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Comments of the Institute for Energy and Environmental Research on the National Nuclear Security Administration of the Department of Energy in its *Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement* (DOE/EIS-0236-S4), December 2007

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The following are IEER's comments on the National Nuclear Security Administration (NNSA) of the Department of Energy in its *Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement* (Draft SPEIS) for the transformation of its nuclear complex to make it "smaller, and more responsive, efficient and secure."¹ The comments are divided in two parts.

As a preliminary statement, it should be noted that the NNSA failed to respond to a number of comments that IEER submitted on 17 January 2007 on the *Notice of Intent to Prepare a Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement – Complex 2030*, October 19, 2006. Specifically, the NNSA did not address

- The environmental impacts of the resumption of testing
- At least one alternative examining a configuration for accomplishment of Complex 2030, now called Complex Transformation, goals without the inclusion of Los Alamos National Laboratory (LANL). On the contrary, Los Alamos is chosen in the "Preferred Alternative" as the site for plutonium pit manufacturing without discussion of the security issues that have plagued Los Alamos.
- The need for any new pit manufacturing, given that existing plutonium pits are expected to have a lifetime in excess of 85 years. Instead, the Draft SPEIS, in its no action alternative, keeps the status quo that consists of the potential production of 20 pits per year at LANL.²
- The global environmental and security impacts of continued U.S. manufacturing of pits and the global impacts in case the U.S. resumes testing.

¹ Draft SPEIS 2007, p. S-1 (U.S. Department of Energy, National Nuclear Security Administration, *Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement*, DOE/EIS-0236-S4, December 2007, at <http://www.eh.doe.gov/NEPA/docs/deis/deis0236S4/index.htm>).

² Draft SPEIS 2007, p. S-20.

While we do not expect that the NNSA would agree with our comments, we do expect that if substantive comments are rejected, some reason would be provided by NNSA as part of the analysis of why certain alternatives and details were chosen for analysis and others were rejected.

Each of the comments below contains one or more recommendations for what should be incorporated into the Final SPEIS for it to be a credible and sound document in terms of considering reasonable alternative courses of action and evaluating potential environmental impacts, as required under NEPA.

Introduction

The “preferred alternative” specified in the Draft SPEIS has the following major elements:

- Plutonium manufacturing at Los Alamos National Laboratory, at a rate of 50 to 80 pits (the nuclear triggers of thermonuclear warheads) per year as well as plutonium research and development,
- Manufacturing of uranium warhead components at Y-12, in Oak Ridge, Tennessee, as well as uranium research and development,
- Assembly and disassembly of nuclear warheads, high explosive production, and smaller scale high explosive testing at Pantex, near Amarillo, Texas,
- Storage of Category I and II Special Nuclear Material at Pantex, requiring the highest level of security,³
- Consolidation of tritium research and development at Savannah River Site (along with continued tritium production in commercial nuclear reactors belonging to the Tennessee Valley Authority),
- Maintenance of the Nevada Test Site in readiness to test nuclear weapons and larger scale high explosive testing (more than 10 kilograms of high explosives).⁴

Some other elements include research and development of high explosives at Lawrence Livermore National Laboratory and very small-scale (less than one kilogram) high explosives testing and other research at Sandia National Laboratory.

Comment 1: Costs range is not presented

The Draft SPEIS claims that the changes that the complex would undergo could result in reduced costs.⁵ However, NNSA's Complex Transformation plan would continue Cold War levels of spending on nuclear weapons work, more than \$6 billion annually, for at least the next 25 years.⁶

³ Draft SPEIS 2007, p. S-2.

⁴ Draft SPEIS 2007, Section 3.17; Washington Savannah River Company, *SRS Tritium Facilities*, Facts About the Savannah River Site, Aiken, SC: SRS, January 2008, at <http://www.srs.gov/general/news/factsheets/TF.pdf>; *Nuclear Posture Review*, Submitted to Congress on 31 December 2001, Excerpts at <http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm>.

⁵ Draft SPEIS 2007, p. S-1

⁶ Tom Clements, “DOE on that \$150 billion for rebuilding the complex,” e-mail on February 23, 2008, to the ANA Bananas listserv, quoting George C. Allen Jr., Director of the DOE's Office of Transformation.

