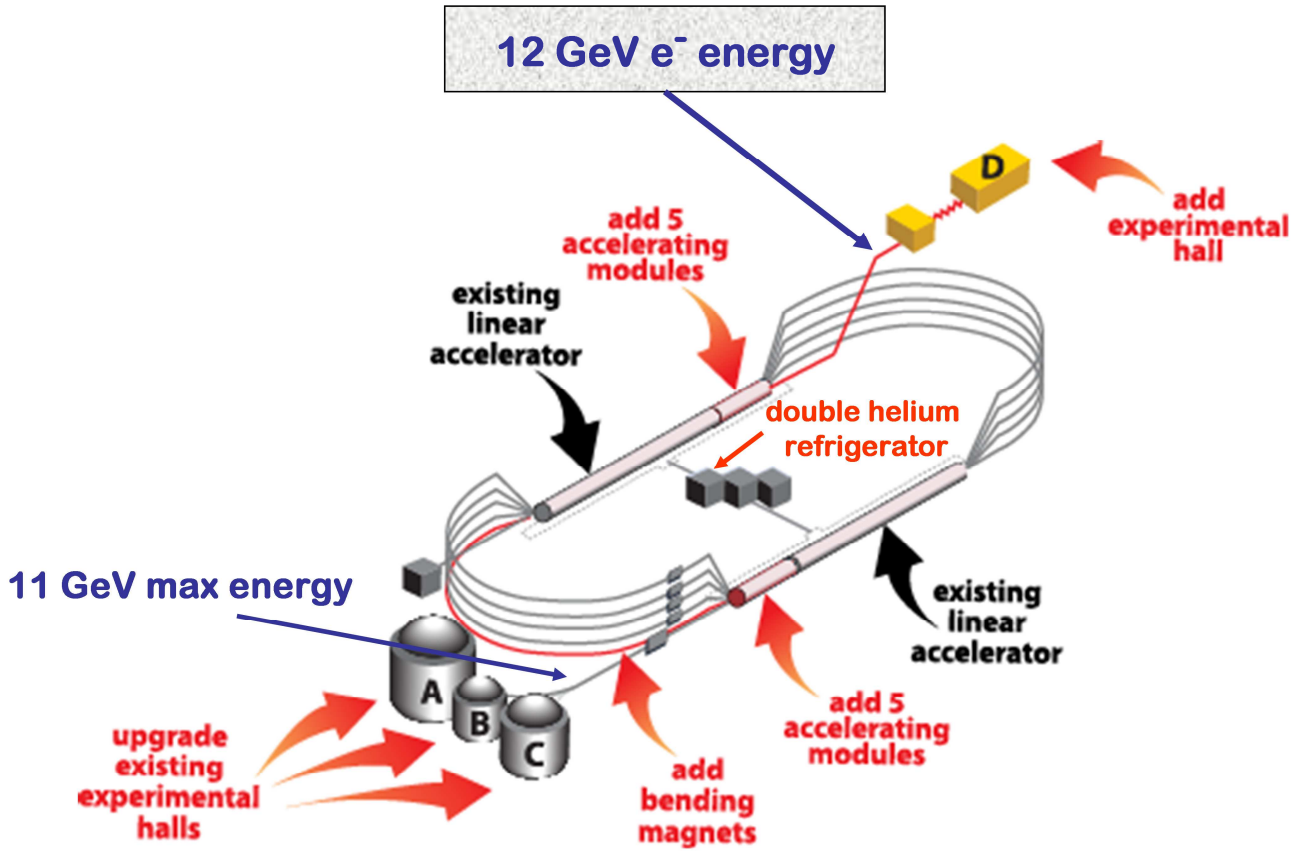
Jefferson Lab
Thomas Jefferson National Accelerator Facility

12 GeV CEBAF Upgrade
Monthly Report
August 2013



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Project Overview and Assessment

Highlights:

The project has continued to make good overall progress at Level 1. The contingency level including management reserve is 27.7% (percentage of ETC). Contingency plus Management Reserve is $10.8M. Construction is 82.0% complete. $236.3M of construction funds has been obligated. In addition, $8.9M of project scope has been obligated on WFO (Commonwealth of Virginia) funding (WBS 1.9).

The $16M FY12 budget cut has forced the project to lengthen the long installation shutdown from twelve to sixteen months. Twelve FY12 change requests have been processed to shift significant scope from FY12 to FY13 and FY14. The CD-4B Schedule Contingency went to zero in September 2012. As of October 2012, the Project was no longer able to maintain the CD-4B milestone; Halls B and C are the critical path with negative nine months of schedule contingency.

The project has no Level 2 reportable Construction variances. The Pre-Ops effort in August 2013 again generated a Level 2 unfavorable Schedule Variance (Sv= -$474K, SPI = 0.79) The Schedule Variance is due to delays in SRF and RF non-beam commissioning tasks, and to Hall D Pre-Ops activities that in the rebaseline plan have been delayed. It will be recovered in September.

Assessment and Issues:
The Project continues to achieve good overall Performance Indices at Level 1.

SPI = 0.94
CPI = 0.92
PERCENTAGE COMPLETE = 81.2%

OPC SPI = 0.96
OPC CPI = 0.98
PERCENTAGE COMPLETE = 54.8%

PED SPI = 1.00
PED CPI = 0.96
PERCENTAGE COMPLETE = 100%

CONSTRUCTION SPI = 0.93
CONSTRUCTION CPI = 0.91
PERCENTAGE COMPLETE = 82.0%
% OBLIGATED INCLUDING PHASED AND
AWAITING FINAL CONTRACT APPROVAL = 95.8%, $236.3M
FUNDING TO DATE = $274.0M

Risk Assessment:

As of the end of August, the project continues to track two Moderate risk items (box power supplies, and cryomodule microphonics) and eight High risk items (FY12 funding allocation impact, SVT detector, Hall D solenoid, Hall C Q1 magnet, Hall C HB magnet, Hall C D/Q2/Q3 magnets, Hall B Torus magnet, and Hall B Solenoid magnet). The semi-annual project-wide risk assessment has been completed. No new Moderate of High risks were identified.

<u>High Risks:</u>

The FY12 funding allocation for the Project was $50M, a reduction of $16M from the baseline plan. This represents a High risk to completion of the project on cost and on schedule. Significant scope has been delayed into FY13 and FY14, through the Change Request process, in order to complete the remaining FY12 scope within budget. Re-planning of FY12 scope is complete. As a result of the above actions, schedule contingency and cost contingency has been significantly reduced, so that project completion by June 2015 can no longer be met. An Independent Project Mini-Review (Lehman) was held on August 9, 2013 to evaluate the progress made on recommendations from the rebaseline review held on May 7 – 9, 2013. Plans are in progress for scheduling an ESAAB Review later this month or early September.

The five superconducting magnets for Hall C continue to be tracked as High risks for both cost and schedule due to the technical difficulties with the Q2/Q3/Dipole magnets, and to delays at Michigan State University (MSU) on the Horizontal Bend (HB) magnet and at Scientific Magnetics for the Q1 magnet. Steady progress is being made on the HB and the Q1 magnets, and these risks will be re-assessed following a project rebaseline implementation.

- The Q1 yokes were test fit to be sure all surfaces mated up properly (see photo). The process of attaching the coils to the yoke steel for Q1 continued.
- MSU continues to make steady progress on the HB magnet. Welding, machining after welds, and leak checking of the HB helium vessel continued at MSU. The LN2 shield fabrication continued. The critical path is still the helium vessel.
- SigmaPhi began winding the Dipole prototype coil, and is expected to be complete in September. Analysis continued for the Dipole collaring process. Sigma Phi continued work on open issues from the Dipole FDR and made first submissions for the Quadrupole FDR. Consolidation of a fifth reel of the conductor continued. A procurement was submitted for the contract modification needed to revise production costs and modify the intermediate schedule dates accordingly. SigmaPhi prepared samples of all conductor needed to measure conductor properties at 4.5°K; these tests are scheduled to be performed at CEA Saclay in September. SigmaPhi has arranged directly with ANSYS, the vendor of the FEA software used by both groups, to consult on the use of that software to perform non-linear FEA, to better compare with Jefferson Lab results.

The two superconducting magnets for Hall B are overall High cost and schedule risks.

- Fermi National Accelerator Laboratory (FNAL) Fermi National Accelerator Laboratory (FNAL) started winding the first, practice, full double-pancake coil for the Torus. Procurements were started for the out-of-plane suspension system, thermal shield and outer vacuum jacket for the Torus, with vendor bids due in September. Regular visits and weekly videoconferences continued.
- The action item list from the Preliminary Design Review for the Solenoid continues to be reviewed with Everson Tesla, Inc., (ETI). Discussions continued with Everson Tesla, Incorporated (ETI) about the open issues from the Intermediate Design Review for the Solenoid. Revised IDR documents were received from ETI and reviewed and a preliminary set of responses sent to ETI.

The Hall B detectors, specifically the Silicon Vertex Tracker (SVT), remains a High risk element because of the likelihood of significant cost increases and schedule delays related to the complexity of the technology. Manufacturing of the first production SVT module started at Fermi National Accelerator Laboratory (FNAL); its completion and testing are expected in mid-September.

The potential for schedule risk to the 12 GeV Project, related to the refurbishment of the existing solenoid magnet, planned for Hall D, remains High. The start of the magnet cool-down began in mid-December 2012 and successfully reached 80K. Compressor repairs were completed. Magnet cool-down continued from 80K to 4K using the Hall D refrigerator. During the cool-down, a problem with the 80K adsorber bed carbon dusting into the turbine inlet filter was encountered. This had the effect of decreasing the refrigerator capacity, so frequent blowing out of the carbon dust is required. The solenoid magnet was cooled to 4.5K using dewars of liquid helium drawn from the CHL. The solenoid magnet experienced a quench at 1460 A on May 1 during the second ramp to 1500A. No definite cause is established, but a series of improvements in power supply operation, quench detection, and ramp rate control were made. The Hall D solenoid was successfully ramped to a series of set points, culminating in 1355A, followed by making a set of field maps at 1300A. The magnet was warmed to room temperature, and the leak in the insulating vacuum flange seal repaired. Analysis continued of the quench experienced by the solenoid magnet on May 1 during the second ramp to 1500A. Level 2 milestone (2-11) has been met.

Moderate Risks:
The schedule risk item identified for the Accelerator Box Power Supplies continues to be monitored as a Moderate risk. This risk may be re-evaluated once vendor deliveries begin depending on the timeliness of the schedule. Installation and testing of the Arc 1 and Arc 2 power supplies, delivered in July, began in August. Preparation for full power testing is underway. The Hall A power supply was shipped by the vendor and delivery is expected in late September.

The Moderate risk of cost increases due to larger than expected microphonics behavior seen in the R-100 cryomodule during Test Lab testing continues to be tracked. The promising in-tunnel performance indicates that large microphonics do not limit the performance of one cryomodule, however this risk will continue to be tracked until testing is complete on multiple cryomodules in the tunnel operating with beam loading.

Project Management

WBS 1.7 Construction

Highlights:

As of August 31, 2013, 64 major procurements have been awarded.

The Hall D solenoid was successfully ramped to a series of set points, culminating in 1355A, followed by making a set of field maps at 1300A. The magnet was warmed to room temperature, and the leak in the insulating vacuum flange seal repaired. Analysis continued of the quench experienced by the solenoid magnet on May 1 during the second ramp to 1500A. Level 2 milestone (2-11), "Installation of the Hall D Solenoid Complete", has been met.

Manufacturing of the first production SVT module started at Fermi National Accelerator Laboratory (FNAL); its completion and testing are expected in mid-September.

The delivery schedule of the Hall C superconducting magnets continues to be a significant concern. Steady progress continues on the Q1 and HB magnets; both magnets are within one month of the plan. At MSU, welding of the helium vessel is still the critical path for the HB magnet. Vendor visits to SMI to assess progress on the Q1 magnet took place in August and another is planned for September 2013. SigmaPhi began winding the Dipole prototype coil. Progress has been made resolving differences on the Dipole acceptance criteria. The IDR for the Q2/Q3 magnets was passed in July with no issues, and the FDR is being scheduled for early October.

For the Hall B torus magnet, Fermi National Accelerator Laboratory (FNAL) started winding the first, practice, full double-pancake coil for the Torus. Additional risk mitigation has been added to the rebaseline plan to include construction of a spare coil, and cold testing of the pre-production prototype coil and the spare coil. The action item list from the Preliminary Design Review for the Solenoid continues to be reviewed with Everson Tesla, Inc., (ETI). Revised IDR documents were received from ETI and reviewed, and a preliminary set of responses sent to ETI. Vendor visits took place in August and are planned for September.

At the request of DOE's Office of Nuclear Physics, Daniel Lehman, director of the Office of Project Assessment in DOE's Office of Science, convened a Mini-Independent Project Review of the 12 GeV CEBAF Upgrade Project at the DOE Office in Germantown, MD on August 9th. The purpose of the review was to assess the progress made on previous review recommendations, and the readiness for a rebaseline. Following the Jefferson Lab response to Recommendations regarding additional cost and schedule risk mitigation for superconducting magnets, plans are in progress for holding an ESAAB meeting in early September.

Assessment and Issues:

CONSTRUCTION SPI = 1.00
CONSTRUCTION CPI = 1.12
PERCENTAGE COMPLETE = 98.4%

Accelerator Systems

WBS 1.1.1, 1.2.1, 1.2.6, 1.3 R&D, PED, and Construction

Highlights:

Cryomodules: In-tunnel checkout of C100-10 is about to start.

Power: Retuning of the circulators was completed successfully and installation of the requisite 80 units is complete. RF zone NL25 LLRF-cryomodule commissioning was completed. NL26 completed RF testing into waveguide shorts and is now undergoing cryomodule commissioning. Zone SL26, the last of the new 12 GeV RF zones, has completed RF testing into waveguide shorts and is being prepared for cryomodule commissioning. 12 GeV RF system construction activities are complete; only commissioning activities remain. Installation and testing of the Arc 1 and Arc 2 power supplies, delivered in July, began in August. Initial checks, interlock testing, and controls checks were completed. Preparation for full power testing is underway. The Hall A power supply was shipped by the vendor and delivery is expected in late September.

Deliveries of the 20 amp trim power supplies slowed in August due to production problems at the vendor. Jefferson Lab has requested the vendor hold deliveries until the problems are corrected and fixes are implemented. The total number of units delivered is 154, with 106 installed in the accelerator. The vendor has approximately 50 units waiting at their facility for the resolution of the production problem. There are more than enough power supplies at Jefferson Lab to support the Run 1 commissioning plan.

Reconfiguration and installation of the 10 amp trim system was completed. Tunnel installation and load connection in the accelerator are nearly complete with only a punch list of items remaining to be done. Cable pulls in the BSY enclosure and service building are nearly complete with only 10 trim system cables remaining to be installed. With the completion of the tunnel work in sight, the focus has shifted to completing the service building tasks and the start of system QA checks.

Cryogenics: CHL#2 transfer line fabrication and installation continued on schedule for completion by September 15th. CHL#2 4.5K cold box was retested after the vendor corrective actions. The tests indicate that the 30K return line vibrations have been corrected but the higher than expected LN2 usage has not been.

Beam Transport: Vacuum leak checks were completed for the east spreader and east extraction regions. Beamline installation neared completion in the west spreader and recombiner. Good progress was made in the extraction and transport recombiner regions. LCW plumbing installation was completed in the west arc. LCW hose installation and leak checks were completed in the east spreader and recombiner and west spreader and recombiner. Instrument air installation was completed in all regions except for the transport channel recombiner and the Hall D beamline. The last three girders on the Hall D beamline ramp were installed and vacuum beamline installation is underway. Final alignment was completed in the west recombiner.

