

LA-UR-12-26190

Approved for public release; distribution is unlimited.

Title: Los Alamos National Laboratory and Lawrence
Livermore National Laboratory Plutonium
Sustainment Monthly Program Report May 2013

Author(s): (b) (6)
[Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]

Intended for: Report

Issued: 2013-07-01 (Rev.7)



Disclaimer:

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the Los Alamos National Security, LLC for the National Nuclear Security Administration of the U.S. Department of Energy under contract DE-AC52-06NA25396. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

UNCLASSIFIED

LANL Executive Summary	5
LANL Response to April NNSA Comments	5
General Comments	5
Specific Section Comments	6
Table 1: May Baseline Change Requests	6
1.0 LANL - Pit Development	9
1.1 Technical Progress.....	10
1.2 Equipment	10
1.3 Issues	10
1.4 Variance Analysis and Recovery Plan.....	10
1.5 BCRs.....	10
1.6 Risk Table.....	11
1.7 Earned Value Metrics	12
2.0 LANL - Power Supply.....	13
2.1 Technical Progress.....	13
2.2 Equipment	14
2.3 Issues	14
2.4 Variance Analysis and Recovery Plan.....	14
2.5 BCRs.....	15
2.6 Risk Table.....	16
2.7 Earned Value Metrics	17
3.0 Program Management and Support.....	18
3.1 Program Management	18
3.2 Support	18
3.3 Issues	18
3.4 Variance Analysis and Recovery Plan.....	18
3.5 BCRs.....	19
3.6 Earned Value Metrics	20
4.0 Facilities, Waste and Institutional Support.....	21
4.1 Technical Progress.....	21
4.2 Equipment	21
4.3 Issues	21
4.4 Variance Analysis and Recovery Plan.....	21
4.5 BCRs.....	21
4.6 Earned Value Metrics	22
5.0 LLNL	23
5.1 Technical Progress.....	23
5.2 Equipment	23
5.3 Issues	23
5.4 Variance Analysis and Recovery Plan.....	24

5.5 BCRs.....	24
5.6 Risk Table.....	25
5.7 Earned Value Metrics	26

LANL Executive Summary

In May of 2013 the Plutonium Sustainment program at LANL completed or addressed the following high-level activities:

- 1) (b) (5), (b) (7)(F)
- 2) (b) (7)(F)
- 3) Completed material recovery on all fuel storage containers for shipment 9 in support of the material recovery efforts for radioisotope thermoelectric generator (RTG) production. The non-destructive evaluation data has been reviewed and the material has been moved to the vault for storage. This completes the NNSA Level Two milestone, MRT 4624.
- 4) Completed the Management-Self Assessment of the Radioisotope Thermoelectric Generator Assembly and Test Facility (RTG-ATF). The final assessment report was delivered and 8 Pre-Starts, 5 Post-Starts, and 4 Observations were identified.
- 5) The NNSA Los Alamos Field Office completed a QAS-2 audit of the Power Supply Program. The Potential Findings and Issues Summary identified five potential findings involving production support processes, but no findings affecting product quality.

All four NNSA Level 2 Milestones (MRT 4622-4625) associated with Plutonium Sustainment are on track for success in FY13. MRT 4623 and MRT 4624 are complete.

The earned value metrics overall for LANL are within acceptable thresholds, so no high-level recovery plan is required.

Each of the four major LANL WBS elements is discussed in detail below with a section at the end that is provided by LLNL (the KCP report is filed separately and directly).

LANL Response to April NNSA Comments

General Comments

- A. Please include, in all future Monthly Reports, a section at the beginning of the Report that summarizes how each NNSA comment from the last (or further back) Report is addressed in the current Report.
 - o LANL responses will be included in this section.
- B. Provide FY13 estimates to complete (ETC); estimates at complete (EAC) and variance at complete (VAC) for each individual WBS area: Pit Manufacturing, Power Supply, Program Office and Landlord Recovery. Many of these cumulative variances exceed \$1M.
 - o With the exception of the RTG-ATF project and Program Management, ETC and EAC values are substantially equal to the budget at completion. When a substantial variance is expected, as is the case for the RTG-ATF project, a variance explanation and/or recovery plan is provided. Program Management includes budget changes, shifting carryover target guidance, release or removal of held back funding, etc. As such, ETC, EAC, and VAC have little meaning for this element.
- C. Please address this comment from the January Report: Page 22, Facilities, Waste and Institutional Support: From the January report, no explanation has been provided regarding the specific impacts of an additional 2% RTBF allocation. Last month's report noted the 2% allocation impacted several areas but did not provide an explanation. Explain whether any of the impacts result in increased costs.
 - o There was no impact to Pu Sustainment or the facility.

Specific Section Comments

- *Page 12, Section 2.2 Equipment, (b) (7)(F)*: The final pre-start finding was closed out in May (see section 2.2 of this report). Closure of post-start findings will be reported in subsequent reports.
- *Page 15, Section 2.4 Variance Analysis and Recovery Plan*: The paragraph notes the program will continue to carry the variance through project completion. Also notes that the RTG-ATF is currently on track for completion June 3, 2013 "Release for Operations", Level 3 milestone. Provide explanation whether the date and milestone are synonymous with "project completion."
 - Currently, the completion is on track for a mid/late July close out of all findings. While the June 3rd L3 milestone will be missed, the Level 2 milestone is still on track. These two milestones will finish concurrently and signify "project complete." The project will carry negative cost and schedule variances upon completion later this year.
- *Page 15, Power Supply Performance Curve*: As noted in the Program Management Section in the April Monthly report under BCR PSM-13-056 scope and funds from the institutional quality assurance organization were transferred into the directorate specific quality organization. This change adjusted the Power Supply WBS element due to scope and funds being shifted to the Power Supply Quality Assurance Work Package.
- *Page 16, Calibration*: N/A.
- *Page 19, Technical Progress*: N/A.

