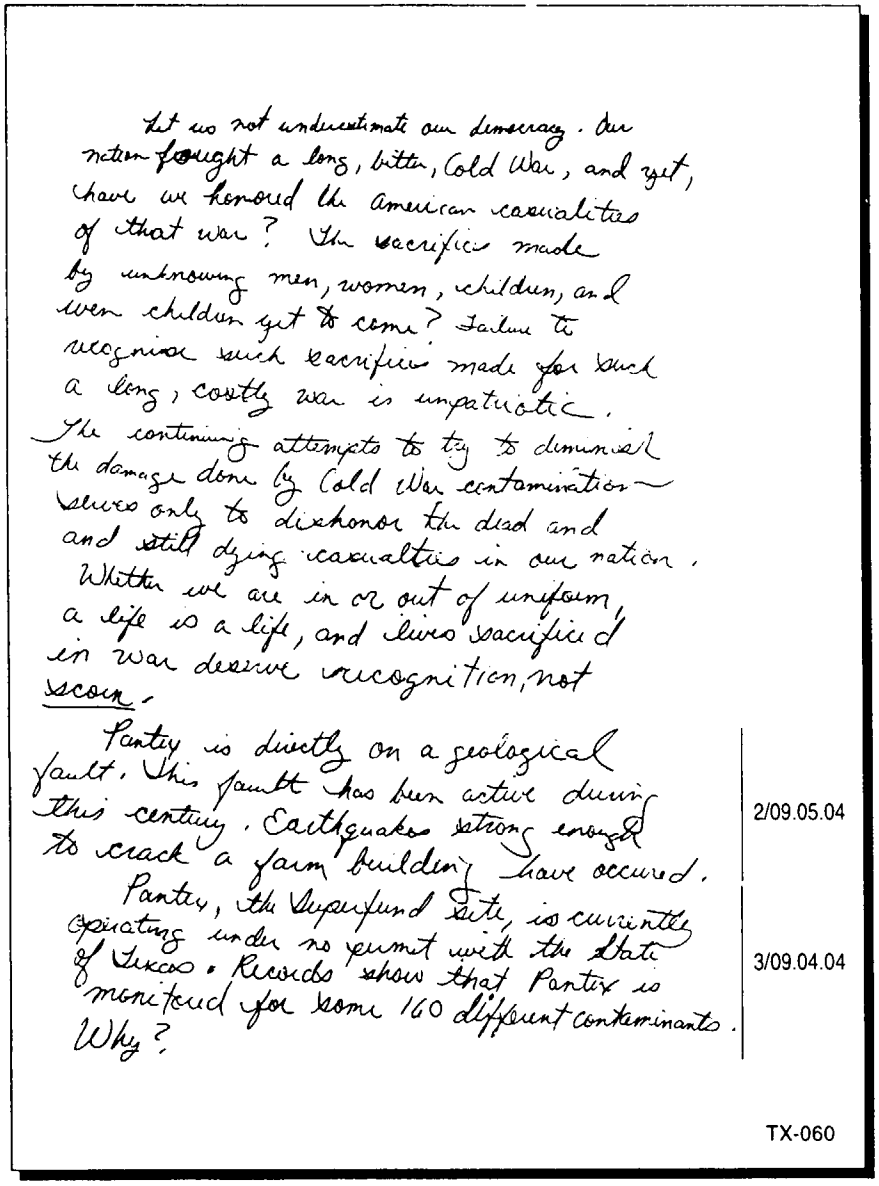
What a very sad day this is. This is a day
on which some of our leaders have demonstrated
that we aren't civil enough to handle the truth
Some identify the act of requiring government to
to account with the act of yelling "fire"
in a crowded theater. Such a comparison is
both untrue and un-American.

Are my fellow citizens to become an unruly,
riotous lot if we discover that some in our
leadership have not had our best interests at heart?
Are we too immature, after 200 years of democracy
to handle the truth about mistakes we have allowed
the government to make? Will you, of the D.O.E.,
respect our comments and opinions knowing
that we are submitting them based on
only partial truths?

This political in-fighting must stop.
The facts need to see the light of day,
the public needs to hear them. Some of
the hidden information is depressing - OR WELL!
Some of the hidden information involves deception - UNFORTUNATE
Some of the hidden info shakes our fragile
perceptions of validity - THAT'S LIFE, FOLKS!

