

Highlights of [GAO-12-337](#), a report to the Subcommittee on Energy and Water Development, Committee on Appropriations, U.S. Senate

## Why GAO Did This Study

Plutonium—a man-made element produced by irradiating uranium in nuclear reactors—is vital to the nuclear weapons stockpile. Much of the nation's current plutonium research capabilities are housed in aging facilities at Los Alamos National Laboratory in New Mexico. These facilities pose safety hazards. The National Nuclear Security Administration (NNSA) has decided to construct a multibillion dollar Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR) to modernize the laboratory's capabilities to analyze and store plutonium. GAO was asked to examine (1) the cost and schedule estimates to construct CMRR and the extent to which its most recent estimates reflect best practices, (2) options NNSA considered to ensure that needed plutonium research activities could continue, and (3) the extent to which NNSA's plans reflected changes in stockpile requirements and other plutonium research needs. GAO reviewed NNSA and contractor project design documents and visited Los Alamos and another plutonium facility at Lawrence Livermore National Laboratory in California.

## What GAO Recommends

GAO is making recommendations to improve CMRR's schedule risk analysis and to conduct an assessment of plutonium research needs. NNSA agreed with GAO's recommendations to assess plutonium research needs, but disagreed that its schedule risk analysis should be revised, citing its recent decision to defer the project. GAO clarified the recommendation to specify that NNSA should take action when it resumes the project.

View [GAO-12-337](#). For more information, contact Gene Aloise at (202) 512-3841 or [aloise@gao.gov](mailto:aloise@gao.gov).

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# MODERNIZING THE NUCLEAR SECURITY ENTERPRISE

## New Plutonium Research Facility at Los Alamos May Not Meet All Mission Needs

### What GAO Found

The estimated cost to construct the CMRR has greatly increased since NNSA's initial plans, and the project's schedule has been significantly delayed. According to its most recent estimates prepared in April 2010, NNSA determined that the CMRR will cost between \$3.7 billion and \$5.8 billion—nearly a six-fold increase from the initial estimate. Construction has also been repeatedly delayed and, in February 2012 after GAO provided its draft report to NNSA for comment, NNSA decided to defer CMRR construction by at least an additional 5 years, bringing the total delay to between 8 and 12 years from NNSA's original plans. Infrastructure-related design changes and longer-than-expected overall project duration have contributed to these cost increases and delays. GAO's review of NNSA's April 2010 cost and schedule estimates for CMRR found that the estimates were generally well prepared, but important weaknesses remain. For example, a high-quality schedule requires a schedule risk analysis that incorporates known risks to predict the level of confidence in meeting a project's completion date and the amount of contingency time needed to cover unexpected delays. CMRR project officials identified hundreds of risks to the project, but GAO found that these risks were not used in preparing a schedule risk analysis. As a result of these weaknesses, NNSA cannot be fully confident, once it decides to resume the CMRR project, that the project will be completed on time and within estimated costs.

NNSA considered several options to preserve its plutonium-related research capabilities in its decision to build CMRR at Los Alamos. NNSA assessed three different sizes for a new facility—22,500, 31,500, and 40,500 square feet. In 2004, NNSA chose the smallest option. NNSA officials stated that cost was the primary driver of the decision, but that building a smaller facility would result in trade-offs, including the elimination of contingency space. In the end, NNSA decided to build a minimally-sized CMRR facility at Los Alamos with a broad suite of capabilities to meet nuclear weapons stockpile needs over the long-term. These capabilities would also be used to support plutonium-related research needs of other departmental missions.

NNSA's plans to construct CMRR focused on meeting nuclear weapons stockpile requirements, but CMRR may not meet all stockpile and other plutonium-related research needs. NNSA analyzed data on past workload and the expected need for new weapon components to help ensure CMRR's design included the necessary plutonium-related research capabilities for maintaining the safety and reliability of the nuclear stockpile. However, some plutonium research, storage, and environmental testing capabilities that exist at Lawrence Livermore National Laboratory may no longer be available after NNSA consolidates plutonium-related research at Los Alamos. Furthermore, NNSA conducts important plutonium-related research in other areas such as homeland security and nuclear nonproliferation, but it has not comprehensively analyzed plutonium research and storage needs of these other programs outside of its nuclear weapons stockpile work and therefore cannot be sure that the CMRR plans will effectively accommodate these needs. As a result, expansion of CMRR or construction of more plutonium research and storage facilities at Los Alamos or elsewhere may be needed in the future, potentially further adding to costs.