

The Spallation Neutron Source Monthly Report

August 2004



First beam to the beam stop and full CCL acceleration was achieved on September 17, 2004





CONTENTS

PROJECT OVERVIEW AND ASSESSMENT	3
TECHNICAL AND PROGRAMMATIC PROGRESS	
WBS 1.4 Los Alamos Linac	5
WBS 1.4 Thomas Jefferson Linac	6
WBS 1.5 Ring and Transfer Systems	7
WBS 1.6 Target Systems	8
WBS 1.7 Instrument Systems	9
WBS 1.8 Conventional Facilities	10
WBS 1.9 Integrated Control Systems	11
WBS 1.3, 1.4, 1.5 Accelerator Systems Division	12
WBS 1.2 Project Support	13
COST/SCHEDULE PERFORMANCE REPORTS	15
GLOSSARY	20




Project Overview and Assessment



Poured in place shielding for the Backscattering Spectrometer Instrument

Technical Assessment:	Satisfactory
Cost Assessment:	Satisfactory
Schedule Assessment:	Satisfactory


 Carl N. Strawbridge
 SNS Deputy Project Director
 10/17/04
 Date

Highlights and Issues:

- Good project performance continues with minor cumulative cost and schedule variances of 0.3% and -1.6% respectively against the March 2006 early finish schedule. Through the end of August, 85.5% of the project is complete. Completion percentages by area are:
 - ◇ 99 % of R&D
 - ◇ 96 % of design
 - ◇ 83% of technical hardware (including procurement and fabrication)
 - ◇ 93 % of conventional construction
 - ◇ 65 % of installation
- Contingency continues to be tight. The available contingency balance of \$28.1M will be reduced to \$18.1M once the changes identified in the Estimate at Completion are incorporated into the base-line. Approximately \$13M of undistributed pre-operations budget is also available.
- Management focus continues on executing/managing the critical path work of target installation, prioritizing FY05 activities to optimize the BA usage and planning/organizing for the transition to operations.
- Through August 20, 2004, the total project has worked in excess of 6 million hours with 78 recordable injuries (an increase of 4 from last month) and 1 lost work day (away) case. Injuries and trends have been evaluated and methods to improve safety performance have been discussed with all contractors and staff. Increased attention to job planning and interfaces with other work has been requested from all individuals on site. Recent performance has improved.
- The Accelerator Readiness Review (ARR) for the entire Drift Tube Linac as well as Coupled Cavity Linac modules 1-3 was successfully completed on August 26, 2004.

Assessment:

Accelerator Systems Division (ASD): The 11 prestart action items from the ARR were closed out on Friday September 3, 2004 and beam commissioning activities began on September 7th. Field gradients at the full pulse length were achieved and beam was accelerated by the full DTL and drifted through the CCL to the beam stop by September 9th. First beam to the beam stop was achieved on September 17th. Beam energy has been measured at the expected values through CCL-2 and beam commissioning continues. The systems integration test of the first cryomodule has been completed and the 4K cryosystem commissioned. Cryomodule medium-beta #4 was cooled down to 4.2 K. The 2K cold box feedthrough issue has been successfully resolved and the system is being prepared for commissioning. The Cryogenics Advisory Committee has been established and meetings have begun to review the progress and plans of the cryo group. Linac RF installation is on track with completion of four SCL modulator systems, each supporting 12 klystrons; 79 of the 81 SCL klystrons are in position. Ring installation is also proceeding well. All half-cells have been installed, magnet cable pulling has been completed, the test assembly at BNL of the injection straight is almost completed, and 3 of 4 RF systems are in the tunnel.

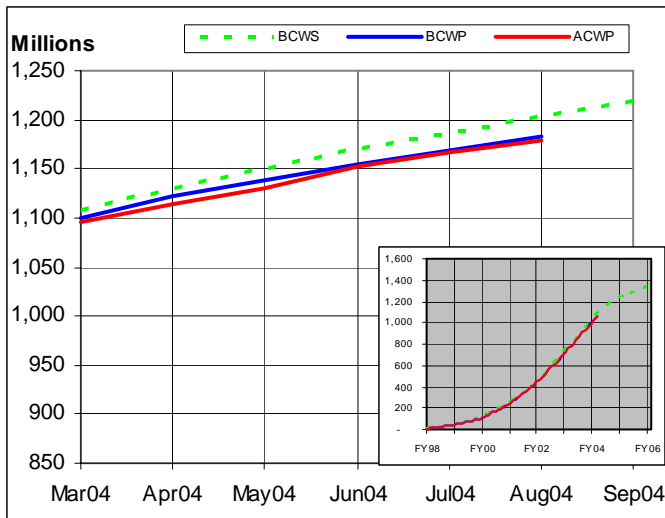
Experimental Systems Division (XFD): Installation continues to proceed well. The last upper interstitial block was received and installed, completing installation of all the "permanent" shielding in the monolith. The balance of the dry disconnects required for the Target Utility cooling loops were received and turned over to the General Contractor for installation. The first two gas panels have been leak tested and received. Assembly of the target carriage in the hot cell was completed and the lower Inner Reflector Plug split plates are ready for E-beam welding. The ninth and last single channel shutter gate was received. Two multi channel gates are being fabricated. Nine of 18 top blocks have also been received and phase 1 commissioning of the helium refrigeration system has begun. The Instrument Design Review was com-

pleted on October 1, 2004. No major recommendations are expected and, once the final report is received and reviewed, the PEP Design Complete milestone can be declared completed. The final section of poured-in-place shielding for the backscattering spectrometer was installed and the first 48 (of the initial complement of 120) detectors for the backscattering spectrometer was received and is in the process of being checked out by the detector group. The beam line components for the high-rate test station at HFIR have been assembled. Safety documentation required for the Instrument Systems labs is being prepared.

Conventional Facilities (CF): Construction activities continue in the Target Building and CLO. Work in the Target Building is primarily cable pulling and installation of insulating piping and ductwork. Work is proceeding on the cryogenic hydrogen equipment installation and related CF support facilities. The substation that serves the Target Helium compressor was successfully energized on September 16th. A total of twenty-four of twenty-six conventional substations have now been energized. Meetings with ORNL Property Management have been initiated to plan for disposition of the Ringer Crane by March 2005. Electrical and drywall work is proceeding in the CLO, with the drywall work being continued on the second shift in an effort to maintain the schedule. Final punch list work is being completed in the central control room. DI water, processed water and compressed air systems have been completed and work on the south plaza continues. The contractor's overall schedule forecasts a December 27th completion date. Trucks continue to haul soil from the SNS stockpile to the ORNL Environmental Restoration Projects (at no cost to SNS). Approximately 60,000 to 80,000 cubic yards of screened soil will be moved. The contract for the exhaust fans is ready for award, completing the Construction Manager Furnished Equipment (CMFE) procurements for the Central Exhaust Facility. Work continues with the Air Blown Fiber System and two test blows between the CUB and the Target Building were successful.



Project Overview and Assessment (con't)



Total Project	Aug04	Cum-to-Date
BCWS	15,641	1,202,611
BCWP	15,030	1,183,503
ACWP	13,222	1,179,791
CV	1,808	3,712
SV	-611	-19,107
CPI	1.14	1.00
SPI	0.96	0.98
Budget at Complete		1,383,555
Contingency		28,145
Total Project Cost		1,411,700

Total Project Cost (TPC)	\$1,411.7 M
Percent planned (cumulative)	86.9%
Percent complete (cumulative)	85.5%
Total Estimated Cost (TEC)	\$1,192.7 M
Cost and Commitments through 8/31/04	\$1,059M
Outstanding Phase Funded Awards	\$18.3M
Budget to Complete	\$105.5M
Contingency	\$28.1M
Estimate at Completion	\$1,174.6M
Remaining Contingency Based on EAC (18.5%)	\$ 18.1M

Critical Path:

Based on the March 30, 2006 completion date, no activities in the project schedule show negative float at this time.