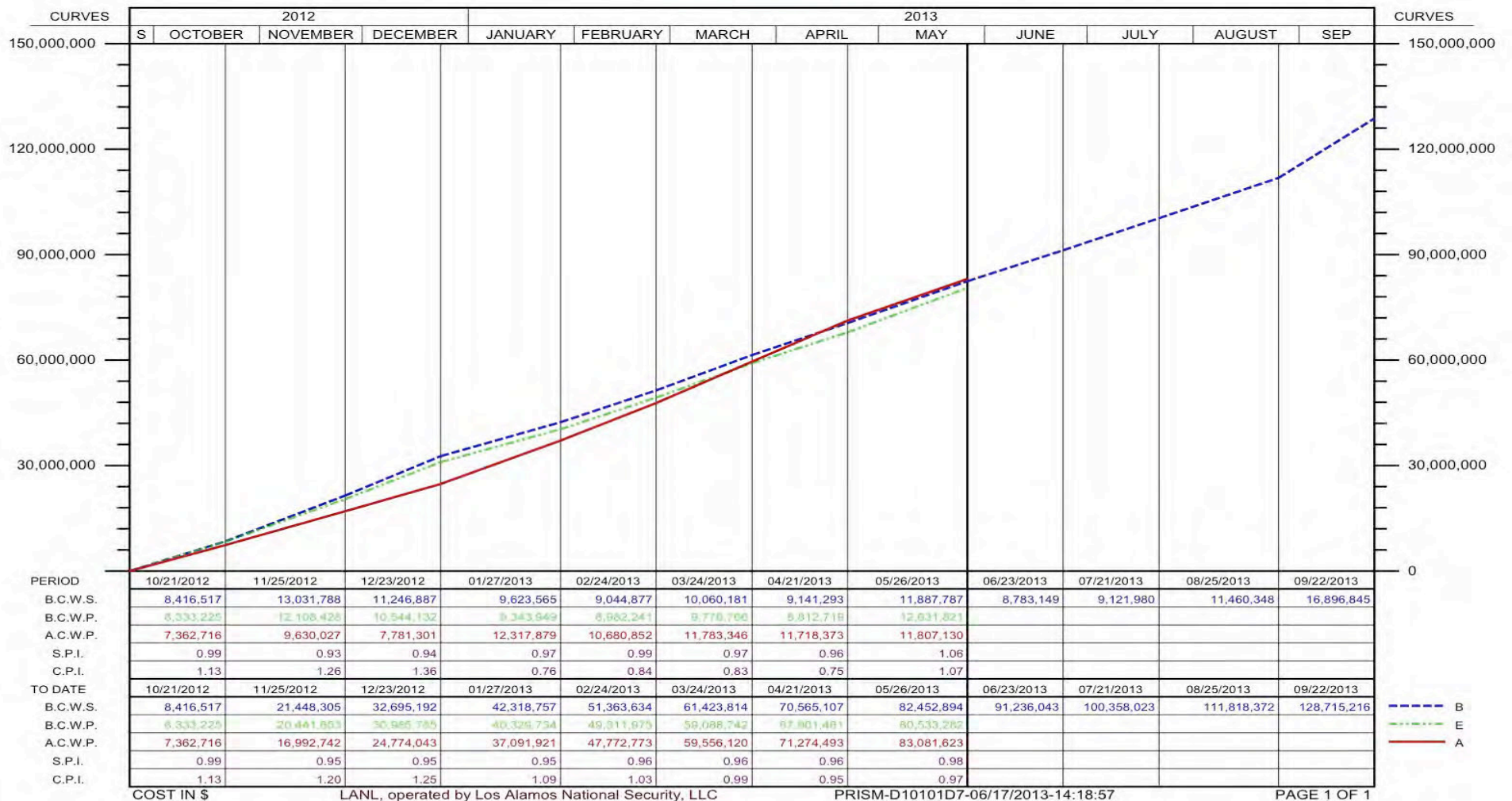
Table 1: May Baseline Change Requests

WBS	BCR #	BCR Description	Date Assigned	Date Approved	Impact	Cost Impact	Change Level
~~Pit Equipment~~	~~PSM-13-032~~	~~(b) (7)(F) - Procurement & D&D Design~~	4/24/13	working	Cost/Schedule	TBD	TBD
Program Management	PSM-13-056	Descope Quality Assessments/ (b) (7)(F) Add Quality Assurance Support Scope	4/10/13	6/5/13	Cost/Schedule	\$225k	3
Program Management	PSM-13-065	Close Wing Support WP	4/30/13	6/7/13	Cost/Schedule	\$187k	3
Power Supply	PSM-13-068	Pu Assay Fire Suppression	5/7/13	5/28/13	Cost/Schedule	\$151k	3
Power Supply	PSM-13-069	Radiochem Fire Suppression	5/7/13	5/28/13	Cost/Schedule	\$150k	3
Program Management	PSM-13-078	Sequestration	6/17/13	working	Cost/Schedule	\$12.3M	1