Extraction: All scope has been completed.

Instrumentation, Controls and Safety Systems: Electronics fabrication for the beam position monitors is well underway. All calibration cells and down convertor chassis are fabricated and being tested. IF board is being finalized for production. Timing system components are being procured. All viewers and harps for the main ring are installed. Three synchrotron light monitor vacuum chambers and light pipe assemblies were readied for installation. The insertable dump electronics were completed. Hook-up is projected for mid-September. All electronics for the Hall D Tagger dump have been procured. Installation is ongoing. Vacuum electronics have been installed for all installed beamlines. PSS stoppers and beam diffusers are now ready for pressure testing followed by installation into the machine. Upgrades for the MCC PSS console were completed. Field wiring of Hall D PLC systems is starting. Procurement packages are being prepared for BELS component for the Hall D beamline.

Assessment and Issues:

CONSTRUCTION SPI = 0.97
CONSTRUCTION CPI = 0.90
PERCENTAGE COMPLETE = 94.8%

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Physics Systems

WBS 1.4 and 1.5 Construction

Highlights:

Hall A
Work on the new optical system for the Compton polarimeter continued.

Hall B
Manufacturing of the first production SVT module started at Fermi National Accelerator Laboratory (FNAL); its completion and testing are expected in mid-September. Manufacturing designs continued for the cooling plates and support structure to be used at Jefferson Lab to assemble the SVT barrel. Shipping containers to hold completed SVT modules were ordered for FNAL.

The PCAL 6th sector was kept operating in the cosmic ray test stand to gain information on long term stability and a higher-statistics map of the sector's efficiency than measured during production testing. Fabrication was completed at a vendor's shop of tooling for the installation of PCAL in the Hall.

Stringing of all wires was completed for the fifth and sixth (final) sector of Region 1 at Idaho State University (ISU). This was followed by tension testing, which was finished, and then HV checks and wire end potting, which will continue thru September. Arrangements were started to ship the completed three R1 chambers (Sectors 2, 3 and 4) from ISU to Jefferson Lab.

Two Old Dominion University (ODU) technicians completed HV cabling for the Sector 1 and Sector 3 of Region 3 (R3) chambers at Jefferson Lab and moved to doing HV cabling for the four R2 sectors stored at Jefferson Lab. The Sector 5 chamber of Region 2 (R2) completed cosmic ray testing at ODU. Arrangements were started to ship the last two R2 chambers from ODU to Jefferson Lab.

Sense wire stringing started for Sector 5 of Region 3 at Jefferson Lab. Construction of the box for Sector 6 is planned to start in October, when PCAL sectors are planned to start moving to Hall B, to have space.

The coatings for the mirror blanks of the High Threshold Cerenkov Counter (HTCC) were suspended. The vendor performed tests for an improved method to chemically clean the mirror blanks. Samples were sent to Jefferson Lab to again test reflectivity. Spare mirror blanks were trimmed in the Jefferson Lab shop. Replacement Winston Cones, for the five that did not pass QC checks, were ordered. The fabrication work for the containment vessel frame continued, with all parts having arrived. First parts for the support carriage for the HTCC arrived from the vendor. A procurement was placed for the parts for the PMT mounts. Layup of the carbon fibers for the central dish of the containment vessel continued.

Testing continued of the FTOF-1b slats at Jefferson Lab. These slats are configured into six arrays that have been placed into a common rack for cosmic ray tests, which in turn will be used to check the counters' efficiencies and measure their timing resolution. The coincidence rate is low enough that a test of one quarter of the arrays requires nearly 4 weeks in order to obtain sufficient counting statistics to measure the timing resolution as precisely as done for individual slats during construction. Parts were ordered for the two patch panels needed for FTOF.

The reformed downstream bent light guides for the central time of flight (CTOF) arrived from the vendor. Re-polishing of the affected sections' surfaces started.

The vendor attempting to re-coat the LTCC mirrors concluded that due to outgassing in the evaporation chambers, only one mirror at a time could be coated. This would require an unacceptably long time, thus a new approach was developed. Thin 10-micron Lexan strips will be coated with aluminum and a protective overcoating and then attached to the existing mirrors used now as substrates. A wavelength shifter overcoating is still planned. Vendor visits to make first tests are planned for September and October.

Fermi National Accelerator Laboratory (FNAL) started winding the first, practice, full double-pancake coil for the Torus (see photo below). The vendor for the potting fixtures informed FNAL that the delivery of that fixture would be, at best, by the last week of September. Regular visits and weekly videoconferences continued.

Hall B Torus: The first pancake winding complete.

Procurements were started for the out-of-plane suspension system, thermal shield and outer vacuum jacket for the Torus, with vendor bids due in September. Development of plans for the

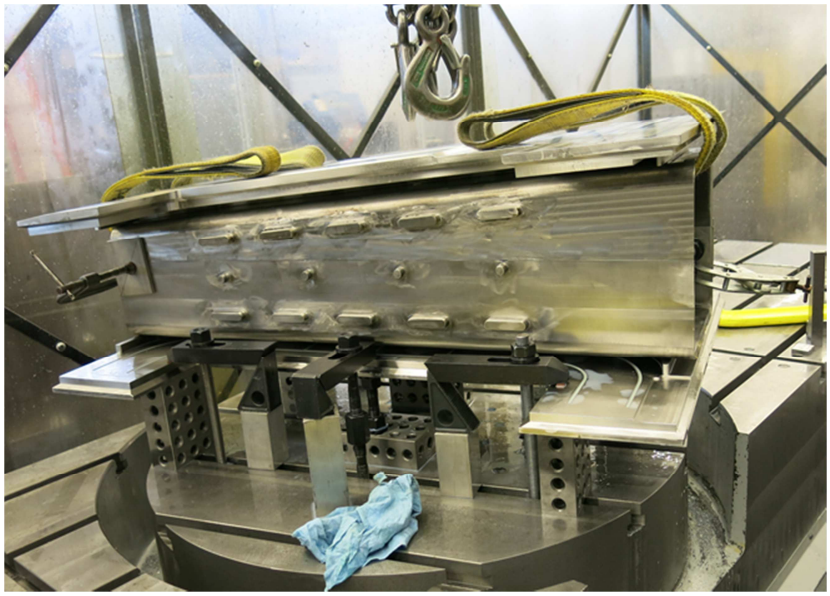
instrumentation, controls, quench protection, and power supply dump resistor continued. Design of the quench protection circuit continued together with the examination of whether it would be less expensive to reconfigure the existing power supply or procure a new one in time. The design of the cryogenic distribution can was reviewed further. The first coil case neared completion at the vendor's shop.

The conductor soldering vendor continued on setup of the buffing line and made several short (100 foot long) test runs. Samples were prepared for adhesion and bending tests. Operation of the buffing line is planned to commence in September. Work continued to change over the soldering line for the Solenoid conductor.

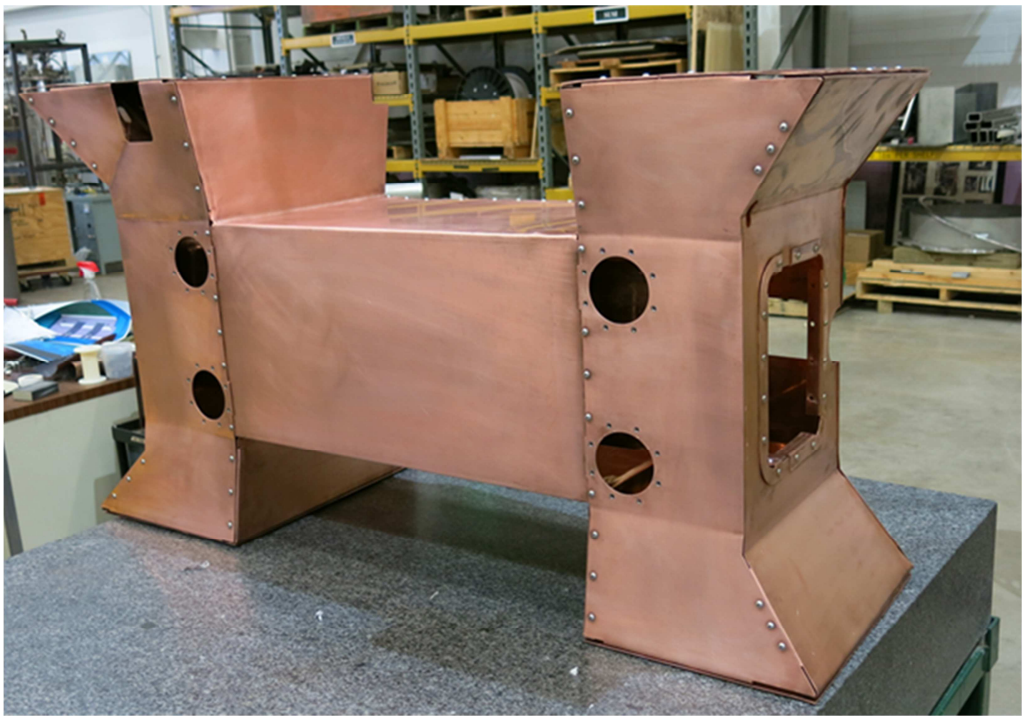
Discussions continued with Everson Tesla, Incorporated (ETI) about the open issues from the Intermediate Design Review for the Solenoid. Revised IDR documents were received from ETI and reviewed and a preliminary set of responses sent to ETI. The sensitivity of the design to construction tolerances achievable was studied by all parties and agreement reached to provide a dedicated set of X, Y and Z corrector coils; this is standard practice in ETI's MRI magnet construction work. Open questions remain after the IDR on stress in the coil winding pack, axial constraints for the winding pack, radial constraints for the shielding section of the coil, and design of the correction coils. Parametric studies continued at BNL to vary materials properties used in the thermal analysis, which is a point of discussion with ETI, notably emissivity data and the need for MLI between cold mass and thermal shield. Regular phone calls continued. A trip to Tesla in the UK is planned for September, as is a trip to Jefferson Lab by Everson senior engineers.

Hall C

Frequent phone calls continued with the three magnet vendors. Welding, machining after welds, and leak checking of the HB helium vessel continued at MSU, with the center bore and side plates being attached (see photo below).



Hall C HB Magnet Helium Vessel fit-up check.



Hall C HB Thermal Shield (LN_2).

A test fit of the coils into the partially completed helium vessel was made. The LN_2 thermal shield fabrication continued (see photo). The critical path is still the helium vessel.

Hall C Q1 Yoke fit-up in cold mass assembly jig.

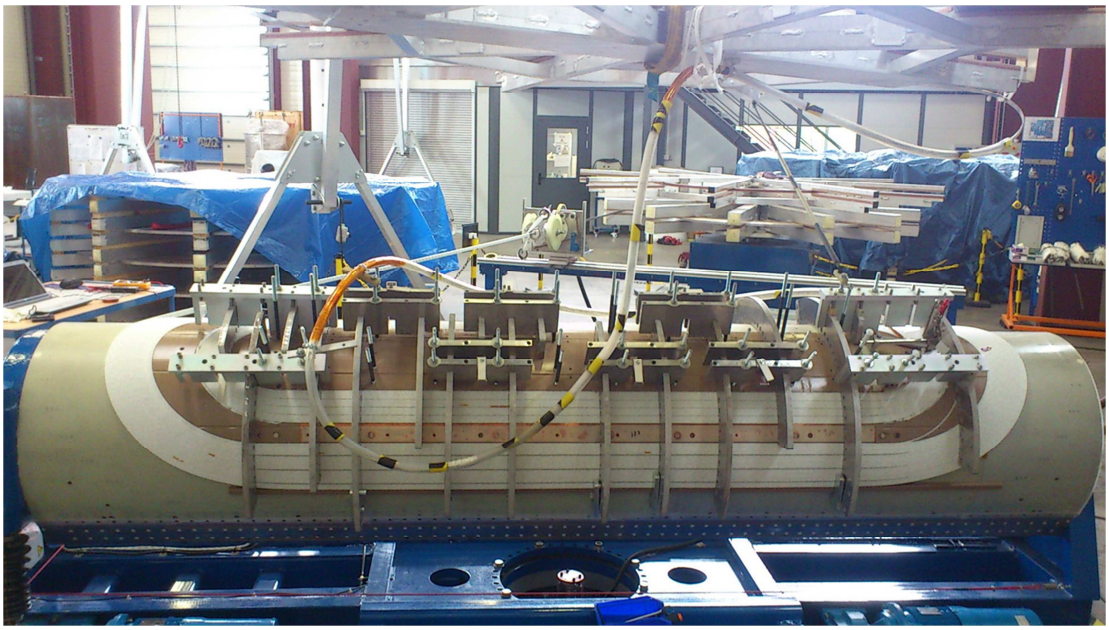
The Q1 yokes were test fit to be sure all surfaces mated up properly (see photo). The process of attaching the coils to the yoke steel for Q1 continued. This has required some adjustment to get all parts to mate properly. A full test assembly was done and then taken down to make further adjustments to mating surfaces and epoxy coatings.

Hall C Q1 lower half yoke fit-up in cold mass assembly jig.

Fabrication of the helium vessel parts and outer vacuum cryostat parts continued at a subcontractor for SMI (see photo on next page). Fit up and welding of these parts continued.

Hall C Q1 Outer Vacuum Cryostat weldment showing beamline cutout at mid-plane.

SigmaPhi began winding the Dipole prototype coil (see photo below). First spacers arrived and were placed; fabrication of the rest is the rate-limiting step for the coil wind and is expected to be complete in September. The spacers are all being made as a group, so they will be ready well ahead of time for later coils including those for the Quadrupole magnets. Analysis continued for the collaring process needed for the Dipole. Sigma Phi continued work on open issues from the Dipole FDR and made first submissions for the Quadrupole FDR. Consolidation of a fifth reel of the conductor continued. SigmaPhi plans to send the consolidating equipment to a vendor for modification in September to increase the number of press heads to three. A procurement was submitted for the contract modification needed to revise production costs and modify the intermediate schedule dates accordingly. SigmaPhi prepared samples of all further conductor received from Jefferson Lab and also prepared those needed to measure conductor properties at 4.5°K, since these properties remain a source of disagreement; these tests are scheduled to be performed at CEA Saclay in September. SigmaPhi has arranged directly with ANSYS, the vendor of the FEA software used by both groups, to consult on the use of that software to perform non-linear FEA, to better compare with Jefferson Lab results. Jefferson Lab continued work to extend their calculations to find their limiting point in terms of Dipole magnet excitation current and sent SigmaPhi a summary of results on the end-spacers.



Hall C Dipole prototype coil with 61 turns.

The University of Virginia continued work on the noble gas Cerenkov counter.

The vendor completed work on the assembly of the SHMS support structure, which has the wheels attached and is now free-standing (see photo below). The vendor for forming and pouring the concrete began mobilization on-site. Procurements were continued for the gears, bearings and other specialty hardware for the shield house.

Hall C SHMS Support Structure, self supporting.

