



Los Alamos Study Group

Nuclear Disarmament • Environmental Protection • Social Justice • Economic Sustainability

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Prepared Testimony

LASG v. DOE/NNSA, Case 1:10-cv-00760-JCH-ACT

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Who are you?

A nuclear physicist by training and a Professor of Public and International Affairs at Princeton University, Since 1973, I have worked on nuclear-weapon, nuclear-safety and nuclear-material policy issues as a university researcher, a government official and a government advisor.

My CV has been submitted to the Court.

What is your experience relevant to the CMRR-NF?

I have followed the debate over the need for a national pit-production capability since I co-authored the American Physical Society's¹ 2004 review of the National Nuclear Security Administration's (NNSA's) proposal to construct a "Modern Pit Facility." The title of the report summarized its conclusion: *The Modern Pit Facility (MPF): No urgency for a MPF, Address key technical issues before proceeding.*²

That review was a significant contributor to the NNSA's decision to withdraw its proposal and opt instead to stay with the capability that it already had and could upgrade at the Los Alamos Plutonium Facility. It is relevant to the current case, however, to note that the budgetary impact of the estimated \$2-4 billion cost of the Modern Pit Facility was a major concern at the time. Now we are discussing a proposed auxiliary facility to the Plutonium Facility whose cost has grown to an estimated \$3.7-5.8 billion.³

I also have done research on nuclear safety, including the consequences of plutonium-dispersal accidents such as the potential plutonium fires that have made the design of the CMRR-NF such a challenge.⁴

I also have been a close observer of the process by which the CMRR-NF became a bargaining chip in the US debate over the ratification of the New START Treaty.

Why do you think that there is a need for a brand-new study of alternatives to the CMRR-NF?

In addition to the enormous increase in the estimated cost of the CMRR-NF, there have been changes in the situation since the 2003 EIS that bring into question the need for this facility and have greatly increased the environmental challenge that it represents:

1. The need for large-scale pit production has vanished; and
2. The earthquake hazard at the Los Alamos National Laboratory has been found to be much larger than had been believed.

The need for large-scale pit production has vanished. In 2003, the National Nuclear Security Administration was arguing that the country needed the capability to produce 125 to 450 pits per year by 2020 to replace the

¹ The APS is the professional of American physicists.

² *The Modern Pit Facility (MPF): No urgency for a MPF, Address key technical issues before proceeding* (American Physical Society, Panel on Public Affairs Report, 2004) <http://www.aps.org/policy/reports/popa-reports/index.cfm>.

³ *Department of Energy, FY 2012 Congressional, Budget Request*, Vol. 1, pp. 156, 225, <http://www.cfo.doe.gov/budget/12budget/Content/Volume1.pdf>.

⁴ Steve Fetter and Frank von Hippel, "The Hazard from Plutonium Dispersal by Nuclear-warhead Accidents," *Science & Global Security*, Vol. 2 (1990), http://www.princeton.edu/sgs/publications/sgs/pdf/2_1Fetter.pdf, p. 21.

pits in the US weapon stockpile that would be 30 to 40 years old by then – an unprecedented age.⁵ But, in 2006, we learned that US pits were so well made that, according to a Congressionally-mandated review of Los Alamos and Livermore studies on pit aging, “Most primary types have credible minimum lifetimes in excess of 100 years as regards aging of plutonium; those with assessed minimum lifetimes of 100 years or less have clear mitigation paths that are proposed and/or being implemented.”⁶

Also, in contrast to the situation during the Cold War, US pit designs are not being made obsolete by the nuclear arms race with the Soviet Union. As stated in the Administration’s 2010 *Nuclear Posture Review Report*,⁷ it is U.S. policy to “not develop new nuclear warheads.” Although the Los Alamos and Livermore National Laboratories have been lobbying to develop and manufacture new-design “reliable replacement warheads,” and the Bush Administration supported the idea, Congress refused in 2007 to fund the program.⁸

The *Nuclear Posture Review Report* states further that, “In any decision to proceed to engineering development for warhead LEPs [Life Extension Programs], the United States will give strong preference to options for refurbishment or reuse. Replacement of nuclear components would be undertaken only if critical Stockpile Management Program goals could not otherwise be met, and if specifically authorized by the President and approved by Congress.”⁹

