



NEWS

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Studies Show Plutonium Degradation in U.S. Nuclear Weapons Will Not Affect Reliability Soon

WASHINGTON, D.C. – Recent studies by Lawrence Livermore and Los Alamos National Laboratories show that the aging of plutonium in U.S. nuclear weapons will not affect reliability over the next several decades. The classified studies were done for the Department of Energy’s National Nuclear Security Administration (NNSA) and have taken five years to complete.

Plutonium, which is used in pits for all U.S. nuclear weapons, is highly radioactive and degrades over time. The material was first produced in significant quantities in the 1940s, and the effects of plutonium aging on nuclear weapon reliability is a question relevant for a stockpile with warheads reaching ages beyond historical experience.

NNSA’s weapons laboratories have been assessing whether the degradation of plutonium will affect the ability of the weapon to perform as designed. NNSA Administrator Linton F. Brooks said the recent aging studies showed that there appear to be no serious or sudden changes occurring, or expected to occur, in plutonium that would affect performance of pits beyond the well-understood, gradual degradation of plutonium materials.

“These studies show that the degradation of plutonium in our nuclear weapons will not affect warhead reliability for decades,” Brooks said. “It is now clear that although plutonium aging contributes, other factors control the overall life expectancy of nuclear weapons systems.”

The classified studies looked at pits in each nuclear weapon type and gave specific information on plutonium properties, aging and other information. Overall, the weapons laboratories studies assessed that the majority of plutonium pits for most nuclear weapons have minimum lifetimes of at least 85 years.

Today’s nuclear weapons have highly-sophisticated designs and rely on thousands of parts and components that act within microseconds to perform complicated and precise functions. Plutonium aging is but one variable that can affect overall system reliability. Other factors include aging of high explosives and other organic components in the design, corrosion of uranium or plutonium components, or discovery of defects uncovered in surveillance programs. Warhead refurbishments, known as life extension programs, are key to replacing aging or otherwise faulty components.

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The scientific process used in the assessment of plutonium aging on pit lifetimes was peer reviewed by the JASON panel, an independent scientific panel of academics with experience in nuclear physics and the nuclear weapons program. The JASON study concludes that most plutonium pit types have credible lifetimes of at least 100 years, while other pit types with less than 100 years of projected stability have mitigations either proposed or being implemented. The JASON review was congressionally mandated by the Defense Authorization Bill for fiscal year 2005, and was submitted to Congress today.

NNSA plans to continue plutonium aging assessments through vigilant surveillance and scientific evaluation, and the weapons laboratories will annually re-assess plutonium in nuclear weapons, incorporating new data and observations.

Established by Congress in 2000, NNSA is a semi-autonomous agency within the U.S. Department of Energy responsible for enhancing national security through the military application of nuclear science. NNSA maintains and enhances the safety, security, reliability and performance of the U.S. nuclear weapons stockpile without nuclear testing; works to reduce global danger from weapons of mass destruction; provides the U.S. Navy with safe and effective nuclear propulsion; and responds to nuclear and radiological emergencies in the U.S. and abroad. Visit www.nnsa.doe.gov for more information.

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