Hall D

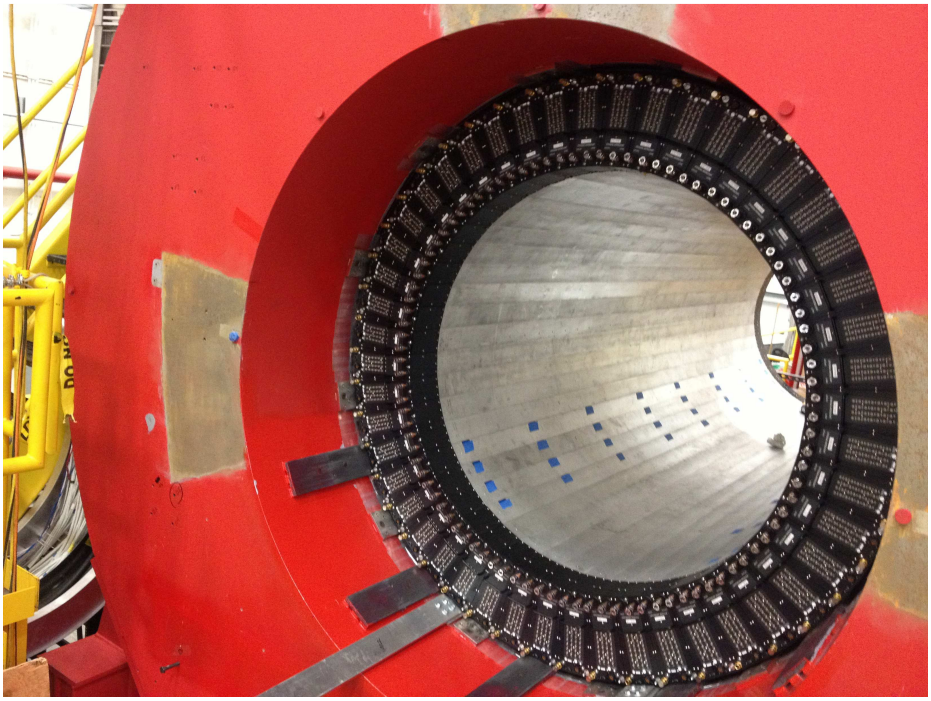
The fully assembled FDC was tested as a unit. The cradle to handle it in Hall D is being prepared.

Tests for the Central Drift Chamber (CDC) continued at Carnegie Mellon University. These will continue until the chamber is shipped to Jefferson Lab in late CY2013.

Florida State University (FSU) continued attaching light guides to TOF scintillators.

Procurements continued for the scintillators and light guides for the tagger hodoscope. Work continued on assembly of the tagger hodoscope at Catholic University. The University of Connecticut continued with fabrication and assembly of the tagger microscope. A procurement to acquire and then thin (to 20 microns) the diamond crystals needed for the coherent bremsstrahlung radiator was discussed with U. Connecticut.

The stacking of BCAL modules into the stacking frame was completed and shimming was done. The full BCAL was prepared for insertion into the bore of the solenoid magnet (see photo below).



Hall D Solenoid with BCAL detector installed.

Series production was completed for the Crate Trigger Processor (CTP) boards for Halls C and D, with testing after delivery still ongoing. First tests of assembled electronics boards were done for the start counter, tagger microscope and tagger hodoscope. Further procurements for the electronics for the pair spectrometer were placed. Firmware improvements for the various FADCs and trigger modules were continued. The fit-out of the Counting House continued. Placement of racks, power and cable race continues, and installation of the full electronics and cabling for the FCAL started.

Further procurements were made for parts needed to assemble the hydrogen target.

The solenoid was successfully ramped to a series of set points, culminating in 1355A, followed by making a set of field maps at 1300A. The magnet was warmed to room temperature, the leak in the insulating vacuum flange seal repaired, and work done on the bore to allow insertion of the BCAL. Analysis continued of the quench experienced by the solenoid magnet on May 1 during the second ramp to 1500A.

Assessment and Issues:

WBS 1.4 Halls A, B & C
CONSTRUCTION SPI = 0.80
CONSTRUCTION CPI = 0.87
PERCENTAGE COMPLETE = 65.7%

WBS 1.4.1 Hall A
CONSTRUCTION SPI = 0.86
CONSTRUCTION CPI = 0.77
PERCENTAGE COMPLETE = 85.9%

WBS 1.4.2 Hall B
CONSTRUCTION SPI = 0.86
CONSTRUCTION CPI = 0.86
PERCENTAGE COMPLETE = 70.6%

WBS 1.4.3 Hall C
CONSTRUCTION SPI = 0.71
CONSTRUCTION CPI = 0.91
PERCENTAGE COMPLETE = 57.8%

WBS 1.5, 1.9.5 and 1.9.7 Hall D
CONSTRUCTION SPI = 0.96
CONSTRUCTION CPI = 0.91
PERCENTAGE COMPLETE = 72.4%

WBS 1.5 Hall D - NP
CONSTRUCTION SPI = 0.95
CONSTRUCTION CPI = 0.90
PERCENTAGE COMPLETE = 69.0%

WBS 1.9.5 and 1.9.7 Hall D - VA
CONSTRUCTION SPI = 1.00
CONSTRUCTION CPI = 0.98
PERCENTAGE COMPLETE = 99.9%

Conventional Facilities

WBS 1.6 Construction

Highlights:
North and South Linac Service Building Air Conditioning Upgrades: All the ductwork and equipment at both the North and South Linac service buildings was installed. The duct insulation was completed at the South Linac service building. Progress continues on the controls at both the service buildings. Water and air balancing is scheduled for September. Anticipate substantial completion in September.

Assessment and Issues:

WBS 1.6, and 1.9.6 Civil
CONSTRUCTION SPI = 1.00
CONSTRUCTION CPI = 1.00
PERCENTAGE COMPLETE = 94.0%

WBS 1.6 Civil - NP
CONSTRUCTION SPI = 1.00
CONSTRUCTION CPI = 1.00
PERCENTAGE COMPLETE = 93.3%

WBS 1.9.6 Civil - VA
CONSTRUCTION SPI = 1.00
CONSTRUCTION CPI = 1.01
PERCENTAGE COMPLETE = 100%

Construction Pre-Ops

WBS 1.8 Construction Pre-Ops

Highlights:

See details in the Accelerator and Physics sections of this report.

Assessment and Issues:

WBS 1.8
CONSTRUCTION SPI = 0.79
CONSTRUCTION CPI = 0.95
PERCENTAGE COMPLETE = 15.1%

Jefferson Lab
Thomas Jefferson National Accelerator Facility

COST PERFORMANCE REPORTS

12 GeV Cost/Schedule Status Report												31-Aug-13
	Cumulative to Date ($K)									Independent	Contin.	
	Budgeted Cost		Actual Cost	Variance		Performance Indices		Budget At	Estimate At	Estimate At	& MR	
	Work	Work	Work					Complete	Completion	Completion	%	% Complete
WBS	Scheduled	Performed	Performed	Schedule	Cost	SPI	CPI	($K)	($K)	($K)	($/ETC$_{ob}$)	
1.2 PED	20,141	20,141	20,993	0	(853)	1.00	0.96	20,141	20,993	20,993		100%
1.3 Construction Accelerator Systems	92,371	89,492	99,290	(2,878)	(9,798)	0.97	0.90	94,414	99,471	104,751		95%
1.4 Construction Upgrade Halls A, B & C	56,967	45,759	52,408	(11,208)	(6,649)	0.80	0.87	69,623	71,899	79,740		66%
1.4.1 Construction Upgrade Hall A	588	505	657	(83)	(152)	0.86	0.77	588	623	765		86%
1.4.2 Construction Upgrade Hall B	34,429	29,635	34,659	(4,794)	(5,024)	0.86	0.86	42,002	44,265	49,122		71%
1.4.3 Construction Upgrade Hall C	21,950	15,619	17,093	(6,331)	(1,474)	0.71	0.91	27,033	27,011	29,583		58%
1.5 Construction Hall D	31,344	29,803	33,187	(1,540)	(3,383)	0.95	0.90	43,170	45,514	48,070		69%
1.6 Construction Conventional Facilities	28,087	28,182	28,197	95	(15)	1.00	1.00	30,219	30,306	30,235		93%
1.7 Construction Project Management	9,056	9,056	8,051	0	1,005	1.00	1.12	9,207	8,656	8,185		98%
12 GeV Total Estimated Base Cost	**237,966**	**222,433**	**242,127**	**(15,532)**	**(19,694)**	**0.93**	**0.92**	**266,773**	**276,838**	**291,975**		**83.4%**
				Management Reserve					**423**	**423**	1%	
				IEAC Projected Variance					**(0)**	**(15,137)**	0%	
				DOE Held Contingency					**10,240**	**10,240**	35%	
				12 GeV Total Estimated Cost					**287,500**	**287,500**		
1.0 ACD/CDR	3,497	3,497	3,445	0	52	1.00	1.02	3,497	3,445	3,445		100%
1.1 R&D	6,878	6,878	7,052	0	(173)	1.00	0.98	6,878	7,052	7,052		100%
1.8 Construction Pre-Ops	2,257	1,783	1,885	(474)	(103)	0.79	0.95	11,831	11,824	11,831		15%
12 GeV Total Other Project Base Cost	**12,632**	**12,158**	**12,382**	**(474)**	**(224)**	**0.96**	**0.98**	**22,206**	**22,321**	**22,327**		**54.8%**
				Management Reserve					**13**	**13**	0%	
				IEAC Projected Variance					**0**	**(6)**	0%	
				DOE Held Contingency					**166**	**166**	2%	
				12 GeV Other Project Cost					**22,500**	**22,500**		
12 GeV Total Project Cost	**250,598**	**234,591**	**254,509**	**(16,006)**	**(19,918)**	**0.94**	**0.92**	**288,979**	**310,000**	**310,000**	**27.7%**	**81.2%**

Contingency	**26.5%**
Mgmt Reserve	**1.1%**
Contingency + Mgmt Reserve on Actual Costs	**19.9%**
Contingency Based on Actual Costs	**19.1%**
Mgmt Reserve Based on Actual Costs	**0.8%**

Monthly EVMS Data	**BCWS**	**BCWP**	**ACWP**
12 GeV Total Estimated Cost	2,839	2,547	3,826
12 GeV Other Project Cost	116	105	323
12 GeV Total Project Cost	2,954	2,652	4,149

Contingency and MR % calculation includes out-year phased contracts: **0**

Contingency and MR % calculation includes contract vendor notifications.

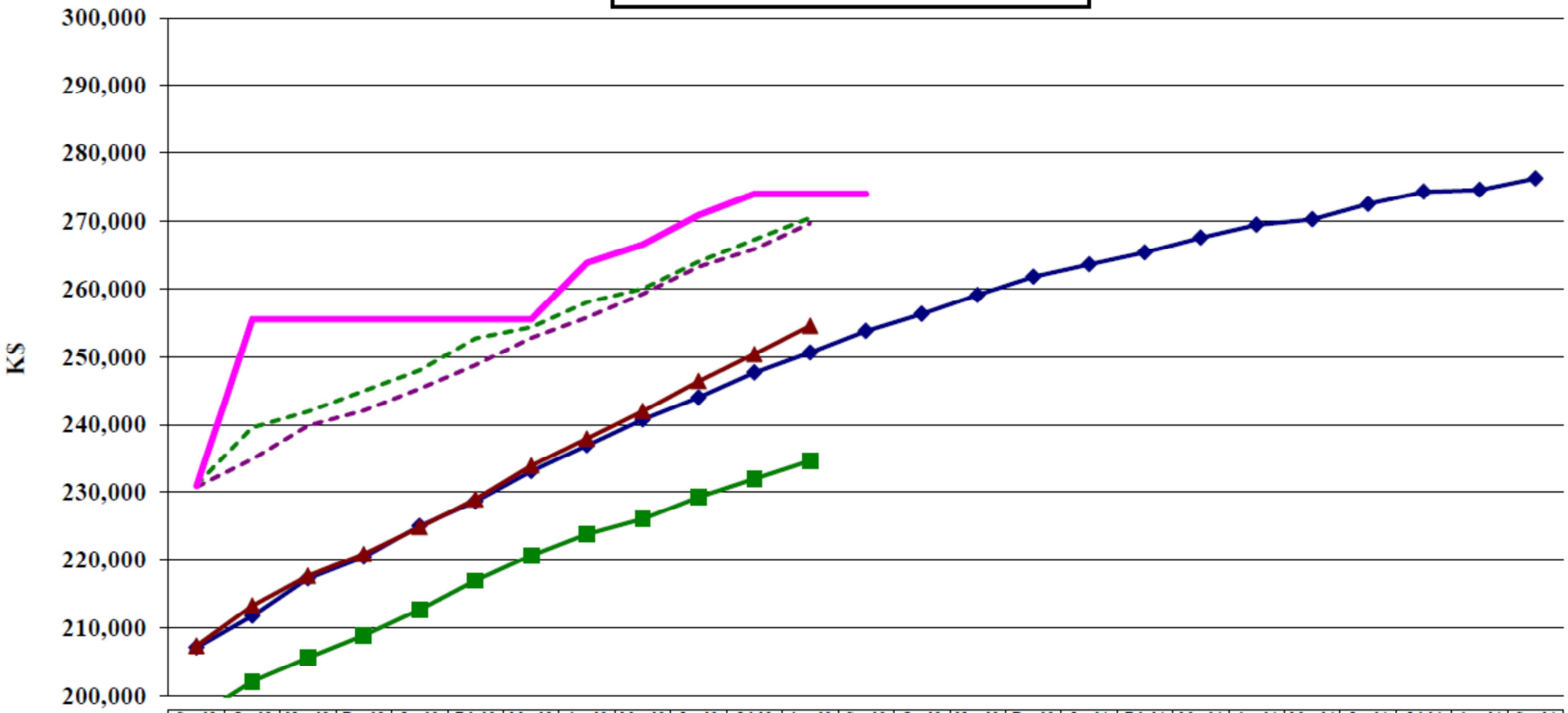
Assigned ~ $1.25M Mgmt Reserve for Civil contracts.