The project's longest path remains unchanged and is associated with the Target System's Target Service Bay installation sequence. Currently, 20 days of positive float exist in this installation and integrated testing sequence. The schedule is being monitored closely to ensure that there are no delays in the loading of Target Mercury, conducting integrated startup testing of the Target systems and the Target Readiness assessment. Target Systems installation effort has been grouped into "installation packages" with the General Construction Contractor responsible. Target System Installation Engineers are working closely with the General Contractor to ensure timely delivery of equipment to minimize changes to the installation schedule.

Milestones:

Description	Milestone Date	Forecast Date
CD-1 Mission Need	Aug-96	Aug-96 ✓
CD-2 Baseline Approved	Dec-97	Dec-97 ✓
CD-3 Begin Construction	Nov-99	Nov-99 ✓
CD-4 Project Complete	Jun-06	Mar-06



Highlights:

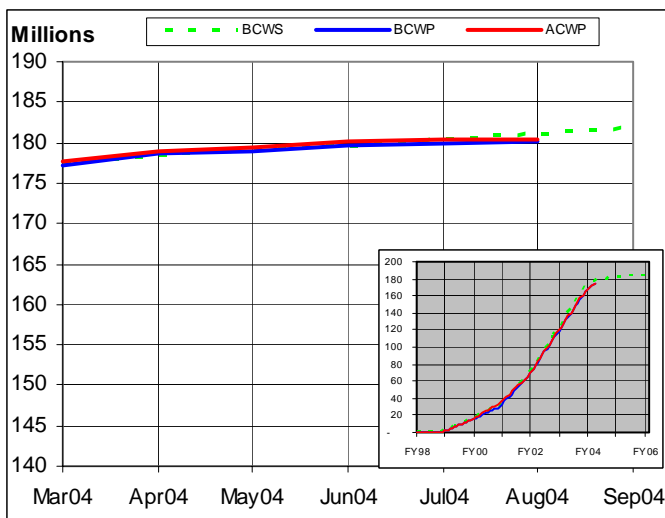
- All technical work at LANL continued to be on hold in August due to LANL safety directives.

CCL-2 Beam Stop installed in the Linac Tunnel

Assessment/ Issues:

- Project management for the remaining LANL effort has been transitioned to ASD-ORNL.
- The recent work stoppage at LANL is being evaluated for cost/schedule impact. Selected SNS tasks are expected to resume in October.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	607	181,122
BCWP	235	180,175
ACWP	-10	180,335
CV	245	-160
SV	-372	-947
CPI		
	-22.69	1.00
SPI		
	0.39	0.99
Budget at Complete		183,448
Planned % Complete		98.7%
Actual % Complete		98.2%

Cost Performance:

Cause and Impact: The current period cost variance is due to cost corrections performed at LANL.

Corrective Action: None required.

Description	Milestone Date	Forecast Date
Linac Design Complete	Sep-02	Apr-02 ✓

Schedule Performance :

Cause and Impact: The current period schedule variance is due to delayed deliveries of spare klystrons.

Corrective Action: None required.



Linac Systems– Thomas Jefferson National Accelerator Facility



Completed Cryomodule H-6

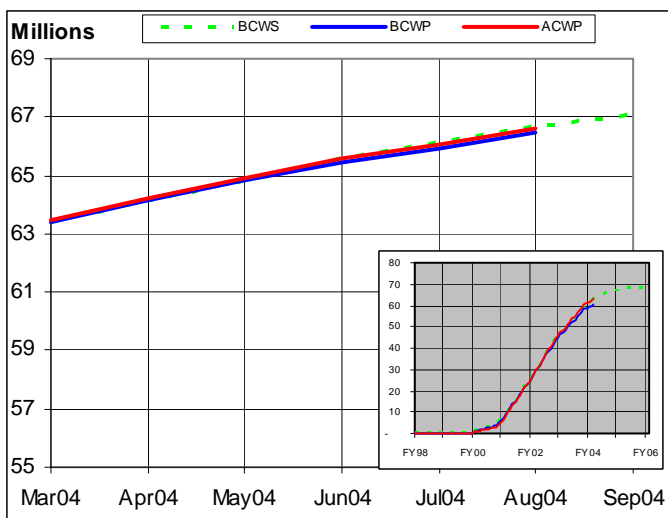
Highlights:

- Nine additional High-β cavities were qualified this month.
- String assembly for Cryomodule H-8 was completed and string assembly for Cryomodule H-9 was started.
- The leak in Cryomodule H-3 was located and repaired.
- Assembly of Cryomodule H-6 was completed, assembly of Cryomodule H-7 continued and assembly of Cryomodule H-8 was started.
- Testing of H-1 was completed. Cryomodule H-5 was installed in the test cave in preparation for testing.

Assessment/Issues:

There are no current outstanding issues or actions to be reported.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	504	66,648
BCWP	537	66,451
ACWP	543	66,589
CV	-6	-138
SV	33	-197
Performance Indicators		
CPI	0.99	1.00
SPI	1.06	1.00
Budget at Complete		
		68,358
Planned % Complete		
		97.5%
Actual % Complete		
		97.2%

Cost Performance:

Cause and Impact: Not required.
Corrective Action: None required.

Description	Milestone Date	Forecast Date
Linac Design Complete	Sep-02	Apr-02 ✓
Initiate Testing of Prototype Cryomodule	May-02	Apr-02 ✓

Schedule Performance:

Cause and Impact: Not required.
Corrective Action: None required.



Ring RF equipment in the tunnel

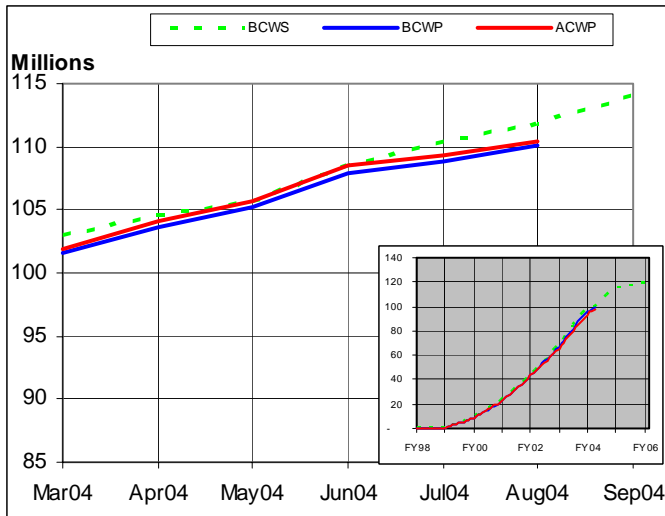
Highlights:

- The third Radio-frequency (RF) system including the RF cavity, power supply, power amplifier, wall-current monitor, and spare parts were shipped to ORNL. The last (4th) RF system will remain at BNL until December 2004 for personnel training and system cross-verification.
- A test set-up is underway to measure the impedance of the TiN-coated extraction ferrite kicker module in conjunction with the production vacuum chamber and the Pulse-Forming-Network (PFN)/ power supply. The impedance measurement will be followed by a test of high-voltage pulsing of the kicker magnet at operating conditions by the PFN.
- A leak in the vacuum chamber of a quarter-cell assembly in the Ring “C” arc is due to damage to the bellow shipping support during the transit from BNL to ORNL. A spare TiN-coated vacuum chamber is now being leak checked.
- A leak around the shaft seal of the kicker PFN oil pumps is being investigated. Issues related to priming and back pressure were explored.
- Field measurements and corrections continue on the injection chicane #1, a special magnet that has an asymmetric iron geometry to clear the injected beam. Effects of the newly fabricated steel "z-bumps" were evaluated. Although the sextupole component was improved considerably, the decapole component deteriorated. After further analysis, another set of bumps is under fabrication.
- A status review was conducted on the diagnostics systems. Partial funding for the beam current monitor will be transferred to ORNL to complete the BCM electronics. The diagnostics production plan will be revised to reflect the current status.
- Vendor acceptance tests of two more 1st article power supplies were performed. One of the two failed these tests. Deliveries to ORNL of other accepted power supplies (injection bump, extraction kicker, and other medium range power supplies) continue.
- Vendor visits to review the production status of the Extraction Lambertson Septum magnet have begun.