Earned Value Metrics

PERFORMANCE S-CURVE

LANL Pu Sustainment



UNCLASSIFIED

PERFORMANCE S-CURVE

LANL Pu Sustainment W/O Facility Infrastructure



LANL, operated by Los Alamos National Security, LLC

PRISM-D10101D7-1-06/17/2013-14:23:28

PAGE 1 OF 1

1.0 LANL - Pit Development

MRT 4622		GREEN	Perform Activities to Sustain Base Pit Material Processing and Fabrication Capability		
1.	(b) (7)(F)				
2.	Maintain pit manufacturing capability by producing (b) (7)(F) and/or exercising the pit fabrication flow sheet.				
3.	Continue to make progress on the Electro-Refining line, Plutonium Foundry, and (b) (7)(F) projects.				
(b) (7)(F)			RGYB		
			BLUE		
			BLUE		
			BLUE		
			BLUE		
			BLUE		
			BLUE		
			BLUE		
Equipment					
(b) (7)(F)		November 1, 2012		October 17, 2012	BLUE
		March 13, 2013		March 12, 2013	BLUE
		March 21, 2013		March 4, 2013	BLUE
		April 19, 2013		February 27, 2013	BLUE
		June 27, 2013	On schedule to meet L3 Milestone		GREEN
		June 30, 2013			GREEN
		July 19, 2013			GREEN
		July 26, 2013			GREEN
		July 30, 2013			GREEN
		August 29, 2013			GREEN
		September 20, 2013		April 22, 2013	BLUE
		September 30, 2013			GREEN
		September 30, 2013			GREEN
MRT 4623		BLUE	(b) (7)(F)		
		(b) (7)(F)			
1.	(b) (7)(F)				
(b) (7)(F)					
BLUE					

1.1 Technical Progress

- (b) (5), (b) (7)(F)
- (b) (7)(F)
 - o Completed Drill and Press of tube using the Bostomatic mill. Completed (b) (7)(F), leak check, and (b) (7)(F) Failed final leak check.
 - o (b) (7)(F)
- Completed work authorization documents associated with the replacement of the spindle motor for the (b) (7)(F) Motor replacement and prove-in testing is scheduled for early June.

1.2 Equipment

- The plan to meet the grading criterion #3 for L2 milestone MRT 4622 includes the following:
 1. The (b) (7)(F) Upgrade - complete all planned (b) (7)(F) system upgrades and release both the “cold” and “hot” glovebox for welding operations by September 30, 2013.
 2. The Plutonium Foundry Upgrades - complete cold testing, issue an approved design for construction, and start construction on the first of three foundry gloveboxes by September 30, 2013.
 3. The Electro-Refining Line Upgrade - complete all mechanical and electrical construction activity associated with the eleven electro-refining boxes and systems by September 30, 2013.
- (b) (7)(F) Upgrade
 - o Maintenance was performed on the cooling system common to (b) (7)(F) gloveboxes.
 - o The flow to the (b) (7)(F) in the (b) (7)(F) was increased to required levels (2 Liters/minute).
 - o Trouble shooting of the x-axis drive system in the (b) (7)(F) was performed. The same issue will be encountered in the (b) (7)(F) and same solution should be applicable.
- Foundry Upgrade
 - o Fabrication of the (b) (7)(F) skid has started.
 - o System functionality testing of the induction heating system in the Cold Laboratory with bismuth was performed. Samples were cut and metallography will be performed.
 - o Issues with performance of the power supply and transfer systems were identified and are being addressed.
 - o Started Decontamination and Dismantlement (D&D) of GB-2.
- Electro-Refining Line Upgrade
 - o Continued work on mechanical and electrical installation for Trunklines II, III, and IV to meet L3 milestone in June.
 - o Ahead of schedule for selected items of Electrical/Mechanical Complete for MTS Conveyor, Dri-train, Trunklines I & V to meet the L3 Milestone in July.
 - o ERCS software contractor Releases 1 & 2 restructured to provide easier tracking and review of upgrades.

1.3 Issues

- None

1.4 Variance Analysis and Recovery Plan

- None

1.5 BCRs

- PSM-13-032: This BCR has been postponed resulting from the budget pull associated with sequestration (see PSM-13-078 in Program Management §3.5).