Non-DOE	**BCWS**	**BCWP**	**ACWP**	**Sv**	**Cv**	**SPI**	**CPI**	**BAC**	**EAC**	**IEAC**	**Cont/MR %**	**% Complete**
1.09 Work for Others	8,747	8,741	8,810	(6)	(69)	1.00	0.99	8,747	8,930	8,816	1157%	100%
1.10 Non-DOE	624	624	N/A	-		1.00		624	-			100%

12 GeV Upgrade NP Project

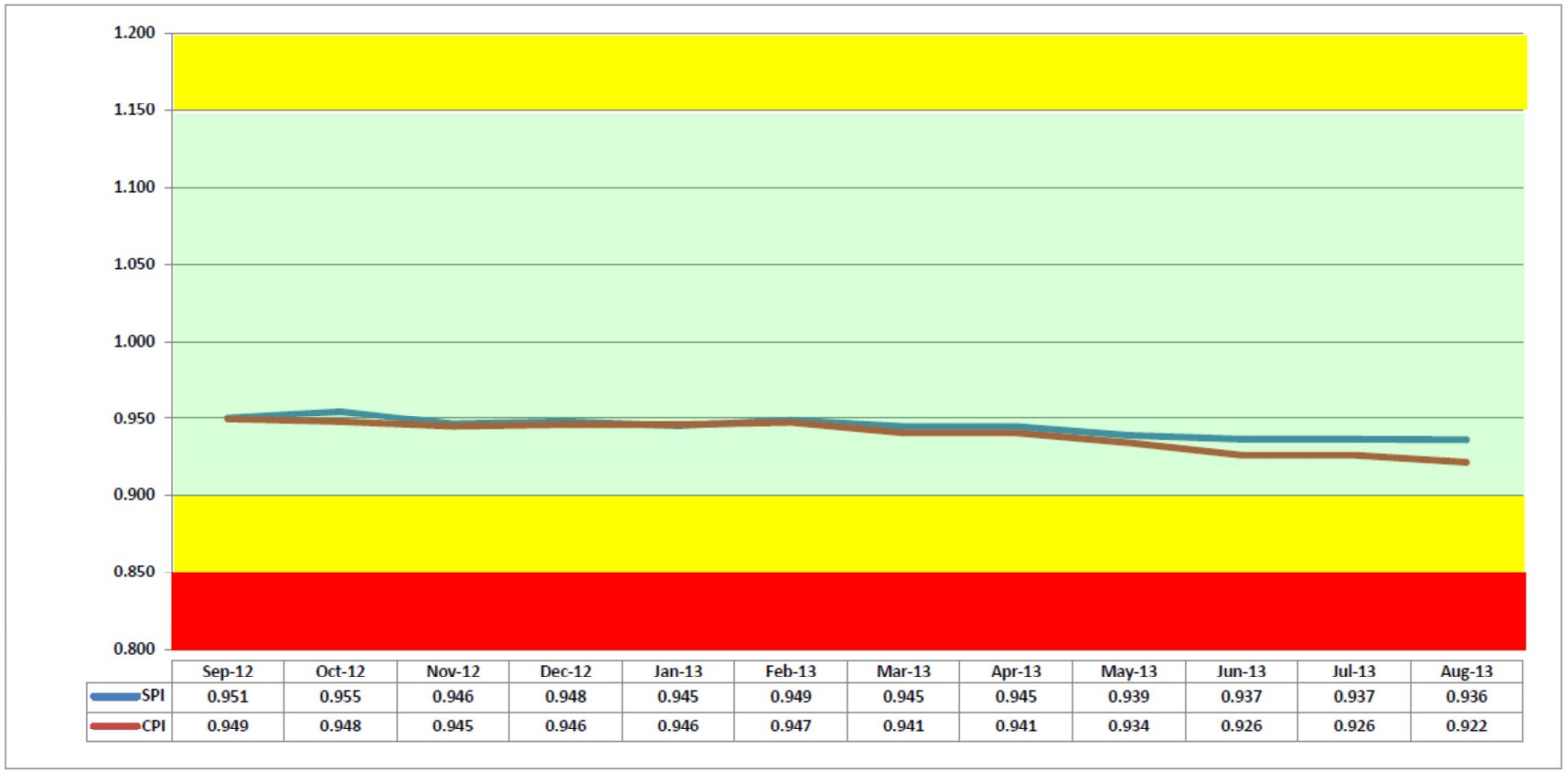
Earned Value $K

Including changes through CR13-006



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	207,076	211,714	217,223	220,376	224,996	228,642	233,075	236,886	240,754	244,008	247,643	250,598	253,763	256,257	259,048	261,765	263,617	265,398	267,580	269,451	270,265	272,518	274,300	274,581	276,252
BCWP	196,828	202,093	205,586	208,848	212,640	216,903	220,616	223,778	226,077	229,258	231,939	234,591													
ACWP	207,310	213,223	217,584	220,821	224,806	228,973	233,869	237,904	241,999	246,379	250,360	254,509													
Obligated	230,766	234,825	239,830	242,097	245,295	248,742	252,750	255,767	259,230	263,244	265,907	269,694													
Pending	231,009	239,563	241,935	244,993	247,989	252,682	254,344	257,980	259,969	264,010	267,289	270,500													
Funding	230,928	255,493	255,493	255,493	255,493	255,493	255,493	263,836	266,573	270,903	274,000	274,000	274,000												

CPI / SPI August 2013

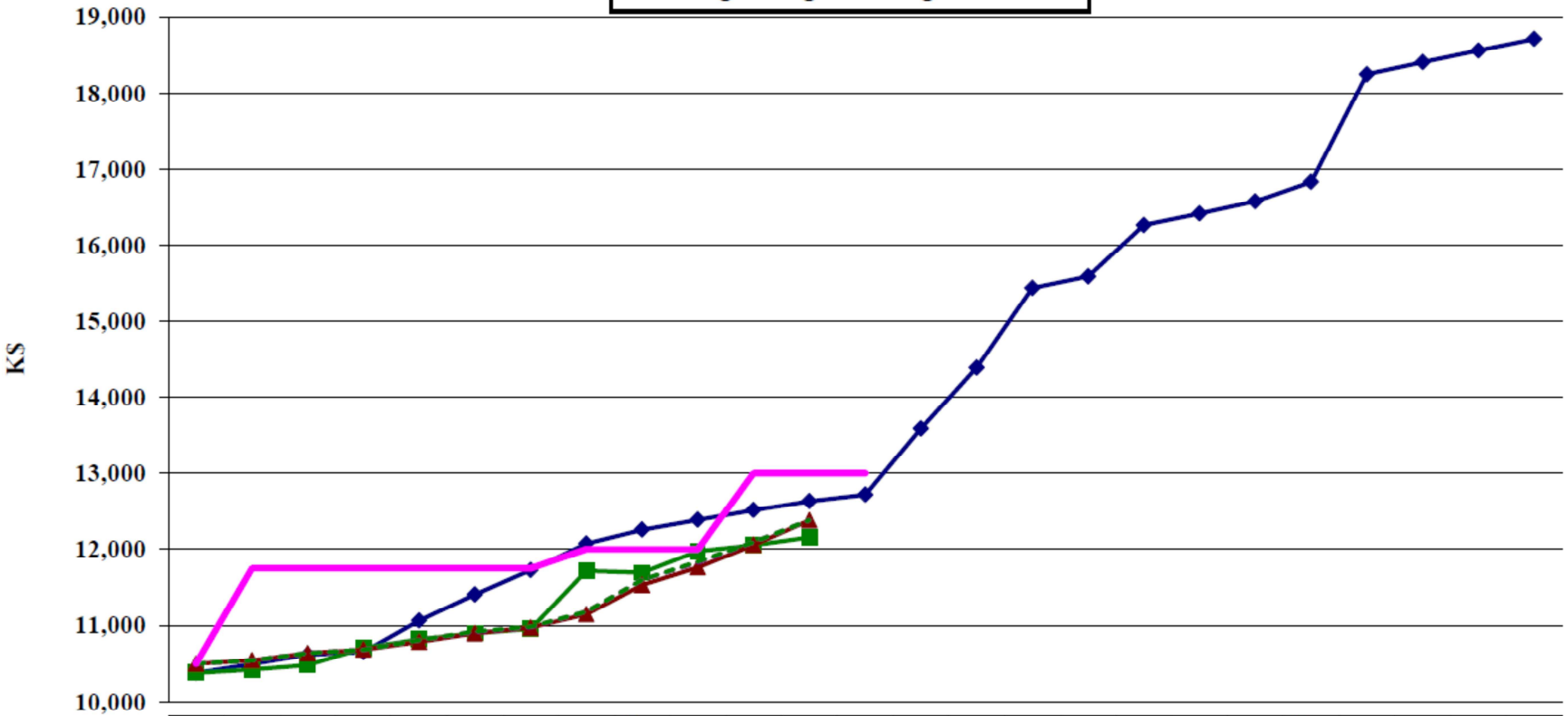


	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13
SPI	0.951	0.955	0.946	0.948	0.945	0.949	0.945	0.945	0.939	0.937	0.937	0.936
CPI	0.949	0.948	0.945	0.946	0.946	0.947	0.941	0.941	0.934	0.926	0.926	0.922

12 GeV Upgrade NP OPC

Earned Value $K

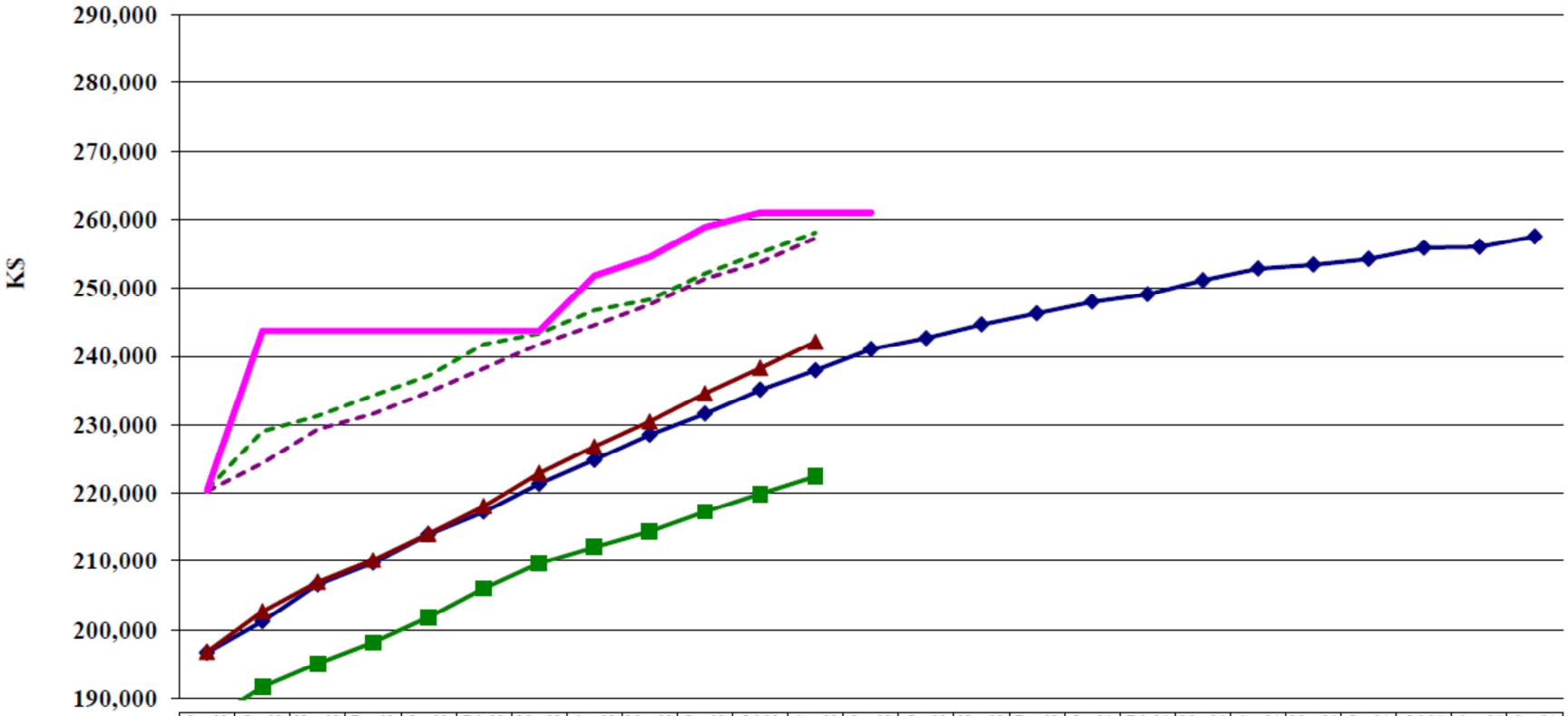
Including changes through CR13-006



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	10,375	10,489	10,613	10,649	11,062	11,405	11,727	12,075	12,257	12,388	12,516	12,632	12,718	13,587	14,388	15,437	15,590	16,263	16,416	16,576	16,832	18,246	18,406	18,559	18,712
BCWP	10,375	10,419	10,477	10,700	10,817	10,896	10,955	11,718	11,693	11,977	12,053	12,158													
ACWP	10,497	10,539	10,635	10,680	10,782	10,894	10,971	11,146	11,530	11,763	12,059	12,382													
Obligated	10,497	10,539	10,635	10,681	10,808	10,914	10,974	11,180	11,601	11,825	12,095	12,383													
Pending	10,497	10,539	10,635	10,681	10,808	10,920	10,984	11,180	11,601	11,840	12,097	12,383													
Funding	10,500	11,750	11,750	11,750	11,750	11,750	11,750	12,000	12,000	12,000	13,000	13,000	13,000												

12 GeV Upgrade NP TEC
Earned Value $K

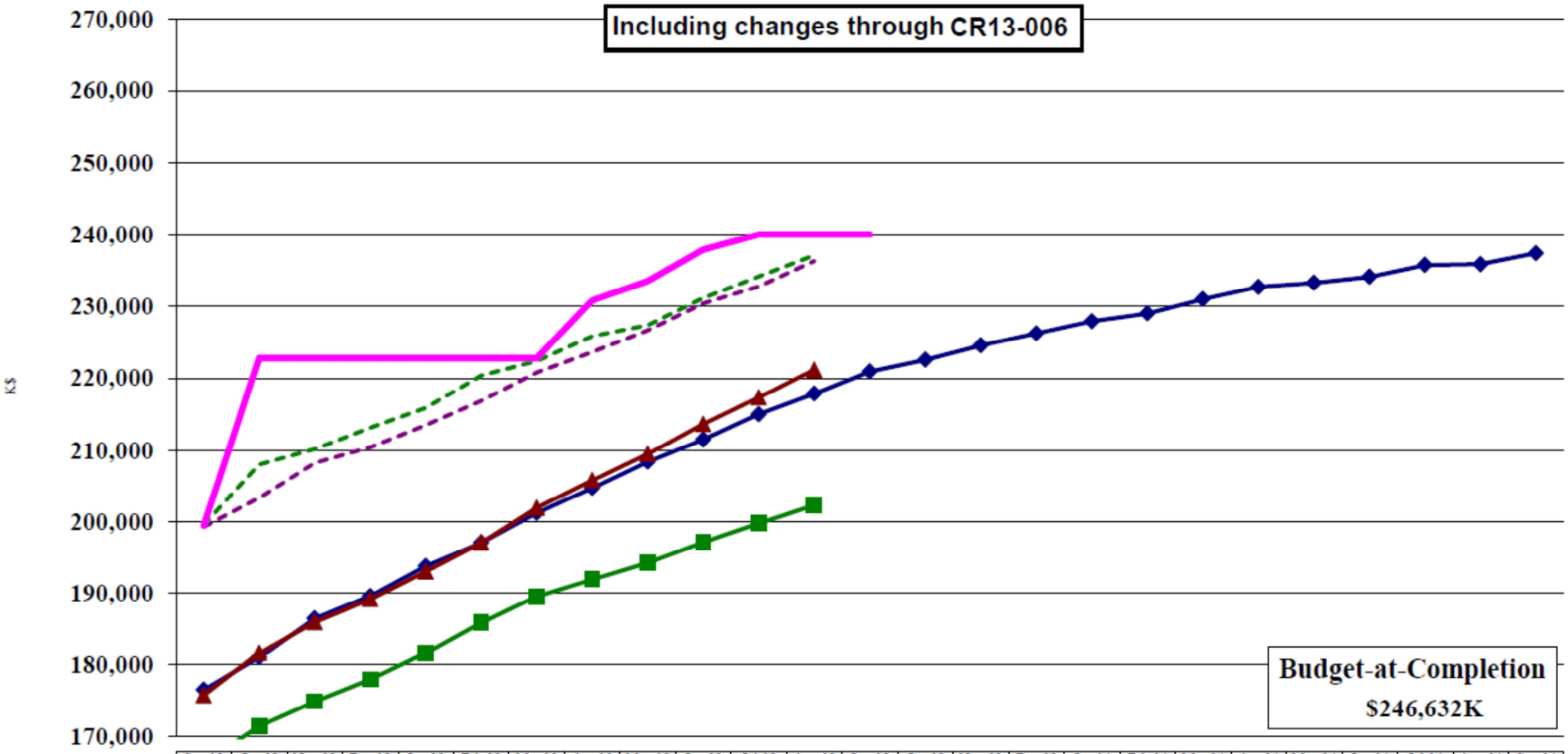
Including changes through CR13-006



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	196,700	201,225	206,610	209,727	213,934	217,237	221,349	224,811	228,497	231,620	235,127	237,966	241,045	242,670	244,659	246,328	248,027	249,134	251,163	252,875	253,434	254,272	255,894	256,022	257,540
BCWP	186,453	191,674	195,109	198,148	201,823	206,007	209,661	212,060	214,384	217,281	219,886	222,433													
ACWP	196,813	202,684	206,949	210,141	214,024	218,079	222,898	226,758	230,469	234,617	238,301	242,127													
Obligated	220,269	224,329	229,334	231,601	234,799	238,246	241,776	244,587	247,628	251,418	253,812	257,311													
Pending	220,513	229,024	231,299	234,312	237,181	241,762	243,361	246,800	248,368	252,170	255,193	258,117													
Funding	220,428	243,743	243,743	243,743	243,743	243,743	243,743	251,836	254,572	258,902	261,000	261,000	261,000												