This means that the preferred strategy is to reuse existing pits where necessary, or simply refurbish the balance of the warhead. This latter strategy is already being implemented in the on-going life extension program of the warhead that is the most central to the US deterrent, the W76 warhead that is carried by US ballistic submarines. Extension by 30 years of the lifetimes of more than one thousand W76s is at approximately mid-course and planning for pit reuse in the next life extension program, that of the B61 bomb, the most important nuclear bomb in the US stockpile, is underway.¹⁰

As of the end of Fiscal Year 2009, the total size of the U.S. warhead stockpile was about 5,000 warheads – half its size in 2003¹¹ -- and about 14,000 pits recovered from warheads made excess by the end of the Cold War were in storage at the Pantex warhead assembly/disassembly facility in Amarillo.¹² Some thousands of these are being kept as a strategic pit reserve. There will be no shortage of pits to reuse.

The earthquake hazard at the Los Alamos National Laboratory has been found to be much larger than had been believed. There has been the dramatic increase in the estimated seismic hazard to Los Alamos facilities since 2003. The 2500-year earthquake acceleration at the surface of the site is now estimated to be about the same as that which was experienced at the Fukushima-Daiichi nuclear power plant in March and the 10,000-year

⁵ Draft Supplemental Programmatic Environmental Impact Statement on Stockpile Stewardship and Management for a Modern Pit Facility (Department of Energy, DOE/EIS-0236-S2; 2003) Chapter 2, “Purpose and Need,” http://nepa.energy.gov/nepa_documents/docs/deis/DEIS0236S2/vol_1/Ch_2.pdf p. 2-6.

⁶ *Pit Lifetime*, JASON report JSR-06-335, 2006, submitted by NNSA Administrator Linton Brook to Congress on 28 November 2006, unclassified Executive Summary, <http://www.fas.org/irp/agency/dod/jason/pit.pdf>.

⁷ *Nuclear Posture Review Report* (US Department of Defense, 2010) <http://www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf>, p. 39.

⁸ National Defense Authorization Act for Fiscal Year 2008 [H.R. 4986], Sec. 3111. “*Reliable Replacement Warhead Program*, <http://www.gpo.gov/fdsys/pkg/BILLS-110hr4986enr/pdf/BILLS-110hr4986enr.pdf>. No funds appropriated pursuant to the authorization of appropriations in section 3101(a)(1) or otherwise made available for weapons activities of the National Nuclear Security Administration for fiscal year 2008 may be obligated or expended for activities under the Reliable Replacement Warhead program under section 4204a of the Atomic Energy Defense Act (50 U.S.C. 2524a) beyond phase 2A activities.” Phase 2A is “Design definition and cost study,” <http://www.acq.osd.mil/necbdp/nm/nmbook/chapters/ch2.htm>.

⁹ *Nuclear Posture Review Report*, *op. cit.*, p. 39.

¹⁰ *Department of Energy, FY 2012 Congressional Budget Request*, *op. cit.* Vol. 1, pp. 50, 61, 63. The number of W76 warheads is classified but is almost certainly more than 1000.

¹¹ “Increasing Transparency in the U.S. Nuclear Weapons Stockpile,” US Department of Defense, May 3, 2010, http://www.defense.gov/npr/docs/10-05-03_fact_sheet_us_nuclear_transparency_final_w_date.pdf.

¹² Robert Norris and Hans M. Kristensen, “U.S. Nuclear Forces, 2010,” *Bulletin of the Atomic Scientists*, May/June 2010, p. 57, <http://www.thebulletin.org/files/066003008.pdf>.

earthquake acceleration is twice as large.¹³ This is of great concern for facilities containing a large amount of plutonium that might be exposed to an earthquake-caused fire. The draft SEIS emphasizes the challenges of upgrading CMR but it has been necessary to go back to the drawing board to redesign the CMRR-NF and the Plutonium Facility also has to be upgraded.