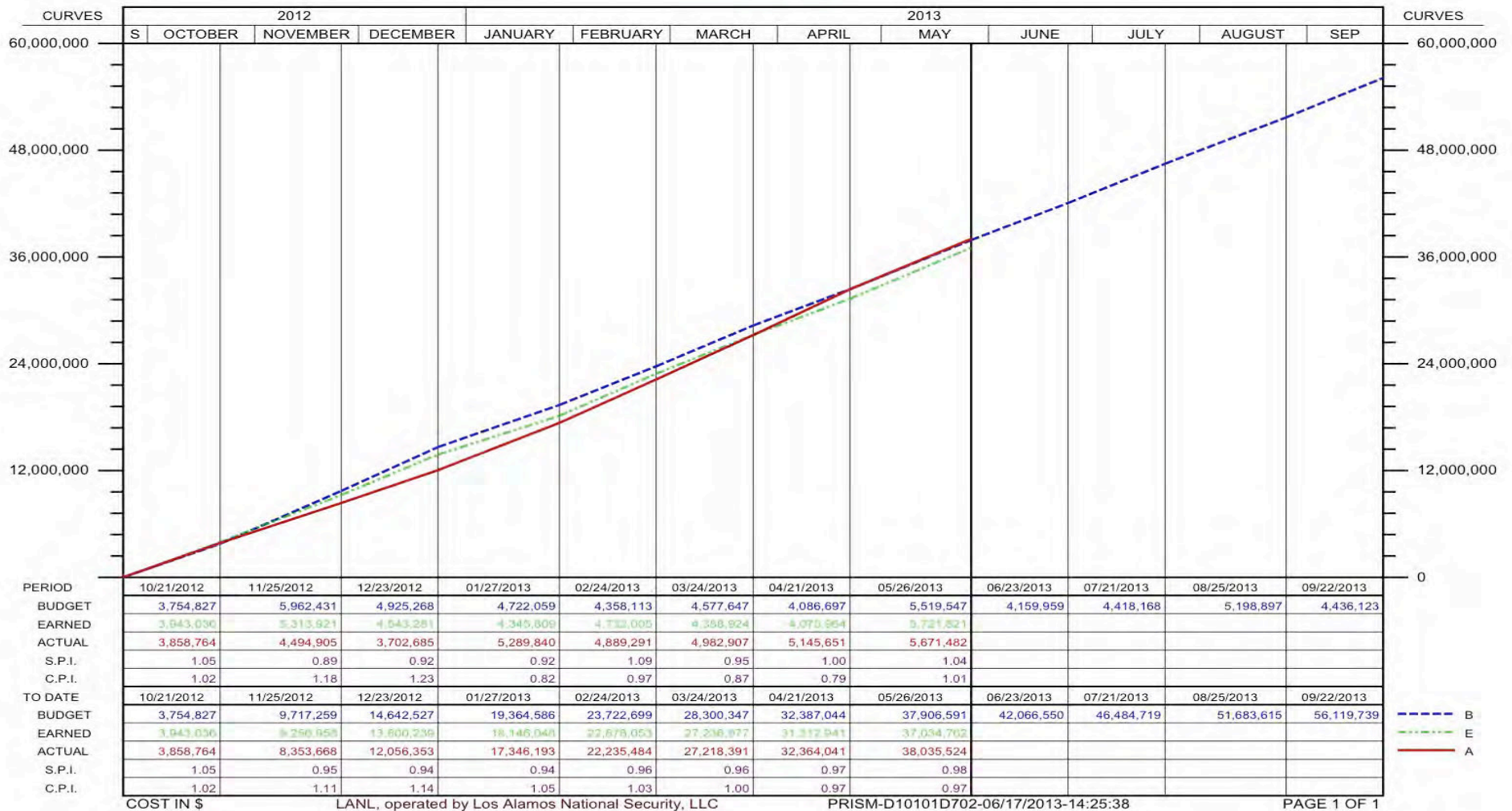
1.6 Risk Table

Work	Description	Handling Strategy	Status
(b) (7)(F)	(b) (5), (b) (7)(F)	(b) (5), (b) (7)(F) On May 20, with concurrence from (b) (6), we allowed the (b) (7)(F) to be taken out of service for upgrades. On May 30, a leak developed in the assembly prior to welder dismantlement. A schedule has been developed to attempt a (b) (7)(F) in the first week of June and again turn the welder over to the upgrade project no later than June 12, 2013	(b) (5), (b) (7)(F)
Use of the (b) (7)(F) may not be authorized given the need for an updated Criticality Safety Evaluation Document (CSED) for the process.	Programmatic Criticality Safety Evaluations have been placed hold per Memorandum AD-NHHO:13-060. This could impact the ability to perform welding operations using nuclear material.	This is tracked as a potential impact at a weekly AD-PSM project /program status briefing	(b) (7)(F) Upgrades will be added to priority list for pending CSEDs and tracked closely.
(b) (7)(F)			
Analytical actinide chemistry may lose the support from other programs at LANL.	The NA-26 funded ARIES program is considering the option to transfer chemistry out of LANL. Currently the Program and ARIES are the primary funding sources for this capability. The Program has already reduced the number of samples for chemistry analysis. This potential for an ARIES elimination and Program reduction in funding could result in loss of the chemistry capability altogether for actinide samples at LANL.	1) Senior managers at LANL and LAFO are working to resolve this issue. 2) The Program could increase the amount of chemistry work beyond the minimum required to explore issues of lower importance in order to maintain this competency.	Discussions continue with Chemistry Division managers have resulted in a first pass estimate of approximately \$10M (including CMR RTBF recovery) to maintain core competencies during the next few transitional years.

1.7 Earned Value Metrics

PERFORMANCE S-CURVE

Pit Manufacturing



2.0 LANL - Power Supply

MRT 4624		BLUE	Complete FY 2013 RTG material recovery activities		
(b) (7)(F)					
L3 Milestone	Baseline Date	Status/Comments	Completion Date	RGYB	
(b) (7)(F)					

2.1 Technical Progress

- Material Recovery
 - (b) (7)(F)
 - (b) (7)(F)
- The NNSA Los Alamos Field Office completed a QAS-2 audit of the Power Supply Program. The Quality Assurance Survey Report identified three Findings, one Observation, and two Remarks.
 - Finding 1: Some of the procedures identified for harvesting are not identified as LANL WQAP-PA procedures and there is no documentation to support procedure evaluation by the Program.
 - Finding 2: The Radiography Procedure does not align with requirements of PA-AP-01001, Immediate Procedure Changes at TA-55, RLW, and RLUOB. The reviewed procedure continued to reflect IPC changes in the margins.