Assessment/Issues:

In response to FY04 BA constraints, vendor visits and other procurements are being monitored carefully.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	1,524	111,882
BCWP	1,333	110,133
ACWP	1,118	110,435
CV	215	-302
SV	-191	-1,750
CPI		
	1.19	1.00
SPI		
	0.87	0.98
Budget at Complete		118,925
Planned % Complete		94.1%
Actual % Complete		92.6%

Cost Performance :

Cause and Impact: The current period variance is due to early receipt of 11 extraction kicker power supplies without corresponding actual costs being incurred.

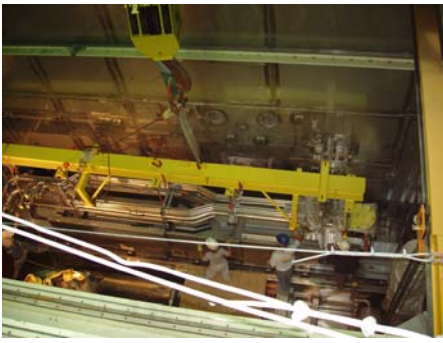
Corrective Action: None required. The actual costs will be incurred in September.

Schedule Performance :

Cause and Impact: The current period schedule variance is due to delays in High Field Magnet and collimator support deliveries.

Corrective Action: None required. The magnets will be completed by December 2004 and the supports will be completed by the end of FY04.

Description	Milestone Date	Forecast Date
Ring Design Complete	Oct-03	Jul-03



Mercury and utility piping module being placed into the target carriage in the Target Maintenance Cell

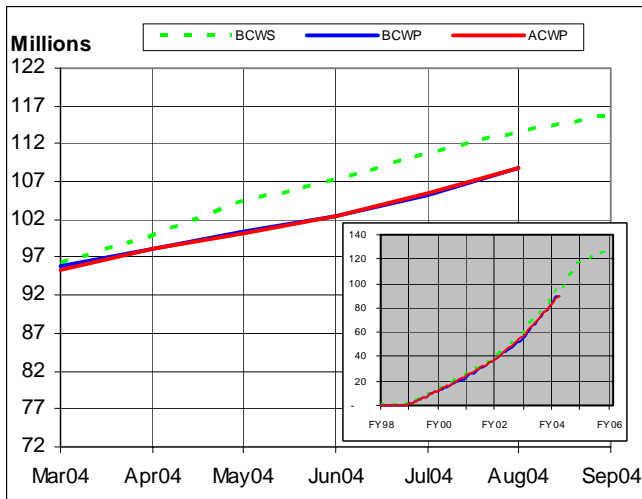
Highlights:

- The target cart rail system was delivered, installed, and aligned within specifications. The base of the Target cart assembly was placed on the rail system, demonstrating that it fits well within the Target cart liner. The mercury heat exchanger, mercury loop isolation valve and mercury pump have been installed.
- The vacuum jacketed lines and I&C cabinet for the Helium Refrigeration System have arrived on site.
- Two more single channel shutter gates were delivered, completing the single channel gate deliveries.
- The shutter drive system hardware and the hydraulic pump unit were received and stored.
- Installation Package 2D (concrete plugs and mods to current 2A contract) has been submitted, bids returned, and award is expected soon.
- The off-gas valve panel has been delivered and installed.
- The five cooling loop water sampler cabinets were delivered and are ready for installation when required.
- The seismic anchors for the target inflatable seal glovebox stand were delivered. Some modifications to the anchors are required for it to fit in the space available in the Target Building Service Gallery.
- The target shroud delay tank was delivered and is being installed in the Target Service Bay.
- The video monitoring system has been received.

Assessment/ Issues:

Hardware deliveries and the installation schedule continue to be monitored closely. Critical deliveries are monitored weekly at the division level.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	2,802	113,663
BCWP	3,489	108,716
ACWP	3,386	108,831
CV	103	-115
SV	687	-4,948
CPI		
	1.03	1.00
SPI		
	1.25	0.96
Budget at Complete		126,338
Planned % Complete		90.0%
Actual % Complete		86.1%

Cost Performance:

Cause and Impact: Not required.

Corrective Action: None required.

Schedule Performance:

Cause and Impact: The current month variance reflects the delivery of the target carriage. The cumulative variance is due to delays in installation work by the General Contractor as well as delays in high value equipment deliveries.

Corrective Action: Most of the hardware will have been delivered by the end of September. Work-arounds have been implemented to allow installation to proceed without these items.

Description	Milestone Date	Forecast Date
Target Design Complete	Jun-03	Jun-03 ✓
Start Target Installation	Jun-03	Apr-03 ✓
Start System Test with Beam	June-06	Mar-06



Instrument Systems– Argonne and Oak Ridge National Labs



First production detectors for the Backscattering Spectrometer mounted in the prototype rig

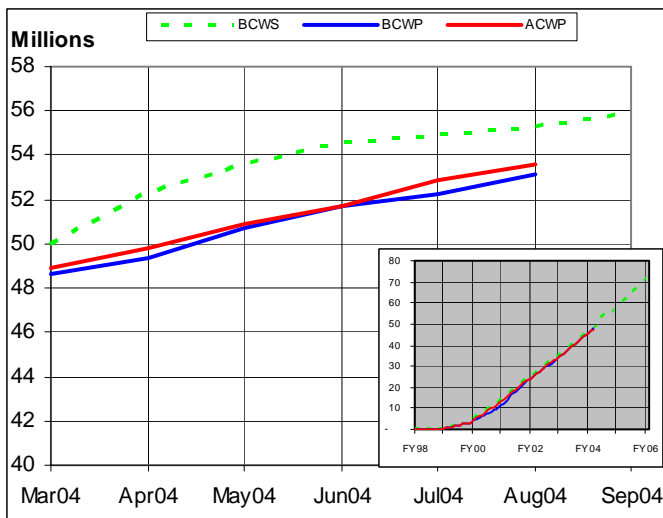
Highlights:

- Standardization efforts on vacuum systems and the utility interface to sample environment equipment are under development. All instruments will employ a standard distribution panel of utilities to the sample environment equipment.
- Successful completion of a student summer research project in the sample environment group has led to recruitment of one student for a full-time position in the data acquisition/detector groups.
- The beamline shielding design for the backscattering spectrometer was presented to the Instrument Safety Committee. The presentations included an overall description of the instrument, detailed neutronic calculations, and engineering design/seismic calculations. Operational issues, such as the need for handrails and bandwidth chopper maintenance, were also discussed. A follow-up on radiation safety issues was made to the Radiation Safety Committee.
- Due to lack of performance, the contract with the vendor for the goniometer for the liquids reflectometer was terminated. Preparations for an accelerated re-bid of this component are underway.
- The core vessel insert for Beamline 4 was delivered.

