

Update & Discussion on Pit Production Issues, including Widely Held Misconceptions (#2 in our seminar series)

Greg Mello and Trish Williams-Mello, Los Alamos Study Group, February 26, 2024

It is for him that is lonely or in prison to dream of fellowship, but for him that is of a fellowship to do and not to dream. (William Morris, A Dream of John Ball)

Only he who knows the empire of might and knows how not to respect it is capable of love and justice...Thus it is that those to whom destiny lends might, perish for having relied too much upon it. (Simone Weil, "The Iliad, Poem of Might")



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*****Apologies for not having everything written out in advance in today's slides!*****

For the first seminar in this series please see:

- [Virtual seminar on issues \(and misconceptions\) in plutonium warhead core \("pit"\) production today, 11 am MST, Dec 7, 2023.](https://www.youtube.com/watch?v=LeKGo0qJCR4) For a video recording please see <https://www.youtube.com/watch?v=LeKGo0qJCR4>.
- **Next discussion: March 5, "The dire influence of "Russophobia" on the anti-war and disarmament movements, and what we can do about it." Time: Mar 5, 2024 11:00 AM Mountain Time (US and Canada) To join the meeting:**
<https://us02web.zoom.us/j/82527838619?pwd=WIFWNCtmdnd6YUdrYjBzaUplQ2lpUT09>
Meeting ID: 825 2783 8619. Passcode: 848463
- Other topics to follow, to be announced

The Year in Pits (I)

- "[Nuclear Weapons: NNSA Does Not Have a Comprehensive Schedule or Cost Estimate for Pit Production Capability](#)," GAO-23-104661, Jan 12, 2023.
- A week later, DOE announces internally that at LANL, the “30 Base” subproject of LAP4 will be delayed 4 years.
- **See [The Year in Pits, LASG letter to Congressional Colleagues, Jan 30, 2024, to which we now turn.](#)**
- If you last tuned in on December 7, see also since then these summaries:
 - [Plutonium warhead factory: it's about new missiles, an arms race, greed, & domination](#), LASG double-page ad in *Santa Fe Reporter*, Dec 20, 2023
 - [Plutonium warhead factory under construction near Santa Fe](#), LASG double-page ad in *Santa Fe Reporter*, Dec 13, 2023
- Get ready for the new NNSA budget, coming the week of March 11.

First, some widely-distributed but misleading articles:

- [“Inside the delicate art of maintaining America’s aging nuclear weapons,”](#) Tara Copp, September 20, 2023, contains this doozy:

The core of every nuclear warhead is a hollow, globe-shaped plutonium pit made by engineers at the Energy Department’s lab in Los Alamos, New Mexico, birthplace of the atom bomb.

(Same author, AP, same day: [“This is what it’s like to maintain the US nuclear arsenal”](#) and [“Watchdog: Nuclear states modernize their weapons, Chinese arsenal is growing,”](#) both puff pieces.)

It is important that [the Carnegie Corporation of New York](#) and [Outrider Foundation](#) helped fund this article (and others elsewhere). Journalists with no particular background in the topic are being paid to produce puff pieces as “objective” journalism, which are in each and every case friendly to most (if not all, as in this case) nuclear weapons interests. Foundations like Carnegie maintain close ties with the U.S. government and never veer far from its priorities. *These foundations are not funding opposition to nuclear weapons. They are funding journalists who have neither the background nor the time, nor the editorial freedom, to research the topic.* In effect, they are being to not investigate too deeply.

Many of the individuals doing this mean well. They believe, mistakenly, that “awareness” about nuclear weapons will lead to better public policy, e.g. arms control. They also see the declining state of mainstream journalism and want to help do something about it, in this particular field.

Larger reasons include a perceived need for prestige and legitimacy, and a desire to maintain dominance and narrative control. Prestige and control are probably even more important than any of the specific narrative(s) being promoted.

- [“Behind the Scenes at a U.S. Factory Building New Nuclear Bombs”](#) Sarah Scoles, *Sci. Am.* Dec. 1, 2023.

“The National Nuclear Security Administration's own studies have suggested the pits will last at least 150 years but also that their degradation could result in surprise defects.”

No, they did not say that. The plutonium in the pits was studied to come that conclusion, in the form of Pu metal coupons. Other processes occur in pits, and there are additional degradation mechanisms. The maximum confident pit age is a function of warhead type.

“So far restarting American pit production is proving challenging. Los Alamos's efforts are at least a year behind schedule, and Savannah River's are more like five years delayed.”

At LANL, the first WR pit is to be 2 years delayed (first "certifiable" pit expected in 2024, first actual WR pit in 2025). The “reliable” 30 WR ppy milestone will be delayed until FY2032 according to NNSA, 6 years after the legal 2026 deadline and NNSA’s prior commitment to Congress.

This article is almost silent about Savannah River Site pit production plans, other than to say that they are to be delayed 5x more than at LANL.

