

# Pit Lifetime

Mello Aff #1, par. 15, [http://www.lasg.org/JASONS\\_report\\_pit\\_aging\\_ocr.pdf](http://www.lasg.org/JASONS_report_pit_aging_ocr.pdf)

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# 1 EXECUTIVE SUMMARY

JASON reviewed the nearly-completed assessment of primary-stage “pit” lifetimes due to plutonium aging for nuclear weapon systems in the enduring U.S. stockpile. The assessment is being prepared by Los Alamos and Lawrence Livermore National Laboratories in support of NNSA’s “Level-1” milestone to understand possible aging effects in the primary stages of nuclear weapons in the current stockpile and to provide system-specific lifetimes for pits. The joint Laboratory assessment uses the methodology of Quantification of Margins and Uncertainties (QMU) and specifically considers the physical aging effects of plutonium.

We judge that the Los Alamos/Livermore assessment provides a scientifically valid framework for evaluating pit lifetimes. The assessment demonstrates that there is no degradation in performance of primaries of stockpile systems due to plutonium aging that would be cause for near-term concern regarding their safety and reliability. 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.

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. The detailed experiments and computer simulations performed by the Laboratories to better understand plutonium aging mechanisms and their possible impact on performance of weapons primaries