CENTER FOR ARMS CONTROL AND NON-PROLIFERATION

U.S. Plutonium Pit Production

Plutonium pits are a critical component of all U.S. nuclear weapons. The pit acts as a trigger: on detonation, the plutonium sets off a small nuclear reaction, creating a larger secondary explosion in the main nuclear payload. The United States produced between 1,000 and 2,000 pits per year during the Cold War at the Rocky Flats Plant near Golden, Colorado. The facility shut down in 1989 after being raided by the FBI and Environmental Protection Agency over alleged environmental regulation violations. With the exception of 31 pits manufactured at the Los Alamos National Laboratory (LANL) in New Mexico between 2007 and 2013, the United States has not produced any pits since. As a result, most pits in the U.S. stockpile today are between 30 and 40 years old.

Aging gracefully or past their prime?

Plutonium degrades slowly over time, corroding the pit and potentially affecting the efficacy of the weapon. How long that process takes and how seriously it affects the weapon's performance is subject to debate. A 2007 study by JASON, an independent scientific advisory group, determined plutonium pits have a minimum lifetime of well over 100 years. A later study by Lawrence Livermore National Laboratory found that plutonium pits artificially aged to 150 years still performed as designed. The National Nuclear Security Administration (NNSA), a semi-autonomous part of the Department of Energy responsible for managing America's nuclear arsenal, has largely ignored calls for additional plutonium aging studies, instead assuming an arbitrary maximum pit lifetime of 100 years.

The Trump administration's 2018 Nuclear Posture Review called on the NNSA to produce at least 80 plutonium pits per year by 2030. The rationale for 80 pits per year is seemingly straightforward — if America has about 4,000 nuclear weapons and pits last 100 years, then the NNSA needs to produce 80 pits per year by 2030 in order to replace all pits by 2080. However, many question the need to replace all 4,000 pits when the United States has fewer than half that number deployed and point out that pit lifetimes are likely much longer than 100 years.

An unachievable goal?

The NNSA plans to expand its existing facilities at LANL to produce 30 pits per year. The other 50 pits per year will come from repurposing the abandoned shell of the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site (SRS) in South Carolina, itself a previous NNSA project that was eventually scrapped after running 32 years behind schedule and $13 billion over budget. Many doubt the NNSA will be able to get the infrastructure set up by 2030, with a 2019 Institute for Defense Analyses report flatly stating that 80 pits per year by 2030 is not achievable. The NNSA has since admitted their initial timeline was too ambitious, hinting they may not hit 80 pits per year until 2035.

Congress allocated $1.37 billion for the project in the FY2021 National Defense Authorization Act. The Congressional Budget Office estimated that expanding plutonium pit production would cost about $9 billion between 2019 and 2028, though they characterized that estimate as "very uncertain." Previous NNSA projects of this scale "all experienced substantial cost growth and schedule slippage," according to the 2019 IDA report. True to form, the NNSA's cost estimates for the SRS side of the project have more than doubled from $4.5 billion to $11 billion, while the price tag for the LANL expansion has jumped from $3 billion to $4 billion.

Unnecessary and Unsafe

Expanded plutonium pit production is not necessary to maintain the safety or reliability of the existing U.S. nuclear weapons stockpile and could feed perceptions of a nuclear arms race. Given the NNSA's track record of security breaches, lax safety protocols and general mismanagement, Congress should postpone current expansion plans until the NNSA can prove that current pits are unsuitable for the job, or failing that at least wait until the agency completes the pilot facility at LANL and shows the facility can safely produce pits in the quantity advertised before replicating it at the SRS.