Comment Form

These comments apply to the following document:

_X_ Storage and Disposition Draft PEIS

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The following comments are in regard to the long-term storage of plutonium as discussed in the Storage and Disposition of Weapons-Usable Fissile Materials Draft PEIS, dated February 1996.

Introduction

Surplus and non-surplus plutonium must be packaged and stored in a manner that ensures material control and accountability, safeguards and security, as well as public and worker safety for at least 50 years until the material is permanently dispositioned -- i.e., "The Stored Weapons Standard." In placing the plutonium into such a storage configuration, the Department further desires to implement the President's Nonproliferation and Export control Policy in a safe, reliable, cost-effective, technically feasible, and timely manner.

The Department has made significant progress toward a materials storage Record of Decision considering the referenced goals, however the options currently under consideration by the Department in the Material Disposition Program (MD) encompass only renovation of existing facilities and/or construction of new facilities at DOE sites thereby limiting options that provide for increased safety, timeliness, and cost effectiveness with less environmental insult. Furthermore the Department has limited itself by considering Storage to be only a domestic issue to be decided by the Secretary of Energy while Disposition is considered an International issue to be decided by a larger audience -- Joint Chief's, etc. 1/01.04.00 2/01.00.00

The Concept

The relatively simple concept for interim storage of plutonium in minuteman missile silos that has significant political (international), cost, materials control and accountability, safety, and environmental impact advantages over the current options should be considered by the Department. This option makes use of existing facilities already designed and constructed for secure storage of plutonium under the most extreme conditions and the supporting infrastructure which is currently providing safety and security assurance for U.S. strategic weapons and associated launch systems. 3/14.00.00

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01 04 00 Comment Number 1

The Department of Energy utilized a screening process to select the alternatives which were analyzed in the PEIS. Safety, timelines, cost, and environmental impacts were factors considered in the screening process and continue to be considered in DOE's decisionmaking process.

01 00 00 Comment Number 2

Both storage and disposition of weapons-usable fissile materials are important domestic and international issues. Decisions made in the United States can influence decisions in Russia, and possibly other foreign nations, and should result in international progress and cooperation to reduce the global nuclear danger.

14 00 00 Comment Number 3

The use of existing facilities at non-DOE sites for storage was considered but eliminated in the screening process. The reasons for the elimination include cost, environmental, safety, and health concerns, and public and institutional acceptance. In the case of a Department of Defense (DoD) site, the additional costs and regulatory requirements for support facilities such as radioactive materials analytical laboratories, radioactive waste treatment, and nuclear material processing facilities associated with long-term storage could be very high. Furthermore, the public and other Government agencies would express concern over creating another DOE nuclear site when several are being phased out.

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Discussion

Utilizing minuteman missile silos for storage of plutonium could be perceived as creating "new" plutonium sites. However, these missile silos have been storing plutonium for almost 30 years in a form and under conditions which pose a much greater risk to the public and workers than what is proposed herein. In fact, this concept would reduce the overall risk to the workers and public, eliminating plutonium sites by consolidating plutonium from several existing DOE sites.

With regard to the direct support facilities needed for packaging disassembly, material analysis, repackaging, and waste management, they are not required under this concept. The Department's proposed Primary Containment Vessels (PCV) could be placed within a third containment/shipping vessel that could be fully instrumented with continuous-remote monitoring -- any detected "inner" problem would cause that vessel to be removed and sent to a processing facility (LANL, for example). In principle this operation would be similar to any needed corrective or maintenance items required for the missiles and the respective nuclear packages today. A two part surveillance program could be implemented that would enhance the Department's knowledge of long-term storage, complementing missile silo storage that could include: 1) a Storage Reliability Evaluation Program and 2) a Shelf-Life Monitoring Program, similar to existing pit surveillance programs.

3/14.00.00 cont.

Utilizing minuteman missile silos for storage of plutonium could be considered as a concept with increased risk since metal and oxide as well as "contained" pits would be stored. Plutonium in pits exist as a metal form, sealed within an inert environment, and packaged in specially designed containers that ensure a very low probability of breach, metal oxidation, and dispersion of oxidation products. Metal pieces and ingots, packaged to the Department's new storage/packaging standard represents a similar packaging configuration with minimal risk similar to that of the pits. The issue is with oxides and their potential dispersibility in various accident scenarios. To mitigate this problem the Department could improve upon the packaging system or simply stabilize the material form to one that is not dispersible. Non-dispersible forms of oxide can in fact be produced through processing that could be at least as simple as the existing proposed oxide stabilization-calcination process without any detriment to proposed disposition alternatives. The Department appears to erroneously assume plutonium oxide is always dispersible from past practices of weapon production processing versus alternatives available for long-term storage.

Utilizing the silos for storage of plutonium would enhance transparency of plutonium storage and operations for purposes of nonproliferation assurance and compliance as well as compliance with nuclear arms reduction and control requirements established by the START treaties (not in DOE's backyard). Not only are the existing silos located in remote and open areas and readily observable through satellite networks, but they could be instrumented with safeguard systems similar to those already developed by SNLA for potential use in dismantlement agreements with Russia to enhance a regime of reciprocal inspections. The Department with interagency coordination could implement this concept in concert with or in addition to the present treaties thereby enhancing the United *State's credibility and flexibility in negotiations on bilateral or multilateral nonproliferation of* weapons-usable fissile material inventories. Dedicated plutonium storage facilities separate from existing Department sites would provide a level of safeguards and security and degree of nonproliferation assurance not reasonably achieved with existing or proposed facilities at DOE sites.