This does not include long-term cleanup and decommissioning. Nor does it take into account the Department of Energy’s (DOE) tendency to vastly underestimate costs of major projects. Table 1 shows cost escalations in some of DOE’s large projects.

Table 1: Cost data in some major Department of Energy projects

Project	Early Estimate	Later Estimate
Superconducting Super-collider	\$5.3 billion (1987)	\$8.25 billion (1991)
National Ignition Facility	\$2.03 billion (FY1998)	\$3.26 billion (June 2000)
Savannah River Site Defense Waste Processing Facility	\$1.2 billion (1987)	\$3.9 billion (1992) (\$2.1 billion plus \$1.8 billion for supporting facilities)
Hanford Tank Waste Project (Phase I)	\$4.3 billion (before September 1996)	\$8.9 billion (August 1998)
All High-Level Waste Management Programs	\$63 billion (1996)	\$105 billion (2003)
Fernald Vitrification Project	\$14.1 million (February 1994)	\$20.6 million (December 1994) \$56 million (July 1996) \$66 million (September 1996)
Yucca Mountain	\$17.5 billion (30 year cost estimated in 1990 adjusted to year 2000 dollars)	\$58 billion (100 year cost estimated in 2000) DOE contractors said cost was understated by \$3 billion since repository would not likely open in 2010 as claimed

Sources: GAO/RCED-93-87 p. 2, GAO/RCED-97-63 p. 5, GAO/T-RCED-99-21 p. 2-4, GAO-02-191 p. 19, GAO/T-RCED-93-58 p. 8, GAO-03-593 p. 17, GAO/RCED-92-183 p. 3, and Rowberg 2001⁷ p. CRS-3 and CRS-5

Recommendation 1: *The Final SPEIS should provide a range of costs, with the upper end of the range based on an analysis of the cost overruns of major projects, such as the ones mentioned above, with all overruns to the present time included.*

Comment 2: There is no need for new pit production

The NNSA claims that its needs to continue the production of plutonium pits to maintain a reliable stockpile because of plutonium aging. The need for continued production of plutonium pits is dubious. A recent study by the JASONs, an elite group of scientists who regularly provide analysis and advice to the government, including on nuclear weapons matters, concluded that the expected lifetime of existing plutonium pits was on the order of 100 years:

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.

⁷ Richard Rowberg, *The National Ignition Facility: Management, Technical, and Other Issues*, CRS report for Congress, Order code RL30540, Congressional Research Service, updated November 8, 2001

The Laboratories have made significant progress over the past 3-5 years in understanding plutonium aging and pit lifetimes. Their work is based on analyses of archival underground nuclear-explosion testing (UGT) data, laboratory experiments, and computer simulations. As a result of the Los Alamos/Livermore efforts, JASON concludes that **there is no evidence from the UGT analyses for plutonium aging mechanisms affecting primary performance on timescales of a century or less in ways that would be detrimental to the enduring stockpile.**⁸ [emphasis added]

There is no need therefore for enhanced pit production capability, or indeed any pit production capacity at all. This appears to be little more than a vast and continuing pork barrel program for the nuclear weapons establishment.

Any arguments related to safety and reliability would either be related to secondary components or to the non-nuclear components. New pit production capacity is not relevant to these concerns, should they be legitimate. Moreover, in the context of the disarmament requirements of the NPT, they are not legitimate.

Recommendation 2: *An alternative of no pit production should be included in the Final SPEIS. It is certainly one reasonable alternative, without which the SPEIS would be fundamentally incomplete.*

Comment 3. An option without Los Alamos needs to be considered

The competition between Livermore and Los Alamos for the design of the nuclear components of the so-called “Reliable Replacement Warhead” was “won” by Livermore. Moreover, Los Alamos has had many security-related problems. In January 2007, the Director of NNSA was relieved of his responsibilities, at least partly due to LANL’s repeated major security problems and scandals.⁹