Improving the condition of the human spirit
is still a noble pursuit, and any contributions
we can make towards such is worth it.

TX-060



Let us not underestimate our democracy. Our nation fought a long, bitter, Cold War, and yet, have we honored the American casualties of that war? The sacrifice made by unknowing men, women, children, and even children yet to come? Failure to recognize such sacrifice made for such a long, costly war is unpatriotic. The continuing attempts to try to diminish the damage done by Cold War contamination serves only to dishonor the dead and and still dying casualties in our nation. Whether we are in or out of uniform, a life is a life, and lives sacrificed in war deserve recognition, not scorn.

Pantex is directly on a geological fault. This fault has been active during this century. Earthquakes strong enough to crack a farm building have occured. 2/09.05.04

Pantex, the Superfund Site, is currently operating under no permit with the State of Texas. Records show that Pantex is monitored for some 160 different contaminants. Why? 3/09.04.04

TX-060

09 05 04 **Comment Number 2**

Section 3.5.5 of the Final PEIS provides a description of the seismic condition of the Pantex area and notes that the area is relatively free from earthquakes. It also notes that little or no damage could occur as a result of an earthquake. Appropriate seismic criteria will be used for any facility upgrades or new facility designs.

09 04 04 **Comment Number 3**

Activities conducted under the Superfund Program do not require permits; however, Pantex does have appropriate permits and all administrative requirements associated with the applicable permits must be adhered to.

A full suite of contaminants is monitored to understand the nature and extent of the contamination in order to fully protect human health and the environment.

(next page, first paragraph, thru this)

I call on the D.O.E and the State of Texas to establish a standard for multiple contaminants in water, rather than measuring contaminant by contaminant. I do not wish to have a glass of drinking water with 20-100 tiny teeny contaminants, all of which individually fall below "safe" drinking water standards

TX-060

Pantex did not know that such contamination would spread to the groundwater.

The use of Strontium-90 to test ~~containment~~ containment at the firing sites is an un-acceptable, unpleasant fact. Please tell us more about this, as well as the other open air experiments conducted at the site. DU particles from the test explosions at the firing sites spread into the air, land, and water on and off site. DU is toxic and radioactive. While I thank-you for starting to clean it up, once again, I must say, tell us more!

In closing, I regret that our local business leaders used your hearings to toast our United States President and Honorable Sec of Energy. I appreciate all efforts to make a historically negligent, dangerous industry safer and more ~~accountable~~ accountable.

TX-060

Comment ID: P0030
Date Received: 04/25/96
Name: W. H. Keisimeyer, M.D.
Organization: Augusta Hypertension
Address: 1021 15th Street, Suite 2
Augusta, GA 30901
Phone: 706-722-4688

Transcription:

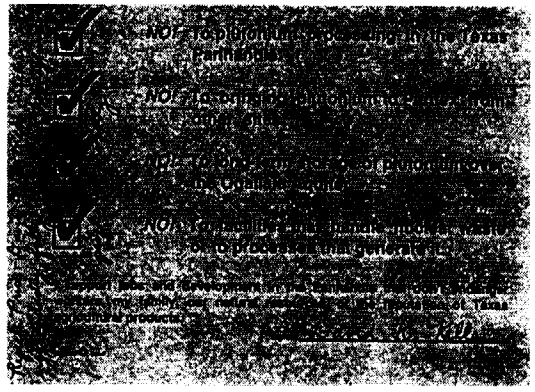
My comment on this question of how can we safety store and dispose of plutonium dismantled from nuclear weapons is that the plutonium would be processed in a safe fashion so that it can be loaded on rockets and sent to the sun for ultimate recycling of it to where it originated and I am recommending that this be considered to be done in a central location such as Savannah River Site in South Carolina so as to have not only an environmental impact but also have a positive effect on downsizing from defense cutbacks, in other words, this would be processed for the entire planet at SRS. It would be shipped from other countries into this location and it could be processed in pellets that would be suitable for launching from rockets and furthermore if necessary it would be worth the consideration of launching these loads from a remote area, an uncivilized area, similar to those areas in the South Pacific that were sites of tests such as Bikini Atoll, and this would avoid the concern over rocket explosions or launch explosions and contamination of the local environment. I can be reached here if you have any further questions. Thank you and have a pleasant day. 1/01.04.00

P-030

01 04 00 Comment Number 1

The Space Disposition Option was eliminated during a technology screening process that preceded the PEIS. There were several reasons for eliminating this option, including safety, cost, and environmental concerns.

