



**Director's Office**

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General Frank G. Klotz  
Administrator for the National Nuclear Security Administration  
U. S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, DC 20585

**SUBJECT: Chemistry and Metallurgy Research Replacement (CMRR) Project  
and the CMR Facility**

Dear Administrator Klotz:

Los Alamos has achieved significant progress in plutonium infrastructure related projects since the issuance of the plutonium infrastructure strategy in 2014.<sup>1</sup> The important achievements include:

- The Laboratory's Plutonium Facility (PF-4) has resumed operations paused in 2013 and made significant improvements in both conduct of operations and the criticality safety program.
- The CMR Replacement (CMRR) project was re-constituted with Critical Decision (CD)-1R on 4 subprojects to execute steps 1 and 2 in the strategy.
- Two CMRR subprojects, Equipment Installation Phases 1 and 2 (PEI1 and REI2), have recently received approval of CD-2/3, establishing the foundation for project execution.
- The Plutonium Modular Project CD-0 was approved and the analysis of alternatives study is well underway towards step 3 in the strategy.
- The Confinement Vessel Disposition (CVD) Project has completed processing on 4 of the 9 large vessels that must be completed prior to terminating CMR operations.
- The Transuranic Waste Facility (TWF) has achieved beneficial occupancy and is expected to begin hot operations in early calendar year 2017 to mitigate waste staging impacts on plutonium operations.

<sup>1</sup> DOE memorandum, from Don Cook, NA-10, to Charles McMillan, LANL, dated Jan 10, 2014, Subject: "Plutonium Infrastructure Strategy for Defense Programs"

In light of the recent CMRR approvals of CD 2/3 for REI2 and PEI1, I wanted to take this opportunity to reexamine what this means in terms of the aging Chemistry and Metallurgy Research (CMR) facility. In a series of memoranda since 2012<sup>2,3</sup>, the National Nuclear Security Administration (NNSA) established a commitment to terminate program operations in the CMR building by the end of calendar year 2019. The summarized intent behind this commitment is as follows: a) manage the risk associated with the aging CMR facility by incrementally transferring capabilities from CMR into either PF-4 or the CMRR-RLUOB<sup>4</sup>; and b) provide continuous, analytical support to plutonium programs, including plutonium sustainment, across the 2019 timeline.

Since the issuance of this guidance, Los Alamos has made much progress toward managing CMR risk and transferring the required analytical capabilities; but challenges have also arisen. The purpose of this letter is to convey the Laboratory's perspective on determining the most responsible path forward in light of these challenges so that our future decisions and actions remain aligned with NNSA.

Risk in CMR is primarily related to material inventory; the CVD vessels represent the most significant source of Material at Risk (MAR) for the CMR facility. The Material Recycle and Recovery (MR&R) program is charged with dispositioning this material and has made excellent progress in doing so. This program is a solid partnership with the NNSA and is fully funded through completion of five more vessels. Figure 1 below illustrates the general relationship between total MAR in CMR and the CVD project.

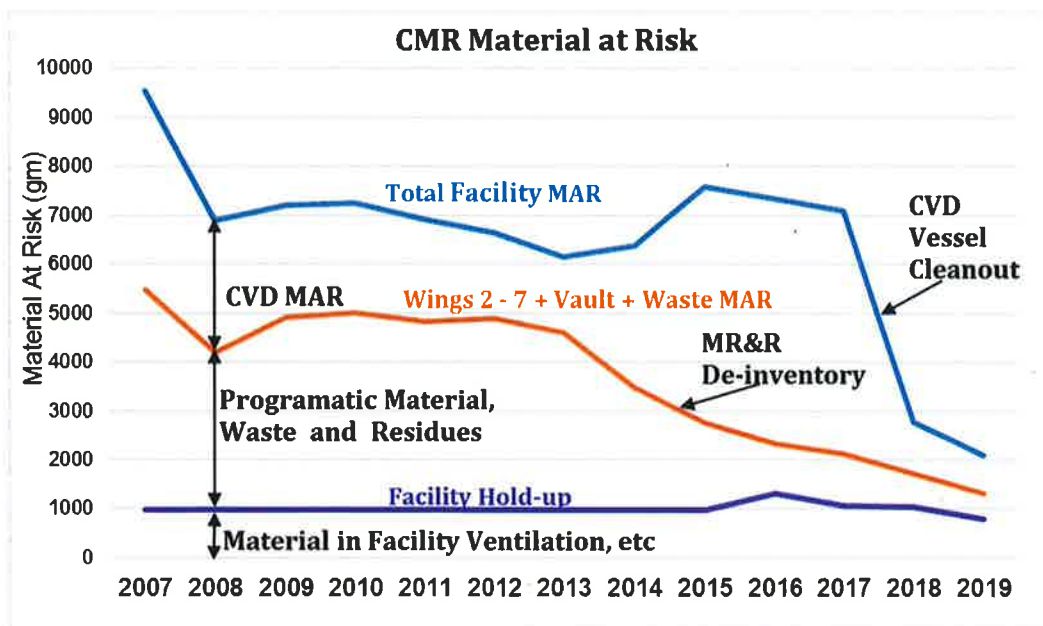


Figure 1: The blue line represents the total amount of Material at Risk (MAR) in the CMR facility vs time and highlights the strong relationship between total facility MAR and CVD project execution. The decline in the blue line is through execution of the CVD project, the decline in the orange line is through MR&R program execution. The increase in the purple line in 2016 was based on new measurements on facility holdup. The amount of programmatic material post 2019 depends primarily upon the level of execution of pit manufacturing.