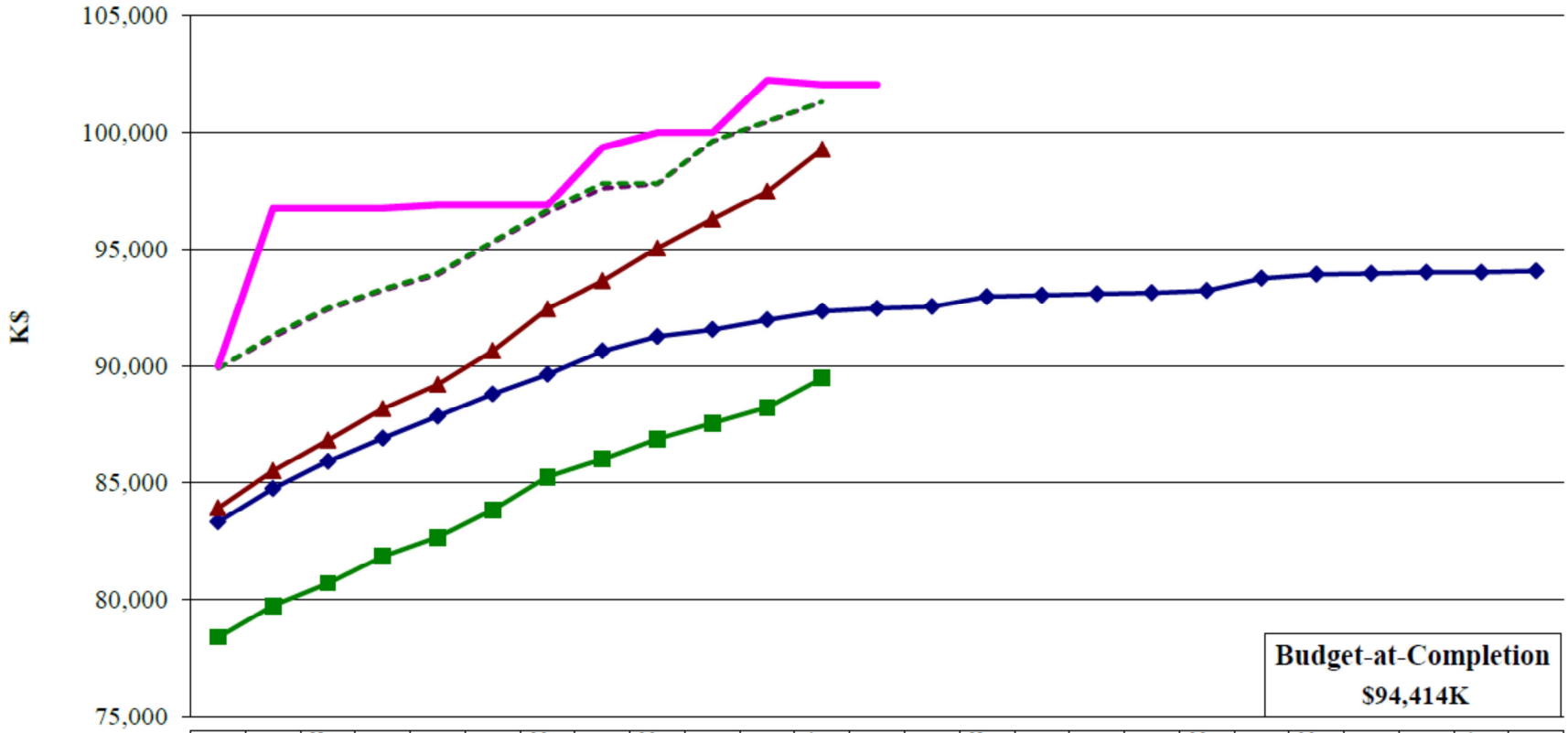
12 GeV Upgrade NP Construction

Earned Value $K



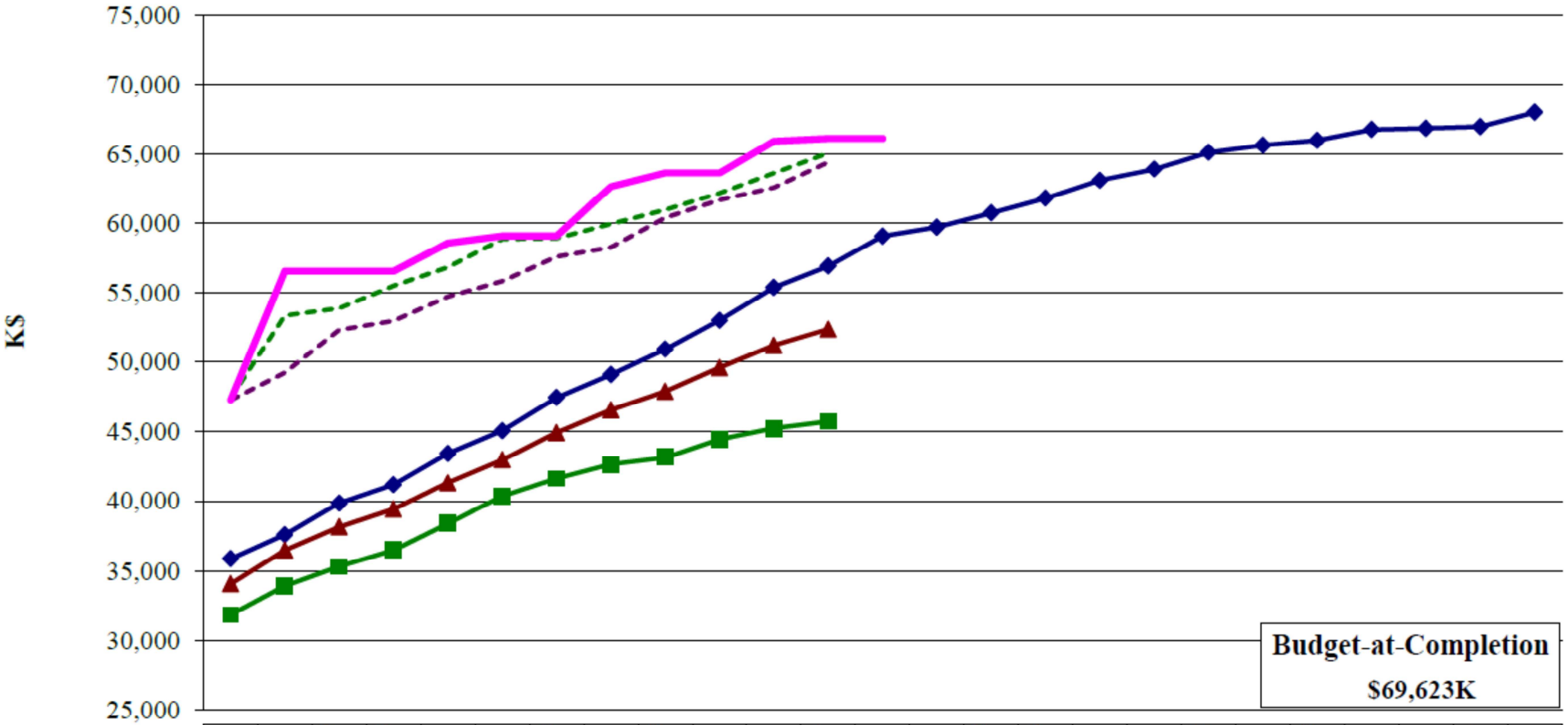
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	176,560	181,085	186,469	189,586	193,793	197,096	201,208	204,670	208,356	211,480	214,987	217,825	220,905	222,529	224,519	226,187	227,886	228,994	231,023	232,734	233,293	234,131	235,753	235,882	237,399
BCWP	166,313	171,533	174,968	178,008	181,682	185,867	189,521	191,919	194,244	197,141	199,746	202,293													
ACWP	175,820	181,690	185,956	189,148	193,031	197,086	201,905	205,765	209,475	213,623	217,308	221,134													
Obligated	199,276	203,293	208,201	210,423	213,494	216,835	220,782	223,593	226,635	230,425	232,819	236,318													
Pending	199,519	207,987	210,167	213,134	215,877	220,345	222,367	225,807	227,375	231,177	234,199	237,124													
Funding	199,428	222,743	222,743	222,743	222,743	222,743	222,743	230,836	233,572	237,902	240,000	240,000	240,000												

12 GeV 1.3 Construction Accelerator Systems
Earned Value $K



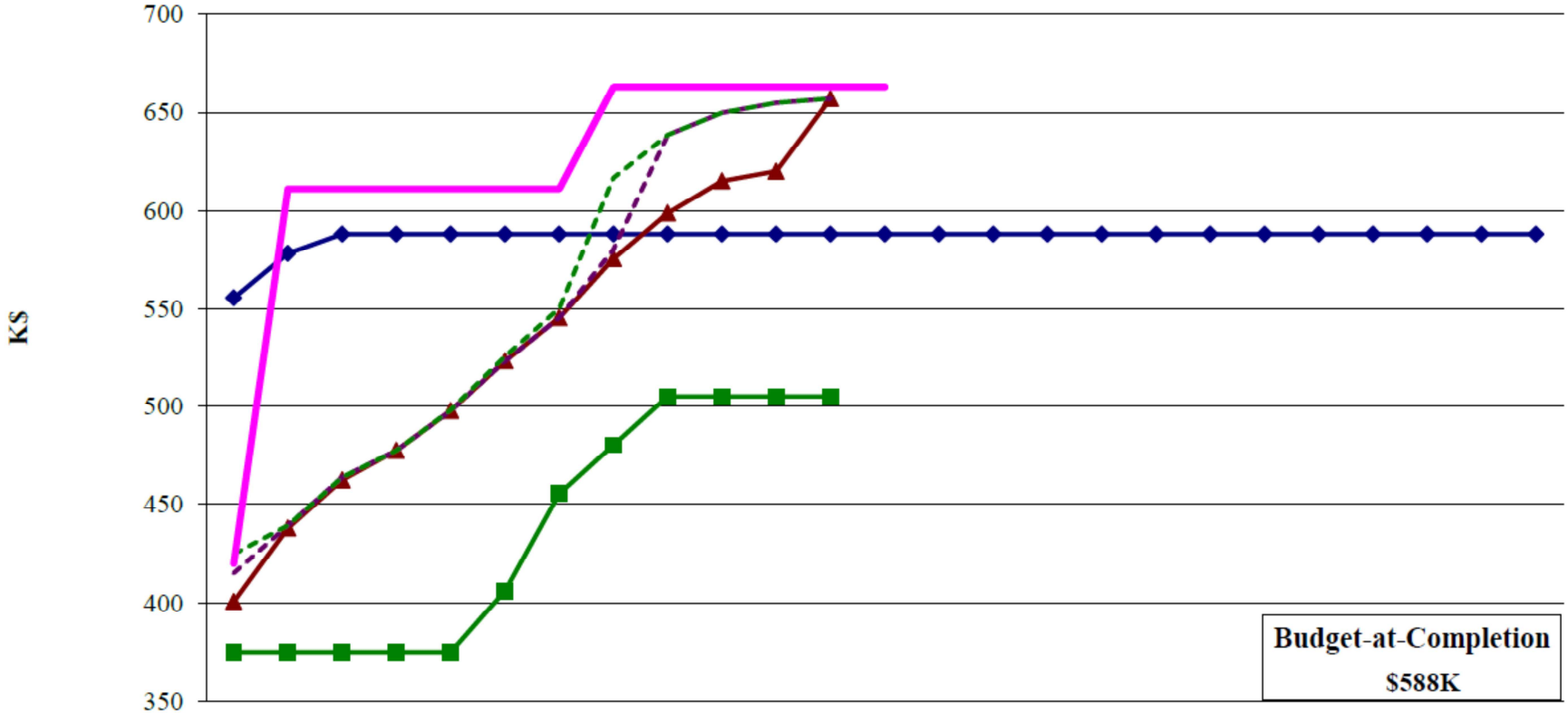
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	83,322	84,744	85,909	86,902	87,842	88,796	89,651	90,667	91,288	91,581	92,003	92,371	92,488	92,561	92,992	93,047	93,111	93,160	93,247	93,773	93,948	93,980	94,030	94,030	94,089
BCWP	78,386	79,741	80,694	81,843	82,665	83,831	85,246	86,004	86,872	87,548	88,220	89,492													
ACWP	83,915	85,505	86,819	88,167	89,214	90,680	92,465	93,669	95,068	96,306	97,499	99,290													
Obligated	89,907	91,263	92,447	93,258	93,931	95,305	96,583	97,630	97,816	99,635	100,47	101,32													
Pending	89,907	91,371	92,519	93,324	94,007	95,361	96,705	97,848	97,853	99,656	100,51	101,33													
Funding	90,015	96,775	96,775	96,775	96,905	96,905	96,905	99,370	100,02	100,02	102,25	102,05	102,05												

12 GeV 1.4 Construction Upgrade Hall A, B & C
Earned Value $K



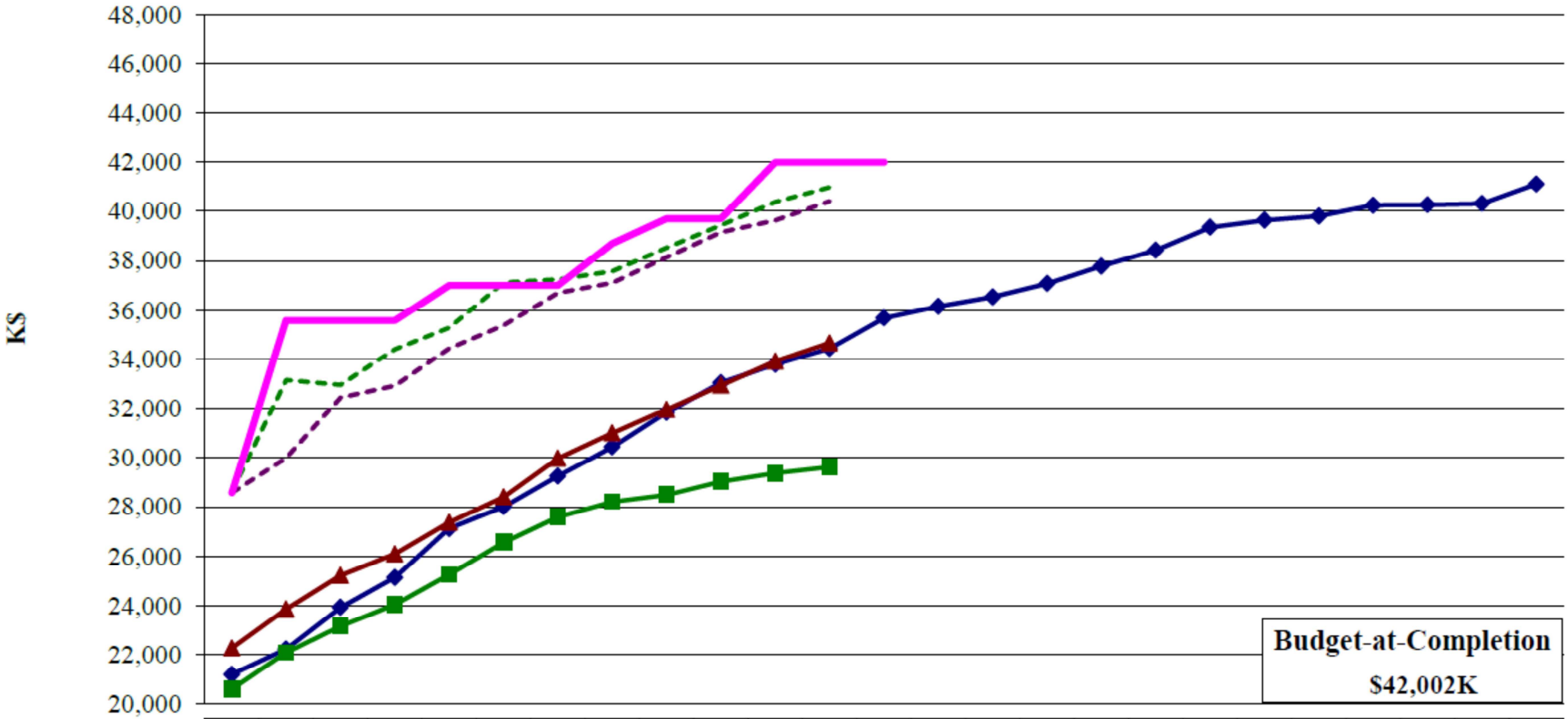
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	35,853	37,583	39,847	41,190	43,462	45,097	47,472	49,117	50,946	53,045	55,427	56,967	59,100	59,746	60,771	61,826	63,122	63,935	65,164	65,683	66,033	66,804	66,899	67,008	68,041
BCWP	31,835	33,921	35,294	36,473	38,376	40,360	41,641	42,681	43,177	44,482	45,274	45,759													
ACWP	34,061	36,469	38,141	39,418	41,333	43,003	44,967	46,580	47,911	49,613	51,232	52,408													
Obligated	47,301	49,267	52,344	53,024	54,777	55,892	57,645	58,313	60,441	61,713	62,597	64,464													
Pending	47,411	53,406	53,931	55,560	56,881	58,888	58,953	59,979	60,994	62,196	63,655	65,124													
Funding	47,310	56,601	56,601	56,601	58,611	59,111	59,111	62,663	63,663	63,663	65,963	66,163	66,163												