KELLEY, DAVID K., AMARILLO, TX
PAGE 1 OF 1



1/08.03.01

2/08.03.01
3/15.00.00

PC-228

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to new missions at Pantex. Decisions on storage and disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 **Comment Number 2**

Comment noted.

15 00 00 **Comment Number 3**

Comment noted.

Stephen L. Kimberley M.D.
Medical - Legal Consultation
85296 Ridgetop Drive
Eugene, Oregon 97405
(541) 342-6298

DOE
Department of Fissile Materials Disposition
PO Box 23786
Washington, D.C. 20026-3786

Dear Sirs,

I am writing you in urgent regard to the situation at Hanford Nuclear Reserve. In my opinion as a scientist and physician the situation there represents the greatest threat to biological life on the planet. You do not need to be a scientist to understand that millions of tons of active and eminently explosive nuclear waste stored haphazardly on the banks of one of the largest rivers in the world is a situation that is primed for disaster. I am speaking of the type of disaster that would change life on earth as we know it forever.

I realize that those in your office have been working diligently on this problem for decades and it is not a situation that you personally created. However I am asking you to bear with me as I point out the direction of the only viable solution. I am not some radical that is protesting a nearly impossible situation but rather a scientist trying to shed light on a political and environmental issue of greatest import. Any attempts to control this problem by containment will be obviously temporary. To bury this waste miles beneath the earth could be more harmful than helpful. The only viable method of solution is to neutralize this waste using microorganisms. This technology is rapidly evolving and if it were stimulated and fostered the neutralization process could be started soon. 1/08.03.01

Please focus on this area of waste neutralization using microorganism technology. Your funds will be much better spent and the public and politicians will be far happier and more accepting of this solution than of those which call for feeble containment at the expense of future generations. Please contact me if you would like to discuss this further. I suggest you work with existing bioremediation companies and researchers for direction. 2/14.00.00

With Sincere Thanks,

Stephen L. Kimberley M.D.