One of the most important problems at LANL, but one that yet has not been fully investigated, has been its poor plutonium accounting as it relates to waste. There are two sets of books on plutonium accounts. One of these, the Nuclear Materials Management and Safeguards System (NMMSS), the master nuclear materials account, is at variance with the waste account, notably that compiled by LANL for the U.S. Environmental Protection Agency (EPA) as part of its program to send transuranic wastes to the Waste Isolation Pilot Plant (WIPP) for deep geologic disposal. A study by IEER has shown that the NMMSS account and WIPP account for plutonium in waste cannot both be right at the same time (though they may both be wrong).¹⁰ The discrepancy amounts to about 300 kilograms. There are potentially serious environmental implications if the amount in waste is greater than now believed by 300 kilograms. There are potentially serious security implications if the NMMSS account is short by 300 kilograms.

⁸ JASON Program Office, *Pit Lifetime*, R.J. Hemley, et al., JSR-06-335, MITRE, McLean, VA, January 11, 2007, p. 1. (“Approved for public release”).

⁹ “Statement from Linton Brooks,” January 4, 2007, at http://www.nnsa.doe.gov/docs/newsreleases/2007/PR_2007-01-04_NA-07-01.pdf.

¹⁰ The analysis of this assertion is to be found in IEER’s report, *Dangerous Discrepancies*, at www.ieer.org/reports/lanl/weaponspureport.pdf.

Repeated attempts to get the DOE and the NNSA, as well as the EPA, to seriously investigate this problem, which amounts to 60 bombs worth of plutonium, have failed.¹¹ IEER has received assurances from NNSA that the NMMSS account is correct. We have also received assurances from the EPA that the WIPP account is correct. These statements cannot both be correct – it is arithmetically impossible.

There have been other security-related scandals at Los Alamos, going back to the Manhattan Project, when the plutonium bomb design was stolen and given to the Soviets. More recently, in 2006, an employee was able to walk away with highly classified documents on a flash drive, which was found in a house-trailer.¹²

Further, plutonium, strontium, and other radionuclides have found their way into groundwater near Los Alamos. Because of past dumping, storm water in the canyons as well as groundwater nearby is contaminated – in excess of drinking water standards in some cases (see Tables 2 and 3). While the water is not used for drinking, it does flow into the Rio Grande.

Table 2: Some storm water data for canyons near LANL in picocuries per liter

	Onsite canyons	Mortandad Canyon	Drinking water standard	Drinking water standard, if all 3 radionuclides are present equally
Americium-241	15	40	15	5
Plutonium-238	15	50	15	5
Plutonium-239/240	10	30	15	5

Values estimated from graphs in the 2006 Draft LANL SWEIS, Appendix F, Figures F-13, F15, and F-16; Standard from 40 CFR 141.66 2005.¹³

¹¹ Correspondence with the EPA, DOE, NNSA, can be found at www.ieer.org/latest/pudiscrepanciesindex.html.

¹² For a record of the many security-related infractions at Los Alamos, see the compilation by the Project on Government Oversight at <http://www.pogo.org/p/homeland/ha-071212-lanl.html> and the related document URLs at that location and at <http://www.pogo.org/p/environment/eo-losalamos.html>.

¹³ U.S. Department of Energy, National Nuclear Security Administration. Los Alamos Site Office, *Draft Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico*, DOE/EIS-0380D, June 2006, at <http://www.eh.doe.gov/nepa/docs/deis/eis0380d/index.html> and *Code of Federal Regulations. Title 40--Protection of Environment. Chapter I--Environmental Protection Agency. Part 141--National Primary Drinking Water Regulations*, 7-1-05 Edition, at http://www.access.gpo.gov/nara/cfr/waisidx_05/40cfr141_05.html.