12 GeV 1.4.1 Construction Hall A
Earned Value $K



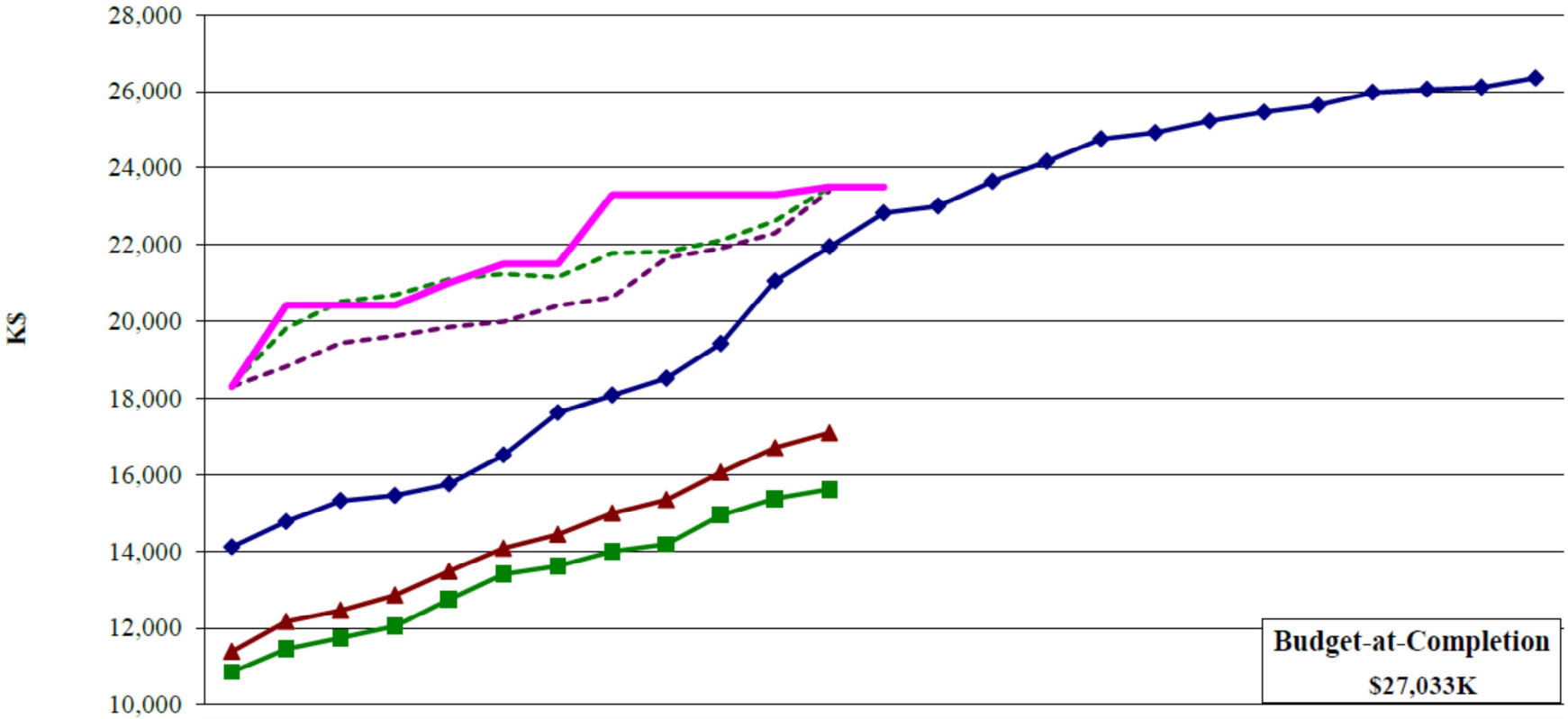
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	556	578	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588
BCWP	375	375	375	375	375	406	456	480	505	505	505	505													
ACWP	401	438	462	478	498	523	546	576	599	615	620	657													
Obligated	415	439	464	478	498	523	546	580	639	650	655	657													
Pending	425	439	464	478	498	526	550	617	639	650	655	657													
Funding	420	611	611	611	611	611	611	663	663	663	663	663	663												

12 GeV 1.4.2 Construction Hall B
Earned Value $K



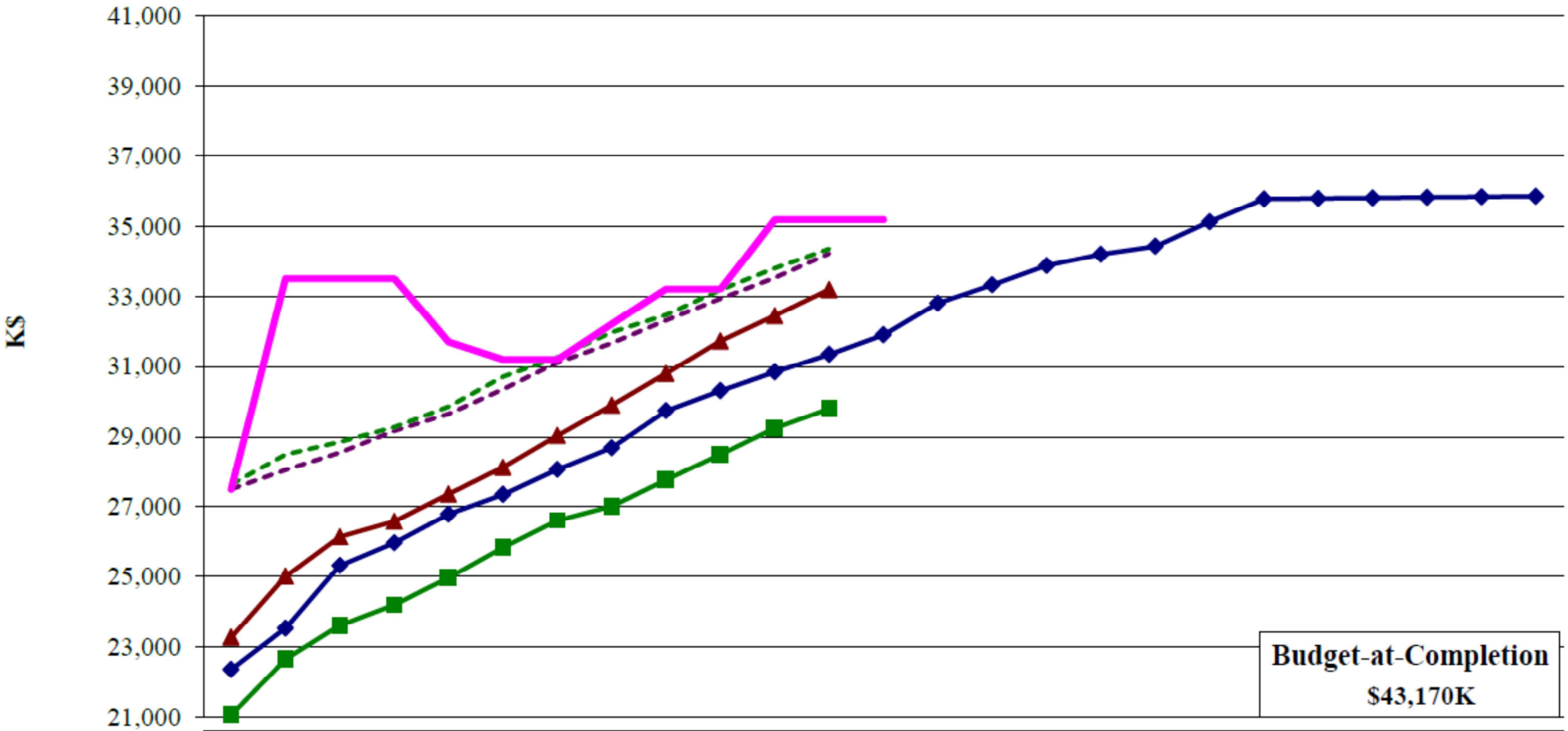
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	21,188	22,230	23,939	25,146	27,119	28,002	29,261	30,449	31,839	33,040	33,785	34,429	35,683	36,153	36,539	37,078	37,785	38,430	39,349	39,636	39,806	40,241	40,260	40,314	41,104
BCWP	20,601	22,086	23,173	24,054	25,257	26,561	27,579	28,210	28,493	29,030	29,389	29,635													
ACWP	22,267	23,862	25,224	26,092	27,366	28,404	29,986	31,005	31,963	32,939	33,910	34,659													
Obligated	28,578	30,003	32,448	32,929	34,434	35,380	36,699	37,114	38,146	39,151	39,634	40,405													
Pending	28,623	33,149	32,957	34,396	35,285	37,120	37,250	37,574	38,533	39,434	40,377	40,971													
Funding	28,580	35,580	35,580	35,580	37,000	37,000	37,000	38,700	39,700	39,700	42,000	42,000	42,000												

12 GeV 1.4.3 Construction Hall C
Earned Value $K



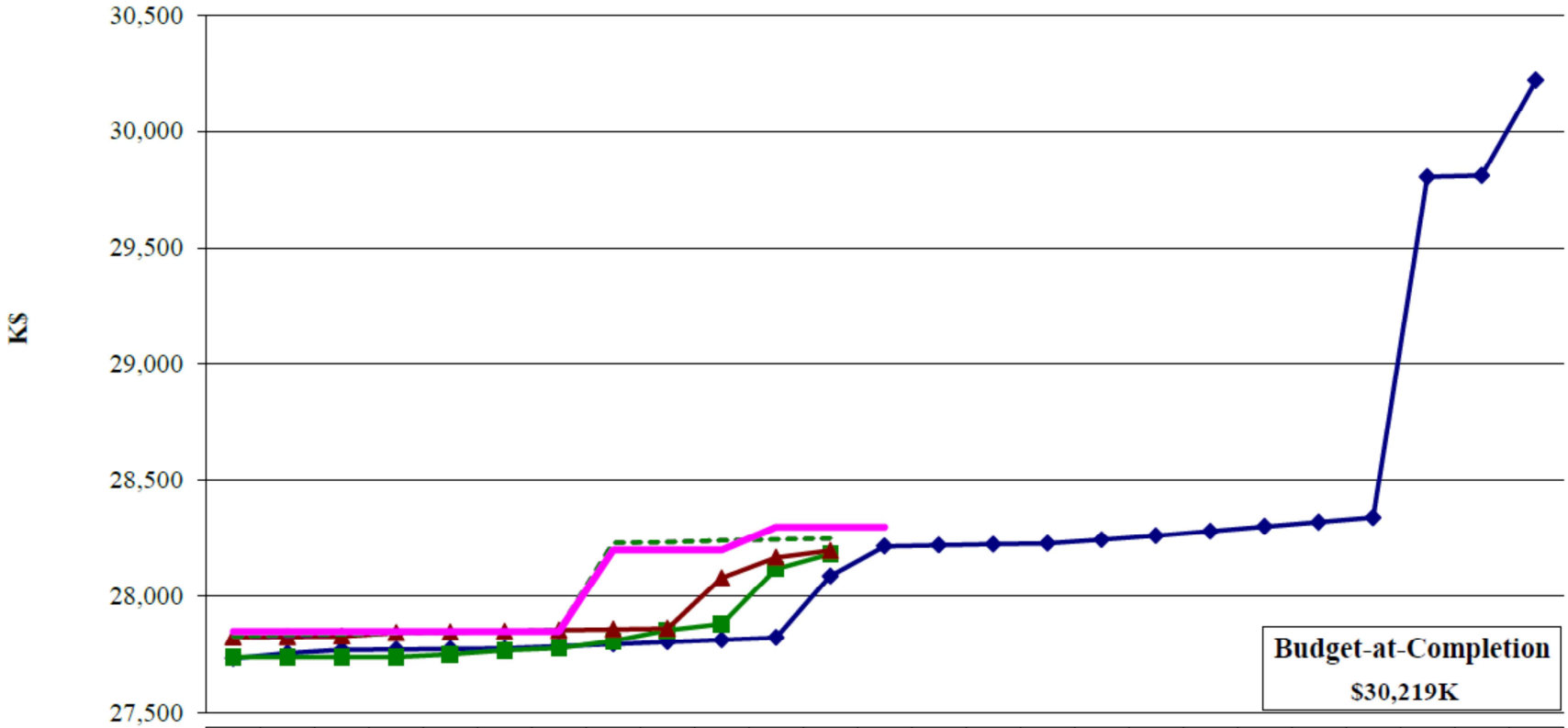
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	14,109	14,775	15,320	15,457	15,754	16,507	17,622	18,080	18,519	19,416	21,054	21,950	22,829	23,004	23,644	24,160	24,750	24,917	25,227	25,458	25,638	25,975	26,051	26,106	26,349
BCWP	10,859	11,460	11,746	12,044	12,744	13,393	13,607	13,990	14,180	14,946	15,379	15,619													
ACWP	11,393	12,169	12,454	12,849	13,470	14,075	14,435	14,999	15,349	16,059	16,701	17,093													
Obligated	18,308	18,825	19,431	19,617	19,846	19,988	20,400	20,620	21,657	21,912	22,308	23,403													
Pending	18,363	19,817	20,510	20,687	21,097	21,242	21,153	21,788	21,822	22,113	22,623	23,495													
Funding	18,310	20,410	20,410	20,410	21,000	21,500	21,500	23,300	23,300	23,300	23,300	23,500	23,500												