cc: Ron Wyden US Senate

M-044

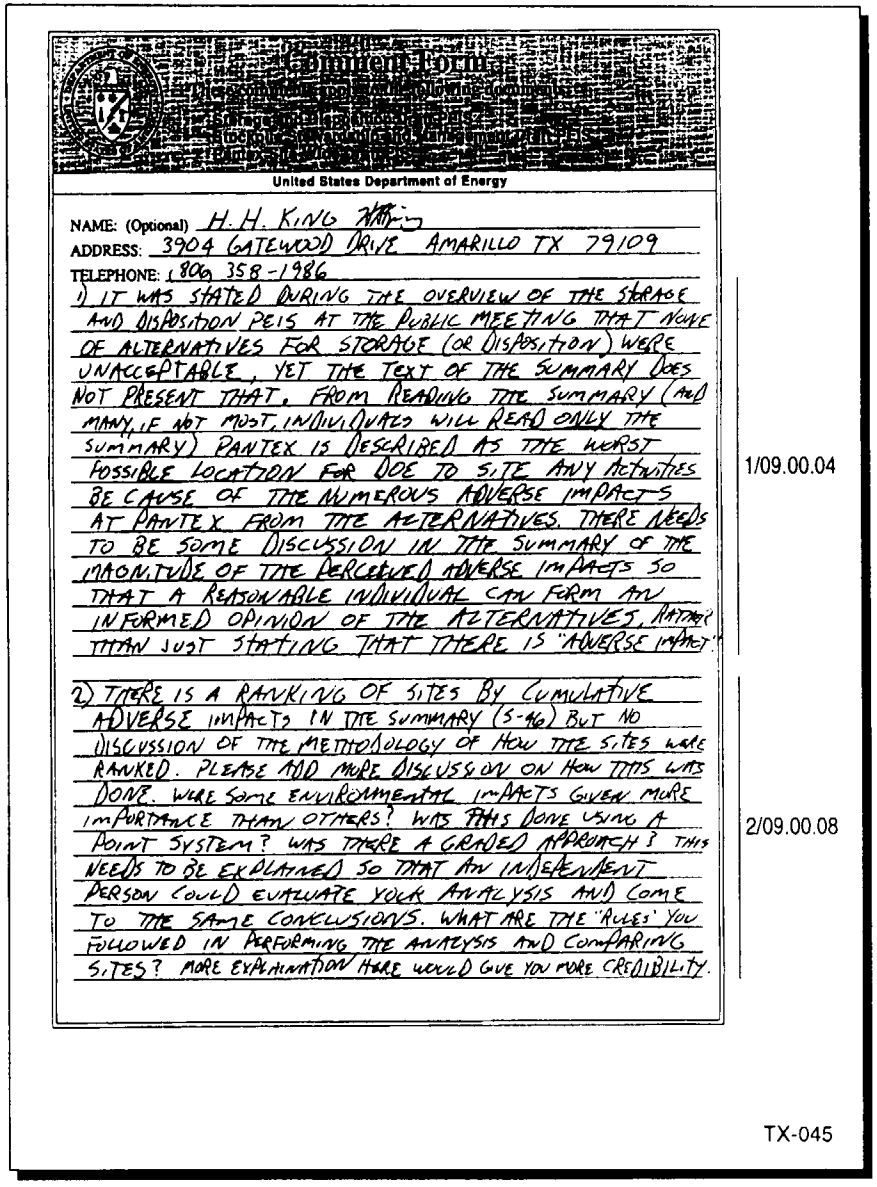
08 03 01 **Comment Number 1**

The Department of Energy recognizes the commentor's concern with the Borehole Alternatives. Decisions on the disposition alternatives will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

14 00 00 **Comment Number 2**

The purpose of the Proposed Action is to convert the surplus weapons-usable Pu into a form that meets the Spent Fuel Standard for proliferation resistance. Existing proven waste forms are sufficient to meet the needs of the Proposed Action. Development of new waste forms is beyond the scope of this PEIS.

KING, H. H., AMARILLO, TX
PAGE 1 OF 1



Comment Form

United States Department of Energy

NAME: (Optional) H. H. KING

ADDRESS: 3904 GATEWOOD DRIVE AMARILLO TX 79109

TELEPHONE: (806) 358-1986

1) IT WAS STATED DURING THE OVERVIEW OF THE STORAGE AND DISPOSITION PEIS AT THE PUBLIC MEETING THAT NONE OF ALTERNATIVES FOR STORAGE (OR DISPOSITION) WERE UNACCEPTABLE, YET THE TEXT OF THE SUMMARY DOES NOT PRESENT THAT. FROM READING THE SUMMARY (AND MANY, IF NOT MOST, INDIVIDUALS WILL READ ONLY THE SUMMARY) PANTEX IS DESCRIBED AS THE WORST POSSIBLE LOCATION FOR DOE TO SITE ANY ACTIVITIES BE CAUSE OF THE NUMEROUS ADVERSE IMPACTS AT PANTEX FROM THE ALTERNATIVES. THERE NEEDS TO BE SOME DISCUSSION IN THE SUMMARY OF THE MAGNITUDE OF THE PERCEIVED ADVERSE IMPACTS SO THAT A REASONABLE INDIVIDUAL CAN FORM AN INFORMED OPINION OF THE ALTERNATIVES. RATHER THAN JUST STATING THAT THERE IS "ADVERSE IMPACT"

1/09.00.04

2) THERE IS A RANKING OF SITES BY CUMULATIVE ADVERSE IMPACTS IN THE SUMMARY (S-46) BUT NO DISCUSSION OF THE METHODOLOGY OF HOW THE SITES WERE RANKED. PLEASE ADD MORE DISCUSSION ON HOW THIS WAS DONE. WERE SOME ENVIRONMENTAL IMPACTS GIVEN MORE IMPORTANCE THAN OTHERS? WAS THIS DONE USING A POINT SYSTEM? WAS THERE A GRADED APPROACH? THIS NEEDS TO BE EXPLAINED SO THAT AN INDEPENDENT PERSON COULD EVALUATE YOUR ANALYSIS AND COME TO THE SAME CONCLUSIONS. WHAT ARE THE "RULES" YOU FOLLOWED IN PERFORMING THE ANALYSIS AND COMPARING SITES? MORE EXPLANATION HERE WOULD GIVE YOU MORE CREDIBILITY.