<sup>2</sup> DOE memorandum, from NNSA administrator Bruce Held to Don Cook, NA-10, Robert Raines, NA-APM, Steven Ho, CEPE, dated March 17, 2014, Subject: "Roles and Responsibilities for Plutonium Infrastructure Delivery and Chemistry and Metallurgy Facility Transition at Los Alamos National Laboratory".

<sup>3</sup> DOE memorandum, from NNSA administrator Bruce Held to Don Cook, NA-10, Robert Raines, NA-APM, Steven Ho, CEPE, dated March 17, 2014, Subject: "Roles and Responsibilities for Plutonium Infrastructure Delivery and Chemistry and Metallurgy Facility Transition at Los Alamos National Laboratory".

<sup>4</sup> Radiological Laboratory Utility Office Building

With regard to the intent of reducing risk exposure in the CMR facility, the MR&R program is on track to substantially reduce risk exposure by 2019—responsive to the underlying intent of the NNSA commitment. Beyond the CVD project, the MAR in the building is largely associated with Analytical Chemistry (AC) operations. The ability to reduce MAR is coupled to the pace of execution of the CMRR project (to re-locate AC capabilities into either PF-4 or RLUOB) and the continuing need to analyze samples for the plutonium missions.

Transferring the capabilities from CMR is being accomplished by the CMRR line item project. At inception, the programmatic objective was to have the analytical capabilities transferred from CMR to either PF-4 (through the PEI subproject) or to the RLUOB (through the REI2 sub-project) to support the termination of operations commitment. While CD-1R planning indicated this achievement was possible, it was initially optimistic and did not include full schedule contingency against the 2019 date. With schedule contingency applied, the scope required for the 2019 commitment was forecast to be 2021 at project inception. At that time, the schedule gap was intended to be managed through small capability gaps or alternative means.

Two key schedule-risks surfaced during development of the CMRR CD-2/3 packages for PEI1 and REI2:

- First, the CD-2/3 dates for both PEI1 and REI2 were not achieved in June 2016, resulting in a four-month schedule delay. My March 2016 letter transmitting the CD 2/3 package explains in detail the day-for-day impact that would result if the June 2016 date was not achieved.
- Second, 2017 funding for PEI1 does not align with the proposed baseline plan for execution. The CMRR budget line has sufficient funding in 2017, but since it is allocated by subproject, it cannot be effectively used to support execution on PEI.

Between these two events, the Laboratory realized and anticipated, a combined loss of up to 16 months (4+12 months, respectively) of schedule delay. If both risks are realized, this is a combined risk of more than 40% of the available time for execution between June and December 2019 for the PEI subproject.


The original strategy of potentially gapping selected analytical capabilities in the 2019 time period was enabled by a dip in anticipated program requirements in the 2019 time period. Since the original planning, the program requirements have changed to restore War Reserve capability earlier in order to pull risk forward in the plutonium sustainment program. The joint plan between Los Alamos, Livermore and NA-10 to pull forward plutonium component acceptance (as opposed to performing acceptance at only final assembly) will significantly limit the opportunity to have disruptions in the continuity of analytical operations in the 2019 – 2020 time period.

In summary, the initial conditions for achieving the dual intent of the 2019 commitment were tenuous at project inception. Since then, several schedule risks have been realized, and others are likely, absent budget changes through an appropriations bill in 2017. In addition, the program conditions have shifted to make the continuous availability of capability a firm requirement in 2019. The cumulative effect of these changes leads us to conclude that achieving the dual intent of the original 2019 commitment is no longer fully achievable, and this prior commitment needs to be revisited.

The solution paths start with the recognition that risk associated with operations in CMR is not binary, but rather a continuum. I believe the Government would be best served by restating the goal as reducing risk in CMR and at the same time providing analytical support to programs. Figure 1 depicts the path to accomplishing that intent. In my judgment, doing so would be entirely consistent with the underlying principles behind the Department's enterprise risk management initiative. The Laboratory's risk profile will be materially improved by the end of 2019, to a degree that the mission imperative warrants the acceptance of the diminished risk for a limited period beyond 2019.

I look forward to working with your staff in NA-10, NA-50, and NA-APM to detail the path forward in a manner that achieves our mutual objectives.

Sincerely,



Charles H. McMillan  
Director

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