Assessment/ Issues:

Recommendations from the Integrated Installation Schedule review are being addressed.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	405	55,300
BCWP	934	53,143
ACWP	747	53,608
CV	186	-465
SV	529	-2,157
<hr/>		
CPI	1.25	0.99
SPI	2.31	0.96
<hr/>		
Budget at Complete		78,121
<hr/>		
Planned % Complete		70.8%
Actual % Complete		68.0%

Cost Performance:

Cause and Impact: The current period cost variance reflects earned value taken for neutron guide progress milestones achieved for two instruments as well as credit for receipt of the SANS core vessel insert. The costs for the guide payments was reflected in prior periods and the cost for the core vessel insert will be reflected in September.

Corrective Action: None required.

Schedule Performance:

Cause and Impact: The current period schedule variance reflects earned value taken for neutron guide progress milestones achieved for two instruments.. The cumulative schedule variance is due to behind schedule deliveries in the goniometers and shielding for several instruments.

Corrective Action: The contract for one of the two goniometers is in the process of being re-awarded to a different vendor. The second will be complete in FY05. These delays do not impact the project's completion date.

Description	Milestone Date	Forecast Date
Start Instrument Installation	Mar-04	Mar-04 ✓
Instrument Design Complete	Oct-04	Oct-04
Complete Subproject Acceptance Tests	June-06	Mar-06



Conventional Facilities– Oak Ridge National Lab



Target Building Construction

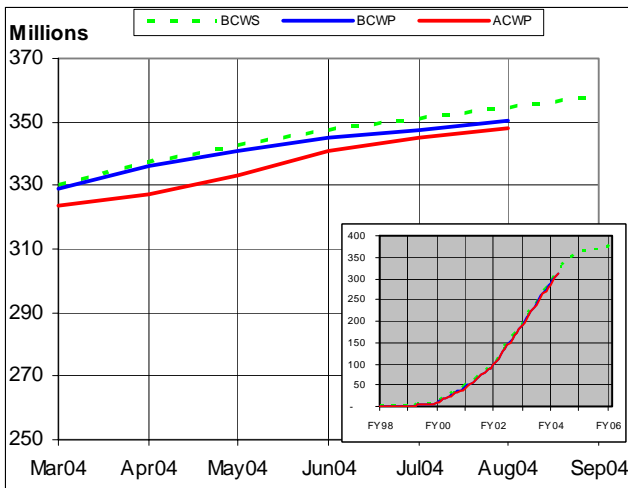
Highlights:

- RTBT tunnel backfill and liner installation is complete, as is additional work for storm drain installations. Settlement of the RTBT tunnel continues to be monitored closely.
- Construction work continued on the CLO Building. The utilities tie-in for the natural gas line has been completed. Mechanical, electrical and drywall work continues in the front office wing. Punch list items continue to be worked in the occupied areas of the CLO.
- Several labs and shops needed by ASD, as well as a break room, mail room, and computer graphics shop in the CLO basement level, have been completed and are ready for turnover. Fire alarm system installation is continuing and is almost complete. Siding, window framing and glazing continued.
- Target Building piping, HVAC ductwork and insulation, interior rough-in and electrical work continues. Piping installation in the monolith piping pan continues and should progress much faster with the introduction of orbital welding.

Assessment/ Issues:

Focus continues on coordinating Target Building construction and Target Systems component installation to achieve required milestones.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	3,473	354,550
BCWP	2,999	350,499
ACWP	2,527	347,754
CV	472	2,745
SV	-474	-4,052
CPI		
CPI	1.19	1.01
SPI		
SPI	0.86	0.99
Budget at Complete		
Budget at Complete		378,912
Planned % Complete		
Planned % Complete		93.6%
Actual % Complete		
Actual % Complete		92.5%

Description	Milestone Date	Forecast Date
Award AECM Contract	Nov-98	Nov-98 ✓
Start Site Work	Mar-00	Mar-00 ✓
BOD Front End Building	Dec-02	Oct-02 ✓
BOD 1000 MeV Linac	Apr-03	Dec-02 ✓
BOD Ring Tunnel	Aug-03	Jun-03 ✓
BOD Target Building	May-05	Feb-05
Construction Complete	Nov-05	Mar-05

Cost Performance:

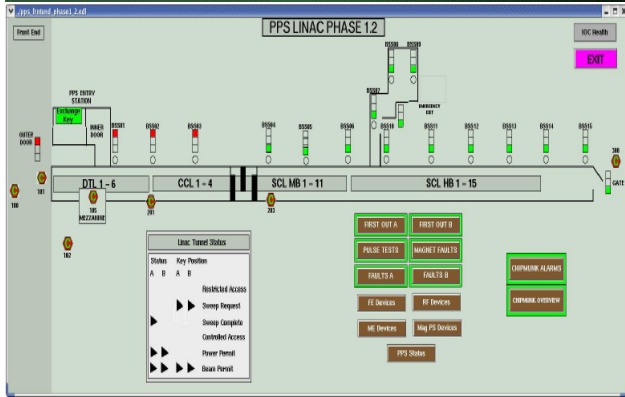
Cause and Impact: The positive cost variance is the result of a contractual issue with the structural steel (\$1.1M) and the retention earned to date in CLO and the Target Building (\$2.4M).

Corrective Action: The contractual issues with the steel have been resolved.

Schedule Performance:

Cause and Impact: The negative schedule variance is primarily in the CLO (-\$2.7M), the Target Building (-\$374K) and CF Local Controls, which has been deferred until FY05 (-\$805K).

Corrective Action: None required. This work does not impact the critical path or project end date.



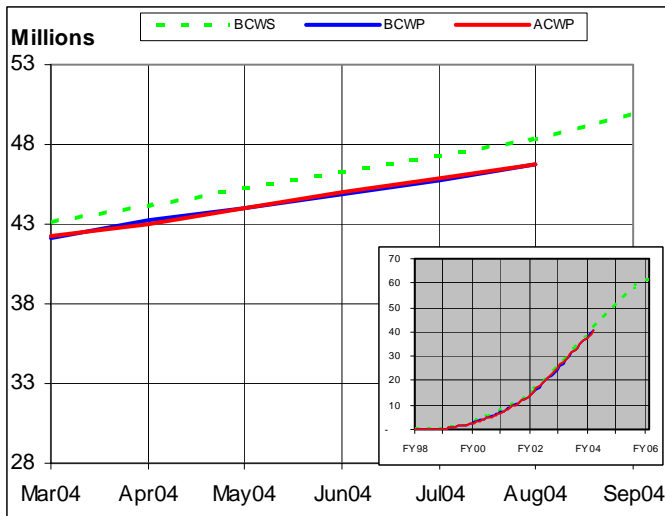
Linac Personnel Protection System

Highlights:

- All controls subsystems required for the September commissioning of the warm linac were installed and tested. All test plans were completed and signed off before the Accelerator Readiness Review (ARR). This included testing of the timing, MPS, vacuum, RCCS, power supply, RF and Beam Loss Monitor systems. The Personal Protection and Oxygen Deficiency Hazard systems (PPS and ODH) were certified in their configurations. The PPS, ODH and MPS Systems were presented to the ARR Committee at the review and all passed with no pre- or post-start requirements.
- Testing and calibration of all signals and integrated control system equipment needed for cool down of the cryogenic transfer line and cryomodule MB03 was completed. Cryogenic control worked well and was used to track progress. The level control loop for the cryomodules was tuned and successfully maintained the level within 0.2 % of the set point (requirement is 1.0%). The coupler window heater control routine also operated as expected. Of the planned 11 cryogenic control system IOCs, five are running and two more have been checked out.
- To correct a time-response problem with the SCL vacuum-to-LLRF interlock, JLab replaced 27 boards and then shipped them over-night to ORNL. Modified boards were installed in the first control chassis (which provides controls for cryomodules 1 through 4) in time to support the cooldown.