2/09.00.08

TX-045

09 00 04 **Comment Number 1**

Based on comments received, the Summary was revised. There was no intention to portray Pantex, the Pantex region, or the Texas Panhandle region in a negative fashion. Each DOE site was analyzed and studied in the same manner and presented in the Draft PEIS accurately per these analyses and studies. All revisions made to the PEIS text are included in the Summary of the Final PEIS.

09 00 08 **Comment Number 2**

The Department of Energy did not intend to give the perception that the sites were ranked. Based on comments received, the Summary of the Draft PEIS was revised. All revisions made appear in the Summary of the Final PEIS.

April 29, 1996
304 Manor Drive
Sautee, GA 30571

U.S. Department of Energy
Office of Fissile Materials Disposition
Washington, D.C. 20026-3786

Statement for the record: Weapons Usable Fissile Material PEIS

I am unable to attend the April 30 PEIS on the disposition of weapon grade Plutonium in Augusta and wish this written statement to be interested into the record in my absence.

First, I oppose any plan to dispose of Plutonium by turning it into MOX fuel. In other words, I oppose burning Pu in a reactor. I oppose reprocessing of any kind because of it sends the wrong message internationally. | 1/08.03.01 | 2/01.00.00

The U.S. is the leader of the free world. We should not deviate from our commitment not to reprocess commercially. I want to point out that this commitment was made by President Jimmy Carter who was trained in nuclear technology, served aboard a nuclear submarine, and was in a better position than any world leader to understand the implications of reprocessing.

Second, I protest the PEIS system itself as it pertains to this decision. By holding these hearings at DOE sites around the country in cities where the public has a strong economic interest in perpetuating DOE related jobs, the outcome is biased. While I applaud the DOE's efforts to establish and support a Citizens Advisory Board and thereby encourage public input, I question its effectiveness in reaching the general public. | 3/08.02.00

I attended the CAB forum in August on April 25 but feel it was slanted toward a preconceived outcome. I also protest the relatively short time allowed for written comment following the PEIS. Seven days (deadline May 7th) is not enough time for the general public to absorb the information and express their concerns. | 4/08.01.00

I am aware of the urgency in this matter, but I am convinced that we must secure all fissile material as best we can without being rushed into long-term solutions that can possibly lead to even greater problems in the future. If we burn fissile Pu in reactors, we have no guarantee that the process will stop there and that we will not continue to depend on MOX as a source of energy.

Our biggest long-term problem is what to do with radioactive waste from reactors in the U.S. and around the world. This problem was not even addressed at the CAB meeting on April 25. I asked this question and so did others I spoke to, but we had to ask in writing and the panel choose not to answer. The MOX option only exacerbates this problem and is a primary reason why it must be opposed. | 5/15.00.00

Sincerely,

Joan O. King

Joan O. King

M-200

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

01 00 00 **Comment Number 2**

The specific purpose of DOE's PEIS effort is to evaluate alternatives for the disposition of surplus weapons-usable Pu that would render the Pu as inaccessible and unattractive for reuse in nuclear weapons as the much larger and growing quantity of Pu that exists in spent nuclear fuel from commercial power reactors. This condition is referred to as the Spent Fuel Standard. If an alternative using MOX fuel in reactors is selected, the surplus Pu would eventually be contained in spent fuel and, by definition, the Spent Fuel Standard would be achieved.

While the PEIS discusses the generation of spent fuel as an indirect result of potential disposition actions, any subsequent reprocessing and extraction of Pu from that spent fuel is beyond the scope of the PEIS and the fundamental nonproliferation purpose of the disposition effort. The fact that the PEIS evaluates disposition of surplus weapons Pu through use in MOX fuel, but does not further evaluate reprocessing of the spent fuel, does not foreclose policy or technology options, nor does it prejudice future decisions regarding the management or disposition of the spent fuel.

