Los Alamos Study Group

Nuclear Disarmament • Environmental Protection • Social Justice • Economic Sustainability

For a House member: considerations in warhead core ("pit") production policy

September 14, 2022 version; slight edits from original / Greg Mello / 505-577-8563 / gmello@lasg.org

We are unsure why you and some of your colleagues are supporting a crash program in early-to-need pit production, minimizing pit reuse while promoting MIRVs for the Sentinel system and building two separate pit factories, one of which is unsafe, wholly inadequate, uncosted, and non-enduring. No formal study supports these wasteful, risky policies.

- Pit production deadlines and quantities are changing. The previous (statutory) schedule cannot be met at either SRS[1] or LANL[2,3]. The pending FY23 NDAA will likely give DoD the authority to "rebaseline" pit production policy in concert with NNSA. We support this.
- DoD, STRATCOM, and the NWC will need to realize that prior to full production at SRPPF, only a very limited number of pits will be available. Optimistically assuming steady, uninterrupted production at LANL of 30 WR ppy in 2028, and none at SRPP, roughly 200 pits might be available by 2032,[4] in the very best case. This production is unlikely to reliable.
- LANL will not be able to change pit types easily or quickly. It would be unwise to attempt this. So all these pits will be committed to the W87-1.
- There will be no new pits for the W93 or any other warhead built in the first half of the 2030s, unless pit reuse is specified for all W87-1s built during this period.
- These LANL pits would be fantastically expensive, tripling or quadrupling the price of W87-1 warheads over re-used pits – or pits made at SRPPF once the latter is built and operational.[5]
- There are enough W87-0 pits to populate the entire proposed Sentinel missile fleet. These pits are approximately 35 years old now and will not exceed 80 years old by about 2067. We believe all the units of a W87-1 LEP concluded in 2037 would last until then.
- As much as we would like to postpone (which may happen perforce), downsize, or eliminate the Sentinel system, there are other less-bad options for Sentinel warheads:
    - Eliminate the MIRV option, allowing pit reuse for all W87-1 warheads.
    - Use all W87-0 warheads (sufficient numbers are available; it is safe, modern, and sufficiently accurate; does not require a new-design RV and extensive flight tests)
- An average LANL production rate of 10 ppy starting in 2026 would build roughly 100 pits through 2035 under *single-shift production*, with greater overall resilience, allowing
    - The LAP4 project to be rebaselined and truncated, saving $1-2 billion;
    - A long-term staff reduction of about 2,000 people (most of whom have not been hired; attrition and retirements will obviate layoffs), saving roughly $0.7 billion annually;
    - Elimination and/or downsizing of several prospective line items and other capital investments, saving an indeterminate amount of up to several billions up to many billions if augmentation or replacement of PF-4 can be avoided;
    - Safer, single-shift operation, with attendant smaller impacts on transportation, housing, services, resources, and waste management, which impact LANL programs; and

- A clear focus on technology demonstration, capability maintenance, training, with less direct and indirect impact on other PF-4 missions.

- Costs are much higher than previously realized at both main sites, especially LANL (from "$3 billion" (B) in 2017 to >$14 B through FY28, not including major new facilities needed[6]) but also SRS (~$14 B through FY33[7]);
- Planned pit production capacities at LANL and SRS have never been clarified. We believe the baseline capacity of SRPPF is going to be 80 ppy, with more than one production line. If not it should be, as that capacity would be highly cost-effective and add much more resilience than LANL production would. We believe SRPPF already has considerable internal resilience in its baseline design. You should seek this.
- The expected longevities and operational and safety statuses of key LANL facilities, needed replacements and augmentations, needed support facilities, and required infrastructure, and related program risks have never been satisfactorily clarified.[8]
- To start and maintain reliable pit production at LANL at any level, an open-ended series of major facility investments and replacements will be needed. These include:
    - CMRR, TLWF, TRPIII (already included in our cost analysis[9])
    - Five additional facilities with FY23, 24, 25,26, and 27 start dates, ~$50 M each
    - Sigma replacement (cited in CMP and SSMP)
    - Radiography replacement (in SSMP)
    - PF-4 replacement/augmentation and any associated PIDAS changes (in CMP)
    - Security facilities
    - (List incomplete; others and references to be added as time allows)
    - Site-wide infrastructure investments to support all the above.
- By some time in the 2030s the U.S. will have one main pit factory. The burden of maintaining two operating factories will be too great and there will be no net value, and much risk, in maintaining LANL as a production site, as opposed to an R&D and training site.
- Underscoring this, the dynamic of resource limitations, persistent energy-related inflation, debt service, climate-related emergencies, rising mandatory spending, and competing federal priorities related to social stability will test the present relative lack of accountability in NNSA Weapon Activities spending.
- That one factory will be at SRS, because there are no circumstances under which LANL can produce enough pits to support more than a very small fraction of today's arsenal.[10] If a decision were made right now to dramatically slash the U.S. arsenal, and to continue the above investment campaign at LANL, and to accept the risks inherent in LANL production, further SRS pit production investment could be avoided. No such decision appears realistic for the foreseeable future. As for expansion at LANL, site limitations have already been reached.
- By definition, spare capacity at SRS does not need to be continuously used. In contrast, "surging" at LANL will be nearly impossible, given that two production shifts are needed to reach even 20 ppy, if that is even possible or sustainable.
- To our knowledge, no NNSA or contractor study supports splitting production between two sites, or using 24/7 operation of PF-4 as a baseline. Yet this is the current plan.