- o Finding 3: Objective evidence demonstrating documentation of software verification and validation activities was unavailable at the time of this assessment.
- o Observation 1: During the QAS 2.0 a sampling of individual training records was selected and requested from different functional responsibilities and authorities. Eventually all requested training information was provided to the assessment team; however it was noted that it took several days for the program to pull the required data together.
- o Remark 1: LANS did not specify a sampling plan for dimensional inspection on the parts made (100% or otherwise) in the purchase order to Hand.
- o Remark 2: LANS may want to consider a "Desktop" or "Helper" field for the comments section of the "Update Quality Records" like the ones used in other modules of MRP to provide specific direction and/or instruction to ensure consistency of defined information continues to be input into the comment fields as the system is used by more and more users during the coming years.
- Process Development
 - o Continued testing of Government Furnished Equipment (GFE) in the RTG-ATF PF-5 basement.
 - o Continued weld development for Heat Source Development Series #1 on the liners, strength members, and clads.
 - o Continued RTG process development and assembled an RTG with a surrogate heater.

2.2 Equipment

- Radioisotope Thermoelectric Generator - Assembly & Testing Facility (RTG-ATF)
 - o Completed the Management Self-Assessment. The final assessment report was delivered and 8 Pre-Starts, 5 Post-Starts, and 4 Observations were identified. One pre-start and one post-start finding were closed in May.
 - o Continued development of operations and maintenance procedures.
 - o Completed changes to the Facility Safety Plan to include more detail of item locations and quantities.
- The (b) (7)(F)
 - o Completed required software quality assurance testing to support the final pre-start finding closure.
- Analytical Chemistry glove boxes (Pu Assay and Radiochemistry)
 - o Continued Zone 1 installation.
 - o Continued installation of Fire Skirting and Fire Foe tubing.
 - o Continued development of operations and maintenance procedures.
- SM-39 Development Laboratory
 - o Started the Xenon leak testing process development.
 - o Continued to work the design and procurement for the Quartz tube assembly for furnace operations.

2.3 Issues

- None

2.4 Variance Analysis and Recovery Plan

- CPI: Spending deviated from planning basis due to addition of In-Scope scope within the RTG-ATF project, which required the utilization of night and overtime shifts to maintain scheduled completion dates. The Program will continue to carry this variance through project completion. At that time all construction related codes for the RTG-ATF will be closed and the project will be considered complete. The completion of the Level 3 milestone Release for Operations will also complete the Level 2 milestone, MRT 4625.

2.5 BCRs

- PSM-13-068: This BCR includes funds specified for engineering and fabrication work to support the design and installation of additional fire suppression requirements that were not part of the original scope within the Pu Assay glovebox.
- PSM-13-069: This BCR includes funds specified for engineering and fabrication work to support the design and installation of additional fire suppression requirements that were not part of the original scope within the Radiochemistry glovebox.