08 02 00 **Comment Number 3**

Comment noted.

08 01 00 **Comment Number 4**

At the request of several organizations and individuals, the public comment period was extended to a total of 92 days.

15 00 00 **Comment Number 5**

Comment noted.

Comment ID: P0033
Date Received: May 1, 1996
Name: Joan King
Address: 304 Manor Drive
Sautee, GA 30571
Phone: 706-878-3459

Transcription:

I am concerned about several things. 1) I can not get to Augusta for the PEIS hearing on the disposal of plutonium, but I am opposed to anything that would jeopardize our position against producing plutonium. That means I don't want to see MOX fuel option used. Glassify it if possible. But, I'm also concerned that there isn't enough time for the information to get out. If May 7 is the deadline for written comments, this is not allowing enough time. I know it must be very difficult to get all of this in, but you are asking the public to be informed about something that is tremendously complicated. I would like to see a special panel address this; do it publicly; give the public enough time to become educated and to know what the issues are. This is not something that can be settled in Augusta or near any of the nuclear plants where people are already predisposed towards certain options. I hope somebody will get back to me on this. I will write written comments. Thank you. Bye.

1/08.03.01
2/08.03.01
3/08.01.00
4/08.01.00

P-033

08 03 01 **Comment Number 1**

The Department of Energy acknowledges the commentor's opposition to the Reactor Alternative using MOX fuel. Decisions on disposition of weapons-usable fissile materials will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 03 01 **Comment Number 2**

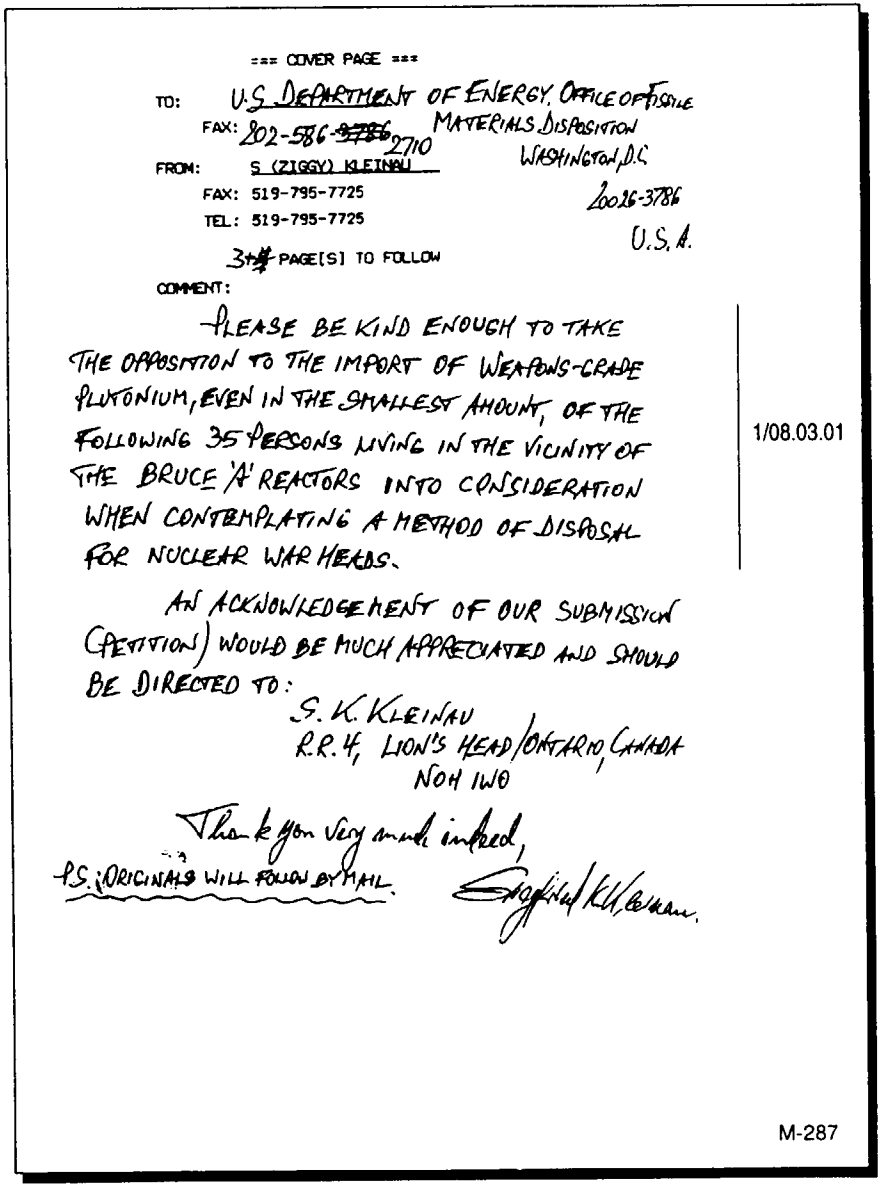
The Department of Energy acknowledges the commentor's support for the Immobilization Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