Assessment/Issues: No issues at this time.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	1,066	48,366
BCWP	1,001	46,784
ACWP	821	46,724
CV	179	60
SV	-65	-1,582
<hr/>		
CPI	1.22	1.00
SPI	0.94	0.97
<hr/>		
Budget at Complete		61,449
<hr/>		
Planned % Complete		78.7%
Actual % Complete		76.1%

Description	Milestone Date	Forecast Date
Start Front End Controls Installation	Oct-02	Jun-02 ✓
Global Controls Design Complete	Jan-03	Sep-02 ✓
Global Controls Subproject Test Complete	May-06	Mar-06

Cost Performance:

Cause and Impact: The current period cost variance is largely due to cost corrections performed at LANL.
Corrective Action: None required.

Schedule Performance:

Cause and Impact: The schedule variance is due to activities that have been deliberately delayed for the purpose of conserving BA.
Corrective Action: None required. At this time, there is no impact to the project finish date.



Cryomodules installed in the Linac Tunnel

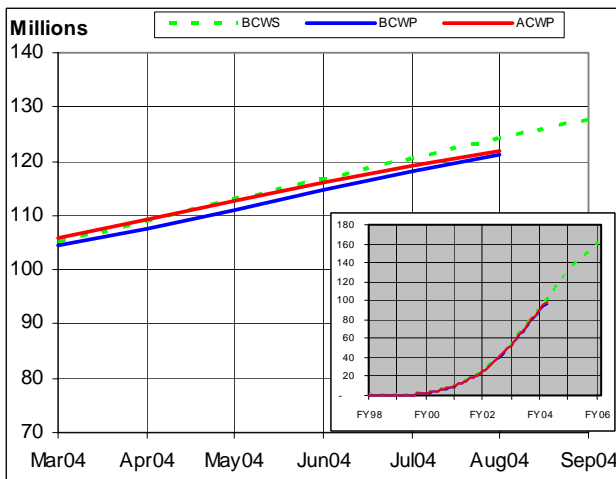
Highlights:

- Preparations for the ARR were completed.
- All warm Linac magnet power supplies were ready for beam tests and alignment and polarity checks of all 48 CCL magnets was completed. The diagnostics were reinstalled into the DTL beam boxes and the beam stop, which will be positioned at the end of CCL-4, was fiducialized with respect to the new mounting plate.
- The review for cooling down cryomodule MB-3 was held and the recommendations from the committee have been implemented. Preparations for cooldown of the transfer lines are in the final stages with initiation of cooldown in the last week of August.
- High power certification tests were run on SCL ME-1 RF systems in preparation for applying RF to cryomodule MB-3.
- Lead shielding and output waveguide sections were installed on the MB-5 klystrons.
- Installation of the DI piping to the SCL-ME3 HVCM and water lines to SCL Cryomodule #3 couplers was completed.
- SCL magnet power supplies were installed through Modulator SCL ME-4 (Cryomodule HB3). ME-3 LLRF installation is complete with testing and check-out is in progress.

Assessment/Issues:

All deliveries that could affect the commissioning schedule are being monitored closely.

Performance and Milestones:



	Aug04	Cum-to-Date
BCWS	3,724	124,228
BCWP	2,966	121,168
ACWP	2,956	121,959
CV	10	-791
SV	-758	-3,060
<hr/>		
CPI	1.00	0.99
SPI	0.80	0.98
<hr/>		
Budget at Complete		172,139
<hr/>		
Planned % Complete		72.2%
Actual % Complete		70.4%

Cost Performance:

Cause and Impact: The cumulative cost variance is due primarily to over runs in craft labor associated with installation activities.

Corrective Action: The cumulative cost variance in craft labor is not recoverable and is included in ASD's EAC.

Schedule Performance:

Cause and Impact: 50% of the current month variance is due to the CMCIP anticipated payment which did not occur as planned. The remaining variance is due to LLRF procurements which occurred in a prior period and delayed delivery of the CPI klystrons. The cumulative variance is due to late delivery of klystron spares.

Corrective Action: None required.

Description	Milestone Date	Forecast Date
Start Front End Installation	Sep-02	Jun-02 ✓
Start Linac Installation	Sep-02	Apr-03 ✓
Start Ring Installation	Aug-03	Jul-03 ✓
FE Beam Available to DTL	Mar-03	Dec-02 ✓
Linac Beam Available to HEBT	Aug-05	May-05
HEBT& Ring Beam Available to RTBT and Target	Feb-06	Nov-05



CLO construction

Highlights:

- The SNS Student Poster Session was held on August 10, 2004 in the CLO. SNS staff turned out to view the posters and talk with the students about their accomplishments this summer. SNS students also participated in the ORNL poster session. Mariano Ruiz, one of XFD’s summer students, along with his mentor Lou Santodonato were interviewed by the local newspaper, “The Oak Ridger”. Mariano was offered a full time position with XFD’s Data Acquisition group.
- Two SNS managers, Norbert Holtkamp and Frank Kornegay will be recognized at ORNL’s Awards Night, an event that recognizes outstanding performance.
- A number of scenarios that optimize BA usage in FY05 are being evaluated.

Assessment/Issues: Managing within budget. Continuing strong focus on BA management, cost control and contingency management.

External Review Data:

One Action Item from external reviews was closed in August.

Review	Recommendations	Closed This Month	Open Actions
DOE SC Review (11/03)	25	0	1
DOE SC Review (5/04)	22	1	20

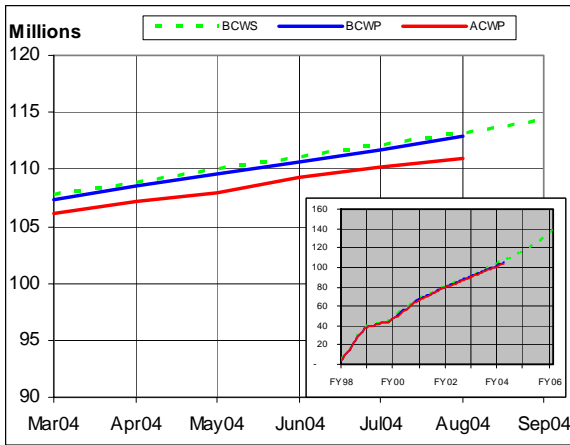
Life of Project Market Experience:

Major Awards (\$M)	Baseline Estimate (\$M)	Baseline Savings (\$M)	Percent savings over baseline
549.1	512.9	-36.2	-7.1%

Through September 2, 2004: 98% of the major procurements have been awarded.



Performance:



	Aug04	Cum-to-Date
BCWS	1,101	113,277
BCWP	1,102	112,861
ACWP	753	110,990
CV	349	1,871
SV	1	-416
CPI		
	1.46	1.02
SPI		
	1.00	1.00
BAC (1.2)		75,636
BAC (1.10.3, 1.1.13, 1.10.5)		71,284
Planned % Complete		77.1%
Actual % Complete		76.8%

Cost Performance:

Cause and Impact: The cost variance is largely due to increased efficiencies and move costs that have not yet been paid.

Corrective Action: None required.

Schedule Performance:

Cause and Impact: None required.

Corrective Action: None required.