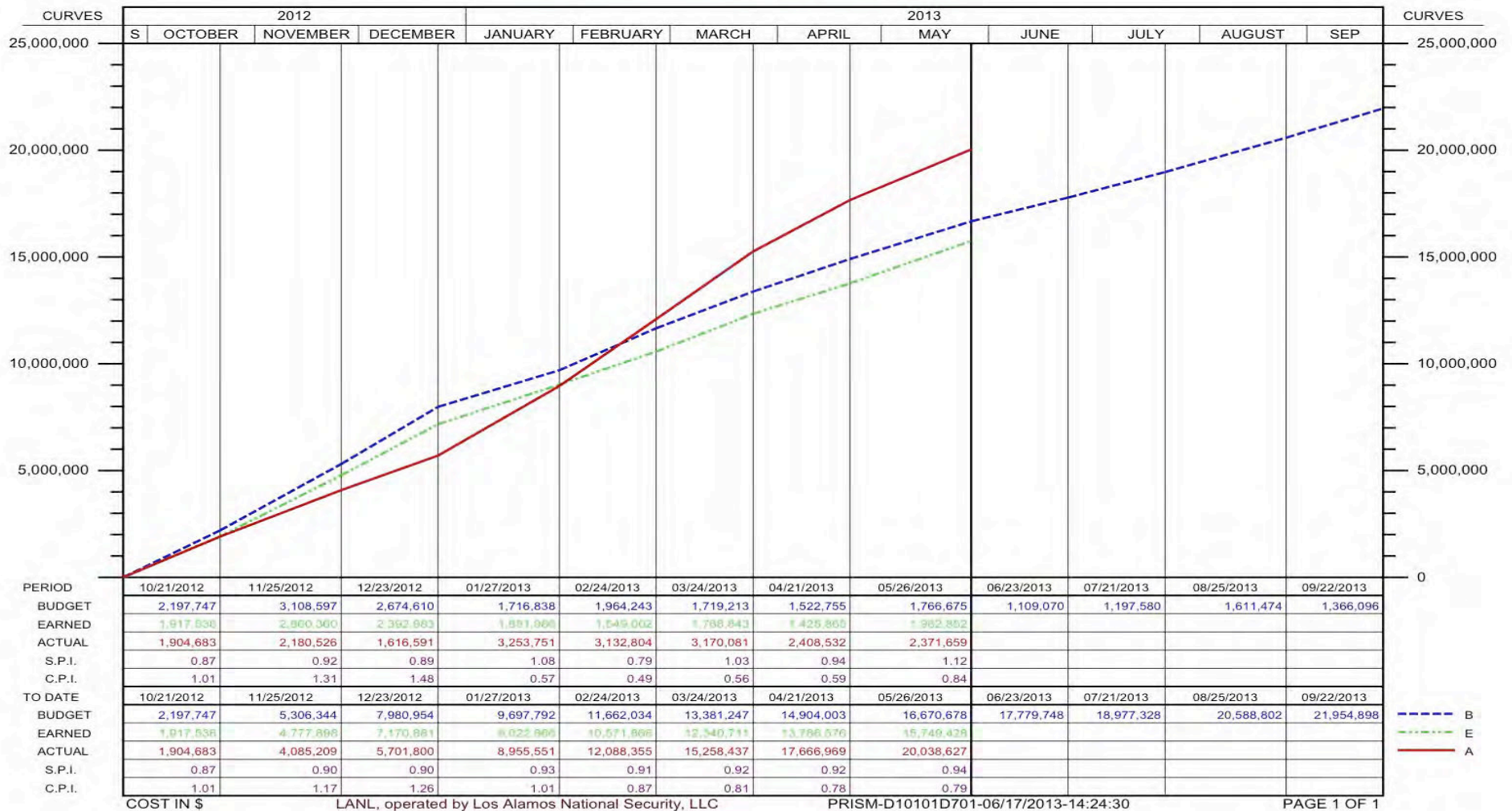
2.6 Risk Table

Work	Description	Handling Strategy	Status
Workforce development and recruiting	Dedicated staffing and depth of trained operators are both at risk to support the Development, PPI, and Qual series for RTG manufacturing development. The plan to start hiring in FY13 for dedicated staffing will not occur. Staffing is shared with other programs and may not always be available as scheduled. Note that the increase in staff also was planned to maintain lower dose rates in the staff as part of LANL ALARA goals.	1) Communicate and integrate frequently with RTG surveillance, NE-75, and other programs to make the best use of available staff. 2) Request LANL and LA Field Office management to allow for increase dose in staff assigned to this work. 3) Delay non-critical path activities until they become critical path for FPU.	Daily work planning meetings continue to ensure availability of staffing resources. Completed out-year resource loaded schedule through FY20. This schedule will be used for strategic hiring.
(b) (7)(F)	(b) (7)(F)	(b) (7)(F)	

2.7 Earned Value Metrics

PERFORMANCE S-CURVE

Reconstitution of Power Supply Manufacturing



3.0 Program Management and Support

3.1 Program Management

- Supported the Pu Sustainment Quarterly Meeting.
- Supported the Pit IPT Meeting.
- Supported a System Site Review meeting for Power Supply.

3.2 Support

- Industrial Engineering
 - Incorporated comments into the draft of a 300 Area reconfiguration analysis to support 30 pits/y new fabrication that included proposed layouts, cost estimates, and a proposed schedule.
- Document Control, Records Management, and Training
 - A total of 132 document requests were received in May
 - The new revision of the Document and Procedure Development process was released. A new and simplified Document Action Request form is available and the process is readied for broader implementation of the Document Review System
 - Reduction in records backlog holdings during the month of 60 cubic feet
- Production Control
 - Provided M&TE and classified parts coordination support.
 - Continued to provide shop floor control and daily schedule status to Enduring Stockpile and Power Supply projects.
- Maintenance
 - Corrective Maintenance: Worked on chilled water system. Completed welder repair and several additional process repairs.
 - Preventative Maintenance: Completed preventative maintenance on seven systems.
 - Work Management & Control: Continued to collect specific history and determine how to view, report, and analyze.
- Warehousing and Procurement
 - Continued to effectively procure and manage material for multiple Pu Sustainment projects (ER, Pu Assay and Radio Chemistry, Foundry cold testing and Foundry Vacuum upgrades, and (b) (7)(F) upgrades.)
 - The Procurement team prepared procurement documentation and submissions for end-of year procurement requests. Currently working with the line organization to ensure all end of year procurements are in place prior to system closure.
- Calibration
 - Perform Monthly Calibrations: The S&CL has calibrated approximately 195 Pu Sustainment items through May.
 - Customer Liaison Support: The S&CL continues to work with dimensional inspection at TA-55 to develop processes for re-certifying various M&TE in glove boxes that most benefits the Laboratory in regards to minimizing waste and maximizing the useful life of the M&TE.