A striking example of the absurdity of the design requirements that have been used to justify the CMRR-NF is the assumption that it must be designed to hold 6,000 kilograms of plutonium.¹⁴ This makes the off-site consequences of a plutonium fire potentially very large.

Six thousand kilograms is roughly the amount of plutonium in 1500 warheads – the entire US deployed strategic arsenal under New START and almost 20 years production of pits at the Plutonium Facility’s planned design capacity.¹⁵ But the principal justification for the CMRR facility is to analyze samples of plutonium from the Plutonium Facility. Such samples must typically be grams out of the kilograms of plutonium in a pit. Apparently 10 to 15 samples are taken per pit.¹⁶ It would take gram-sized samples from hundreds of thousands of pits to cumulate to 6,000 kilograms of plutonium.

The Plutonium Facility already contains a large amount of plutonium. Given the challenge of making such facilities earthquake resistant, why should Los Alamos have two such facilities? Serious consideration should be given to moving the essential capabilities of CMRR-NF into the Plutonium Facility. There are reasons to believe that this could be a serious alternative.¹⁷

¹³ Ivan Wong, et al, *Update of the Probabilistic Seismic Hazard Analysis and Development of Seismic Design Ground Motions at the Los Alamos National Laboratory* (URS Seismic Hazards Group, 2007) http://www.lasg.org/CMRR/Litigation/Mello_aff1_ref/Par16_Ref1_PSHA_report_May2007.pdf. Table ES-1 gives 2500-year peak ground horizontal and vertical accelerations of 0.52 and 0.6 g respectively with 10,000-year accelerations approximately twice as large. The previously assumed horizontal peak ground acceleration was 0.3 g, *Draft CMRR Supplemental EIS*, Chapter 4, “Environmental Consequences,” <http://nnsa.energy.gov/nepa/cmrrseis>, p.4-3. For comparison, the peak acceleration reported at the Fukushima Daichi plant was 507 gal or 0.52 g, Japan Atomic Industrial Forum, “Status of Fukushima #1 power station as of 06:00, March 20, 2011,” http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300579753P.pdf.

¹⁴ DOE/EIS-0350; *Final Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico*, Appendix C, http://nepa.energy.gov/nepa_documents/EIS/EIS0350/AppendixC.pdf, p. 10.

¹⁵ The DOE informed that National Academy of Sciences that, for planning purposes for its study on disposition options for its excess weapon-grade plutonium, it could assume that the average US nuclear weapon contains 4 kg of plutonium, *Management and Disposition of Excess Weapons Plutonium* (National Academy Press, 1994) http://books.nap.edu/openbook.php?record_id=2345&page=19, p. 19. See also *Restricted Data Declassification Decisions: 1946 To The Present* (DOE, RDD-8, 2002), <http://www.fas.org/sgp/othergov/doe/rdd-8.pdf>, p. 23, item 33a. The current design capacity of the Plutonium Facility is 80 pits year, “Completion/Validation Statements...Measure 1.13 Build Six New W88 Pits & Install Equipment in FY 2008 to increase Pit Capacity to 80 Pits per Year by the Operational Date of a CMRR-Nuclear Facility,” *FY 2008 Performance Evaluation Report for the Los Alamos National Security, LLC’s Management and Operation of the Los Alamos National Laboratory Contract No. DE-AC52-06NA25396, Performance Period October 1, 2007 Through September 30, 2008* (NNSA, 2008), http://lasg.org/documents/FY2008_PER.pdf, p. 12.

¹⁶ Government Accountability Office, *NNSA Needs to Establish a Cost and Schedule Baseline for Manufacturing a Critical Nuclear Weapon Component*, <http://www.gao.gov/new.items/d08593.pdf>, p. 20.