08 01 00 **Comment Number 3**

At the request of several organizations and individuals, the public comment period was extended to a total of 92 days.

08 01 00 **Comment Number 4**

Comment noted.



=== COVER PAGE ===

TO: U.S. DEPARTMENT OF ENERGY, OFFICE OF FISSILE MATERIALS DISPOSITION
FAX: 202-586-~~5786~~ 2710
WASHINGTON, D.C. 20026-3786 U.S.A.

FROM: S (ZIGGY) KLEINAU
FAX: 519-795-7725
TEL: 519-795-7725

3+~~1~~ PAGE[S] TO FOLLOW

COMMENT:

PLEASE BE KIND ENOUGH TO TAKE THE OPPOSITION TO THE IMPORT OF WEAPONS-GRADE PLUTONIUM, EVEN IN THE SMALLEST AMOUNT, OF THE FOLLOWING 35 PERSONS LIVING IN THE VICINITY OF THE BRUCE 'A' REACTORS INTO CONSIDERATION WHEN CONTEMPLATING A METHOD OF DISPOSAL FOR NUCLEAR WAR HEADS.

1/08.03.01

AN ACKNOWLEDGEMENT OF OUR SUBMISSION (PETITION) WOULD BE MUCH APPRECIATED AND SHOULD BE DIRECTED TO:

S. K. KLEINAU
R.R.4, LION'S HEAD/ONTARIO, CANADA
N0H 1W0

Thank you very much indeed,

P.S. ORIGINALS WILL FOLLOW BY MAIL. Sigfried Kleinau

M-287

08 03 01 Comment Number 1

The Department of Energy acknowledges the commentor's opposition to the use of the CANDU Reactor Alternative for the disposition of Pu. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input. This will include an appropriate level of analysis by Canada before any decision on burning Pu in a CANDU reactor is implemented.

U.S. Department of Energy,
Office of Fissile Materials Disposition,
P.O. Box 23786,
Washington, D. C. 20026-3786, U.S.A.

By Facsimile 202-586-2710 May 4, 1996

Re; Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement.

We, the undersigned, citizens of Ontario, are strongly opposed to the import of weapons-grade plutonium for use as fuel in CANDU reactors. 1/08.03.01 cont.

We want to prevent exposing millions of residents along shipping routes to this deadly material and suggest it be burned or disposed of at point of origin(manufacture). 2/08.03.01

Sincerely,

Siegfried K. Kleinau
R.R.4, Lion's Head Ontario
N0H 1W0 CANADA

[signature]
RR 3 LION'S HEAD
ON N0H 1W0.

Susan [signature]
P.O BOX 977
Lion's Head
Ontario
N0H 1W0

Marcella [signature]
General delivery
TOBERMORY ONTARIO
N0H 2R0

Sandra [signature]
RR 1
Lion's Head, Ont N0H 1W0

Tom Nuen
RR1, LION'S HEAD, ONT.
N0H 1W0

M-287

08 03 01 **Comment Number 2**

The Department of Energy acknowledges the commentor's support for Pu disposition in reactors. Decisions on disposition will be made based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

KLEINAU, S. K., ET AL., KEMBLE, ON
PAGE 3 OF 8

U.S. Department of Energy,
Office of Fissile Materials Disposition,
P.O. Box 23786,
Washington, D. C. 20026-3786, U.S.A.

By Facsimile 202-586-2710 May 4, 1996

Re; Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement.