3.3 Issues

- None

3.4 Variance Analysis and Recovery Plan

- None

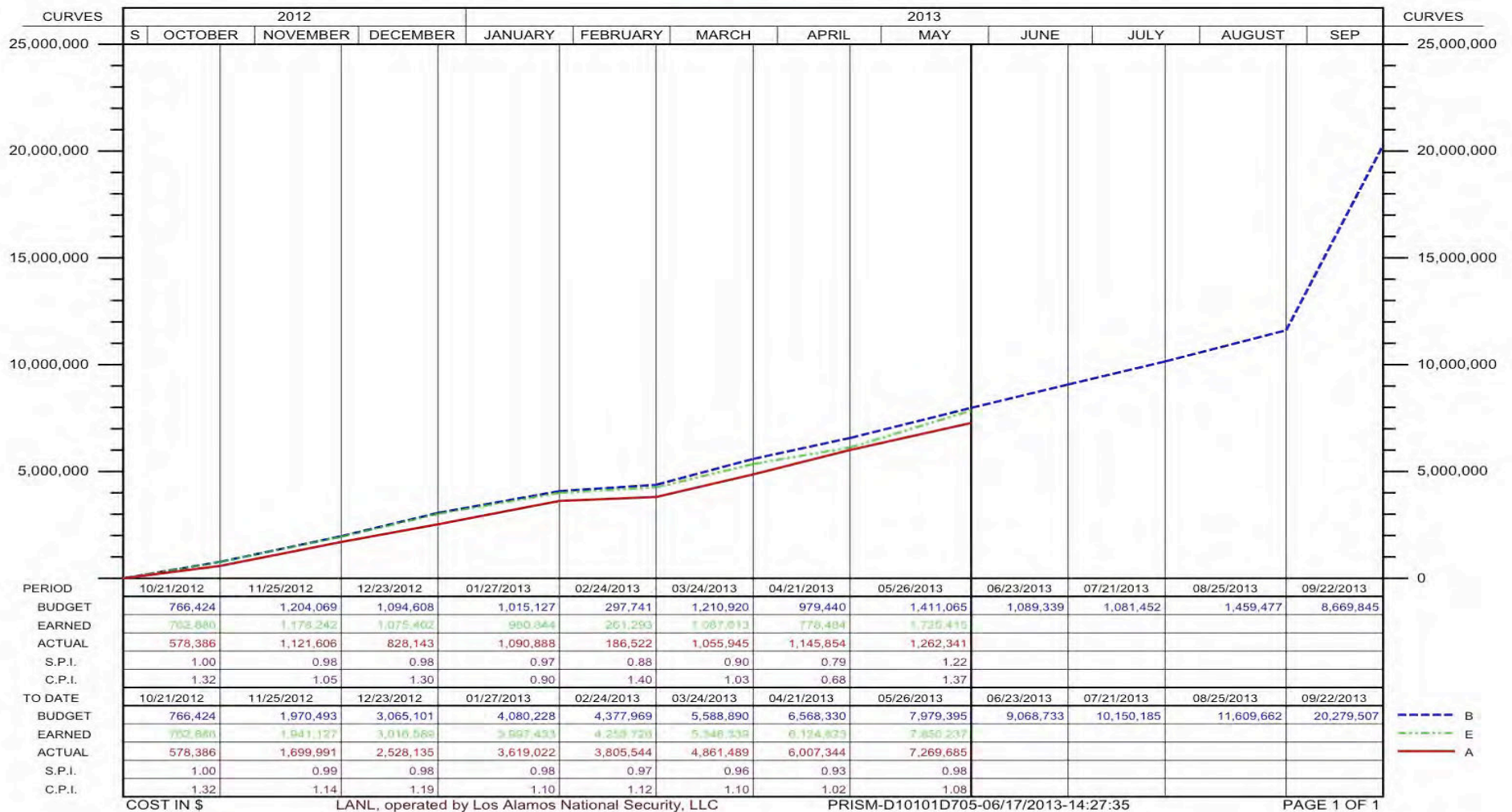
3.5 BCRs

- PSM-13-056 for \$225K: This BCR was initiated in April and is now completed with a revised budget. This BCR includes funds specified for transfer of scope and funds from the institutional quality assurance organization to the directorate specific quality organization.
- PSM-13-065 for \$187K: This BCR was initiated in April and is now completed. The BCR includes removal of funds specified for the PF-4 Wing Controller position. This position was scheduled to be filled in FY13, but due to organizational changes will be funded through the current operational work packages of all PF-4 programs.
- PSM-13-078 for \$12,312K: The BCR covers the sequestration pullback. Funds were held back by the program to prepare for this eventuality. Subsequently, no budget pulls were required and the scope impact is represented by a lost opportunity to start late-year projects such as CMM and (b) (7)(F) procurements. This is reflected in the postponement of PSM-13-032.

3.6 Earned Value Metrics

PERFORMANCE S-CURVE

Program Office



4.0 Facilities, Waste and Institutional Support

4.1 Technical Progress

- The transmittal of AD-NHHO: 13-124 Proposed Modifications to FY13 Plutonium Facility Seismic/Structural Analyses and Facility Upgrades – May 29, 2013.
- System Health Reports continue to be produced per schedule for TA-55.
- Vital Safety System Assessments continue to be produced per schedule for TA-55

4.2 Equipment

- Electrical
 - LED Lighting Fixture for PF-4 Gloveboxes: Recommendation based on light level measurements taken on the full scale mock-up on gloveboxes in ARTIC, equipment pricing, and the manufacturers willingness to make factory modifications to match PF-4 physical requirements. The manufacturer will equip the fixtures and power supply with cord lengths and plug connectors such that the fixtures will be plug & play with no modifications required.

4.3 Issues

- The Defense Nuclear Facilities Safety Board Staff conducted a visit 21-23 May, 2013.
 - The visit included a discussion of programmatic issues as well as detailed walkdowns of Fissile Material Operations. As a result of walk downs, a process deviation was observed, appropriate response actions taken and a critique held. A level 4 infraction was subsequently declared. Based on recent criticality safety trends for this location and crew, a pause to all room operations was instituted pending a detailed walk down of all room operations with criticality safety, operations, and management. Overall observations from the DNFSB Staff visit were that the current criticality safety Corrective Action Plan does not address all compliance gaps identified with the LANL criticality safety program and requested three follow-up areas that could not be addressed in the time allotted: specific question on criticality safety evaluations, pass-through limits; and emergency exercises and drills. Pursuant to a recommendation in the CSSG draft report, Criticality Safety management is addressing CSSG identified concerns with management trust.
 - An Organizational Behavior specialist from within HR has completed several interviews, and will complete her data collection by 6/1/13.