[“Inside the \\$1.5-Trillion Nuclear Weapons Program You’ve Never Heard Of,”](#) Abe Streep, Sci. Am. Dec. 1, 2023.

The \$100 billion that will go to Sentinel represents only the first step of what is anticipated to be a \$1.5-trillion investment in the triad, all of which is predicated on ramping up production of new plutonium pits, the deadly metallic hearts of nuclear warheads.

“I expect the coming decades are going to be a boom time for the nuclear weapons industry,” says Jeffrey Lewis, a nonproliferation expert and professor at the Middlebury Institute of International Studies at Monterey, Calif.

Another climate change & fiscal debt denier. It is common to believe that the late 2020s through 2040s will be like today.

After the closure of Rocky Flats, in 2003 LANL once again veered back into war-reserve pit production. It was soon tasked with making a limited number of pits for submarines, but that project was scuttled when it was revealed that scientists had put a number of pits side by side for the purpose of taking a photograph—a scenario that, hypothetically, could lead to a critical nuclear reaction.

No pits were put side by side. No pits were made in 2003. The first one was in 2007. The project was scuttled because of lack of need for pits, not criticality infractions. PF-4 was shut down later because of this and other safety violations.

Today there are an estimated 20,000 vintage pits in storage, many of them held in a plant in Texas called Pantex that disassembles, stores and reassembles old weapons. Whether those pits retain their efficacy is a matter of consequential debate.

Wrong. Most of those pits are unusable for other reasons. Some might be usable in warheads not presently in the arsenal, and in future warhead designs not currently contemplated. Creating those reuse opportunities would require years, but there is and will remain no reason to do so. Those pits too are aging and are mostly older than stockpile pits.

Some studies have suggested that America's stockpiled pits will probably remain effective for a long time. "As far as we can tell, scientifically, there's no justification for needing to make new pits at the rate [the government] is proposing," says Dylan Spaulding, a senior scientist in the global security program at [UCS]...

That's not true. And this is not just a scientific problem, so "scientifically" is too narrow a frame. As far as the period from now to the mid-2030s goes, there is no justification at all for making pits in any quantity. The justifications for making pits after that arise from nuclear policy, engineering, and personnel considerations, in addition to "scientific" ones.

In 2018 LANL was told to get ready to produce 30 war-reserve-ready plutonium pits a year by 2026. (A new facility in South Carolina, under construction, will eventually contribute at least 50 plutonium pits a year.)

SRS is again parenthesis, all but erased. SRPPF is supposed to begin production in 2035, 3 years after LANL "30 reliable" production is supposed to begin.

To support the production of new plutonium pits, the annual budget for Los Alamos's nuclear weapons program and related construction has recently swelled to \$3.5 billion...Webster says his team is ...behind schedule. The lab is planning to hire 1,400 workers, and the city is looking to find housing for them at a time when an influx of wealthy residents has reshaped the economic terrain of northern New Mexico.

Behind schedule? Just a bit! Also, LANL's enacted FY23 budget for Weapons Activities is \$4.0 billion (B). According to Director Mason, LANL has already hired 5,000 net new workers, and will hire more. 4,105 are needed for pit production.

In the 1990s people traveling through the state were treated to a sign funded by an activist group that read: "WELCOME TO NEW MEXICO, AMERICA'S NUCLEAR WEAPONS COLONY."

Suppressing our name is the game. How unethical! Abe Streeper lives or lived in Santa Fe.

- [“Who Would Take the Brunt of an Attack on U.S. Nuclear Missile Silos?”](#) Sebastien Philippe, *Sci. Am.*, Dec. 1, 2023 issue.

I had no questions about the science in this article, but the nuclear attack scenario is unrealistic – it is far too optimistic.

In other words: a bad question (“what would happen if adversaries attacked missile silos only, leaving everything in the U.S. untouched?”), and a good answer.

This is part of an overarching effort from those who helped advise *Sci. Am.* to shut down the Sentinel project. There is nothing wrong with that, except that it is too narrow a focus. It is odd to promote Sentinel warheads at the same time.

- [“The U.S.’s Plans to Modernize Nuclear Weapons Are Dangerous and Unnecessary,”](#) *Sci. Am.* editorial, same issue.

Surely it would be cheaper, safer and smarter to build factories or universities or research lab in these places [missile silos], construct low-cost housing next to new engineering or biomedical campuses there, and watch them boom, in a good way, for the next century at a fraction of the silo-overhaul price tag.

Really? One assumption here is the common one: arms control and partial disarmament can be achieved without any real political or social change, and without an end to U.S. hegemony, which is now dying on the Ukrainian steppes and in food lines I Gaza. A strategic defeat is underway: change by *force majeure*. [Added after the seminar: see [“The Bitter Pill of Decisive Strategic Defeat,”](#) William Schryver, Feb 28, 2024.]

Could the “ICBM economy” be replaced with R&D on the Great Plains? That is preposterous. Why bring in that fantasy? It won’t help sell ending the ICBM force.