The capability to contain plutonium within a missile silo under the most adverse conditions has been demonstrated both by full scale proof of principle testing and severe accidents which have occurred within active missile silos. As a matter of comparison, Rocky Flat's most natural phenomena resistant facility, Building 371, is designed to about 1/2 Gs and is considered "good," while minuteman missile silos are designed to withstand forces greater than 100 Gs.

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Safeguards requirements could be satisfied through an "item" control and accountability system. This would require a 100% inspection and verification of the plutonium form and quantity that is loaded into each PCV and vessel. In addition to standard Department safeguards, surplus plutonium could be inspected and verified by the Department and IAEA, and/or Russia through a bilateral or trilateral agreement.

Storage of plutonium in minuteman silos should be licensed by the NRC. Independent regulatory oversight of these facilities with clear and definitive conditions and requirements will reassure the stakeholders and state governments that the plutonium is not a significant risk to the workers and the communities or the environment.

Difficulty has been experienced in the design and construction of the new storage facility in Russia – the cost effectiveness and implementation could be greatly expedited under the missile silo concept if utilized in Russia also – a significant improvement for the timeliness of nonproliferation. The same benefits that accrue to the Department and the U.S. would also be realized by the Russian utilization of their similar assets, thus bettering our relative positions in environmental safety and nonproliferation.

The Environmental Impact

Potential impacts to cultural and paleontological resources are eliminated since there is no ground disturbance for this concept, an improvement as compared to the three proposed alternatives (TPA). Again impacts to air quality would be less than the TPA since construction would be limited to modifications within the silos. There would be negligible impacts to community services similar to those of the TPA. There would be no impacts to land use nor any adverse visual resource impact with this concept. Water resource requirements for this concept would be less than the TPA. The potential for environmental justice impacts would be reduced. 3/14.00.00 cont.

Employment and income would generally remain stable in the storage locations with a small increase during the modification activities. Increases could be expected from international inspection and verification activities. DOE sites could expedite the respective cleanup missions which could impact required technical qualifications and worker skills.

The key environmental resource discriminators and issues of public concern are biological resources, waste management, public and occupational health and safety, and transportation. For biological resources and waste management the missile silo concept would have no or negligible impacts. In terms of public and occupational health and safety, the silos offer a far superior facility to any modification or new facility considered by the TPA. Transportation impacts would be similar to that of the proposed Consolidation and Co-location Alternatives.

Technical Description

A minuteman silo is basically a hardened concrete structure extending approximately 80-feet underground with a 12-foot diameter steel tube extending from the top to the bottom of the structure. At the top of the concrete structure is a circular room approximately 28-feet in diameter and 22-feet high. The missile and warheads were housed within the steel launch tube. The on-site launch support and security systems were housed on shock isolation tables in the open bay surrounding the missile tube.

The concrete structure, missile door and support systems are designed and constructed to survive detonation of a nuclear weapon in very close proximity to the silo and permit subsequent deployment of the weapons system. The resultant shock from the nearby detonation of a nuclear

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weapon would subject the silo structure to violent ground motions (and atmospheric over pressure) far exceeding those anticipated from any conceivable earthquake or other natural event.

A high degree of access security is inherent in the silo design and is assured by the Air Force SWAT teams that provide physical security for the active missile fields. Thus, the basic structure of the minuteman missile silos and the existing AF security operations provides a level of physical security and structural integrity and safety that is not reasonably achievable in any new or existing DOE storage vault(s). In addition, all of the missile silos are located in open areas that permit a degree of access transparency for demonstrated assurance of compliance with nonproliferation agreements and commitments that is also not available or readily achievable on existing DOE sites.

In addition to the added reduction of active missile silos, further consideration should be given to the strategic benefits of storing the material in silos that are in the same field of silos that will continue to be operational in the national defense. Future technological enhancements to protect our ability for retaliatory strikes will therefore benefit the protection for the plutonium storage silos also.

In concept the missile silos would be modified for the storage of plutonium similar to LANL's vertical tube storage concept proposed for Rocky Flats and Russia. The primary containment vessels (PCV) could be stored within an additional stainless steel vessel to facilitate handling/transportation and to provide a third inerted containment barrier. Several of these vessels could be stacked in the multiple vertical storage racks of the silo. The storage racks could be spaced and constructed for engineered criticality control and passive cooling. With a PCV loading process and procedures for metal and oxide, for example, that would ensure a 4.5 Kg per PCV, the authorized limit for a PCV, each silo could safely store up to 4.4 MT of plutonium. 3/14.00.00 cont.

The Department in the final decision process is to consider implementation in a cost-effective and timely manner. Preliminary cost estimates provided to MD for long-term interim storage facilities are between $500M and $1B with total life cycle costs at over $4B. Total life cycle costs utilizing mission silos has been reviewed and preliminary estimated by industry experts to be 1/4 to 1/3 of that amount. Greater cost-effective concepts should be seriously evaluated. Rocky Flats proposes to construct a new passive storage facility for about $70M with total life cycle costs of $660M (to 2015). In comparison, four missile silos could be modified for about $35M to contain all 12.9MT of the plutonium presently stored at the Site with a total life cycle cost for 20 years at $150M to $250M, as estimated by industry experts.

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