We, the undersigned, citizens of Ontario, are strongly opposed to the import of weapons-grade plutonium for use as fuel in CANDU reactors.

We want to prevent exposing millions of residents along shipping routes to this deadly material and suggest it be burned or disposed of at point of origin(manufacture).

Sincerely,

Dr. Cathy Stanley
RR1 Kemble, ON
N0H 1S0

HANS ALBARDA
RR1 KEMBLE ONT
N0H1S0

Robert Hall

Justin's Head
Ont

June Fraser
Wiarton ON N0H 2X0

Tonya Osborne

Justin Osborne

Lions Head ONT N0H 1W0

" " " " "

Ryan Higgs Lions Head ont

M-287

U.S. Department of Energy,
Office of Fissile Materials Disposition,
P.O. Box 23786,
Washington, D. C. 20026-3786, U.S.A.

By Facsimile 202-586-2710 May 4, 1996

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We want to prevent exposing millions of residents along shipping routes to this deadly material and suggest it be burned or disposed of at point of origin(manufacture).

Sincerely,

WAYNE STRAUGHAN
RR1 LONDESBORO NOM2HO ONT

RR1 Lucknow Ont N0C 2H0

VITOLD KREUTZER
RR#2 PROTON STATION N0C 1L0

RR#3, Clifford N0G 1M0

Bernice Ellis-Whitney
RR 3 Elmwood Ont N0G 1S0

RR#2 N4L 1W6

HEATHER DUNLOP
RR#1 ELMWOOD, ONT N0G 1S0

DAVID MARCETTS
RR 3 CHESLEY ONT N0G 1L0

RR#1 New Dundee, N0B 2E0 Ont.

M-287

KLEINAU, S. K., ET AL., KEMBLE, ON
PAGE 5 OF 8

U.S. Department of Energy,
Office of Fissile Materials Disposition,
P.O. Box 23786,
Washington, D. C. 20026-3786, U.S.A.

By Facsimile 202-586-2710 May 4, 1996

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We want to prevent exposing millions of residents along shipping routes to this deadly material and suggest it be burned or disposed of at point of origin(manufacture).

Sincerely,

Barbara Dillabough
P.O. Box 957
Lion's Head, Ontario
N0H 1W0

Eric Eberhart
RR1
Sebringville, Ont.
N0K 1X0

Tony McQuaid
RR#1 Lucknow, ON
N0G 2H0

Russ Ohrt
642 Castleguard Cr.
Burlington ON
L7N 2W6

Sandra-Jean Ohrt
642 Castleguard Cr.
Burlington, Ont. L7N 2W6

Jim Kuelliner
61 Beachview Cr
Toronto M4E 2J6

M-287

U.S. Department of Energy,
Office of Fissile Materials Disposition,
P.O. Box 23786,
Washington, D. C. 20026-3786, U.S.A.

By Facsimile 202-586-2710 May 4, 1996

Re; storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement.

We, the undersigned, citizens of Ontario, are strongly opposed to the import of weapons-grade plutonium for use as fuel in CANDU reactors.

We want to prevent exposing millions of residents along shipping routes to this deadly material and suggest it be burned or disposed of at point of origin(manufacture).

Sincerely,

PAUL M L. BRUER RR6 WIARTON ON N0H 2T0
[signature]
Carol Ruland
Carol Ruland RR3 [illegible] N0H 1W0
John [illegible] 450 MAIN ST. W LISTOWEL ONT N4W1A6
T.L. [illegible] Bx 116 Collingwood ON L9Y 3Z4
[signature] Box 374 Merrickville, Ont. K0G-1N0
Mike Nickerson
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KLEINAU, S. K., ET AL., KEMBLE, ON
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Office of Fissile Materials Disposition,
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Sincerely,

Stefan Oahman [signature] 200 Colvilleta Trail B.C. V5E 6E1
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Mireneta [signature] C3 - main St Lions Head N0H 1W0
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Ronald Bladen R.R.#1 MAR. ONT. N0H 1X0
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Faye Burkhart RR2 Lion's Head, Ont. N0H 1W0

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Sincerely,

Keith Tompkins P.O. Box 193, Lion's Head, Ontario N0H 1W0
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