Wishful thinking or worse

The influential *Bulletin of the Atomic Scientists* April 27, 2023 article by Curtis Asplund and Frank von Hippel, [“Dealing with a debacle: A better plan for US plutonium pit production,”](#) is unfortunately materially false in most policy-relevant aspects, as well as misleading. The Administration and Congress have ignored the authors’ unrealistic call to halt design and construction of the Savannah River Plutonium Processing Facility (SRPPF), but their article *has* influenced the popular press and has helped prevent public and congressional scrutiny of the Los Alamos Plutonium Pit Production Project (LAP4) and related investments at LANL, which aim to start pit production a decade sooner than at SRPPF.

(Here’s the timeline: At LANL, one certifiable “war reserve” [WR] pit in late CY24, then slowly ramping up to “30” WR ppy by ~CY30, then producing 30 WR ppy *reliably* beginning in FY32 absent setbacks and failures, and then eventually ending production in the 2040s. At SRPPF, construction is to be complete in FY32, W93 pit production is to begin in FY35.

The article contains dozens of mistakes, which begin *in the second sentence*. I mentioned some of the problems in published comments at BAS but have not written the invited full article, which I probably should have done long ago. (However doing so might also serve to draw attention to the original article. It is difficult to know what to do.)

Points of agreement:

- Pit production is not necessary in at least the coming decade to maintain deployment of all current and planned nuclear weapons at present deployment levels. There are enough modern, highly-accurate (W87-0) warheads made with insensitive high-explosive (IHE) to continue to deploy one warhead on every planned silo-based missile. No other current weapon system requires warheads or bombs made with new pits, in the current planning horizon. Thus, the W87-1 is not immediately necessary, by a long chalk. (Note: the FY24 NDAA, requires exploration of W78 retention).
- Two pit factories are unnecessary if an enduring, reliable production facility of adequate capacity is built.

Summary of some key issues in the Asplund/von Hippel paper (lightly edited from comments published at *Bull. Atom. Sci.* last year):

- By doggedly endorsing early-to-need pit production, the authors support early production of the unnecessary W87-1 warhead they claim to oppose. The grossly unrealistic alternative they offer – make no provision for quantity pit production at all – makes NNSA’s extravagant, doomed-to-fail two-site plan look practical in comparison. There is zero indication that Congress, NNSA, DoD, or STRATCOM will abandon the SRS project. Quite the contrary.
- LANL’s pit production equipment is not in “advanced state of installation.” In addition to LAP4, several other construction line items must also be completed; some billion-plus dollar projects are not yet even requested. According to NNSA’s FY23 budget request and other public sources, roughly \$13 billion more must be invested over the coming 8 or 9 years before reliable production can be achieved at LANL, if that is even possible. That price will rise as the necessity of more facilities is revealed. The scope and cost of the LANL pit project are not yet bounded, nor will they ever be due to the age of key facilities and logistical uncertainties.
- SRPPF is not a “second” pit production facility. The authors also confuse “expertise” with production capability.
- Plans for the SRPPF pit facility came from extensive NNSA analysis from NNSA, not (at all) from SC politicians.
- There is no practical difference in facilities, equipment, and personnel between reliable production at the blithely-stated “10-20” pits per year at LANL and the present 30 ppy plan. Failure to distinguish the “10” and “20” ppy production levels is telling. “10” WR ppy does not require the LAP4 project; it’s funded with program dollars.
- Contra this paper, there are no plans to replace submarine warheads with insensitive high-explosive (IHE) versions.

Summary of some key issues in the Asplund/von Hippel paper (continued)

- The extant literature and recent public statements from cognizant technical experts do not support the contention that pits are certain to last 100 years or more. [For the latest confirmation of this see today's [“Nuclear Weapons: Information on the National Nuclear Security Administration's Research Plan for Plutonium and Pit Aging,”](#) GAO-24-106740, Feb 29, 2024.]
- In 2006 Congress did *not* instruct NNSA to focus on producing pits at LANL. The reference cited does not contain any reference to pit production. Other references used in this paper are also misconstrued.
- Throughout the paper, real and alleged problems at SRPPF are mentioned without mentioning the even greater problems plaguing LANL, which are often the same problems. For example, as of 2019, LANL's plutonium facilities also needed over 300 new gloveboxes, design and procurement of which has delayed completion of the SRS project, according to NNSA's FY23 budget request. LANL costs have risen at least fourfold also. [By now it is at least five-fold.]
- There is zero indication of, or logic in, the notion that the U.S. would ever resume nuclear testing. That is a bugaboo of the 1990s, not relevant today.
- Production of a reliable “10-20” pits per year would not speed future higher production absent a facility in which to do that production, which would take a minimum of 15 years to design and build if that were possible. No prior study supports such an approach – quite the contrary in fact.
- In conclusion, these authors apparently never read the most relevant, published government studies, despite their ready availability and despite being introduced to these studies in seminars the senior author (FvH) attended, and despite dozens of emails. They apparently had a pre-determined rhetorical goal and crafted this paper to support it.