Milestones:

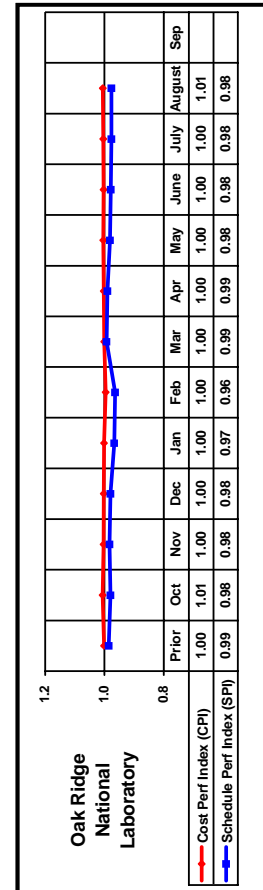
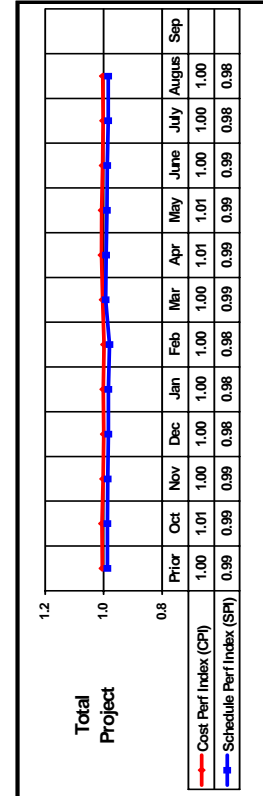
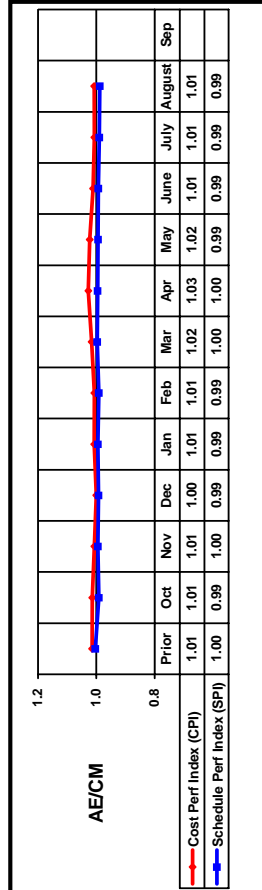
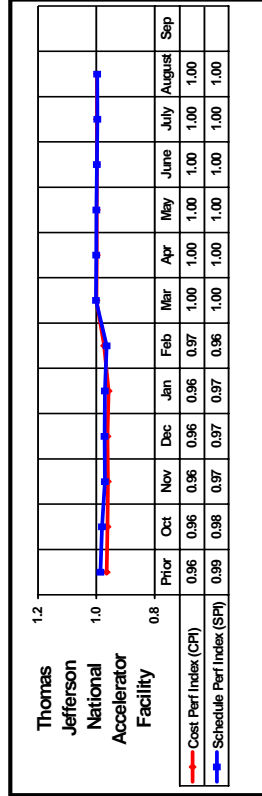
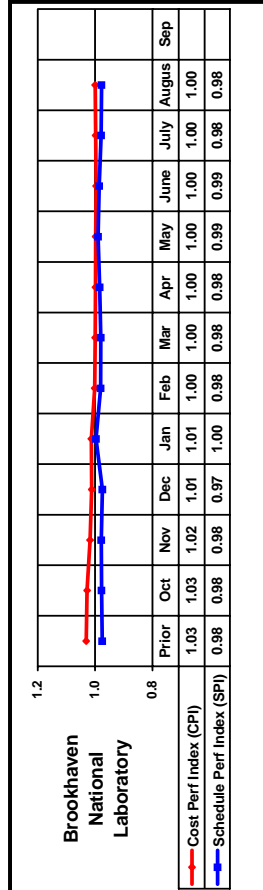
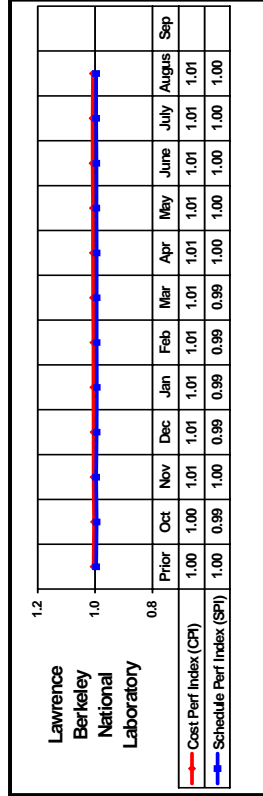
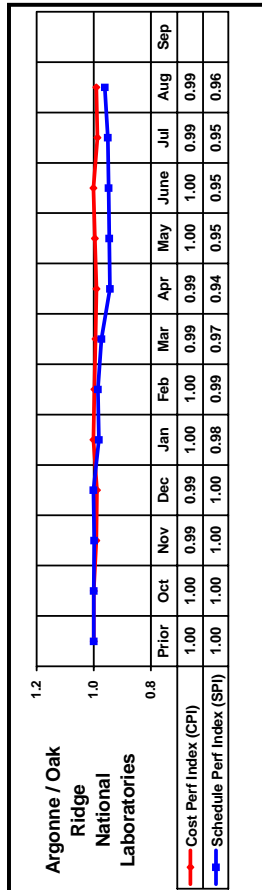
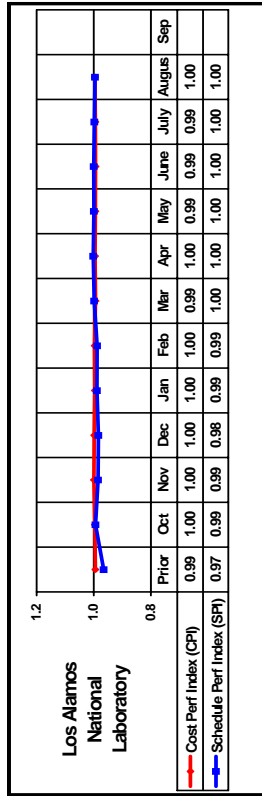
Description	Milestone Date	Forecast Date
EIS ROD	Jun-99	Jun-99 ✓
PSAR Issued for Approval	Dec-99	Dec-99 ✓
Submit PSAR to DOE for Approval	Dec-99	Dec-99 ✓
PSAD issued for Information	Sep-00	Sep-00 ✓
Issue FSAD for approval (Front End and Linac)	Sep-02	Aug-02 ✓
Issue FSAD for approval (Ring and Transfer Lines)	Jun-05	Apr-05
FSAR Issued for Approval	Aug-05	Jun-05
Complete Physical Construction and Project Acceptance Test	Jun-06	Mar-06