12 GeV 1.5 Construction Hall D
Earned Value $K



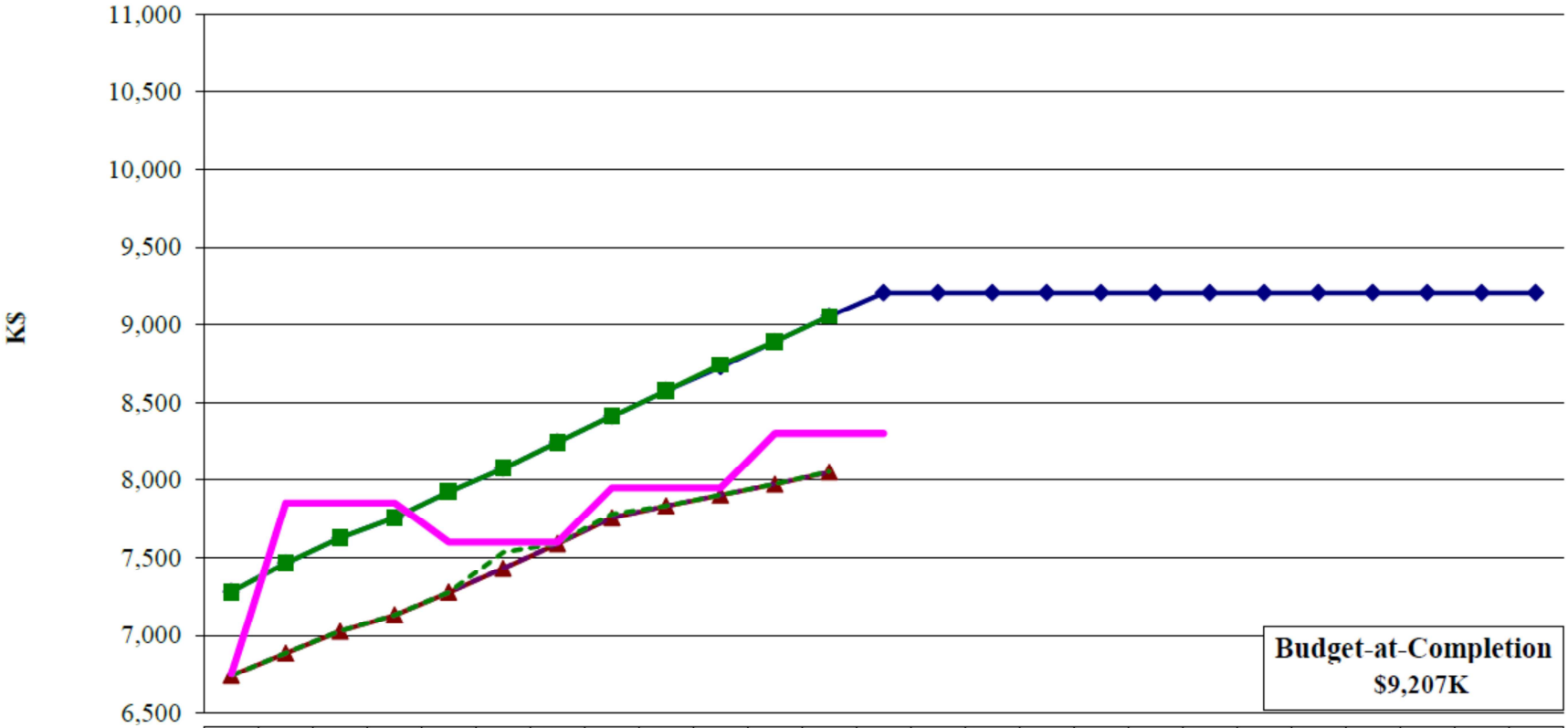
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	22,370	23,536	25,317	25,968	26,792	27,351	28,057	28,682	29,743	30,315	30,842	31,344	31,894	32,795	33,324	33,878	34,202	34,430	35,124	35,770	35,785	35,800	35,815	35,830	35,844
BCWP	21,071	22,666	23,615	24,198	24,967	25,832	26,613	27,016	27,764	28,489	29,244	29,803													
ACWP	23,281	25,006	26,141	26,586	27,360	28,122	29,029	29,903	30,802	31,723	32,437	33,187													
Obligated	27,500	28,047	28,544	29,165	29,661	30,356	31,109	31,663	32,310	32,932	33,527	34,229													
Pending	27,633	28,488	28,851	29,273	29,864	30,712	31,263	31,969	32,460	33,180	33,808	34,361													
Funding	27,500	33,500	33,500	33,500	31,700	31,200	31,200	32,200	33,200	33,200	35,183	35,183	35,183												

12 GeV 1.6 Construction Conventional Facilities
Earned Value $K



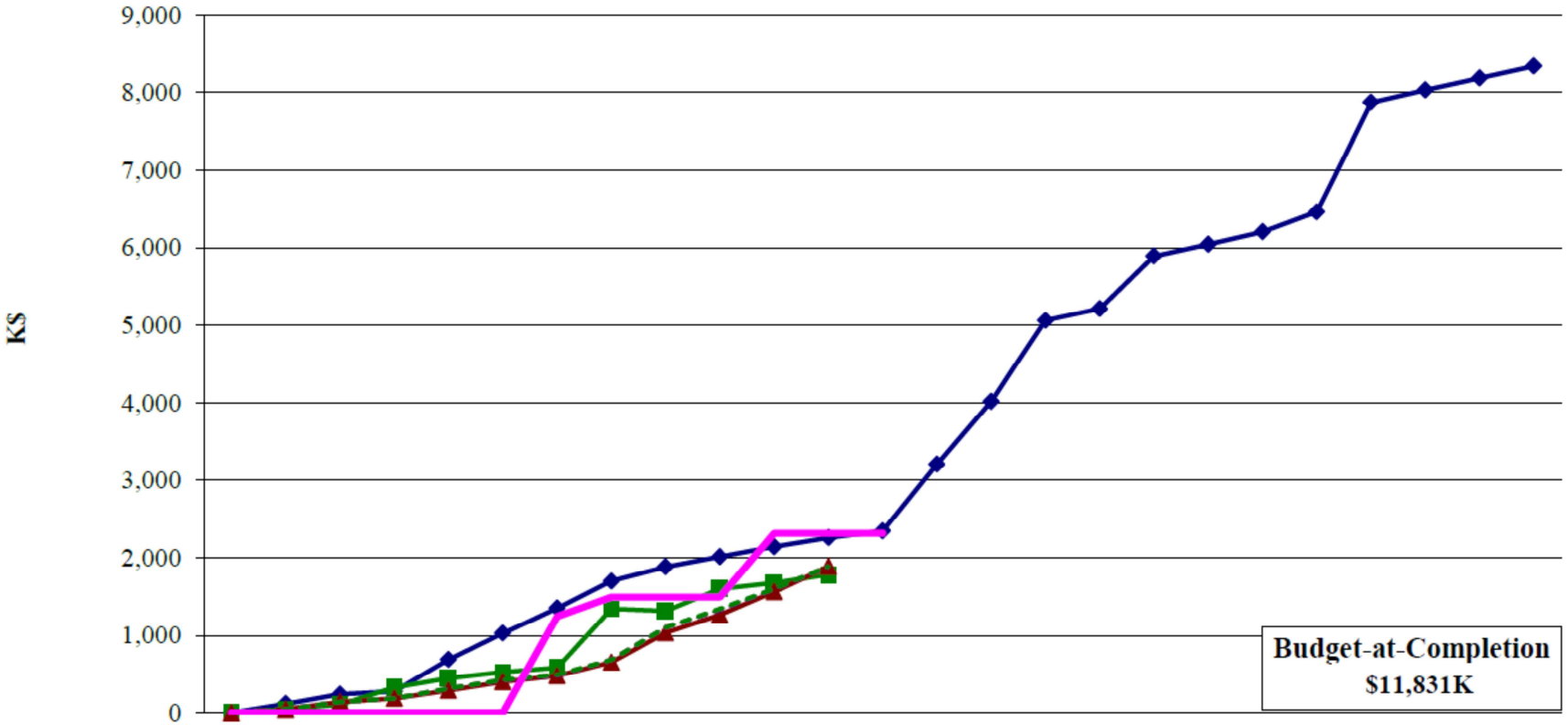
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	27,735	27,756	27,771	27,773	27,775	27,777	27,786	27,795	27,805	27,814	27,824	28,087	28,216	28,221	28,225	28,229	28,245	28,262	28,281	28,302	28,321	28,340	29,802	29,808	30,219
BCWP	27,740	27,740	27,740	27,740	27,752	27,769	27,778	27,809	27,855	27,882	28,117	28,182													
ACWP	27,825	27,826	27,829	27,845	27,847	27,851	27,855	27,859	27,863	28,079	28,168	28,197													
Obligated	27,829	27,830	27,839	27,845	27,847	27,851	27,855	28,231	28,235	28,242	28,246	28,250													
Pending	27,829	27,837	27,839	27,845	27,847	27,851	27,855	28,231	28,235	28,242	28,246	28,250													
Funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Funding	27,850	27,850	27,850	27,850	27,850	27,850	27,850	28,200	28,200	28,200	28,300	28,300	28,300												

12 GeV 1.7 Construction Project Management
Earned Value $K



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	7,280	7,465	7,626	7,754	7,922	8,075	8,244	8,409	8,575	8,725	8,891	9,056	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207	9,207
BCWP	7,280	7,465	7,625	7,754	7,922	8,075	8,244	8,409	8,575	8,740	8,891	9,056													
ACWP	6,738	6,884	7,026	7,131	7,277	7,430	7,589	7,754	7,831	7,901	7,973	8,051													
Obligated	6,739	6,885	7,027	7,132	7,278	7,431	7,590	7,756	7,833	7,903	7,974	8,053													
Pending	6,739	6,885	7,028	7,132	7,278	7,533	7,591	7,779	7,833	7,903	7,975	8,056													
Funding	6,750	7,850	7,850	7,850	7,600	7,600	7,600	7,950	7,950	7,950	8,300	8,300	8,300												

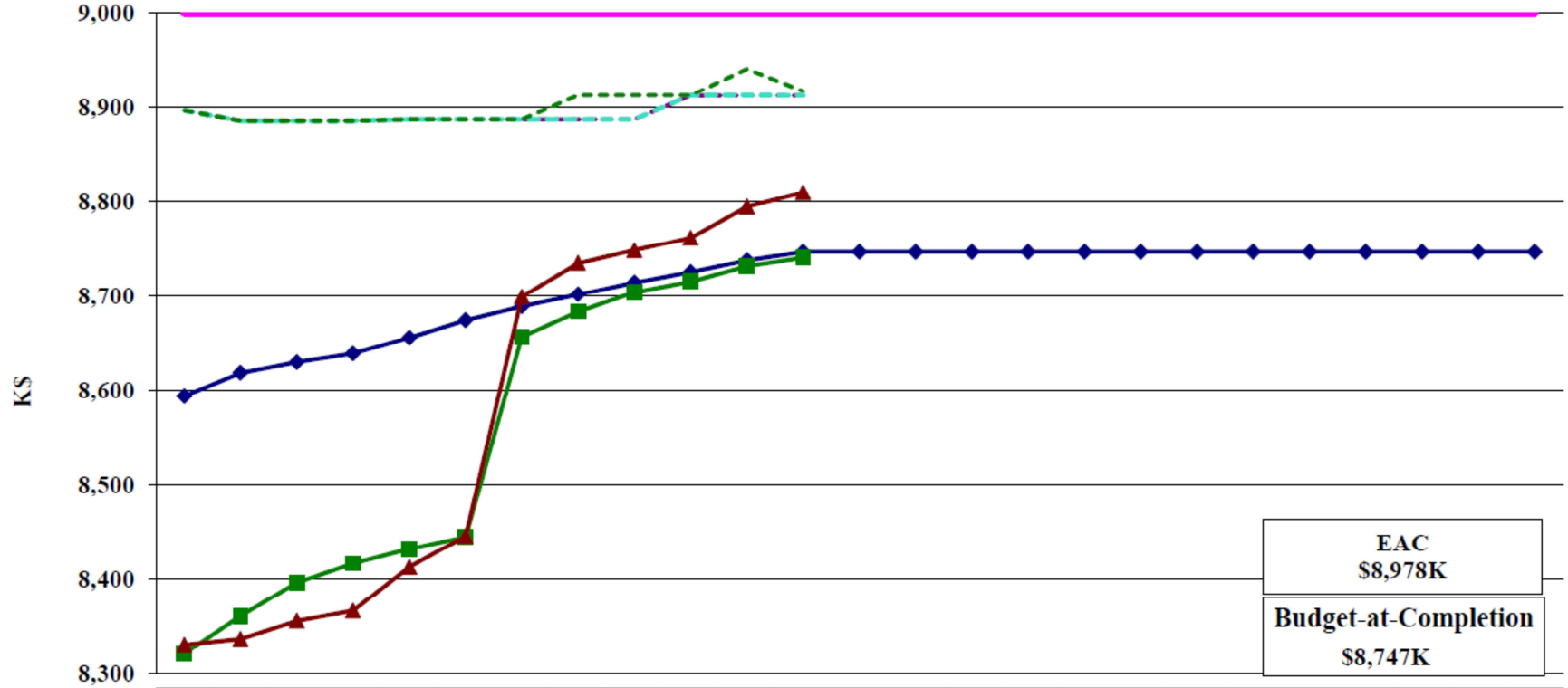
12 GeV 1.8 Construction Pre-Ops
Earned Value $K



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	0	114	238	274	687	1,030	1,351	1,700	1,882	2,012	2,141	2,257	2,343	3,212	4,013	5,062	5,215	5,888	6,041	6,201	6,456	7,871	8,031	8,184	8,337
BCWP	0	44	102	324	442	521	579	1,343	1,317	1,602	1,678	1,783													
ACWP	0	43	138	184	286	398	475	649	1,034	1,266	1,563	1,885													
Obligated	0	43	139	184	311	417	477	683	1,105	1,329	1,598	1,886													
Pending	0	43	139	184	311	423	487	683	1,105	1,343	1,600	1,886													
Funding	0	0	0	0	0	0	1,246	1,496	1,496	1,496	2,311	2,311	2,311												