¹⁷ According to a recent Government Accountability Office report, only 35% of the area in the Plutonium Facility has been made available for pit production and certification. Much of the remaining space is allocated to vague missions such as “for readiness in technical base and facilities” (29%) or for missions that are to be transferred elsewhere, such as the disposition of plutonium from excess pits in mixed-oxide fuel, *NNSA Needs to Establish a Cost and Schedule Baseline for Manufacturing a Critical Nuclear Weapon Component, op. cit.*, p. 22. The Secretary of Energy’s Advisory Board has issued a scathing review of the inefficiency of pit production operations in the Plutonium Facility. This may extend to the use of space there, Secretary of Energy Advisory Board, *Recommendations for the Nuclear Weapons Complex of the Future*, July 13, 2005, http://www.globalsecurity.org/wmd/library/report/2005/nwcitf-rept_13jul2005.pdf, Appendix H, “Industrial Benchmarking.”

In your view, is there time to reopen the issue of alternatives to the CMRR-NF?

There is ample time to revisit the question of alternatives to the CMRR-NF. The Plutonium Facility is a very capable facility without CMRR-NF and is currently slated for major upgrades.¹⁸ Its current defense missions include inspecting sample pits and maintaining the capability to manufacture new pits if needed. It has demonstrated that capability and equipment has been installed to give it the capability to manufacture up to 60 pits per year in 2020 without CMRR-NF.¹⁹

In any case, as I have explained, there are currently no foreseen requirements for the Plutonium Facility to manufacture pits.²⁰ There is therefore time to get this decision right.

Why then, with this huge cost over-run and lack of mission, is the Administration pushing so hard to build the CMRR-NF?

The Administration is indeed pushing hard. This appears to be primarily because a number of Republican Senators extracted a commitment from the Administration to build the CMRR-NF and a facility for producing weapon-components containing highly-enriched uranium at the DOE's Y-12 site in exchange for their votes to ratify the New START Treaty, which occurred on December 22, 2010.

This deal was noted in a December 2, 2010 opinion piece by six former Republican Secretaries of State:²¹

“the Obama administration has agreed to provide for modernization of the infrastructure essential to maintaining our nuclear arsenal. Funding these efforts has become part of the negotiations in the ratification process. The administration has put forth a 10-year plan to spend \$84 billion on the Energy Department's nuclear weapons complex. Much of the credit for getting the administration to add \$14 billion to the originally proposed \$70 billion for modernization goes to Sen. Jon Kyl, the Arizona Republican who has been vigilant in this effort.”

In a November 17, 2010 press release, the White House made clear its understanding of what the extra funds were for and indicated that money would be no object:

“As the UPF [Uranium Production Facility] and CMRR facilities are only at the 45 percent design level, the Administration recognizes that the costs could change over time. At the present time, the range for the Total Project Cost for CMRR is \$3.7 billion to \$5.8 billion and the range for UPF is \$4.2 billion to \$6.5 billion. The Administration is committed to requesting the funds necessary to ensure completion of these facilities.”²²

In the end, Senator Kyl did not vote to ratify the New START Treaty. My guess is that, if this Court required it, some in the Obama Administration would welcome being forced to have a relook at alternatives to the CMRR-NF.

¹⁸ TA-55 Upgrade Project, Phase II, *Department of Energy, FY 2012 Congressional, Budget Request, op. cit.* Vol. 1, p. 175-184.

¹⁹ Annex D. *FY2011 Biennial Plan and Budget Assessment on the Modernization and Refurbishment of the Nuclear Security Complex* (DOE, May 2010), http://www.fas.org/programs/ssp/nukes/nuclearweapons/SSMP2011_annexD.pdf, Table D-2.

²⁰ *Department of Energy, FY 2012 Congressional, Budget Request, op. cit.* Vol. 1, p. 74.

²¹ Henry A. Kissinger, George P. Shultz, James A. Baker III, Lawrence S. Eagleburger and Colin L. Powell, “Why New START deserves GOP support,” *Washington Post*, 2 Dec. 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/12/01/AR2010120106292.html>.

²² “An Enduring Commitment to the U.S. Nuclear Deterrent,” White House, 17 November 2010, <http://www.whitehouse.gov/the-press-office/2010/11/17/fact-sheet-enduring-commitment-us-nuclear-deterrent>. See also *November 2010 Update to the National Defense Authorization Act of FY2010 Section 1251 Report New START Treaty Framework and Nuclear Force Structure Plans*, http://www.lasg.org/CMRR/Sect1251_update_17Nov2010.pdf.