CLO Third floor construction



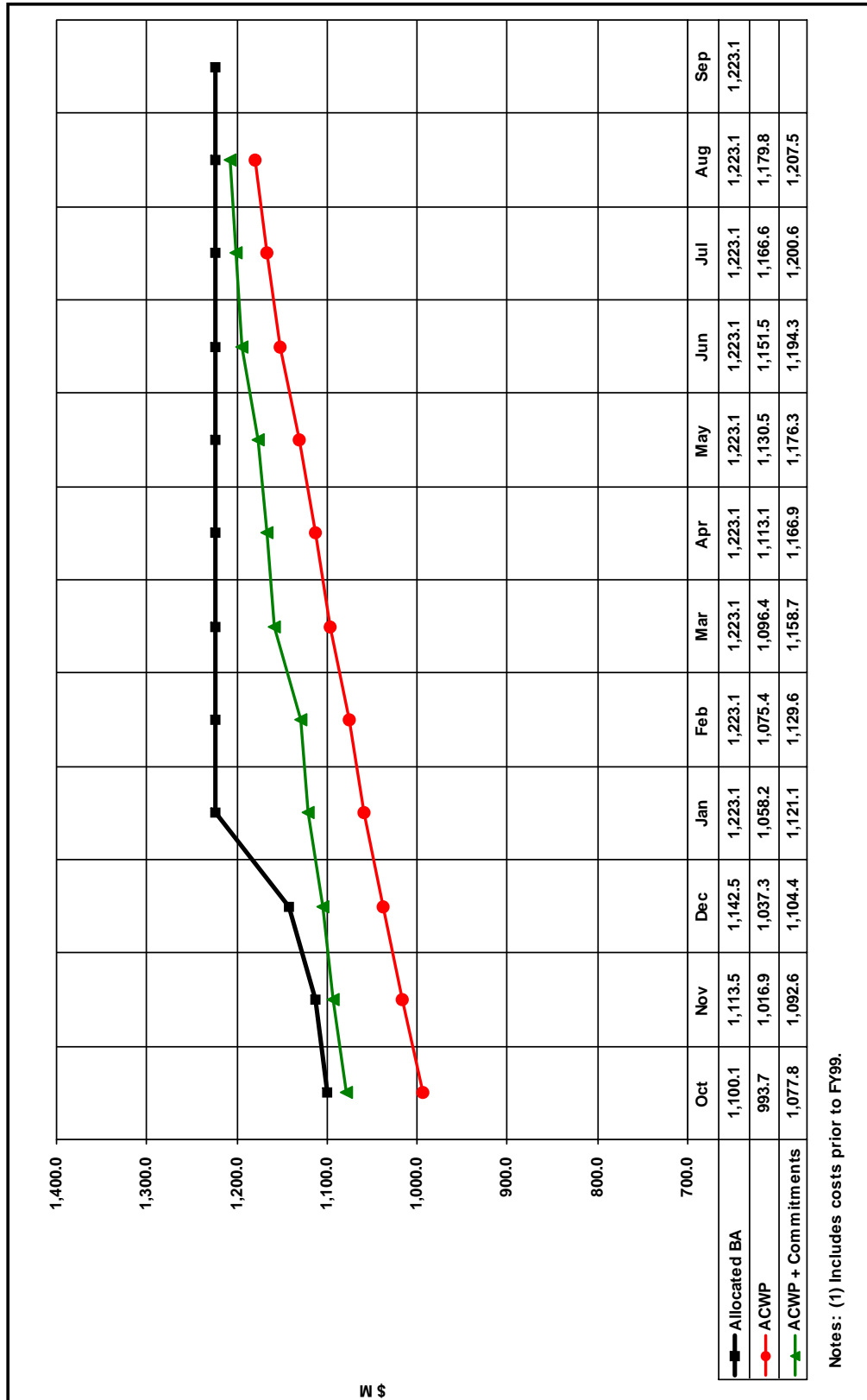


Overall Project Performance is stable





TPC Obligation Profile against BA



Notes: (1) Includes costs prior to FY99.

Phase funded procurements at the end of August could obligate an additional \$18.3M, raising the total obligation potential to \$1,226M.



PROJECT TITLE:	REPORTING PERIOD:										PROJECT NUMBER:			
	Spallation Neutron Source Project										99-E-334			
	August 01, 2004 through August 31, 2004										START DATE: October 1998			
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:										COMPLETION DATE:			
	Oak Ridge National Laboratory										June 2006			
	Oak Ridge, TN										Aug-04			
ITEM	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION			
	BUDGETED COST		ACTUAL COST		VARIANCE	BUDGETED COST		ACTUAL COST		VARIANCE		BUDGET (BAC)	ESTIMATE (EAC)	
	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	SCHED COST	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	SCHED COST	WORK SCHED	WORK PERF	COST	ESTIMATE (EAC)
1.02 Project Support	765.3	765.3	0.0	0.0	0.0	67,432.2	67,432.2	67,432.2	65,647.1	(0.0)	1,785.1	75,636	75,636	75,066
1.03 Front End Systems	3,283.9	2,399.9	2,235.2	0.0	884.0	20,832.0	20,832.0	20,832.0	20,907.7	0.0	(75.7)	20,832	20,832	20,832
1.04 Linac Systems	2,176.7	1,772.1	1,484.6	3,386.4	(404.5)	302,964.1	296,903.3	300,446.7	300,446.7	(4,060.8)	(1,543.4)	315,969	315,969	317,258
1.05 Ring & Transfer System	2,802.2	3,489.2	848.9	662.6	504.4	124,238.7	122,346.3	122,595.2	122,595.2	(1,892.4)	(248.9)	142,001	142,001	142,720
1.06 Target Systems	344.5	848.9	2,988.8	2,526.5	(474.0)	95,508.6	90,561.1	90,676.4	90,676.4	(4,947.5)	(115.2)	108,183	108,183	111,887
1.07 Instrument Systems	3,472.8	2,988.8	1,000.6	821.5	(65.3)	41,129.2	39,079.8	39,246.4	39,246.4	(2,049.4)	(166.6)	63,277	63,277	63,498
1.08 Conventional Facilities	1,065.8	1,000.6	13,274.8	11,361.2	(636.4)	354,550.1	350,498.5	347,754.0	347,754.0	(4,051.6)	2,744.6	378,912	378,912	383,628
1.09 Integrated Control Systems	13,911.3	13,274.8	11,361.2	11,361.2	(636.4)	46,661.5	45,079.4	45,019.6	45,019.6	(1,582.1)	59.8	59,745	59,745	59,745
LINE ITEM SUBTOTAL						1,053,316.4	1,034,732.6	1,032,293.0	1,032,293.0	(18,583.9)	2,439.5	1,164,556	1,164,556	1,174,634
CONTINGENCY												28,145	28,145	18,067
TOTAL LINE ITEM	13,911.3	13,274.8	11,361.2	11,361.2	(636.4)	1,053,316.4	1,034,732.6	1,032,293.0	1,032,293.0	(18,583.9)	2,439.5	1,192,700	1,192,700	1,192,700
1.01 Research & Development	60.2	85.0	84.9	84.9	24.8	99,327.0	99,219.5	99,593.5	99,593.5	(107.6)	(374.0)	100,000	100,000	100,000
1.10 Operations	1,669.2	1,670.1	1,776.2	1,776.2	0.9	49,967.2	49,551.3	47,904.6	47,904.6	(415.9)	1,646.7	119,000	119,000	119,000
OTHER PROJECT COSTS SUBTOTAL	1,729.4	1,755.2	1,861.1	1,861.1	25.8	149,294.3	148,770.8	147,498.1	147,498.1	(523.5)	1,272.7	219,000	219,000	219,000
TOTAL PROJECT COST	15,640.7	15,030.0	13,222.2	13,222.2	(610.7)	1,202,610.7	1,183,503.3	1,179,791.1	1,179,791.1	(19,107.4)	3,712.2	1,411,700	1,411,700	1,411,700
RECONCILIATION TO CONTRACT BUDGET BASE														
DOLLARS EXPRESSED IN: Thousands														
DATE: September 21, 2004														