12 GeV 1.9 Work for Others

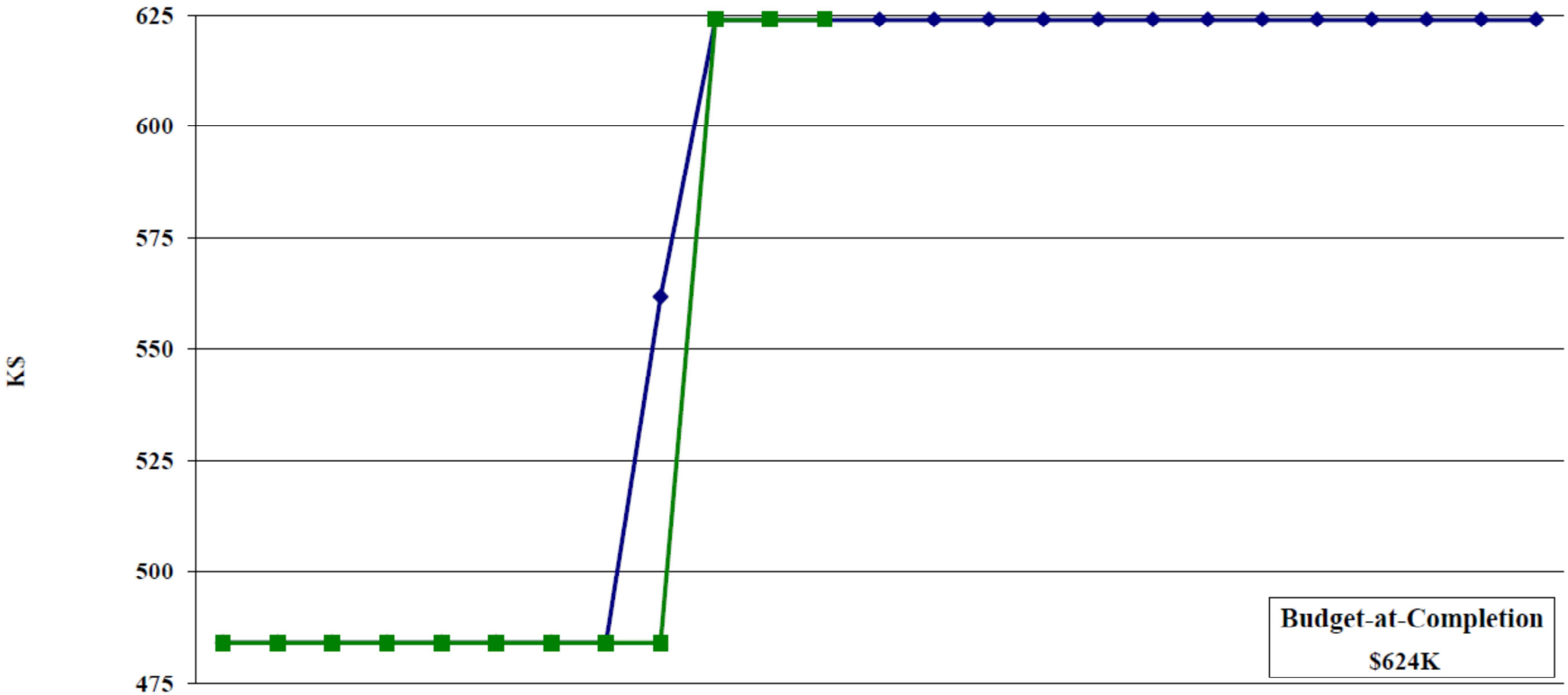
Earned Value $K



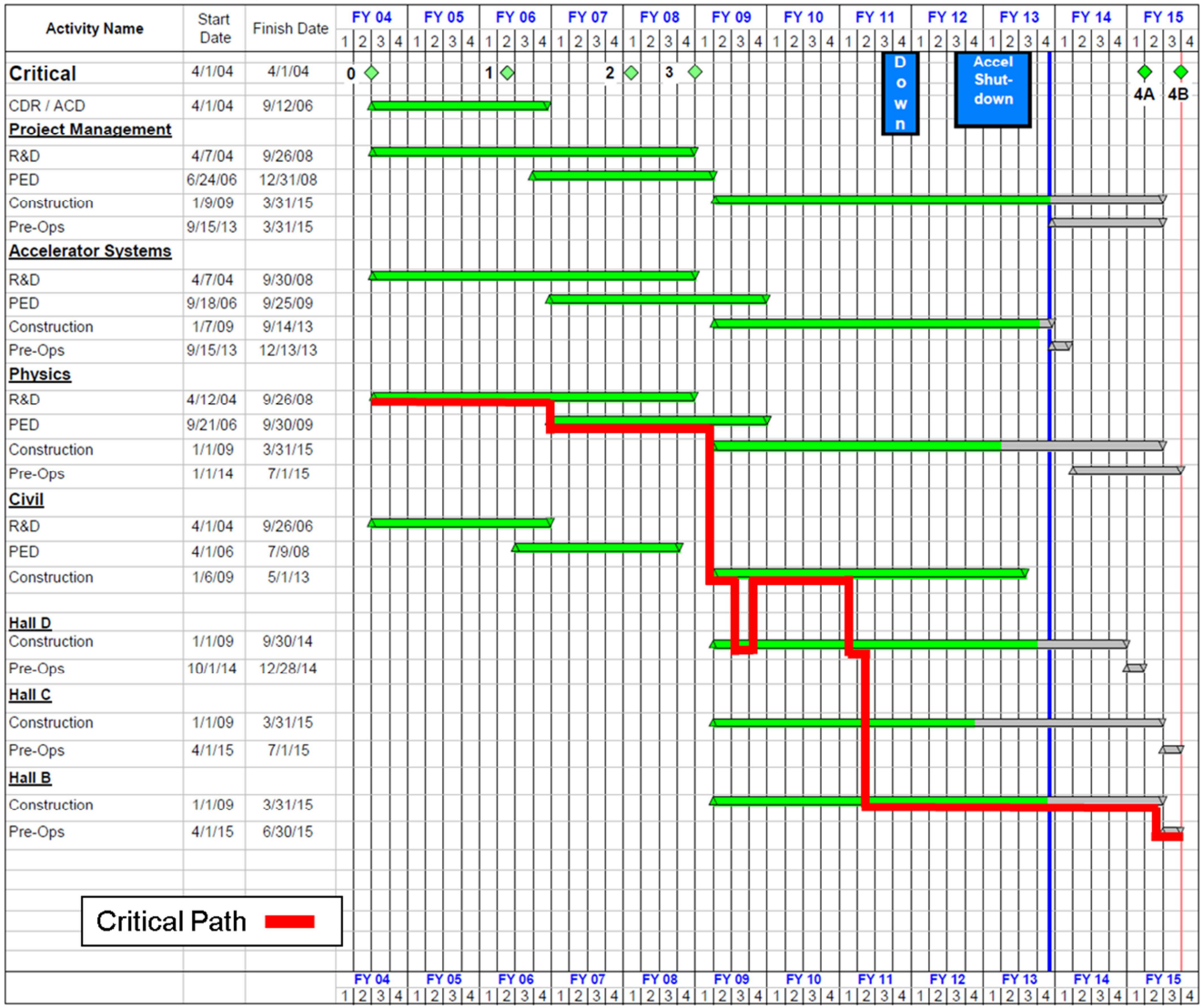
	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	8,594	8,619	8,630	8,639	8,656	8,675	8,689	8,702	8,714	8,726	8,738	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747	8,747
BCWP	8,322	8,361	8,397	8,417	8,432	8,445	8,657	8,684	8,704	8,715	8,732	8,741													
ACWP	8,331	8,337	8,356	8,367	8,413	8,446	8,700	8,735	8,749	8,762	8,795	8,810													
Obligated	8,897	8,886	8,886	8,886	8,887	8,887	8,887	8,887	8,887	8,913	8,913	8,913													
FY13 Phased PO's	8,897	8,886	8,886	8,886	8,887	8,887	8,887	8,887	8,887	8,913	8,913	8,913													
Pending	8,897	8,886	8,886	8,886	8,887	8,887	8,887	8,913	8,913	8,913	8,941	8,917													
Funding	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000

12 GeV 1.10 Non-DOE Scope

Earned Value $K



	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
BCWS	484	484	484	484	484	484	484	484	562	624	624	624	624	624	624	624	624	624	624	624	624	624	624	624	624
BCWP	484	484	484	484	484	484	484	484	484	624	624	624													


Activity Name
Start Date
Finish Date
FY 04
FY 05
FY 06
FY 07
FY 08
FY 09
FY 10
FY 11
FY 12
FY 13
FY 14
FY 15
Critical 4/1/04 4/1/04
CDR / ACD 4/1/04 9/12/06
Project Management
R&D 4/7/04 9/26/08
PED 6/24/06 12/31/08
Construction 1/9/09 3/31/15
Pre-Ops 9/15/13 3/31/15
Accelerator Systems
R&D 4/7/04 9/30/08
PED 9/18/06 9/25/09
Construction 1/7/09 9/14/13
Pre-Ops 9/15/13 12/13/13
Physics
R&D 4/12/04 9/26/08
PED 9/21/06 9/30/09
Construction 1/1/09 3/31/15
Pre-Ops 1/1/14 7/1/15
Civil
R&D 4/1/04 9/26/06
PED 4/1/06 7/9/08
Construction 1/6/09 5/1/13
Hall D
Construction 1/1/09 9/30/14
Pre-Ops 10/1/14 12/28/14
Hall C
Construction 1/1/09 3/31/15
Pre-Ops 4/1/15 7/1/15
Hall B
Construction 1/1/09 3/31/15
Pre-Ops 4/1/15 6/30/15
0
1
2
3
Down
Accel Shut-down
4A
4B
Critical Path

Cost/Schedule Assessment

August 2013 NP Project Performance	AYK$
Total Project Cost (TPC)	**$310,000**
% Planned (Cumulative)	86.7%
% Complete (Cumulative)	81.2%
Funding Received	**$274,000**
Cost and Commitments to Date (does not include out year contractual phases)	$269,694
Pending	$806
Approved Baseline Funding	$310,000
Work Remaining (BCWP Remaining)	$54,387
DOE Held Contingency	$10,406
Contingency as % of ETC_{ob}	26.5%

Project Status

The 12 GeV Upgrade cost is consistent with a Total Estimated Cost (TEC) of $287.5M and a Total Project Cost (TPC) of $310M; however the reduced funding in FY12 required significant work to be shifted to later years which is using schedule float and cost contingency including escalation. The CD-4B milestone of June 30, 2015 can no longer be met. All costs are in actual-year dollars and out-year costs are escalated.

The cost and schedule indices as of August 31, 2013, are 0.92 and 0.94 respectively.

Overall Cost/Schedule Assessment

- The project had no change requests (CRs) during the month of August.

Jefferson Lab
Thomas Jefferson National Accelerator Facility

Milestone Performance

Level and Number	Milestone Description	Baseline	Projected	Actual
2-18	Preliminary Hazard Assessment Submitted to DOE	Jun-05		Jun-05
2-19	Environmental Assessment Completed	Jan-07		Jan-07
2-04	Design Report on Superconducting Magnets	Sep-07		Sep-07
2-20	Completion of Land Transfer	Jun-07		Oct-07
2-21	PEP Issued	Sep-07		Nov-07
2-22	OECM EVMS Contractor Certification Review Complete	Jan-08		Dec-07
2-23	Accelerator Safety Envelope (ASE) Completed	Jun-08		Jun-08
2-24	Safety Assessment Document (SAD) Completed	Jun-08		Jun-08
2-05	Design Review of Superconducting Magnet	Jul-08		May-08
2-14	Design of Conventional Facilities Completed	Sep-08		Sep-08
2-06	Award First Superconducting Magnet Contract	Jul-09		Jul-09
2-15	Ready for Equipment – CHL Addition (RFE)	Sep-10		May-10
2-16	Ready for Equipment – Hall D (RFE)	Nov-10		Dec-10
2-10	Start Hall D Installation	Nov-10		Nov-10
2-01	Klystron Mass Production Authorization	Jun-11		Mar-11
2-17	Accelerator Tunnel Extension Completed	Jul-12		Nov-11
2-02	Start Accelerator Installation Shutdown	Aug-12		May-12
2-07	Start Installation for Existing Halls	Jul-12		Jun-12
2-11	Installation of Hall D Solenoid Completed	Jun-13		**Aug-13**
2-03	Accelerator Commissioned	Jan-14	Jan-14	
2-09	Hall A Beam Commissioning Completed	Mar-14	Mar-14	
2-12	Hall D Equipment Installation Completed	Jun-14	Sep-14	
2-13	Hall D Beam Commissioning Completed	Dec-14	Dec-14	
2-08	Halls A, B & C Equipment Installation Completed	Mar-15	Mar-15	

Jefferson Lab
Thomas Jefferson National Accelerator Facility

Summary of Key Activities: Next 90 Days

Date	Activity
September 4, 2013	DOE Monthly Video Conference
September 4, 2013	ESAAB Meeting
September 9 – 13, 2013	Vendor Visit to Sigma Phi: Hall C Dipole Magnet
September 13 – 15, 2013	Vendor Visit to MSU: Hall C HB Magnet
September 16 – 19, 2013	Vendor Visit to Tesla, Inc: Hall B Solenoid Magnet
September 27, 2013	DOE Monthly Video Conference
Sept 23 – Oct 4, 2013	Vendor Visit to Sigma Phi: Hall C Dipole/Q2/Q3 Magnets
October 1-2, 2013	Final Design Review (Sigma Phi): Hall C Q2/Q3 Magnets
Oct 15 & 16, 2013 (tentative)	Project Review of the SHMS Dipole FEA
Oct 28 & 29, 2013 (tentative)	Director's Review of the CLAS12 Torus Integrated Design
October 29, 2013	DOE Monthly Video Conference
Dec 10 & 11, 2013 (tentative)	Director's Review of the 12 GeV SC Magnets

GLOSSARY

Actual Cost of Work Performed (ACWP) – Actual cost reported through the 12 GeV CEBAF Upgrade cost accounting systems, plus any accruals, for a specific WBS#, subproject, or project.

Budget Authority (BA) – Cumulative funds currently allocated and authorized by the Department of Energy that may be committed and spent by 12 GeV CEBAF Upgrade for project-related activities.

Budget at Completion (BAC) – The total budgeted cost at completion for a given WBS, subproject, or project. BAC is the budgeted cost of the project excluding contingency.

Budgeted Cost of Work Performed (BCWP) – Budgeted value of planned work for a WBS#, subproject, or project physically accomplished.

Budgeted Cost of Work Schedule (BCWS) – Budgeted value of planned work time-phased to the schedule for a specific WBS#, subproject or project.

Commitments – Funds allocated to subcontractors where work has been authorized but not yet expensed.

Cost Performance Index (CPI) – The ratio of the value of the work performed to actual cost; CPI = BCWP/ACWP. Values less than 1.0 represent "cost overrun" condition, and values greater than 1.0 represent "cost underrun" condition.

Cost Variance (CV) – Difference between the estimated value of the physical work performed and the actual cost expended for a specific WBS#, subproject, or project. CV = BCWP-ACWP. A negative result is unfavorable and indicated the potential for a cost overrun.

Estimate at Completion (EAC) – Forecast of the final cost for a specific WBS#, subproject, or project based on the current ACWP plus a management assessment of the cost to complete the remaining scope of work.

Estimate to Complete (ETC) – A realistic appraisal of the cost to complete the remaining scope of work.

Independent Estimate at Completion (IEAC) – Computer forecast of the final cost:
IEAC = BAC/CPI.

Other Project Cost (OPC) – 12 GeV CEBAF Upgrade "supporting" costs not directly contributing to the construction project. OPC costs generally include research and development and pre-operation (start-up) activities.

Pending – Purchase requisitions that have not been obligated through the purchasing system.

Percent Complete – The ratio of the work accomplished (earned-value) to the Budget at Completion for any WBS#, subproject, or project, % Complete = $BCWP_{CUM}$/BAC.

Percent Contingency Remaining – The ratio of unallocated Contingency divided by the Estimate to Complete (ETC).

Percent Planned – The ratio of the current plan to the Budget at Completion. % Planned = BCWS/BAC.

Project Engineering and Design (PED) – Funding used to support the engineering and design effort for the 12 GeV CEBAF Upgrade.

Schedule Performance Index (SPI) – The ratio of the value of work performed to work scheduled, SPI = BCWP/BCWS. Values less than 1.0 represent a "behind schedule" condition, and values greater than 1.0 represent "ahead of schedule" condition.

Schedule Variance (SV) – Difference between the value of the physical work performed and the value of the work planned (scheduled). SV = BCWP-BCWS. A negative result is unfavorable and indicates a behind schedule condition.

Total Estimated Cost (TEC) – The total capital budget authorized for the 12 GeV CEBAF Upgrade project for the construction phase of the project. TEC includes contingency but does not include OPC.

Total Project Cost (TPC) – The total capital budget authorized for the 12 GeV CEBAF Upgrade project, including TEC and OPC.

Work Breakdown Structure (WBS) – A method of hierarchically numbering tasks in a traditional outline numbering format. The WBS provides a basis for the 12 GeV CEBAF Upgrade work plan which is used to track all resources, schedules, and cost.