Table 3: Groundwater contamination near LANL, 2001-2004 in picocuries per liter

	Canyon alluvial groundwater systems	Other springs	San Ildefonso Pueblo	Drinking water standard
Americium-241	0.5	0.03	0.02	15
Plutonium-238	0.6	0.015	2.0	15
Plutonium-239/240	0.25	0.015	0.01	15
Strontium-90	20	50	0.2	8

Values estimated from graphs in the 2006 Draft LANL SWEIS, Appendix F, Figures F-1, F-3, F-4, and F-5; Standard from 40 CFR 141.66 2005.¹⁴

Recommendation 3: *In light of the multiple problems at Los Alamos and the fact that Livermore was given the role of new pit design, one alternative without a Los Alamos in Complex Transformation, in which the existing pit production at Los Alamos is terminated, should be considered.*

Comment 4. Consequences of a resumption of nuclear testing have not been examined

One element of the NNSA plan is the Reliable Replacement Warhead (RRW) program, though the Draft SPEIS claims that it is not essential to the Complex Transformation it seeks.¹⁵ The RRW program aims to create a new generation of nuclear weapons that are more reliable, easier to maintain, and more secure in the sense of preventing unauthorized use.¹⁶ Even if the specific RRW under investigation is not manufactured, new pit manufacturing could create significant uncertainties.

There is a reasonable likelihood that nuclear weapons that incorporate new pit designs will have to be tested before they can be certified as safe and reliable components of the U.S. nuclear arsenal. IEER recognizes that the goal of the Stockpile Stewardship Program has been to certify “the safety and reliability of nuclear weapons without underground testing.”¹⁷ However, the introduction of newly designed pits, rather than the use of existing pits that have already been certified after the testing of existing weapon types, clearly raises the possibility that one or more types of nuclear warheads incorporating these new pit designs will need to be tested before they can be certified for the U.S. nuclear arsenal.

The possibility of testing has arisen already within official circles in the form of a refusal to make commitments on testing:

¹⁴ *ibid.*

¹⁵ Draft SPEIS 2007, Section 2.5.8.

¹⁶ For more information on RRW, see NNSA's March 2007 fact sheet, "Reliable Replacement Warhead Program," at www.nnsa.doe.gov/docs/factsheets/2007/NA-07-FS-02.pdf.

¹⁷ Stockpile Stewardship Program, *op.cit.*, at http://www.nv.doe.gov/library/FactSheets/DOENV_1017.pdf.

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On Friday, Bryan Wilkes, a spokesman for the National Nuclear Security Administration of the Energy Department, said the government would not proceed with the Reliable Replacement Warhead "if it is determined that testing is needed." But other officials in the administration, including Robert Joseph, the under secretary of state for arms control and international security, have said that the White House should make no commitment on testing.¹⁸

Hence, even before a single spadeful of dirt has been turned to implement the new plan, government officials in positions of authority are not in accord. Moreover, once built, there is no guarantee that the specific uses to which the facilities will be put in 2030 or 2040 or 2050 are those that are envisioned today in terms of the types of pits that will be manufactured or the design goals that those weapons must meet. Meeting the requirements of the Department of Defense (DOD) and national security decision-makers is the stated goal of the Complex Transformation program. The Reliable Replacement Warhead program may be initiated with the intent that the warhead would not require testing, but that intent could fall by the wayside if, for instance, the directors of the national laboratories or DOD decision-makers decide after the initial pits are built that testing is needed for safety and/or reliability.

Testing is made even more likely by the recent poor record of the DOE in its performance on major technical projects, as discussed above. Design and manufacturing of a new pit that would be the key component of a warhead that could be certified without testing would be an enormous challenge under any circumstances. Under the management of the DOE as it has operated for the last two decades, the likelihood of testing and the environmental harm that it would cause is considerably greater. Management problems and unforeseen problems in design or new design requirements arising out of new functions of nuclear weapons in DOD's planning or any combination of these factors could lead to a lack of confidence in the reliability of new pits without testing. There is a reasonable likelihood that new pit designs will necessitate testing, especially given DOE's poor track record in major technical projects.

Testing is one reasonable and potential foreseeable consequence of embarking on new pit designs and should be evaluated. This evaluation should take into account the research that has been done at the Nevada Test Site (NTS) that indicates that plutonium in colloidal form may travel much faster than believed when testing was being carried out¹⁹ as well as other research on potentially rapid plutonium migration. The examination of the impacts of testing at NTS must be done for the same reason that the impacts of accidents that can be reasonably regarded as possible, even though unlikely, is necessary as part of the NEPA process. In this case, the likelihood of testing is far greater than that of many accidents that DOE has postulated and examined in the EIS's that form the antecedents to the Draft SPEIS.