PROJECT TITLE:	REPORTING PERIOD:												PROJECT NUMBER:							
	August 01, 2004 through August 31, 2004												99-E-334							
	August 01, 2004 through August 31, 2004												START DATE: October 1998							
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:												COMPLETION DATE:							
	Aug-04												June 2006							
	Oak Ridge National Laboratory Oak Ridge, TN																			
ITEM	CURRENT PERIOD				VARIANCE				CUMULATIVE TO DATE				AT COMPLETION							
	BUDGETED COST		ACTUAL COST		SCHED		COST		BUDGETED COST		ACTUAL COST		VARIANCE		BUDGET		ESTIMATE (EAC)			
	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF	WORK SCHED	WORK PERF		
AE/CM	3,472.8	2,998.8	2,526.5	747.5	(474.0)	472.3	354,550.1	350,498.5	347,754.0	4,051.6	2,744.6	383,628	378,912.0	4,716.0	78,361	78,361	78,361	78,361	78,361	
Argonne National Laboratory / ORNL	404.7	934.0	747.5	1,320.5	529.2	186.5	55,319.8	53,163.0	53,627.8	(2,156.8)	(464.9)	78,361	78,140.3	221.3	78,361	78,361	78,361	78,361	78,361	
Brookhaven National Laboratory	1,744.4	1,552.4	1,320.5	1,320.5	(192.1)	231.9	120,522.4	117,830.8	117,861.9	(2,691.6)	(31.1)	129,555	129,211.9	343.6	129,555	129,555	129,555	129,555	129,555	
Thomas Jefferson Laboratory	504.4	537.0	542.5	542.5	32.6	(5.5)	66,648.1	66,450.9	66,588.9	(197.2)	(138.1)	68,358	68,358.1	0.1	68,358	68,358	68,358	68,358	68,358	
Los Alamos National Laboratory	762.9	381.6	(55.3)	(55.3)	(381.4)	436.8	191,481.9	190,661.3	191,304.5	(820.6)	(643.2)	194,711	194,710.5	0.5	194,711	194,711	194,711	194,711	194,711	
Lawrence Berkeley National Laboratory	51.4	62.7	92.9	92.9	11.3	(30.2)	29,010.8	28,911.4	28,687.5	(99.4)	223.8	29,676	29,675.7	0.3	29,676	29,676	29,676	29,676	29,676	
Oak Ridge National Laboratory	8,699.9	8,563.6	8,047.6	8,047.6	(136.3)	516.0	385,077.6	375,987.5	373,966.5	(9,090.1)	2,021.1	509,345	504,547.1	4,797.9	509,345	509,345	509,345	509,345	509,345	
WBS SUBTOTAL	15,640.7	15,030.0	13,222.2	13,222.2	(610.7)	1,807.8	1,202,610.7	1,183,503.3	1,179,791.1	(19,107.4)	3,712.2	1,383,634	1,383,556	78.0	1,383,634	1,383,634	1,383,634	1,383,634	1,383,634	
CONTINGENCY																				
TOTAL PROJECT COST	15,640.7	15,030.0	13,222.2	13,222.2	(610.7)	1,807.8	1,202,610.7	1,183,503.3	1,179,791.1	(19,107.4)	3,712.2	1,411,700	1,411,700	0.0	1,411,700	1,411,700	1,411,700	1,411,700	1,411,700	
RECONCILIATION TO CONTRACT BUDGET BASE																				
DOLLARS EXPRESSED IN: Thousands												DATE: September 21, 2004								



PROJECT TITLE:	REPORTING PERIOD:												PROJECT NUMBER:			
	Spallation Neutron Source Project August 01, 2004 through August 31, 2004												99-E-334			
PARTICIPANT NAME AND ADDRESS:	BCWS PLAN DATE:												START DATE:			
	Oak Ridge National Laboratory Oak Ridge, TN Aug-04												October 1998			
COMPLETION DATE:																
June 2006																
BUDGETED COST FOR WORK SCHEDULED (NON - CUMULATIVE)																
ITEM	BCWS CUM TO DATE	FISCAL YEAR												FY Total	Out Years	Budget at Completion
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
PM BASELINE (BEGINNING OF PERIOD)	862,169	17,125	19,307	18,982	21,567	17,640	9,985	21,434	18,880	16,783	15,534	15,086	14,313	206,635	95,751	1,164,556
1.02 Project Support		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.03 Front End Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.04 Linac Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.05 Ring & Transfer System		-	-	-	-	-	-	-	-	-	-	(56)	80	25	(25)	-
1.06 Target Systems		-	-	-	-	-	-	-	-	-	-	(903)	(40)	(943)	943	-
1.07 Instrument Systems		-	-	-	-	-	-	-	-	-	-	(217)	45	(171)	171	-
1.08 Conventional Facilities		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.09 Integrated Control Systems		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL AUTHORIZED CHANGES		-	-	-	-	-	-	-	-	-	-	(1,175)	85	(1,089)	1,089	-
PM BASELINE (END OF PERIOD)	862,169	17,125	19,307	18,982	21,567	17,640	9,985	21,434	18,880	16,783	15,534	13,911	14,398	205,546	96,841	1,164,556
RECONCILIATION TO CONTRACT BUDGET BASE																
DOLLARS EXPRESSED IN: Thousands												DATE: September 21, 2004				

Three Project Change Requests were implemented in August:

Revision	PCR Number	Description	Impact (Cost/Sched/Tech)	Actual Cost Impact (Total \$)
R502	TG-04-007	Realignment of BCWS	Schedule	-
R503	RI-04-006	Ring Diagnostics Replan	Cost/Schedule	-
R504	IS-04-007	BCWS Adjustment	Cost/Schedule	-



Actual Cost of Work Performed (ACWP)—Actual cost incurred as reported through laboratory cost accounting systems plus any accruals.

Allocated Budget Authority (BA)—Cumulative funds currently allocated and authorized by the Department of Energy that may be committed and spent by the contractor for project activities.

Budget at Completion (BAC)—The sum of all budgets allocated to the project excluding contingency

Budget to Complete (BTC)—The sum of all budgets allocated to the project less commitments and cumulative actual costs.

Budgeted Cost of Work Performed (BCWP)—Value of the planned scope of work physically accomplished.

Budgeted Cost of Work Scheduled (BCWS)—Cost plan based on the budgeted value of a scope of work, time-phased based on the schedule for the scope of work.

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

Cost Performance Index—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 value of the physical work performed and the actual cost expended. $CV = BCWP - ACWP$. A negative result is unfavorable and indicates the potential for a cost overrun.

Estimate at Completion (EAC)—Forecast final cost of a scope of work based on the current ACWP plus a management assessment of the cost to complete the remaining scope of work.

Estimate to Complete (ETC)—Resource requirements necessary to complete the remaining scope of work.

Forecast Budget Authority—Future time-phased plan of how the project expects remaining BA to be allocated to the project by DOE. Through the current reporting period Forecast BA will equal Allocated BA.

Line Item (LI)—Fund “type” for design, procurement, construction, fabrication, installation, and pre-operational testing of a capital facility.

Obligation Plan—Time-phased plan of how each laboratory plans to commit their Allocated BA. Labor and

materials and supplies are typically time-phased as expended, while procurements are typically time-phased at award of contract plus award of any contract options.

Other Project Cost (OPC)—Fund “types” (Operating Expense and Capital Equipment) supporting, but not directly contributing to a LI construction project, generally include research and development and pre-operation activities.

Percent Complete—The ratio of the Earned value to the Budget at Completion. $\% \text{ Complete} = BCWP/BAC$

Percent Contingency remaining—The ratio of remaining contingency dollars to remaining work calculated as follows. The numerator is equal to the contingency available after consideration of the EAC. The denominator is the EAC less ACWP less commitments (excluding commitment to the AECM that has not been passed through to subcontractors) and outstanding phase funded procurements.

Percent Planned—The ratio of the current plan to the budget at completion. $\% \text{ Planned} = BCWS/BAC$

Schedule Performance Index—The ratio of the value of the work performed to work scheduled; $SPI = BCWP/BCWS$. Values less than 1.0 represent “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 TEC represents the total capital funds authorized for the project including contingency funds.

Total Project Cost (TPC)— $TEC + OPC$