[1] From Los Alamos warhead "pit" production preparations begin dangerous 24/7 work in struggle to meet deadlines; STRATCOM: "unlimited money" would not be enough to meet 2030 deadline, Mar 10, 2022:

In May of 2021, NNSA finally admitted --again -- that it could not meet the 2030 deadline ("SRS Pit Plant Might be Five Years Later Than Hoped, NNSA Administrator-Designate Tells Senators," *NSDM*, Dan Leone, May 28, 2021).

Congress and NNSA have been ignoring, and in some respects still are ignoring, NNSA's 2017 conclusion that achieving production of at least 80 ppy could not be done prior to 2033 at the very earliest (p. 2), which in effect became 2034 because NNSA and Congress delayed initiating work on the SRS facility for a year.

The IDA told (p. vii) DoD, NNSA, and Congress the same thing in 2019: the 80 ppy, 2030 deadline was impossible. (See further references and discussion at slide 9 here).

Despite all this, as late as April or May 2021 NNSA was telling the Nuclear Weapons Council (NWC) that it *could* meet the 2030 deadline, as was reported to us.

This week [Mar 10, 2022], STRATCOM Commander Adm. Charles Richard laid any remaining uncertainty to rest:

> "We have crossed one of those points of no return that I referred to previously, in that we now know we will not get 80 pits per year by 2030, as is statutorily required, and even unlimited money at this point will not buy that back," Richard said.
> "So there is active work underway inside the Nuclear Weapons Council to understand exactly how much of a delay we are going to have, how much of it can be addressed by funding," he said. "We're not mitigating this problem. We have shot all the mitigation to get us to this point, the fourth time the nation has tried to recapitalize its production infrastructure. Now the question becomes, how much damage have we done? And what are the consequences of that? And we're working to better understand that."

(See video at 29:53.)

[2] Nuclear Warhead Agency Admits Los Alamos Likely to Miss Interim Warhead Core Deadlines; Review of value, cost, of Los Alamos factory needed, Feb 12, 2022

[3] "Los Alamos Plutonium Operations FY22-28 Program Management Plan," LA-CP-21-20831, Sept. 2021, redacted, pp. A-3,4:

> Over the 20-month COVID-impacting period (February 2020 through September 2021). the 10-oit capital equipment installation portfolio executed just over 7 months combined planned work [redacted]. This 14-15 month impact directly impacts the ability to reliably produce [redacted] as well as corresponding shifts out to 30 WR pit targets in 2026 and beyond. Pre-COVID, success probabilities (p') for the key war reserve pit deliverables have been notionally between High, $p \geq 60 < 80\%$. Post-COVID, added time is needed for 10-pit equipment installations to retain a ≥80% p'. Success probabilities for War Reserve (WR) pit deliverables are impacted as illustrated by decreased success probability (see Table 1).

[4] Bulletin 297: (04/11/22) LANL pit production is incapable of meaningfully contributing to production requirements. Details at this worksheet. An active version of this worksheet is available on request.

[5] Warhead plutonium modernization spending, actual & proposed by site, May 6, 2022.

[6] Ibid.

[7] Ibid.

[8] There exists a LANL "Campus Master Plan" but it is not yet public. An introduction is available here.

[9] Warhead plutonium modernization spending, actual & proposed by site, May 6, 2022.

[10] Bulletin 297, op. cit.