4.4 Variance Analysis and Recovery Plan

- None

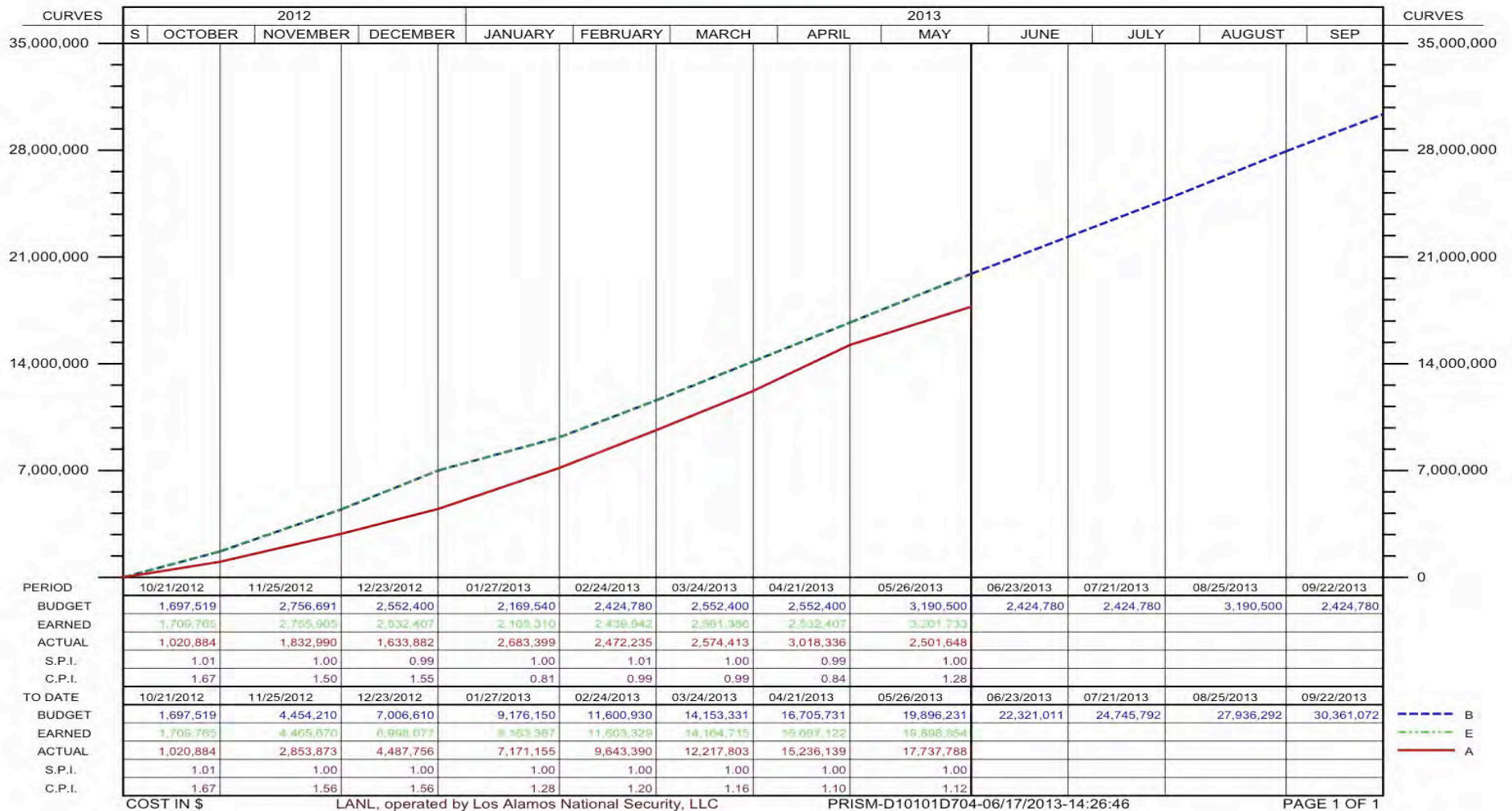
4.5 BCRs

- None

4.6 Earned Value Metrics

PERFORMANCE S-CURVE

Facility Infrastructure



5.0 LLNL

MRT 4749		GREEN	Perform Activities to Enable Plutonium Sustainment Goals		
1. Lead and manage the LLNL Plutonium Sustainment Program.					
2. (b) (7)(F)					
3. (b) (7)(F)					
4. Complete fabrication operations for DDU-1 components in conjunction with LANL to demonstrate DA changes and process improvements.					
5. Sustain minimal "cold testing" on the Modern Foundry system to retain technology and staff for later deployment by NNSA programs.					
Work Package	L3 Milestone		Date	Completion Date	RGYB
(b) (7)(F)	(b) (7)(F)		9/30/2013	February 2013	BLUE
	(b) (7)(F)		7/30/2013		GREEN
	Complete weld certification tests		3/31/2013	March 2013	BLUE
	Begin setup of compatibility tests		9/30/2013		GREEN
(b) (7)(F)					
DDU fabrication at LANL	(b) (7)(F)		12/31/2012	November 2012	BLUE
	In conjunction with LANL PA, (b) (7)(F)		9/30/2013		GREEN
Modern Foundry cold testing	Complete integrated test of material transport system		6/30/2013	December 2012	BLUE

5.1 Technical Progress

- (b) (7)(F)
 - Produced of two more samples.
 - Fabrication of test specimens and analysis continued.
- (b) (7)(F)
 - (b) (7)(F)
 -
 -
 -
- (b) (7)(F)
 - (b) (7)(F) non-nuclear parts were fabricated and are being packaged for shipment to LANL in support of (b) (7)(F)

5.2 Equipment

- None

5.3 Issues

- Compatibility testing

- Sequestration funding limitations required that this milestone be eliminated

5.4 Variance Analysis and Recovery Plan

- None

5.5 BCRs

- None

5.6 Risk Table

Work	Description	Handling Strategy	Status
(b) (7)(F)			

5.7 Earned Value Metrics

PERFORMANCE S-CURVE LLNL