If the United States resumes testing, it is likely to result in the same by one or more of the other nuclear weapon states, such as Russia or China, or India. Note that China has not ratified the CTBT and is unlikely to do so unless the United States does it first; India has not signed it. There is no assurance that foreign resumption of testing would be underground, or, if it is underground, that it would not vent large amounts of radioactivity. Hence, the possibility that

¹⁸ William J. Broad, David E. Sanger, and Thom Shanker, "U.S. Selecting Hybrid Design for Warheads," *New York Times*, 7 January 2007.

¹⁹ A. B. Kersting, D. W. Efurud, D. L. Finnegan, D. J. Rokop, D. K. Smith, and J. L. Thompson, "Migration of plutonium in groundwater at the Nevada Test Site," *Nature* 397 (1999) 56-59.

new pit designs would eventually lead to a complete breakdown of environmental norms cannot be ignored, even though this may now be regarded as unlikely. The direct and indirect environmental impacts on the United States of foreign resumption of testing should be examined as part of the overall potential impacts, in the same manner that accidents, even rather improbable ones, are considered.

Recommendation 4: *The environmental impacts of a resumption of nuclear weapons testing at the Nevada Test Site needs to be evaluated as part of the evaluation of new pit and RRW production and certification. The resumption of testing in other countries, specifically including Russia, China, India, and Pakistan, needs to be evaluated in this context.*

Comment 5. Some risks to human health and environment have not been fully evaluated

DOE estimates that worker radiation exposure would result in about 0.1 cancer deaths per year.²⁰ Multiplying this value for annual expected deaths by the expected operation of 50 years, about five workers would be expected to die of cancer as a result of work-related radiation doses. The surrounding communities would also be at risk. For instance, some accidents, such as a fire or explosion in the feed casting furnace, could cause 11 to 20 cancer fatalities in the community around Los Alamos.²¹ These are estimates straight out of the Draft SPEIS.

Further, the dose estimates for “non-involved” workers in case of accidents appear far too low. The Draft SPEIS assumes that the worker will be as much as one kilometer away from the location of the fire or explosion, when there is a significant chance that, given the layout of Los Alamos facilities buildings and roads, many workers would be a lot closer. External doses vary approximately according to the inverse square of the distance. For instance, if non-involved workers were within 100 meters (about 110 yards) from the accident location, the estimated dose would be roughly 100 times higher than the DOE estimate. The Draft SPEIS also does not provide estimates of how many “involved” workers – those at the place where the accident is hypothesized to occur – would die of cancer or direct injuries as a result of such accidents.

Recommendation 5: *The Final SPEIS should provide an evaluation of the risks to “non-involved” workers that takes into account situations where such workers would be considerably closer to the accident location than 100 meters. If 100 meters is retained, a technical rationale as well as a specification of who is considered a non-involved worker should be provided.*

Comment 6. Evaluation of an additional alternative is needed

New nuclear weapons functions are not required and create needless risks to workers and the public and also will aggravate security problems in the sense that the United States will be setting a poor example by establishing new weapons design and new pit production capability. The preferred alternative in the Draft SPEIS is arguably the worst in many ways because it:

²⁰ DRAFT SPEIS 2007, Table 3.16-1.

²¹ DRAFT SPEIS 2007, Table 5.1.12-1a.

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- wastes huge amounts of taxpayer money by keeping nuclear weapons functions at Los Alamos, even though the new pit design function has been given to Livermore,
- centers plutonium pit production at Los Alamos, which has had serious plutonium accounting problems and many other security related problems and infractions – far more than Livermore – as well as problems with water contamination,
- increases the risk of more serious pollution of ground and surface waters in and around Los Alamos, especially in case of fires or serious accidents, even after past weapons work has already created significant pollution that remains to be remediated.

Recommendation 6: *Another alternative that is in line with health, environmental, and security concerns needs to be examined in the Final SPEIS. This alternative would be to end new nuclear weapons design, testing, and production functions altogether at both laboratories.*