



**INSTITUTE FOR ENERGY AND
ENVIRONMENTAL RESEARCH**

6935 Laurel Avenue, Suite 201
Takoma Park, MD 20912

Phone: (301) 270-5500
FAX: (301) 270-3029
e-mail: ieer@ieer.org
<http://www.ieer.org>

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Ambassador Linton F. Brooks
Administrator
Department of Energy
National Nuclear Security Administration
Washington DC 20585

Dear Ambassador Brooks,

Thank you for your considered reply to my letter of December 19, 2005 and for asking the Los Alamos Site Office Security Management to review the issue of the plutonium accounting discrepancy of over 300 kilograms. I appreciate and clearly understand your statement that you have "the utmost confidence in the information contained in the facility accountability systems and NMMSS."

While I would like to share your "utmost confidence," I must admit that the failure of your letter and the accompanying letter from Michael Ferry to make any mention of the fact that NMMSS plutonium accounting has booked as much as 610 kilograms of plutonium to the Los Alamos waste streams makes this rather difficult. As I noted in my analysis, this represents a loss to waste of about 1 kilogram of plutonium per pit produced at Los Alamos, which is about 20 times the loss per pit produced at Rocky Flats. This means that pit production at Los Alamos involved losses to waste streams of plutonium that cost hundreds of millions of dollars *over and above* the losses that would have been caused if Los Alamos losses were of the same order of magnitude as those at Rocky Flats. As Los Alamos prepares to enter a new era of pit manufacture, a close inquiry into what can only be described as huge losses of plutonium per pit – on the order of 20 percent – is surely warranted if only on grounds of safety. For reference, even the fraction of uranium in waste at Fernald, which was, as you know, not famous for the care with which it processed materials, was an order of magnitude lower than the 20 percent implicit in the Nuclear Materials Management Safeguards System account.

Further, the creation of one kilogram of plutonium waste per warhead has serious questions for the safety and security of operations inside the secure plutonium processing areas. Your conclusion regarding the soundness of the 610 kilogram figure for plutonium in Los Alamos waste implies considerable problems within the secure areas in the handling and processing of plutonium – far above the level at the Rocky Flats site, which had its own problems in these areas, with many fires, big and small, and other accidents and incidents. In your letter you said that "[o]nly forms and quantities of SNM that meet documented waste criteria are removed from the safeguards organization...." However, a 20 percent loss rate for plutonium indicates that plutonium residues, turnings, and filings may well have been part of the waste. Pure plutonium can be recovered from such waste forms by relatively straightforward and

well-known chemical processing steps. This indicates the potential for some security risk even if the accounting is as stated in your letter. Moreover, 1 kilogram of waste per warhead is an average figure over five decades. Given that variations undoubtedly occurred, some warheads and periods likely had wastes far in excess of 1 kilogram per warhead, making the potential for waste related security risks even greater for these periods.

You did not comment on the fact that the accounted for plutonium in the Los Alamos waste accounts only adds up to about 291 kilograms (at most) – more than 300 kilograms short of the 610 kilograms booked to waste in the NMMSS account. By asserting that the latter account is correct and that you have the utmost confidence in it, I must presume that you are implying that the waste accounts are wrong by more than a factor of two. This is very troubling on a number of counts. First, even if the NMMSS account is correct, the corresponding assertion by Mr. Ferry in his letter of February 12, 2006, attached to your own, that “the discrepancy does not relate to a loss of control of nuclear material” is not a necessary corollary. On the contrary, given the clear possibility that recoverable plutonium in the form of high concentration residues may have been discharged as waste, diversion of highly concentrated wastes is not out of the question. Therefore, given the magnitude of losses per warhead, a more detailed security investigation of the nature of the wastes, and not just the policies regarding what could be discharged as waste, is clearly called for. Los Alamos has had a number of policies to ensure security that have not been closely followed over the years. In light of that, I continue to believe that this matter deserves closer scrutiny than it may have been given so far. If these aspects have already been examined, I would appreciate some detail (please see below).

There is another troubling issue. If the accounting of plutonium in waste was correct up to the time that the waste was handed to “a waste management organization,” what happened to the plutonium accounts afterwards? How did the waste data become inaccurate and corrupted? On July 18, 2000, in response to an earlier IEER report, *Containing the Cold War Mess*, then-Assistant Secretary of the DOE for Environmental Management (EM), Carolyn Huntoon, wrote to me as follows:

Your 1997 report indicated that DOE's "Official data on the volume, mass, and radioactivity of buried transuranic waste and transuranic soil are inconsistent and contradictory. There does not appear to *be any scientific basis* on which data are entered and changed from one year to the next, and one document to the next." The *DOE agreed with this criticism* and, in response, committed to "undertake a review and update of its information on its inventory of buried TRU wastes as well as the status of remedial decisions proposed or made to date." The DOE further committed to update the information using consistent and documented assumptions. [emphasis added]

I also intend to raise the issue of the problem of how much plutonium really is in Los Alamos waste with DOE EM and with the Environmental Protection Agency regarding the health and environmental implications of major inaccuracies in waste management.

Therefore I am not making a judgment at this time that the NMMSS number is wrong – nor did I do that before. But, given the magnitude of the issues at stake I believe further explanation from NNSA of the following is clearly needed:

- What investigation was done by the Los Alamos Site Office Security Management in arriving at the conclusion that “the discrepancy does not relate to a loss of control of nuclear material”?
- Why was the average waste per warhead at Los Alamos twenty times higher than at Rocky Flats and what was the variation in waste per warhead over time?
- Why was the Los Alamos waste as much as 20 percent of the plutonium processed in producing pits there, and often more?
- What is the potential for waste-related security risks arising from concentrated forms of plutonium in waste being sent out of the security perimeter to what you call “a waste management organization,” by which I presume you mean the part of the Department of Energy responsible for radioactive waste?
- How did DOE waste management change the figures of amounts of plutonium in waste after they left the perimeter of the facility accountability system to the point that they had no scientific basis?
- What are the security implications of having two sets of accounts of plutonium in waste that differ by more than 300 kilograms and what is the basis for the assurance that wastes with significant plutonium concentrations were not lost to site control?

Finally, your letter implies that plutonium management within the security perimeters where weapons plutonium was handled was very careful and sound. This indicates that no change in procedures and practices is necessary. However, I believe that the clear conclusion of your assertion regarding the soundness of the accounts is that Los Alamos generated an enormous – and, in my view, unacceptable – amount of waste averaging one kilogram per warhead. It was probably considerably more than that in certain periods. This indicates to me that a review of the procedures and the *actual* practices followed in plutonium handling within the facility accountability systems is urgently needed in order to determine which ones led to waste of hundreds of millions of dollars of plutonium, if only to ensure that such problems are not repeated as you proceed to produce more pits.

Again, I truly appreciate the seriousness with which you have taken the analysis done by Institute for Energy and Environmental Research and the review that you and the Los Alamos Site Office Security Management have given it. Unfortunately the nature and magnitude of the problem calls for a deeper probe into the plutonium discrepancy, including the policies and practices that led up to the discharge of one kilogram of plutonium per warhead into waste streams. I will copy you on my correspondence with the DOE Inspector General’s office and with the EPA.

Yours sincerely,

Arjun Makhijani, Ph.D.

President, Institute for Energy and Environmental Research

cc: Samuel Bodman, Secretary of Energy

A.J. Eggenberger, Chairman, DNFSB

Michael Ray Ferry, Assistant Manager, OSM